joint, and the same was repeated on top of the last layer. The whole was then covered with a 2-inch protective coat of cement mortar, reinforced with wire mesh, and graded to the ends for drainage. Stone ballast (2½-inch) was

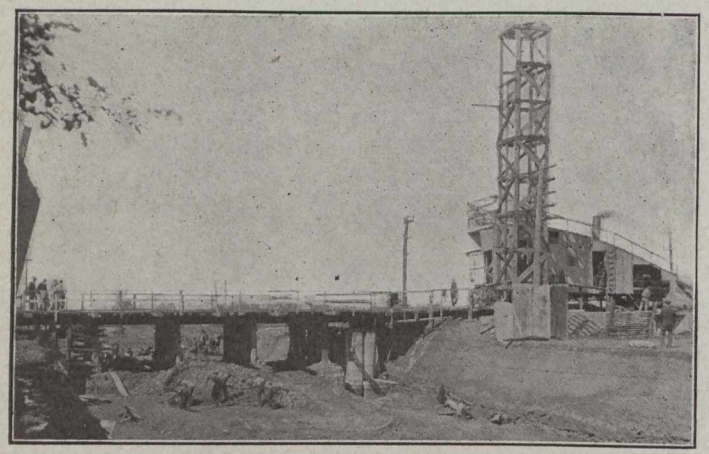

Fig. 8.—General View of Excavation.

specified to cover the entire floor, and the backfill behind the abutments is of cinders. The waterproofing is carried up the side parapets above base of rail, and down over the ends to a point well below the bridge seat, at which level a 4-inch tile drain is laid. The ties and rails were

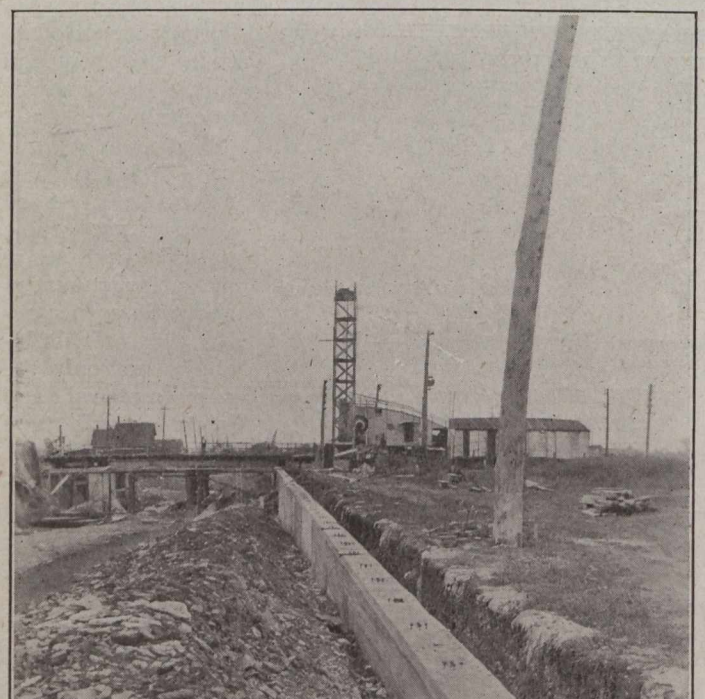

Fig. 9.—Completed Southeast Wall.

then relaid over the completed half, the ties being supported on timbers until ballasting was done. The other track was then gauntletted and work carried out on the other half similarly. Fig. 10 shows the conditions when the waterproofing was complete and ballasting in progress.

The rapidity with which this waterproofing was completed resulted in an unusually small labor charge, and a correspondingly small unit cost. Including a due share of the construction and operation of the gauntlet tracks (which was divided between this and the superstructure concrete work), the unit cost over some 3,500 square feet of bridge floor was about 15 cents per square foot.

After the completion of the bridge floor and retaining walls, the sidewalk retaining walls were poured, these being completed about the middle of October. The erection of the hand-rail completed those parts of the work to be done by the railway forces.

In regard to this hand-rail it may be of interest to note that the standards were of cast iron with flanged bases, and cast holes to receive the 2-inch railing pipes. Six-inch by ½-inch bolts were set in the tops of the walls when these were poured, to receive the flanged bases,

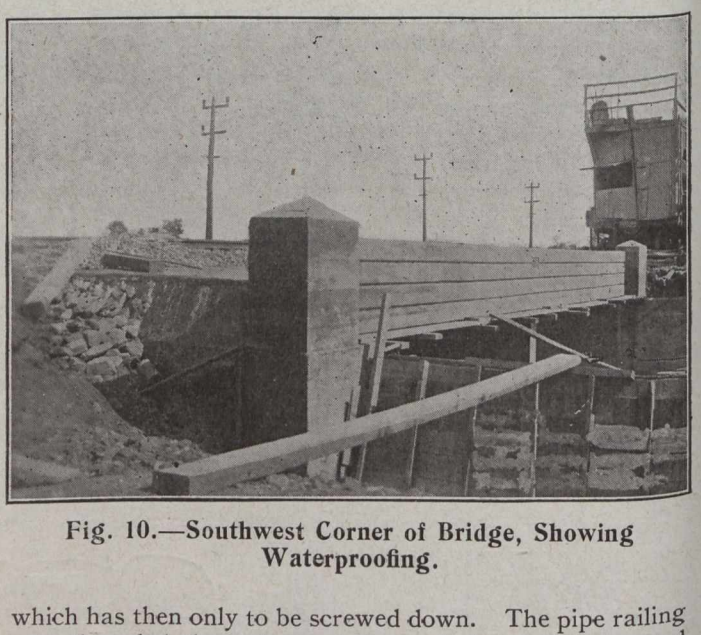

Fig. 10.—Southwest Corner of Bridge, Showing Waterproofing.

which has then only to be screwed down. The pipe railing was threaded through the holes and the ends connected up, there being practically no cutting or threading to be done. The cost of materials being fairly small, and that of erection comparatively negligible, resulted in an unusually cheap hand-rail, some 800 lineal feet being erected at slightly over 60 cents per lineal foot.

The construction of the drainage sewer was commenced by the city before the winter but the remainder of the work—that is, the road paving and sidewalk work, and laying of the street railway tracks, was deferred to the following season.

This work was carried out under the direction of Mr. H. R. Safford, chief engineer; Mr. R. Armour, masonry engineer; and Mr. H. B. Stuart, structural engineer, for the railway; and Mr. A. F. Macallum, city engineer, and Mr. E. R. Gray, deputy city engineer, for the city.

During the first half-year of 1915, sixteen building permits were taken out at Saskatoon, Sask., the total value of the improvements being $79,070, showing an increase over the corresponding half-year of 1915 of over $70,000.

The lightest-section arch-dam in the world is the Medlow dam, on Adams Creek, in the Blue Mountains of New South Wales. The structure is of concrete and is 65 ft. high from the foundation to the top of the parapet. The up-stream face is vertical. The wall is 8.96 ft. thick at the base, tapering on the down-stream face to 3.5 ft. thick at a height of 29 ft., keeping that width to the top water level and finishing with a parapet wall 1 ft. thick for the remaining 3 ft. of height.