

CONCRETE DAM AT HESPELER, ONTARIO

We present herewith views of a concrete dam recently constructed for the R. Forbes Company at Hespeler, Ont. The bed of the stream at the site of the dam is a formation of hard unstratified limestone, forming an ideal sub-base for the concrete structure.

in height. The clear length² of the spillway is 204 feet.

One abutment of an average thickness of 3 ft. 6 in. was built at the eastern end, up against the wall of the mill, and at the western end an abutment, 10 ft. in width, was provided with a 6 x 9 foot opening,

of dams for low heads, and authorizes this journal to state that the use of the design can be had for the asking, although fully protected in the patent office.

Metal reinforcement was used in a horizontal plane at base of the dam, and also in the vertical and



FIG. 1.—VIEW OF FACE OF R. FORBES DAM.

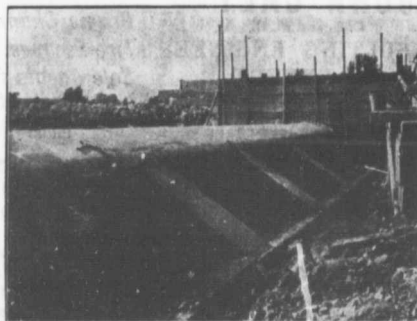


FIG. 2.—UPSTREAM SIDE OF DAM BEFORE BACKED UP WITH STONE.

The old dam was a modern structure with knee frames and stone filling and was thought to be unsafe, and also leaked and failed to hold the water at a time when most needed.

The new dam was built immediately below the old one, the latter serving the work as a coffer dam. The work was carried down to hard rock, all the weathered or deteriorated rock near the surface being removed. The depth necessary to

controlled by stop-logs six feet in length, to enable the reservoir to be emptied when desired.

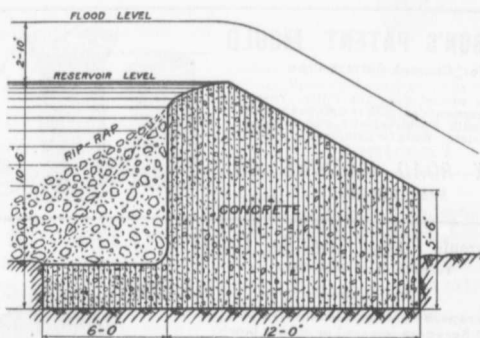
The design of the dam is by Mr. Jno. S. Fielding, C.E., of 15 Toronto Street, Toronto, and contains a special feature in the use of an up-stream floor or toe, extending 6 feet under the reservoir, and loaded with the stone out of the old dam. The connection of this toe to the dam is increased by the addition of ribs, as shown in the

sloping faces, the total cost of such not exceeding \$80, but giving an extra strength to the structure to resist temperature stresses, and to enable it to act as a unit. The total cost of the work, including the stone filling and removal of the old dam, was \$4,100, and one unique feature being that the engineer's estimate of 777 cubic yards as necessary to complete the work was only exceeded by 1 yard, the actual amount being 778 cubic yards.

The safety factors against-sliding with a coefficient of friction of .65 are as follows:

Main portion with water at crest level.....	2.73
Total section with water at crest level.....	3.64
Main portion with 2-10 of flood.....	1.70
Total section with 2-10 of flood.....	2.465
Total section with 4-6 of flood.....	2.10

Messrs. Frazer and Eickle, of New Hamburg, were the contractors.



SECTION OF R. FORBES DAM.

secure a good bed varied from 18 inches to 6 feet.

The concrete used was in the proportion of 1:2½:5, with an addition of 20 per cent. of rubble stones in the interior of the mass. The aggregate used was pit gravel, from ground owned by the company, and sand was obtained by screening.

The height of the dam varies from 12 feet to 8 feet. Fig. 1 shows a section of 10 feet 6 inches

up-stream view Fig. 2, the photo of same having been taken before the stone filling was placed in position.

During flood time the vertical pressure of the water on this toe is increased as the horizontal pressure on the the up-stream face of the dam is increased, and in this way the safety factor remains satisfactory at all conditions of the flood. Mr. Fielding claims this device to be a distinct advance in the design

Mr. G. E. Cooper, has been appointed Assistant City Engineer of the city of Vancouver.

Mr. H. L. Jordan, Canadian Pacific Railway divisional engineer, Montreal, died at St. John, N. B., November 8, aged 35.

J. Galt, C. E., of Toronto, has purchased a property at Vernon, B. C., and will reside for a considerable part of the year there in future.

Building Inspector Capt. G. McSpadden, who has for several years been connected with the building department of the Vancouver city council, and Assistant Commissioner H. T. Devine, have resigned there appointment and will enter the real estate business.