

crete bridge of 3 spans, each $36\frac{1}{2}$ ft. c. to c. of piers, over the G.T.R. right-of-way. It has a 16-ft. roadway and 6-ft. sidewalk.

Bridge No. 9, for the Niagara, St. Catharines and Toronto Railway, will be a swing span of 222 ft. 11 in., with a reinforced concrete skew approach, the centre spans of which are 46 ft. 9 in. c. to c., while the end spans next and farthest from the canal bridge are 11 ft. 7 in. and 28 ft. 6 in. in length respectively.

These bridge structures and diversions are really incidental to the general scope of the contract, and have been mentioned first as the work they involve is encountered at an early stage. There are about 3,500,000 cu. yds. of earth, 2,500,000 cu. yds. of rock and 1,500,000 cu. yds. of concrete masonry on this section. The 3 twin locks in flight are to be built, the lower end of twin Locks No. 4 being located under the Grand Trunk Railway main

was then excavated along the full length of the dam for a few feet in depth into the solid material, and the dam has been built up in layers of approximately 8 to 12 in., each layer being carefully spread, watered and compacted by rolling. This process will be continued to the top. A heavy stone talus consisting of rock from the excavation will then be placed on the downstream side of the dam to add weight and to prevent sliding, and earth will be dumped on the upstream side after the water has been let in, to reduce the depth of water in the pond to about 10 or 12 feet.

The construction of this core wall and watertight embankment will provide a pondage covering 84 acres, for Lock No. 6. The core wall, which has been completed, is irregular in alignment. For a distance of approximately 500 ft. it projects from the canal wall at an angle of 45° . Then its direction changes through an angle

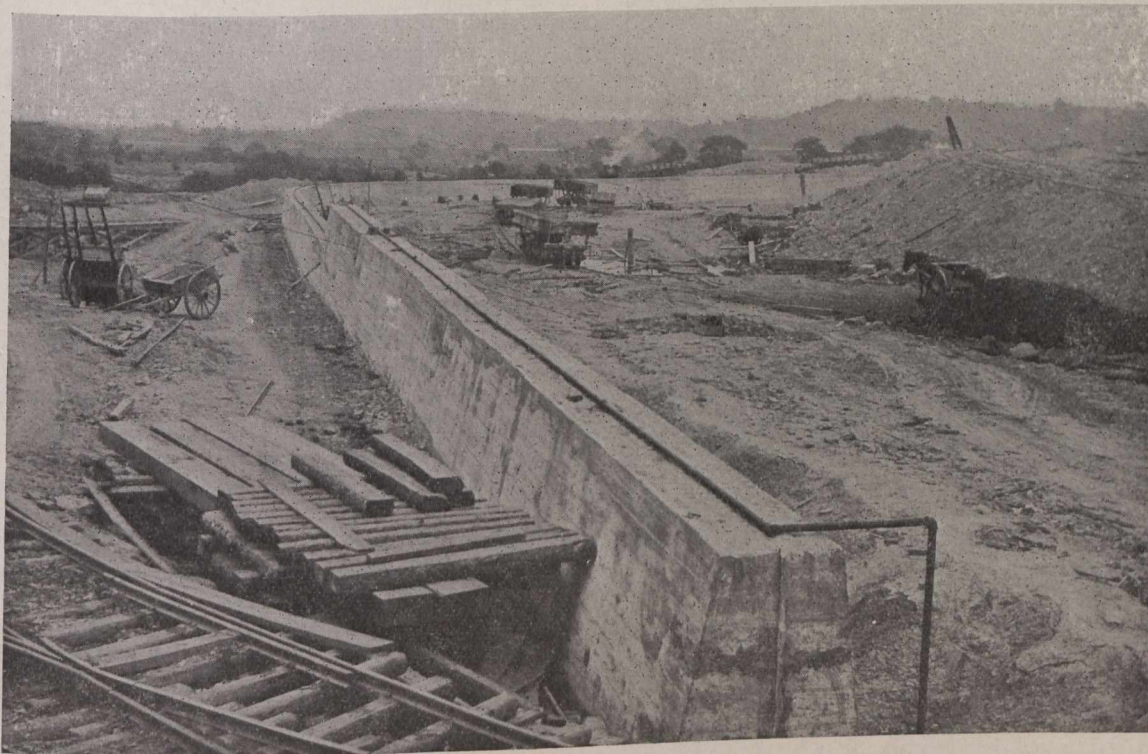


Fig. 10.—Core Wall of Dam at Head of Lock No. 6, Section 3.

line, where the 4 large steel spans noted above carry the diverted railway. These three locks will lift a vessel $139\frac{1}{2}$ feet to a regulating basin which will be formed by a large dam now in course of construction, on the east side at the head of Lock No. 6. Above this pond will be built single Lock No. 7, the head of the lock being located at Peter Street in Thorold, where a swing bridge crosses the present canal at the head of Lock 24.

The dam at the head of Lock No. 6 is an interesting and important part of the section. It is of earthen construction, having a concrete core wall extending from the rock surface to an elevation about 30 ft. below the top of the dam. The latter will be 75 ft. in height at its highest point, and the core wall is built in a trench in the clay overlying the rock, varying in depth from 5 to 30 feet. The good earth from the excavation has been dumped on either side of the dam site, and is now being re-handled into the work. The seat of the dam was carefully prepared by removing all loam and other loose material and by benching all sloping surfaces. A toe trench

of 49° , and for a distance of about 675 ft. it extends outward from the canal and at nearly right angles to it. The centre line of the dam extends from the terminus of the core wall at this point at an angle of nearly 30° for a distance of about 400 ft. where a backward sweep of about 67° occurs. This new line is followed for the remaining portion of the embankment, approximately 650 ft. The thickness of the core wall varies from 5 to 10 ft., depending on the depth, tapering at the top with a batter of 1 to 6 to a uniform width of 3 ft. At any vertical cross-section the thickness is uniform from the taper to the base of the wall.

Two drag-line excavators are re-handling the material that has been dumped along the side of the proposed dam from the stripping of the site of the flight locks, and from railway cuttings in the vicinity. The watertight embankment has been completed to a depth of about 6 ft.

It should be stated that the location of these flight locks, as well as the diversion of the Welland division of the G.T.R., is in the heart of the town of Thorold and