

HALIFAX, N. S.—The City Engineer has recommended the construction of a sewer on Queen street, between Morris and South streets, at a cost of \$2,500.—Tenders are invited by the Board of Commissioners of City Works until noon on Monday, the 26th inst., for lighting the streets for three years with arc lights. Particulars may be obtained from W. B. McNutt, Clerk of Works.

BROCKVILLE, ONT.—The Town Council has given notice of its intention to construct the following works: Sewer on Garden street, from Pearl street to James street cost \$485.60; Sewer on Brock street, from Perth street to Daniel street cost \$688.95; Sewer on Perth street, from Brock street to Abbott street, cost \$1,000.50; Sewer on Kincard street, from Jones street to Gouley street, cost \$180.

LONDON, ONT.—At a recent meeting of the wardens and officers of St. Matthew's church, East End, a building committee was appointed to take action in regard to the erection of the new church.—Messrs. Moore & Henry, architects, invite tenders until Tuesday, the 13th inst., for all trades except mason and brickwork required in the erection of a residence on Dufferin avenue for J. Wishart, M. D.

WINNIPEG, MAN.—G. H. West, Chairman Committee on Works, will receive tenders until Thursday, the 22nd inst., for the supply of from 300,000 to 1,000,000 feet of pine lumber.—Messrs. Plaxton Bros. are about to commence the erection of a large store, on Main street, between Graham and Mary streets. The building will be of solid brick, two stories in height, 60 x 26 ft., and will cost about \$6,000.

GUELPH, ONT.—At a public meeting held on the 23rd of May, it was decided to purchase the lot on the corner of Wyndham and Woodcock sts, for an opera house block. Mr. Blackwell, architect was instructed to prepare plans at once to assist the provisions of the act in selling the stock.—The late Mr. George Elliott donated the sum of \$10,000 as a nucleus for a new wing to the general hospital, and a further sum of about \$15,000 for the erection of a home for the poor.

STRATFORD, ONT.—David G. Baxter, architect is preparing plans for the fitting up of a photograph gallery for La Framier Bros., of Buffalo, N. Y., to be erected in the Indian Block in this city. There will be required best and latest improved back grounds, screens, etc., plumbing, aerial and roof lights, etc., \$5,000. Tenders will be awarded about June 17, 1893.—G. W. Lawrence, city treasurer, will receive tenders until Saturday, the 17th inst., for the purchase of \$125,000 worth of debentures.

KALSO, B. C.—Messrs. Bartlett & Clymo, of Butte, will erect a sampling works, at this place having a capacity of 100 tons per day. The works will cost about \$20,000, and are to be completed in six months.—Mr. W. Baillie, agent of the Kalso Sloane railway has stated that work on the road would be commenced at once as tenders for construction had been invited. Mr. A. McMullan and a party of surveyors are now locating the line. The total length will be 30½ miles, with an estimated cost of \$1,000,000. No engineering difficulties are anticipated, the grades being slight.

KINGSTON, ONT.—The annual meeting of the Kingston and Smith's Falls Railway Company was held in this city recently, when it was decided that if the negotiations now going on proved successful, the work of construction would be commenced in a short time.—Mr. C. G. Horetsky of the Public Works Department, Toronto, was in the city recently looking over the drainage system at Rockwood asylum, with a view to the introduction of a new sewerage system.—W. Newlands, architect, will receive tenders until noon on Monday, the 12th inst., for the building of an addition to the Orphans' Home.

MONTREAL, QUE.—The municipal council of St. Henri has appointed a delegation, consisting of Mayors Dagenais, Councillors Aquin, Barriere Gougeon and Dr. Lanctot, to interview the Grand Trunk authorities to secure the erection of a new depot. It is stated that the council would be willing to assist in the matter.—The City Council will be asked to provide the sum of \$6,000 for repairs to the various markets, the amount required for each being as follows: St. Lawrence, \$1,738; Hochelaga, \$524; St. Jean Baptiste, \$1,095; St. Ann's \$565; St. Gabriel, \$1,327, and St. James, \$563.—Mr. A. Davis, Superintendent Montreal Waterworks will receive tenders until Tuesday, the 13th inst., for 130 tons of cast iron water pipes to be supplied in quantities as specified.—Jos. Haynes, architect, is preparing plans for a new school in Hochelaga.

