of the four trunnion posts would be exactly the same, the tops of the concrete piers were first brought up to an elevation approximately correct. Screed strips were then placed and any differences in elevation were corrected by floating with a 1 to 2 portland cement mortar.

In each trunnion pier there are four anchor bolts 1¾ inches by 6 ft. The value allowed for concrete in compression in these piers was 400 lbs. per square inch.

The total reaction per truss on the main trunnion piers is 680,000 lbs., and on the counterweight trunnion piers is 1,068,000 lbs.

The ballast walls or shore abutments of the bridge are as shown in Fig. No. 5. The elevation of the top of the Don Channel wall is 251.0, Toronto Harbor Commission's gauge; that is, taking mean sea level of New York Harbor as zero. The elevation of the crown of the roadway of the bascule bridge is 256.87. Hence it was necessary to raise the channel wall, for a distance equal to the width of the bridge, to a height of about 6 ft. above its former elevation in order to form the abutment.

The approaches to the bridge rise about four feet. The grade is an easy one on both approaches, but special attention had to be paid to the north approach on account of its intersection with Keating Street. The retaining walls to hold the fill in the approaches are of standard types and vary in height from that of an ordinary sidewalk curb to 6 ft.

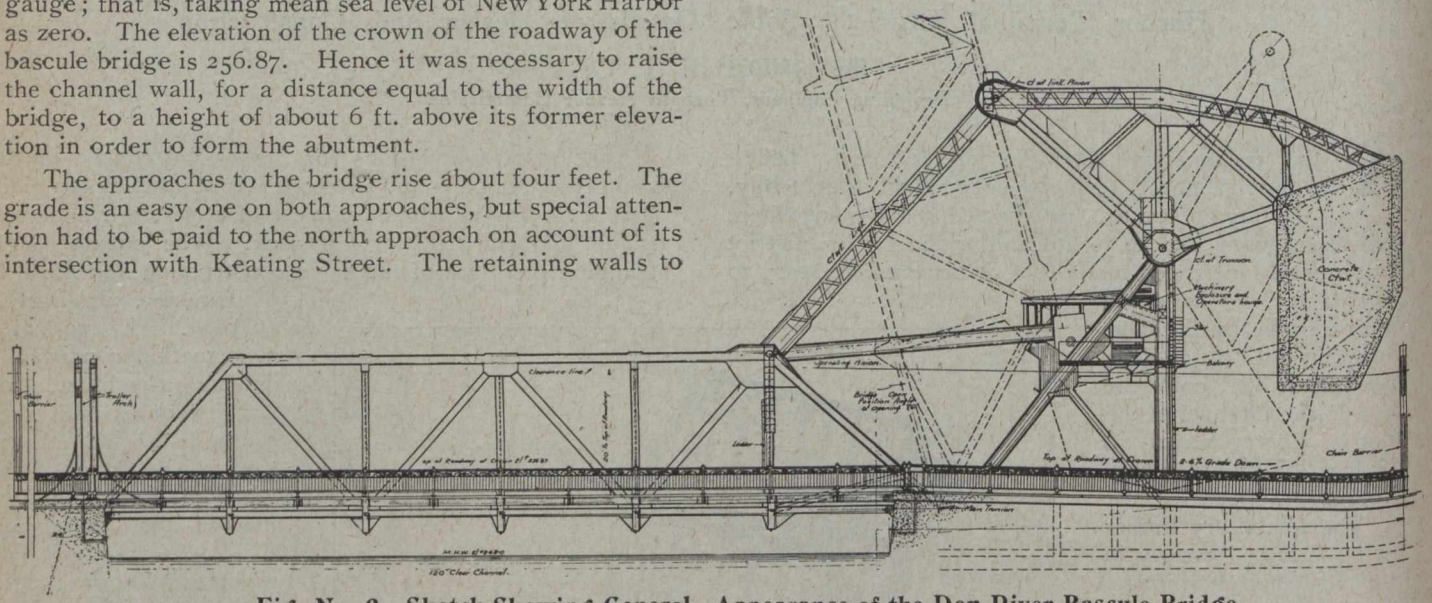

Fig. No. 2—Sketch Showing General Appearance of the Don River Bascule Bridge

Superstructure

The loadings governing the structural design of the bridge were as follows:—

Dead Load, the weight of the entire structure, including the floor system, rails, ties, guard timbers, pavements, handrails, etc.

Live Loads for trusses and floor systems:—

Electric railway, two 40-ton cars, class 20, Ontario Railway and Municipal Board specification.

Roadway, city bridges, class A, and road roller on floor.

Sidewalks, city bridges, class C.

Impact—All live load stresses, except those from road rollers or traction engines, were increased by an impact stress obtained by multiplying the live load stress by a factor derived from the following formulæ:

$$\text{Electric railway, } I = \frac{130}{L + 150}.$$

$$\text{Roadway, } I = \frac{100}{L + 150}.$$

L being the loaded length of the span producing the stress under consideration.

No impact was added to stresses produced by road rollers, traction or centrifugal forces, or wind loads, nor to any dead load stresses except as specifically mentioned for movable bridges.

All dead load stresses in members of movable bridges, towers, and counterweight arms and connections were figured for such positions of the structure as give maximum tensile and compressive stresses, and such stresses were increased by 20% for impact. These impacts were not taken in conjunction with the live load stresses and impacts.

Wind Loads—The entire structure was proportioned to resist a wind pressure of 15 lbs. per square foot on the exposed surface as projected on any vertical plane for any open position of the span; and for a wind pressure of 30 lbs. per square foot when the span is in its closed position. The machinery was proportioned for the maximum wind load on the basis of 15 lbs. per square foot, and the power was proportioned for the maximum wind load on the basis of 5 lbs. per square foot. Lateral systems of main trusses were proportioned for wind loads given for fixed spans where such loads exceeded the above.

The general appearance of the bridge is shown in Fig. No. 2. The moving leaf is a through Warren truss of six panels. The overhead clearance for traffic, from crown of roadway to top-chord bracing, is 20 ft. The length of the bridge, from centre line of main trunnion to centre line of bearing on the north abutment, is 130 ft., and the clear span is the full width of the Don Channel, namely 120 ft. The distance from centre to centre of truss is 45 ft., and the clear width of roadway, face to face of curb, is 42 ft. The roadway will have a double track street railway, 11 ft. from centre to centre of tracks. Sidewalks are 8 ft. wide, in the clear.

The wearing surface of the roadway consists of 3-inch Norway pine paving blocks, treated with 14 lbs. of creosote oil per cubic foot. These blocks are laid on a course of 3½-inch Douglas fir sub-planking, treated with 12 lbs. of creosote oil per cubic foot, and the sub-planking is laid on 6" x 9" Douglas fir cross-ties, treated with 8 lbs. of creosote oil per cubic foot, and laid flatwise, spaced 24" centres.

The requirements for structural and rivet steel and the allowable unit stresses are in accordance with standard bridge practice. All trunnions and pins are of forged steel having an ultimate tensile strength of from 70,000 to 85,000 lbs. per square inch. Bearings and pillow blocks are of cast steel having an ultimate tensile strength of