

The reader is cautioned against attempting to draw too radical conclusions from the above test results. He must fully recognize the fact that the stone aggregate in concrete is but one of a large number of factors tending to produce widely varying results, affecting the strength, reliability and permanence of structures composed wholly or in part of concrete. If the results obtained in this test are interpreted literally we are led to conclude that the stone mason's couplet,

"Stone upon stone makes a very poor wall,
But all mortar makes none at all,"

is mere sentiment and altogether misleading. Whereas the principles which it embodies are entirely sound and quite in accord with good concrete construction practice, for in reality concrete is but rubble masonry under another name.

Insofar as strength is concerned, the stone aggregate of a concrete will become a determining factor (1) when it is weaker in strength or lacks the toughness, hardness or other desired physical properties possessed by the mortar surrounding it, and (2) when its quantity is in excess of that required by practical or economic considerations.

Regardless of strength, it will readily be seen (1) that economy of materials, more especially the cement content of the mix, demands that the mortar portion of the concrete be not excessive, and (2) that economy of labor precludes the use of an excess of stone aggregate. From a practical point of view, to "drown the stone in mortar" means the production of a non-homogeneous concrete by reason of the irregular distribution of the stone particles, while to use a "stony mix" means a harsh, unworkable concrete which can be placed only with difficulty. Erratic field conditions and the "personal equation" of laborers, combined with "the location of the boss," are factors which too frequently produce conditions akin to an excess of stone aggregate. As a result, some structures contain "stone pockets" which greatly reduce their efficiency.

WINDSOR SEWER TENDERS

FOLLOWING are the tenders which were received a few weeks ago for the sewer work that is to be done by the Essex Border Public Utilities Commission in Southwestern Ontario:—

Standard Construction Co., Toronto, \$163,573.40;
Connolly-Agnew Construction Co., Toronto, \$165,382.50;
Merle, Merle & Ray, Walkerville, \$172,379.00.

Tom Lowes, of Mimico, formerly partner of T. Aird Murray, consulting engineer, Toronto, is the manager of the Standard Construction Co., who were the lowest bidders. All bids were rejected and the work will be let at cost plus a sliding scale fee, as adopted by the U.S. War Department. Propositions upon the latter basis were advertised for to be received up to 2 p.m. to-day.

MR. CARPENTER'S ARTICLE

IN last week's issue, reference was made in the report of the Saskatoon meeting of engineers to the paper read by H. S. Carpenter, deputy minister of highways, Regina. A parenthetical note said: "See next issue for Mr. Carpenter's paper." We regret that contrary to expectations, our copy of Mr. Carpenter's paper did not reach us in time for this week's issue, but it will appear in *The Canadian Engineer* for August 29th, 1918.—
EDITOR.

ALUMINUM CO. SEEKS PERMISSION TO BUILD WEIR IN ST. LAWRENCE RIVER

PERMISSION to construct a submerged weir across the south channel of the St. Lawrence River near Massena, N.Y., is being sought by the St. Lawrence River Power Co. The company's application will be heard by the International Joint Commission next Thursday, August 29th, at Montreal. This application, which is being opposed by the Dominion Government through its counsel, F. H. Keefer, of Thorold, and by the Commission of Conservation through A. V. White, of Toronto, was first brought up at a sitting of the International Commission in Atlantic City last week. After hearing the representations of Judge Koonce, counsel for the United States War Department, who argued that the application should be proceeded with immediately, and of Mr. Keefer, the commission determined to hear arguments next week at Montreal, thus partially suspending the rule calling for thirty days' grace for the filing of response to an application.

Needed to Increase Output

Judge Koonce, in pressing the immediate hearing of the application, submitted letters from the chairman of the United States War Industries Board, and the director of aircraft production of the United States, supporting the application. In the letters it was claimed that the construction of the dam would permit the Aluminum Company of America, whose plant is at Massena, N.Y., to increase its output. It was admitted that the supply of aluminum is at present equal to the demand, but the latter, it was stated, is increasing. It was claimed that construction of the dam would constitute no serious disadvantage to Canadian navigation.

Mr. Keefer asked for further delay in order to acquaint himself with what was involved in the application. It is understood that the application is being opposed by the Dominion on the ground that the construction of such a dam would interfere with navigation and that it would be granting to a private company the right to develop water powers which the government itself might later on desire to develop for the benefit of the community at large.

The St. Lawrence River Power Company was represented by Attorney Leighton McCarthy, of Toronto, and by Engineers Henry Holgate, of Montreal, and J. W. Rickey, of Pittsburg. Francis King, K.C., of Kingston, appeared for the Dominion Marine Association.

Government Asks Hearing, Not Approval

The St. Lawrence River Power Company claimed in their application that there is need of a weir in the waters between the Long Sault Island and the canal which leads to Grass River. Through their counsel and the counsel of the War Department, they claimed that in the three worst winter months they would be able to turn out approximately 6,000,000 or 7,000,000 more pounds of aluminum from their plants if this weir is allowed.

F. C. Keefer wanted to know whether the application is asked for by the United States Government, but Judge Koonce declared he was only asking that the application be heard without delay, and that he did not ask for the approval of the application.

The Atlantic City meeting of the International Joint Commission had been called to hear the application of the New York and Ontario Power Company, of Waddington, to do some work to improve their power plant, but before argument on that application was started, Judge Koonce asked to be heard in the other matter.