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KENILWORTH AVENUE SUBWAY, HAMILTON

A DESCRIPTION OF TYPICAL CITY GRADE SEPARATION WORK—NOTES ON WATERPROOFING—OVERCOMING OF FALSEWORK TROUBLE.

By KENNETH CAMERON.

THE gradual extension of the city of Hamilton and the more immediate need of the Street Railway Company to lay tracks on Kenilworth Avenue, necessitated the construction of a subway under the Grand Trunk Railway tracks at the point of their intersection with the street. This section of the railway is the double-track main line from Hamilton to Niagara Falls and Buffalo, over which there are a large number of movements—both passenger and freight—all the year round. Although the ordinary vehicular traffic is at present light, the street being the easterly city limit, yet a grade crossing of the electric line was considered inadvisable, and it was decided to construct a subway under the railway tracks, no change of grade of the latter being made.

When the work was first proposed a preliminary survey and general layout were made by the city engineer's staff, the latter dealing more particularly with the street arrangements, clearances, etc. After approval, detail plans according to this layout were prepared at the office of the chief engineer of the railway. The crossing is practically square ($89^{\circ} 27'$); the approaches have 4 per cent. grades with plain concrete retaining walls, having a clear width of 50 feet between them. The bridge proper consists of a ballasted I-beam floor, carried on plain concrete abutments and a centre steel bent on concrete footings. The superstructure is built for four tracks, there

being two crossing at present, and four up to a point within about half a mile of the subway; and to take care of any future requirements all columns and footings of the centre bent are alike, so that the outside ones can carry double load if additional tracks are added on either side. The floor is carried on 24-inch I-beams, spaced 2 ft. 0 in. centre to centre and parallel to the tracks. These are filled solid with concrete except for a "V" cut between bottom flanges. The general arrangement of these details is shown in Fig. 1, which also shows the columns and

footings. One feature perhaps worth noting is that the girders carrying the I-beams are of unusual depth—with, of course, proportionate section—so that no further bracing of the columns is needed. The whole showing surface of the steel was given a finishing coat of grey paint to conform to the concrete work.

From previous information it was anticipated that the main portion of the excavation would be in medium clay with soft shale near the finished road surface, and it was at first thought that some actual economy might be made by the use of raised sidewalks and correspondingly smaller depth of abutment footings. A comparison, however, seemed to indicate that costs would run about equal, but owing to the difficulty of getting good drainage, it was decided to adopt the raised sidewalks. The section of abutments as finally built is shown in Fig. 2, which also shows the arrangement of the sidewalk, retaining wall

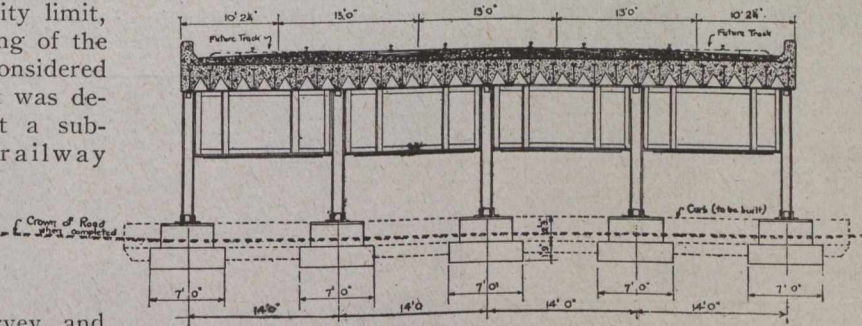


Fig. 1.—Cross-section of Bridge on Centre Line of Street.

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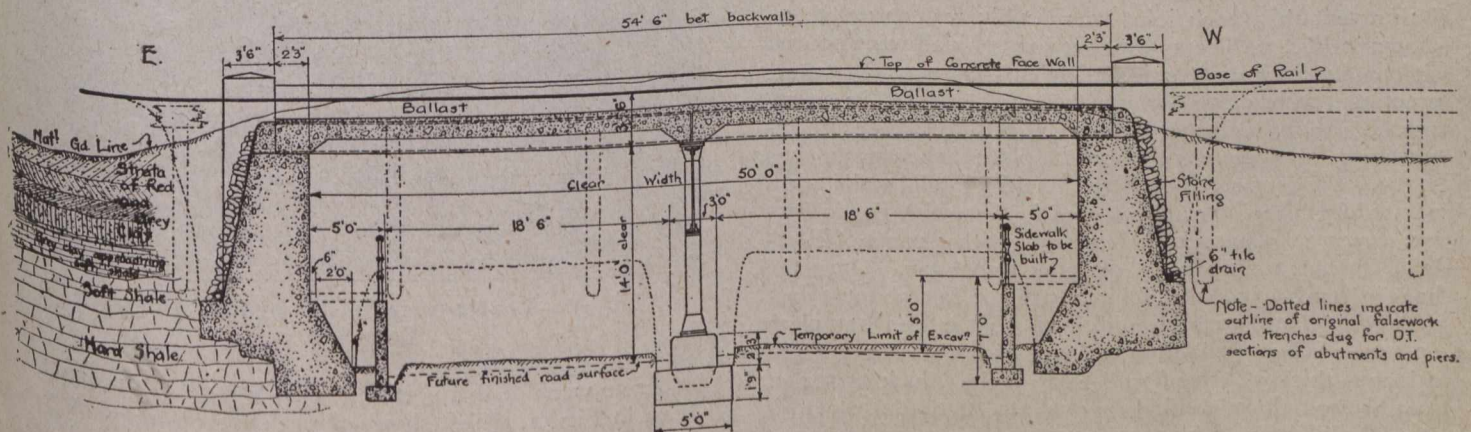


Fig. 2.—Cross-section of Bridge on Centre Line of Railway.