HAMILTON, ONT.—The Imperial Oil Company of Petrolia, is about to establish a storing and barreling station, in this city, and is looking for a site in the east end. The City Council will be asked to grant certain privileges to the company.—Tenders have been asked by the City Clerk for the construction of a pipe sewer on Aikman street.—Building permits have been granted as follows: Thomas Lovejoy, two story brick dwelling on Main street, between Burrell street and Ferne avenue, cost \$2,000; Merion Britannia Company, brick addition to its works on Wellington street, cost \$3,500; Hamilton Viaduct Works Company, alterations to distillery on Wellington street, cost \$1,800.—The City Clerk invites tenders until to-morrow (Friday) for painting and carpentering required at the

city hospital. Plans may be seen at the office of Mr. L. Hills, architect, 60 King street west.—The Separate School Board has decided to take steps to enlarge St. Lawrence school, at a cost of about \$4,500.

OTTAWA, ONT.—The congregation of St. Andrew's Presbyterian church have decided to enlarge the building.—The promoters of a scheme to erect a maternity hospital have taken definite action in the matter, and the building will in all probability be erected this summer. The site will probably be at the rear of the Lady Stanley Institute. It will be two and a half stories high, and built of brick.—Mr. Anderson, engineer of the Marine Department, has returned from his trip to the lower St. Lawrence where he selected a site for a lighthouse and fog alarm on Cape Salmon, on the north shore of the St. Lawrence, east of Murray bay.—E. F. Roy, Secretary Department of Public Works will receive tenders until Friday, the 23rd inst., for the construction of an addition to the wharf at Baie St. Paul, Charlevoix County, Quebec. Plans may be seen at the post-office at Baie St. Paul and at the above department in this city.—The Fire and Light Committee invite tenders until the 12th inst. for work to be done at No. 6 station, Rideau ward.—The Board of Health is looking for sites on which to erect the proposed contagious disease hospital and crematory.—Mr. W. W. Wylie is about to erect an addition to his factory at the corner of Kent and Slater streets.

TORONTO, ONT.—An item of \$7,740 for the purchase of a steam fire engine, recommended by the Fire and Light Committee, has been passed by the City Council.—The City Council will in all probability issue debentures to the amount of \$225,000 to cover the cost of constructing pavements on track allowances over which there has been dispute between the railway company and the city regarding payments for the same. The streets on which the track allowances are to be paved are as follows: Aphthel, Parliament, from Queen to Gerrard; Parliament, from Winchester to Carlton; College from Yonge to McCaul; Dundas, from Queen to the bend, Queen, from Yonge to River; Carlton, from Yonge to Parliament; York, from Front to Queen; Winchester, from Parliament to Sumach; Brick pavements on concrete—College from Dufferin to Landsdowne avenue; Jameson avenue, from College to Dundas; Bathurst from King to Queen; Cedar block on concrete, Gerrard street, from Parliament to Pape; Granite pavement, Front, from Church to Frederick; George and Frederick, from Front to King.—The transfer of the Esplanade property south of the present Union Station from the city to the G. T. R., has been completed and tenders for the train shed to be erected there will be awarded in a few days. The work will take about six months to complete. It is the intention of the G. T. R. to go forward as expeditiously as possible with the new Union Station on the original plans.—The Medical Health Officer is advocating the erection of another crematory, to be situated in the northwest part of the city. The cost is estimated at \$10,000.—Mr. F. H. Herbert, architect, has prepared plans for a stone and brick residence to be erected on Wellesley Crescent for Mr. Henry Gooderham. He is also preparing plans for extensive alterations to a residence on Sherbourne street, for which tenders will be called shortly.—Building permits have been granted as follows: Samuel Rogers & Co., a story brick warehouse, Princess street, cost \$1,100; Mrs. Ross (John Stark & Co., agent), 4 story brick store, King street west, for Fulton, Michie & Co., cost \$23,000; Miss Christie, a story brick addition and alterations to 15 Wilton avenue, cost \$1,600; Henry Gooderham, detached 2 story and attic brick and stone dwelling, Homewood Place, cost \$25,000.—The time for reception of tenders for repairs to city public schools has been extended from the 9th to the 12th inst.

FIRES.

