

dation was on boulder material underlying some 30 ft. of blue clay.

GREASE.—Only one line of 10-ft. pipe was required for the Grease River culvert; the foundation was on piles. An accident occurred during construction. Fig. 6 shows this pipe in place and partly covered with the concrete filling. The water, with which the pit was filled for protection against frost, burst out and its heavy ice covering settled down on top of the cast-iron tube, which had only been half concreted. Many rings were broken, but they were repaired in place with angle irons and bolts.

DRAW BRIDGES.

Four bridges cross the summit level, all of similar design. There is no pivot pier in midchannel, but instead the pivot is placed in line with the south bank, and the whole width of the bottom 100 ft., is free for navigation. A boat passing along the prism resembles a movable dam and piles the water at any restricted part of the channel. The currents thus created tend to swing ves-

sel 50 ft. wide on bottom, with 2 to 1 slopes. It is throttled by two large "Stoney" sluices, 20 ft. x 22 ft., which hoist up into a steel superstructure resembling a double gantry. The guard gate itself is 46 ft. wide—the width of a lock—and consists of two hollow quoin abutments with splay walls above and below, Fig. 9. A pair of gate exactly similar to lock gates revolve in the quoins and close against miter sills. The splay walls above and below are of concrete, and are made 10 ft. wide to form a roadway on the south side. Through these, arches of 15-ft. span are pierced to pass the feed water into the raceway and out of it. A foundation platform was first made of concrete 12 ft. wide and 2 ft. deep, and upon this the arches were built. These slabs and that under the guard gate and sluice rest directly on hard blue clay, and have given no trouble.

LOCK NO. 4.

Between guard gate and lock the ordinary section of canal prism is resumed for about 800 ft. Splay walls, as usual, are placed above and below

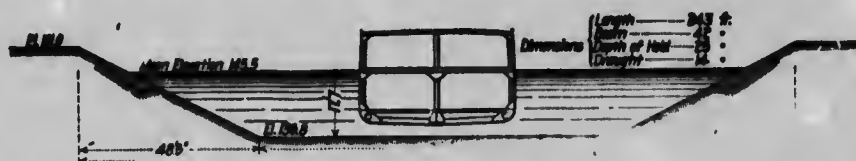


FIG. 2. TRANSVERSE SECTION OF CANAL PRISM; SOULANGES CANAL WORKS, CANADA.

sels across the canal. To avoid this the prism area is increased at the bridges by excavating in rear of the pivot piers (Fig. 7). One arm of the bridge spans this side basin and the other spans the canal proper. Practically all the bridge masonry is concrete, only the copings and parapets being of stone. All ironwork is painted with white lead, and the graceful superstructures, contrasting with the green banks and adjacent woods, give quite a picturesque effect. On top of each bridge a red lantern is placed exactly on the center line of the canal, showing both up and down, as a danger signal, when the draw is closed against navigation.

POWER-HOUSE.

The canal power-house is situated about the middle of the summit level, advantage being taken of the crossing of the Grease River to use it as a tail race. The power-house is combined with a waste weir and will be described further on under electrical installations. Some 720 HP. is generated for lighting and for operating gates and valves.

GUARD GATES FOR LOCK NO. 4

The summit level ends with a guard gate and lift lock. The guard gates are 1,000 ft. above the lock, Fig. 8, and are never opened until the lock gates are closed. To the south is a feed race-

way 50 ft. wide on bottom, with 2 to 1 slopes. It is throttled by two large "Stoney" sluices, 20 ft. x 22 ft., which hoist up into a steel superstructure resembling a double gantry. The guard gate itself is 46 ft. wide—the width of a lock—and consists of two hollow quoin abutments with splay walls above and below, Fig. 9. A pair of gate exactly similar to lock gates revolve in the quoins and close against miter sills. The splay walls above and below are of concrete, and are made 10 ft. wide to form a roadway on the south side. Through these, arches of 15-ft. span are pierced to pass the feed water into the raceway and out of it. A foundation platform was first made of concrete 12 ft. wide and 2 ft. deep, and upon this the arches were built. These slabs and that under the guard gate and sluice rest directly on hard blue clay, and have given no trouble.

The lock itself is of concrete construction, only the face of the chamber above the lower reach water level being of cut stone. The lower sill is elevation 125 (above sea) and the upper is at 137. On top of the sills 15 ft. of water is provided for 14-ft. navigation, so the lower reach working water level is (125 + 15) El. 140 and the upper (137 + 15) El. 152. This would be a lift of 12 ft., but usually the summit level will be worked at El. 154 or 155, making the lift 14 or 15 ft. For the foundation of this lock 1,100 rock elm piles were driven 40 to 45 ft. into blue clay at 4-ft. centers under each lock wall and across the upper and lower ends. The tops were cut off and