THE TOWN OF MAGOG, MUNICIPAL HYDRO-ELECTRIC DEVELOPMENT.

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The town of Magog inaugurated in January, 1912, its new hydro-electric plant on the Magog River, which supplies energy for its waterworks, and electric lighting system, also to the cotton mills of the Dominion Textile Company. This plant replaces the town's old development which had to be abandoned owing to its delapidated condition, and to its serious waste of water due to antiquated design, and non-utilization of the whole head.

The Magog River drains Lake Memphremagog, which is a considerable sheet of water, having a length of 30 miles and an average width of one mile and being fed by numerous small streams and springs. It affords a remarkable natural storage basin for regulation of stream flow which would be advantageous to all the powers on the Magog River, and to the St. Francis River, of which the Magog is a tributary. The flow at present fluctuates considerably, though the dam of the Dominion Textile Company, which controls the outlet of the lake, helps equalization to some extent.

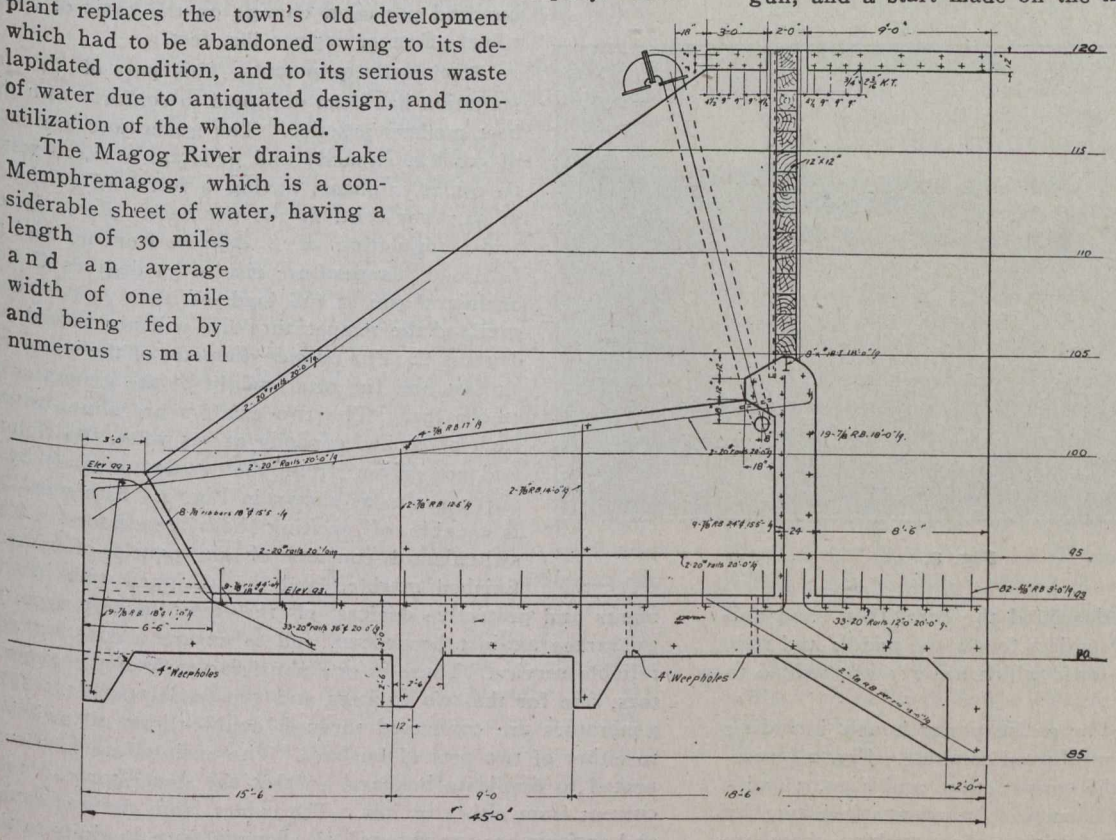

Fig. 1.—Cross-Section Through Sluiceways.

The Development.—The new plant is situated about two miles below the town, just below the site of the old plant, previously mentioned, and consists of a reinforced concrete power house, a reinforced concrete sluiceway, and earth embankment wing walls with concrete cores. Owing to the absence of rock, the design had to be suitable for an earth bottom, and erosion was guarded against by providing tumble-bays below the stoplog sluiceways in which the force of the falling water is absorbed by a water cushion, and by a timber crib which prevents any washing as the water leaves the tumble-bays.

The early spring of 1911 was spent in surveys and sinking test pits to obtain data for designing. The formation generally consisted of a top layer of gravel and boulders, and a heavy underlying stratum of hard clay. In March a wagon road was built into the site as well as a siding from the main line of the Canadian Pacific Railway. As the heavy blanket of snow disappeared clearing the timber and brush from the site, and flooded area was begun, and a start made on the first half of the cofferdam which was built around the site of the power house, work progressed rapidly so that by August 1st the river was turned through the turbine chambers and draft tubes, and the second part of the cofferdam, enclosing the sluiceway section, was begun. Simultaneously with the main part of the work, the concrete core walls and earth embankments were constructed, so that by October 30th the work was practically complete, except for its equipment, which was late in arriving, and it was not until January 20th, 1912, that current was turned on to the transmission line for the first time.

The Dams.—The concrete dam, 144 feet long, 35 feet high, 45 feet wide, at the base, is composed of six stoplog sluiceways and two blind sections, and is built with tumble-bays to break the force of the falling water, as shown in the section of the dam, Fig. 1. Four-inch weep holes are left in the floor of the dam for seepage and to prevent upward pressure and a twelve-inch pipe is imbedded in each pier to prevent a vacuum behind the sheet of falling water. Two recesses, 12 inches by 14 inches, lined with a 12-inch channel are left in each pier to allow the timber stoplogs to slide in. The stoplog openings in the six bays are 15 feet high by 14

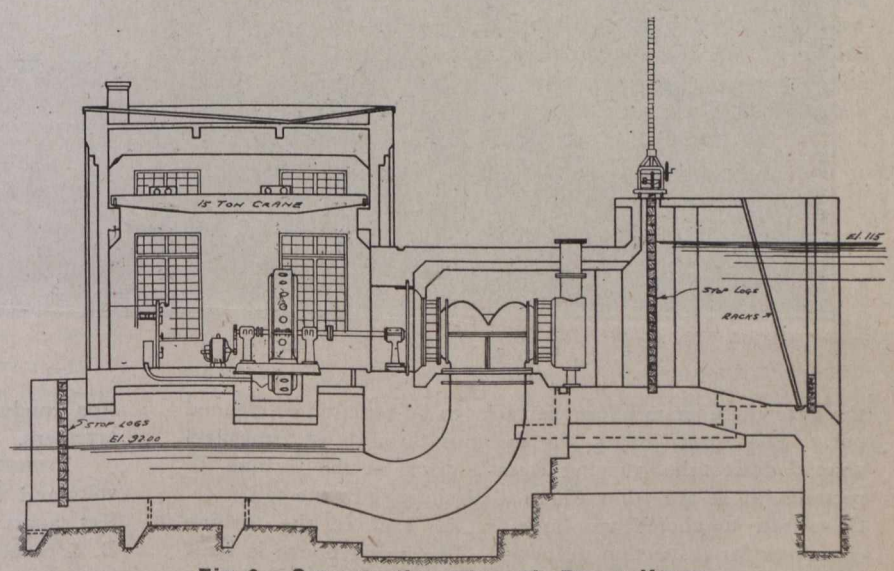

Fig 2.—Cross-Section Through Power House.

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