

terden, of Toronto, and the proprietors, did not get along very well and the end was a grand break up, and the contractor abandoned the work.

WINNIPEG, MAN.—A site has been purchased at the corner of Wellington and Simcoe streets for a new school building, and at next meeting of the School Board a motion will be made that a \$20,000 school building be erected.—The city engineer is preparing to go on with street improvements, which are to be carried out under the board of works' scheme. These will amount to about \$40,000, and consist of block paving, macadamizing and gravelling. Tenders will shortly be called for each class of work.

HAMILTON, ONT.—Competitive plans have been invited from architects until the 19th inst. by the Hospital Committee for the proposed House of Refuge.—T. Beasley, city clerk, will receive tenders until Wednesday, the 18th inst., for the construction of Trinidad asphalt roadways and stone kerbing on King and James streets in this city. The plans may be seen at the office of the City Engineer. The cost of this work will be in the neighborhood of \$150,000.—The City Clerk will receive tenders until noon on the 16th inst. for the erection of two school buildings, designs for which have been prepared by A. W. Peene and W. A. Edwards, architects.—A building permit has been granted to O. A. Horning for two two-story bk. dwellings on Queen street, between George and Main streets, to cost \$6,600.

TORONTO, ONT.—It is proposed to lay a 6 inch water main on Fern avenue, at a cost of \$1,275.—Mr. Edmund Wragge, Local Manager Grand Trunk Railway, will receive tenders until 5 p. m. on Friday, the 13th inst., for the following works in connection with the new Union Station: Painting and glazing; plastering and staff work; tile and cement roofing; galvanized iron work and marble work. Plans may be seen at the office of the architects Messrs. Strickland & Symons, Aberdeen Chambers, Victoria street.—At a meeting of the City Council held on Tuesday last, the Mayor read a message on the water supply question, in which he advocated the construction of a tunnel under the harbor, coupled with a new conduit, at a cost of \$500,000, and a high-level intercepting sewer, at an estimated cost of one million dollars. The question was referred to the Board of Works.—Mr. Thos. Crawford, Chairman Property Committee, will receive tenders until the 19th inst. for enlarging the brick shed in rear of Lombard street fire hall. Plans at office of City Commissioner, City Hall.—Mr. J. McDougall, Engineer for County of York, has been instructed by the Scarborough Council to ask for tenders for a new steel bridge over the Rouge river at Milne's mill.—Building permits have been granted as follows: Thos. Foster, pr. att. one story and mansard bk. dwellings, 3 and 5 Foster place, cost \$2,000; S. B. Chandler, 2 story bk. coach house and stable, rear 79 Spencer ave., cost \$1,500; Union bank additional story to building on Wellington st., cost \$2,100; R. W. Gouinlock, architect, pr. s. d. 2 story and attic bk. dwellings, 92 Spadina rd., cost \$6,000.

MONTREAL, QUE.—Mr. C. Dubreuil, architect, is calling for tenders for the erection of five three story stone front stores and dwellings on Notre Dame street west for A. Mathieu. Same architect is also preparing plans for a cottage to be erected at Cote St. Antoine.—Mr. Charles Bernier, architect, is preparing plans for a three story stone front store and dwelling on Notre Dame street west for Mr. J. B. Decelles.—Messrs. Wright & Son, architects, have prepared plans for a cottage to be erected at Outremont for Mr. Alfred Perry, and for alterations to a residence at Chambly Canton, P. Q., for Romes H. Stephens. Same architects are also preparing plans for a warehouse for Mr. Jas. Robertson, and for a music hall to be erected in the east end.—Building permits have been granted as follows: A. Richer, two two story brick

tenement buildings on Amherst street. Cost \$2,000; H. Charbonneau, two two story brick tenement buildings, corner Malborough and Harbor streets, cost \$2,000; C. A. Provost, two three storey brick tenement buildings on St. Christophe street, cost \$3,600; H. Vincent Meredith one three storey pressed brick residence cor. Pine avenue and Peel street, cost \$25,000; M. McGarr, one two storey bk. cottage on Vallee street, cost \$1,200; D. I. Lachance, two three story stone front stores and dwellings on Notre Dame street west, cost \$9,000; J. N. Boucher one two storey brick tenement building on Bonaparte street, cost \$2,000; J. Findean two three story stone front stores and dwellings on Notre Dame street west, cost \$6,000; Geo. Wilkins, M. D., three two and a half-story brick tenement buildings on Delorimier avenue, cost \$5,000; J. Collins, one two story brick tenement building on Ash avenue, cost \$2,000.—The City Council has decided to grant the sum of \$25,000 towards the establishment of a military school in the city.—The Road Committee has decided to report in favor of the extension of Bonsecours market and Chaboillez square.

CONTRACTS AWARDED.

SYDNEY, C. B.—The contract for a Baptist church, corner Pitt and Bentick streets, has been awarded to Hugh McDonald at \$3,364.

TILBURY CENTRE, ONT.—The Tilbury East Council has accepted the tender of J. B. Pike to improve the Forbes works. Contract price, \$3,885.

HALIFAX, N. S.—J. C. Dumaresq has awarded the contract for a Presbyterian church on Cobourg Road to John McInnis & Son at the price of \$3,000.

HAMILTON, ONT.—The contract for the city's wood supply has been awarded to Mr. C. G. Kelly, and for the coal supply to Messrs. Thomas Myles & Sons.

COLBORNE, ONT.—Mr. W. H. Ives has contracts for the erection of a two story brick veneered house for Joseph Cochrane, postmaster, to cost about \$1,600, and for the remodelling for dwelling purposes of the G. T. R. hotel.

BROCKVILLE, ONT.—It is reported that M. A. Piggott, of Hamilton, has been awarded the contract for the new buildings to be erected in connection with the Brockville asylum, and that Garson, Purser & Co. have the contract for the sewer work at the Kingston asylum.

