LYNHURST BRIDGE.

A. Gillies.

The Lynhurst Bridge is one of four reinforced concrete arch bridges built in St Thomas in the last two summers. This bridge, which has a clear span of 116 feet, is as yet the longest span of the kind in Canada.

The strains on the arch were calculated on a basis of 150 pounds per square foot of live load, the permitting tension in steel being 20,00 pounds per square inch, and compression in concrete 500 pounds per square inch.

The bridge is 22 feet wide, having a 16-foot roadway and 4-foot sidewalk, and contains about 1,470 cubic yards of concrete, including rail, floor, etc. The intrados of the arch is a three-centred circle, having radii of 4 feet, 30 feet and 162 feet. The extrados is a segment of a circle with a radius of 323 feet. The intrados at the crown was 30 feet 6 inches above the footing, the arch having a rise of 18 feet, being 2 feet thick at the crown and 3 feet thick at a point 24 feet out from the crown. The arch was filled in at each end with creek gravel, well packed and rammed before the floor was laid.

Completed Arch Bridge Span, 116 Feet.

The abutments rested on hard pan, and the footings were 4 feet below the bed of the creek. The concrete in the abutments below the line E F (Fig. 1) is composd of one part cement and nine parts gravel. In this part of the work large stones were embedded in the concrete. These stones were separated enough to be each completely surrounded by concrete, and not nearer the face of the work than 3 inches.

The concrete in the arch. spandrel walls, wings, etc., was composed of a mixture of one part cement, two parts sand and four parts screened gravel and crushed stone.

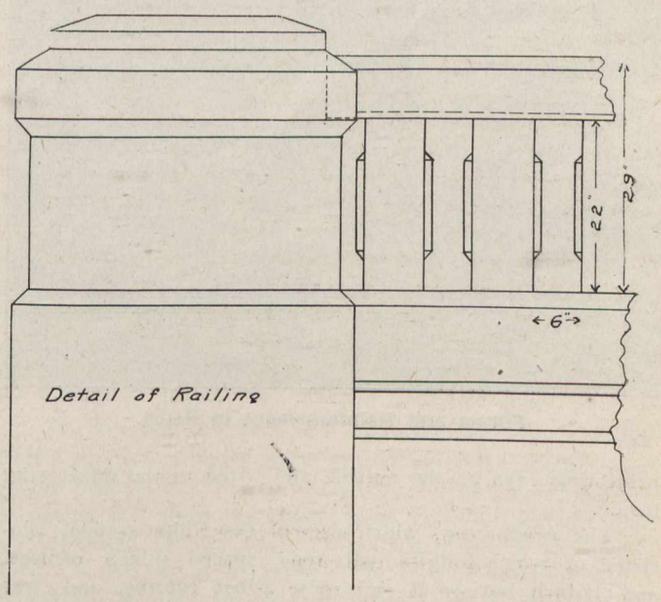
The spandrel walls were battered on the inside from 4 feet thick at the ends to a foot thick just below the level of the floor. The wing walls were 12 feet long and 1 foot thick. They were supported by two counterfort walls running back to the abutment and sloping up to within 2 feet of the top of the wing walls. The tops of the wings and the base of the railing were finished off with a mortar facing 1 inch thick, composed of one part cement and two parts sand.

The railing of the bridge was made separately as shown in Figs. 2 and 3. The small posts were 6 x 8 x 22 inches high, and spaced 14 inches centres. They fit into a groove in the bottom of the cap, and were fastened to the railing base by means of a dowel grouted into holes left in the base. The railing caps were made in 6-foot lengths and joined by means of a steel rod grouted into a groove left in the end. The four end posts and intermediate large posts were 16 inches wide, with a cap which projected above and beyond the railing. These posts were built in place at 25-foot centres, and a receptical left in them for the end of the railing. The end posts were 40 inches long, and the intermediate large posts 16 inches long.

A ½-inch asphalt expansion joint was left, through the railing base, at the crown of the arch. Similar expansion joints were also left in the railing cap and in the bridge floor.

The concrete for the base of the floor was composed of one part cement, two parts sand and three parts screened gravel. The finishing surface of the roadway was 1 inch thick at the curbs and 1½ inches thick at the centre, and composed of one part cement, one part sand, and two parts finely crushed granite. The completed floor was 6 inches thick at the centre and 4½ inches thick at the curbs. The floor crowned from the ends to the centre, the ends being about 18 inches lower than the centre.

A projection, 4 inches thick and 7 inches high, ran the whole length of the bridge, forming a base for the large



intermediate posts, and relieving the plainness. The panels, which were 2 inches deep, also helped in this way.

The excavating was done by means of drag scrapers as long as it was possible, and then by hand, the clay being