

At the site of Lock No. 2, the excavation for a heavy breast wall is in progress. A cavity about 175 ft. long and 25 ft. wide has been made and enclosed in sheet piling 45 ft. in length, driven to refusal and supported by wooden bracing. Excavation will be carried to a depth of 60 ft. to solid rock, whereupon the pit will be filled with concrete, thus forming the breast wall for Lock No. 2.

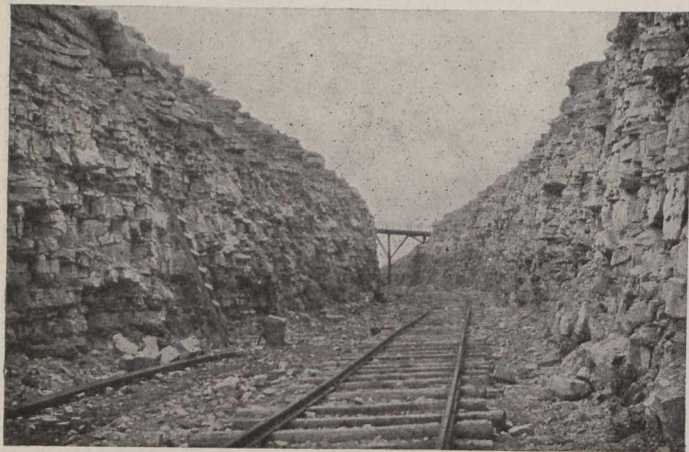


Fig. 8.—Rock-cut on G.T.R. Relocation, 3rd Curve. Thorold (Section 3).

This method of construction was adopted in order to conserve the ground above the breast wall in its natural state, as, had the lock pit been excavated in the usual manner, it would have been open for a couple of years, during which time a slope probably flatter than 1 to 1 would have formed above the breast wall, as well as along the sides of the pit. The present method will leave the material above the breast wall intact.

The contractors had completed on September 30th, 1914, a total of 1,500,000 cubic yards of dry excavation in Section 2. All this material, with the exception of that required for grading the construction railway, has been transported to the harbor site and used in the construction of the dykes. The section involves the excavation of about 6,000,000 cu. yds. of earth. This part of the work has proceeded very rapidly by means of heavy steam shovels, drag-line excavators and several mule outfits operated in connection with grading machines. The embankments are being built by mule teams hauling wagons from the grading machines to the different banks, where it is placed in layers and compacted after being watered.

Section 3.—The contract for Section 3 was let on October 4th, 1913, to O'Brien & Doheny, Montreal, and Quinlan & Robertson, Toronto, in combination, the price being approximately \$9,500,000. It extends from Sta. 380 to Sta. 490 and includes the twin Locks Nos. 4, 5 and 6 in flight, single Lock No. 7, and guard gates. A part of the contract is the diversion of the Welland Division (to Port Colborne) of the Grand Trunk Railway. At present this line extends along the right-of-way of the canal. The relocation is along the west side for a distance of about 3 miles, and extending into Section 4.

The part of this work included in Section 3 is practically completed. Some particularly heavy rock excavation and earth cutting were encountered, as the railway here climbs the Niagara escarpment. The location of the line at this point was a difficult matter on this account. Over 500,000 cu. yds. of material have been removed from this cutting within a length of $1\frac{1}{2}$ miles.

There is also a diversion of the main double-track line of the G.T.R. to Niagara Falls. This line crosses the right-of-way at the foot of Lock 4. The diversion has required the erection of a bridge of 4 truss spans, already supplied and erected by the Hamilton Bridge Works Company. This diversion is only temporary, and the bridge will be removed when the canal is nearing completion, whereupon it will be available for use elsewhere. The pier for the ultimate structure is to form a part of the centre wall of twin Lock No. 4. The final bridge will consist of a bascule lift span on either side of this pier. This diversion allows free passage for the excavated material from the lock pits to the stone crushing plant, and to Port Weller. In order that the diversion might be finally disposed of and cause no further trouble to the Grand Trunk Railway or to the contractor, the centre pier upon which one end of the steel spans rest has been sunk through earth and rock, a depth of 90 ft., to the level of the foundations of the locks, and, as stated, it will be eventually incorporated in the centre wall of the locks. The side piers have been sunk to about two-thirds of this depth, to the surface of the rock below. This will allow the contractors to excavate the lock pit completely and the lock walls to be built without interfering with the bridge. It will be noted that instead of building double-track spans, two single-track spans have been constructed, the idea being that they will be more easily disposed of, upon the completion of the work, than a double-track structure.

In addition to the above, which in reality calls for two bridges, the contract includes the substructures for four others. One of these is bridge No. 7 on the St. David's-Thorold Road in Thorold. It consists of a reinforced concrete bridge 99 ft. in length, and a double bascule bridge over the canal. The contract requires the complete construction of the former and the foundations for the latter. The Hamilton Bridge Works Company has recently finished the erection of a steel bridge for the Welland division of the Grand Trunk Railway. This consists of two deck plate girder spans and one through

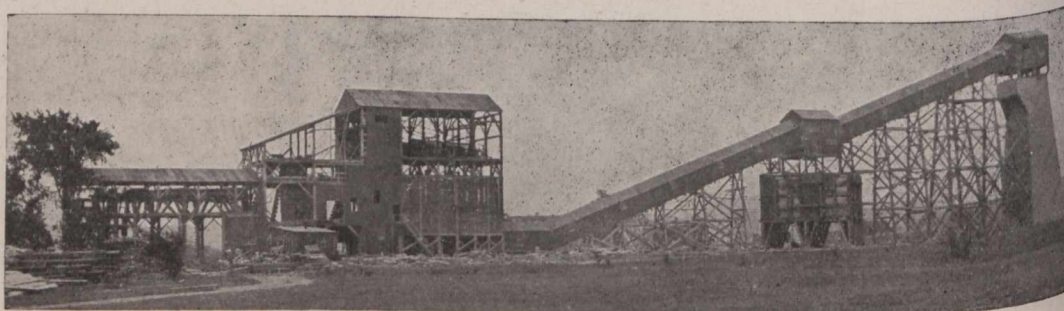


Fig. 9.—Department's Main Crushing Plant, Section 3.

girder span. It is located close to the guard gates above Lock No. 7.

A highway bridge, No. 8, over the railway cutting at Peter Street, Thorold, will consist of a bascule lift bridge, 80-ft. span, over the canal, and a reinforced con-