The village of Canterbury, York county, N. B. was visited by a disastrous fire recently, destroying the house and store of Thomas Falconer, house and store combined of Miss M. London, the house of Luke Lawson.—Mr. Falconer had \$3,300 insurance, Miss London \$3,150 and Mr. Lawson, \$4,275. The total loss will be about \$15,000.—The storehouse of the St. Johns Stone Chinaware Co., at St. Johns, Que., has been destroyed by fire.—The building and machinery of the El Diver mine at Rat Portage, Man., was destroyed by fire last week. There was no insurance. Mr. Webster is proprietor of the mine.—Larsh's hotel at Comber, Ont., was burned on the 31st ultimo. There was an insurance of \$1,900 on the building and contents.—Mr. Caffrey's planing mill at Huntsville, Ont., was totally consumed by fire last week. Loss, \$3,000; no insurance.—On Tuesday morning last, fire was discovered in the building known as the conservum, on English street, Truro, N. S., which was burned to the ground. The adjoining premises of J. E. Biglow & Co., on Havelock street and Gunn & Stack, on English street were also destroyed. Victoria Hall, containing Salvation Army barracks, and Colchester block, occupied by T. Dalrymple, clothing store, was badly damaged. The loss will be heavy as there is a very small insurance.—Dr. Barnes dispensary at Georgetown, P. E. I., together with three dwellings and six barns, was destroyed by fire on the 31st ultimo. Loss about \$10,000; insurance \$3,500.

CONTRACTS AWARDED.

TORONTO, ONT.—The Industrial Exhibition Association last week awarded the contracts for the erection of 22 horse stables, at a cost of \$50,000.

LETHBRIDGE, N. W. T.—Mr. Oliver has been awarded the contract for building the court house and a general public building in this town, toward which the sum of \$7,000 was voted during the last session of parliament.

GUELPH, ONT.—Mr. J. H. Redwood has secured the contract for the stone and brickwork of Mr. J. Kelcher's residence on Chamber street. Mr. L. Wideman will do the carpentering work. The size of the building is to be 62 by 35, four stories high. It will be of terra cotta, with Credit Valley stone facings.

MONTREAL, QUE.—The Road Committee has awarded the following contracts for sewers. O'Connor & Costello, St. Christophe street \$6.30 and \$35 for rock; V. Gosselin, Cadieux street \$6, St. Catherine west \$5.95, Inspector \$5.95 and Latour \$6.25, rock excavation \$1, Nap. Laporte, Sherbrooke street \$5.65, rock \$3.75, Sheridan & Heffernan, St. Catherine east \$5.90 and Fortier \$5.95, rock \$4; P. F. Murray, Mansfield street \$6.29, rock \$4; John Parker, St. Paul street \$6.23, rock \$3.97; Pegman & Downey, St. Jean Baptiste street \$6.475, rock \$4, Charrier & Robin, Jurois street \$6.23, rock \$3.50; Mount St. Mary avenue \$6.19, rock \$3.50, and Place Royale \$7.87, rock \$4.—Tenders for supplies have been awarded by the Water Committee as follows: The Robertson, pig lead \$8.60 a ton, Montreal Rolling Mills Co., lead pipe \$58 a ton, and tin at \$20, M. Sessier, castings \$15.—Tenders for the other supplies were referred to a sub-committee for a report.—The following tenders have been received for the construction of the Brock street tunnel: Nap. Laporte, \$156,175; Lafontaine & Lamoine, \$123,557; H. T. Beemer, \$147,650, and Madigan, Cochran & Co., \$146,147. They were referred to a sub-committee to make a report.

OTTAWA, ONT.—Messrs. S. Davis & Sons, who have the contract for section No. 4 of the Cornwall canal, have also been awarded the contract for the conversion of the north branch of the river into a navigable channel by constructing dams across it at the head and foot of Sheik's island. This basin will be fully three miles long, from 660 to 1,500 feet in width and from 16 to 30 feet deep. The road bridge over the mill dam to the island will have to be rebuilt at a much higher level. The estimated cost is about half a million dollars.—The Public Works Department has awarded the contract for the erection of shelter buildings at the Williams' Head, B. C., quarantine station to Bishop & Sherborne, of Victoria.—The City Council has awarded contracts as follows for the construction of sewers: Broad street, J. Bruce—Earth excavation per foot, \$4, rock, \$27.70, total \$2,292; Redpath and Sussex street, L. Comse—Earth excavation, \$6, rock, \$29, total \$3,080, Primrose avenue, Halpin & Byrne—Earth excavation, \$2.95, rock, \$30, total \$320.65; Thomas and Alexander sts. P. Cassidy—Earth excavation, \$4.50, rock \$23, total \$1,447.50, Union and Stanley avenues, P. Cassidy—Earth excavation, \$4.50, rock, \$19, total \$1,476; alleyways in Rideau ward, P. Cassidy—Earth excavation \$4.50, rock, \$21, total \$4,044.

