

CONTRACTS AWARDED.

VANCOUVER, B.C.—The contract for steam fire engine and Hayes hook-and-ladder truck has been given to the Watrous Engine Works Co., of Brantford.

ARTHUR, ONT.—The contract for building Presbyterian church has been let to Mr. Stephen, of Chesley, at the price of \$6,397, exclusive of slating, windows, heating and ceiling decoration.

FREDERICTON, N.B. Willard Kitchen, of this city, has been awarded the contract for the substructure of the new steel bridge to be erected across the Nashwaak at Marysville; price, about \$10,000.

TORONTO, ONT.—The tender of Oakley & Holmes has been accepted for the excavation, masonry, brick and cut stone work of the new office building of the National Trust Co., 18 King street east; Geo. W. Gounlock, architect.

CHARLOTTETOWN, P.E.I.—C. B. Chapell, architect, has let the contract to Chas. Yeo for two fire-proof vaults in, and restorations to Parliament buildings in this city for the provincial government. Same architect has charge of the new wing to St. Dunstan's College, the contractors for which are Cochrane & Duffy.

ST. THOMAS, ONT.—The following tenders were received for \$40,000 county of Elgin $3\frac{1}{2}\%$ 20-year debentures: G. A. Simson & Co., Toronto, \$40,606 and accrued interest and \$10 exp.; G. W. Wood & Son, \$40,606 and accrued interest; W. H. Brouse, Toronto, \$40,506 and accrued interest and \$10 exp.; A. E. Jarvis, Toronto, \$40,178.08; S. O. Perry, \$40,021 accrued interest and \$10 exp.; Western Canada Loan & Savings Co., 100 less accrued interest; Imperial Bank, 99 $\frac{1}{2}$; A. T. Drummond, Montreal, \$39,800; Hanson Brothers, Montreal, 99.05. The tender of G. A. Simson & Co. has been accepted.

OTTAWA, ONT.—The corporation of Ottawa University have accepted the tender of L. J. Fauteux for the erection of the new museum and science building, at the price of \$38,000. Other tenderers were: Paquette & Godbout, St. Hyacinthe, \$52,000; Alexander Garvoek, Ottawa, \$49,970; Viau & Lachance, Hull, \$49,650; J. J. Lyons, Ottawa, \$44,889; Martineau & Prenoveau, Montreal, \$43,495; Joseph Bourque, Hull, \$42,750.—Mr. J. R. Booth has awarded to the Canadian General Electric Company, of Toronto, the contract for the complete electrical equipment of a power house to be erected at the Chaudiere.—The Metropolitan Electric Company have awarded the contract for their works at Britannia to Brewder & McNaughton, of this city. The work is to be completed by Nov. 15th.

BIDS.

HALIFAX, N. S.—Four tenders have been submitted for the supply of a municipal electric light plant. These will be opened in a few days.

QUEBEC, QUE.—Tenders were opened on Saturday last for the construction of the proposed bridge across the St. Lawrence. Four tenders were submitted, from the Carnegie Steel Company, of Pittsburg; Dominion Bridge Company, Montreal; Phoenix Bridge Company, Pennsylvania; and Union Bridge Company, New York. The contract will not likely be awarded for some time.

OTTAWA, ONT.—The following tenders were received by the Separate School Board for building a new school: Viau & Lachance, Hull, brick, \$15,800; stone, \$16,500. Joseph Bourque, Hull, brick, \$15,750; stone, \$15,300. J. A. Desrivieres and A. Giroux, brick, \$16,467; stone, \$18,522. Davis & Dufour, brick, \$16,557; stone, \$18,825. A. Charlebois, brick, \$16,590; Brouse & Froud, \$16,500. All the tenders are above the estimated cost, and as a result the contract has not yet been awarded.

MUNICIPAL DEPARTMENT

CONSTRUCTION OF MACADAM ROADS.

The following, though entitled "Building Macadam Roads," is in a large measure applicable to the work on many of our city streets, and is from circular No 31 of the U. S. Department of Agriculture:

The ever increasing demand for better highways has led to numerous attempts, which are being made all over the country, to build what are supposed to be "macadam roads." They are mentioned in the country budgets as well as in resolutions for the improvement of city streets, and the indulgent taxpayer, when his eye falls on the high sounding name, takes satisfaction in the idea that he is now to have highways of the most modern type. But, alas, the attempts to build stone roads are rarely successful, for, while much excellent material is often employed, the methods adopted are generally deplorable. In too many cases the men having the work in charge are content to simply deposit the stone upon the highway, frequently throwing it right into a muddy spot, and doing nothing further after the material has been put in place and spread. In many of the towns and cities where a road roller can be afforded the officials undertake to finish their work by placing a layer of dirt or gravel on top of the stone and then running the roller back and forth over the surface until it seems to be hardened.

All these attempts at building Macadam roads are failures, when regarded from the standpoint of intelligent and scientific road construction. To build a Macadam road the material should be put down in layers, and each layer separately rolled and compacted. To begin

with, the sub-soil, which is to serve as a foundation for the stone, must be properly crowned, sloping down from the middle to each side of the road, and then it must be rolled until it is absolutely hard. A soft earth bottom cannot support a stone roadway intended for ordinary heavy travel. When a road is built upon low ground it should be drained. Water finding its way beneath a macadam road, unless quickly removed by drainage, will soon ruin it. The stone used in each layer should be of uniform size as near as practicable. Unless the stone to be used has been properly broken the road can hardly be a success. No stone larger than $2\frac{1}{2}$ inches should be used. If the bed of stone, when compacted, is to be more than four inches thick it should be put down in two or more layers, the material for the upper layer than that used below, say not larger than $1\frac{1}{2}$ inches. Broken stone may readily be assorted by a rotary screen furnished with the stone crusher.

A common mistake is to spread gravel or dirt over a layer of stone before it is rolled, in the belief that it will help to compact it. The stone alone should be rolled. Under the pressure of a suitable roller of sufficient weight the angular pieces of stone will readily shift about until they are firmly wedged in place, while the round particles of gravel, or the smaller pieces will prevent their being thus ground together and compacted. A layer of very small stone, or screening, or fine gravel may be used in a separate layer on the surface after the rolling of the layers beneath is entirely completed. This will also fill the few remaining crevices at the top. The surface of the finished road could then again be rolled to make it hard and smooth, so that the rain and surface water will readily run off to the sides. If this water should penetrate into the road it is liable to soften the foundations. Water is the greatest enemy of good roads.

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