WINNIPEG, MAN.—Following are the successful tenderers for supplies for the Manitoba penitentiary: flour, Ogilvie Milling Co.; drugs, J. F. Howard & Co.; lumber, D. E. Sprague; dry goods, Wright Bros.; coal oil, Imperial Oil Co.; leather, G. S. Hubbell & Co.; groceries, Hudson Bay Co.—The School Board has awarded a contract to C. W. Sharpe & Co., for the erection of the Aberdeen school at about \$4,800.

TORONTO, ONT.—A sub-committee of the Board of Works has awarded the contract for steel water pipe connections with tank and screens to the Bertram Manufacturing Company, at \$7,597.—The Public School Board have accepted the tenders of Elias Rogers & Co. for a supply of hardwood \$5 45 per cord, pine wood \$4.25 per cord, soft coal per ton \$4.75, hard, stove, egg and nut coal per ton \$5.50.—The York County Council received the following tenders for the superstructure of the bridge over the Highland Creek: Dominion Bridge Co., Montreal, \$640; Canadian Bridge Company, Montreal, \$803; Central Bridge Company, Peterboro, \$850; Hamilton Bridge Co., \$720. The tender of the Dominion Bridge Company has been accepted. The contract for the building of the abutments was awarded to Cannon & Son at \$7 per cubic yard for masonry.

MONTREAL, QUE.—Messrs. Wright & Son, architects, have awarded the contract for putting up a store and dwelling at St. Lambert, P. Q., for Mr. J. Duckworth, to Geo. Beatty.—Mr. Granville C. Cunningham, manager and chief engineer of

the Montreal street railway, has awarded the contracts for the erection of a motor house at St. Henri as follows: Masonry, Eggle & Stuart; brickwork, Bernard & Leger; carpenter and joiner's work, Jas. Shearer; roofing, Geo. W. Reed; steel construction, Dominion Bridge Co.; cast iron work, Rodden & Co.; plumbing and heating, Hughes & Stephenson; painting and glazing, A. Craig.—Mr. W. McLea Walbank has awarded the carpenter's and joiner's contract for three stone front stores and dwellings on Notre Dame street west, for J. G. Kennedy to M. Desautels.—Messrs. Fowler & Gardiner, architects, have awarded contracts as follows for a store and dwelling, corner St. Catherine and Oliver ave.: Excavator, drainage and mason, J. B. St. Louis; bricklayer, J. Lewis; carpenter and joiner, J. T. Henderson; plasterer, W. Bremner; painter and glazier, Alex. Craig; plumbing and heating, James Ballantyne.

BIDS.

TORONTO, ONT.—The Board of Works has received bids as follows for the supply of electrical plant at the Toronto water works: Royal Elec. Company, of Montreal, \$3,200; the Canadian General Electric Co., Peterboro, \$2,532; and the Western, of New York, \$2,900, \$2,600, and \$3,900, according to quality. The engineer was asked to make a recommendation as to the tender which should be accepted.

MUNICIPAL DEPARTMENT.

PIPE SEWERS.

When the joints in a pipe sewer have been soundly made, and the pipes have no inherent disposition to crack, the joints may afterwards be broken by the pressure of the superincumbent earth. Everyone practically conversant with the subject knows how difficult it is to form the bottoms of trenches to a true gradient, and at the same time to ensure uniformity in the resistance of the soil to pressure from above, especially in moist situations. A long length of pipe sewer may be regarded as a beam which takes its bearings only upon the incompressible portions of the soil, the intermediate portions being ready to yield under the weight which the sewer has to support. Experiments have shown that the deflection of such a beam formed with pipes cemented together, is utterly insignificant, and that it cannot yield appreciably without breaking. The unequal pressures to which pipe sewers are subjected may be greatly obviated by means of special precautions in filling in trenches. The bottom of the trench should be hollowed out at each joint, to receive the collars of the pipe. The hollows should at first be deep enough to admit of a perfect examination of the joint by passing the hands underneath it when it is made. This is a necessary precaution against the carelessness of some workmen, who will not bestow sufficient pains upon that part of the joint which is not in sight. When the cement is set, the hollows under the pipe collars and the sides of the trenches to a depth of about 6 in. should be filled in with fine earth, all coarse lumps being avoided. This layer of filling-in should then be carefully rammed, and similar successive layers should be added and rammed in turn.

In the neighborhood of streams and rivers, where the soil is liable to disturbances at high tide, the plan of surrounding pipes with concrete will generally answer well, provided that the concrete is not likely to be disintegrated by the action of water. Lining the trench with stout canvas affords considerable protection to concrete under such circumstances. Such a mass of concrete, regarded as a beam, will generally present ample resistance to any pressure from above, unless the soil below is disturbed by the action of water, when danger may perhaps arise. It would be safer in such a case to employ cast-iron pipes, coated with some solution to preserve them from corrosion. They have this conspicuous advantage over a square mass of concrete—that they pre-

sent a much smaller surface to receive the weight of earth above. The chief difficulty arises from the additional cost. A 12 in. diameter stoneware pipe sewer could be provided and laid in most localities for 3s. to 4s. per yard, exclusive of digging. It would require half a cubic yard of concrete to enclose one lineal yard of such a sewer to a thickness of 6 in. from the top, bottom, and sides; and this would cost another 5s. or thereabouts per lineal yard. A 12 in. cast-iron pipe, 3/4 in. thick, would weigh 94 lb. per foot, and could not be provided for much less than 18s. per lineal yard. There being fewer joints than in stoneware pipes, the cost of laying would be less. It might be done for 1s. to 1s. 6d.; so that the cost would be more than double that of stoneware pipes surrounded with concrete.

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