BUSINESS DIFFICULTIES.

Mr. John Harris, builder, Toronto, has made an assignment to Mr. G. M. Gardner. The statement shows assets of \$38,235, with liabilities of less than half that amount.

E. Lecavalier, contractor, Montreal, has assigned, with liabilities at \$18,000.

MUNICIPAL DEPARTMENT.

STREET BRIDGES.

By S. H. DAVIES.

In the design of street bridges, while so far as possible giving regard to economy in the selection of type, the important consideration of appearance should be the chief guide. The situations they occupy generally demand that not only should they be perfect structures from an engineering point of view, but at the same time the detail should be both suitable and refined. The course adopted in the design of the Tower Bridge now under construction, in employing both engineer and architect, is one the wisdom of which will be readily admitted. We have, unfortunately, too many examples of otherwise fine engineering works marred by the intense vulgarity of the detail, the necessary boldness of which readily admits of the grossest treatment.

TYPES OF BRIDGES.

Although certain rules have been laid down with regard to economy and suitability of types, it is impossible to point to one in particular as the best under all circumstances, so much depending upon the natural features of the site. In the R. E. "Aide Mémoire," Colonel Cooke gives the following rule, which is, however, open to many exceptions: "Generally the cheap efficient bridge will be the one having at every point the longest

efficient span which can be made for a sum equal to the cost of the pier on which it stands." But while recognizing the impossibility of choosing one type as the most economical, the following points may with advantage be borne in mind in the design of various forms.

Stone Bridges.—Stone bridges over 100 ft. span are difficult to construct, necessitating centering of an elaborate and expensive character, and the abutments, unless natural, are very costly. On the other hand, it should be borne in mind that the cost of a stone bridge is a first cost, and that no further expense is necessitated for painting or renewal, in which respect they possess a very natural advantage over steel or iron.

Suspension Bridges.—The selection of a suspension bridge must depend largely upon the nature of the abutments, owing to their necessary massiveness. Apart from this, the economical advantages are dependent upon the span having a high ratio to the load per foot run, which is found to exist in foot bridges of 100 ft., road bridges 200 ft., and railway bridges of 1,000 ft. span. In considering a distributed dead load only, it is impossible to point to a more economical form of construction for large spans than that of a flexible suspension bridge, but the oscillation caused by heavy live loads and wind pressure demands that the weight of the chains and platform should be sufficiently great to neutralize such action, or that some other means be adopted to ensure stability. Various devices have been employed to secure this result, but such means, while considerably modifying the oscillation, do not produce absolute rigidity, which condition is only to be obtained by adopting a form of construction the cost of which is greatly in excess of that of the more common form of suspension bridge.

Swing Bridges.—The principle points to be observed in designing swing bridges are that they should be built of a material which is light, and at the same time the form of construction should be as simple as possible, in order to avoid frequency of repair and the consequent interruption of traffic. Two passages of equal span should be aimed at, whenever possible as in this form both the counterpoise and wind pressure are greatly reduced. Some excellent information on the subject of swing bridges may be found in a paper read some time ago before the Institution of Civil Engineers by Mr. J. Price.

Longitudinal Girders.—In bridges of small span, and wherever possible, the advantages to be gained by building the bridge with longitudinal instead of cross-girders are very great. The form of construction is cheap, pipes can be carried over the opening with great convenience, and the bridge erected without interruption to the traffic, which in the case of renewals is a matter of great importance. In addition to this, by making the top flange curved form, assistance can be given to the gradient of the approaches when steep. This form of bridge is one which is frequently employed for railway underbridges of small span, a girder being placed under each rail and the outside ones acting as parapets.

Some remarks on the relative economy of long-span bridges may be found in Mr. T. Claxton Fidler's recently-published treatise on "Bridge Construction," in which it is stated that the actual economy is dependent mainly on the method adopted for crossing the opening. Where one span is necessary, cantilever and rigid suspension bridges are under an obvious disadvantage on account of the side spans, or towers or backstays, and independent girders are preferable; but where three openings are admissible, the choice will lie between these forms and continuous girders of uniform depth.

(To be Continued.)

Mr. B. D. McConnell has been appointed town engineer of Cote St. Antoine, Que.

Mr. T. H. Jones has been elected city engineer of Brantford, Ont., at a salary of \$1,000 per year.

The Richmond, Que., council has decided to purchase the town waterworks from Messrs. Lafontaine & Rousseau for \$7,000.

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