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THE CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF THE PUBLIC WORKS AND TENDERS OF CANADA

PUBLIC WORKS • TENDERS • ADVANCE INFORMATION • AND MUNICIPAL PROGRESS

EVERY WEDNESDAY

This paper reaches every week the Town and City Clerks, Town and City Engineers, County Clerks and County Engineers Purchasers of Municipal Debentures and leading Contractors in all lines throughout Canada.

VOL. 9.

AUGUST 31, 1898

No. 31.

THE CANADIAN CONTRACT RECORD,

PUBLISHED EVERY WEDNESDAY

As an Intermediate Edition of the "Canadian Architect and Builder."

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Information solicited from any part of the Dominion regarding contracts open to tender.

Advertising Rates on application.

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CONCRETE-CEMENT SIDEWALKS

Sealed tenders, addressed to the Chairman Board of Works, Town of Owen Sound, will be received up to noon, WEDNESDAY, SEPT. 27th, for the construction of 100,000 square feet of CEMENT CONCRETE SIDEWALKS (or any part of it) in said Town.

A marked cheque, payable to the order of the Town Treasurer, for 5% of the contract price, must accompany each tender, which will be returned to unsuccessful bidders.

Specifications and forms of tender may be obtained from the Town Engineer.

The lowest or any tender not necessarily accepted.

R. McDOWALL, WM. LITTLE,
Town Engineer. Chairman Bd. of Works.
Owen Sound, Aug. 23rd, 1898.

TENDERS

FOR

GRANOLITHIC WALKS

Tenders will be received, addressed to George S. Jarvis, Town Clerk, Cornwall, Ont., up to 4:30 o'clock p.m. on SATURDAY, SEPTEMBER 3rd, 1898, for the construction of GRANOLITHIC WALKS on the following streets:

Second Street East, north side, 5 feet wide and 2,846 feet in length.
Second Street West, north side, 4 feet wide and 917 feet in length.
Second Street West, south side, 4 and 5 feet wide and 2,159 feet in length.
Third Street West, south side, 4 feet wide and 542 feet in length.

Specifications may be seen and forms of tender obtained at the Town Clerk's office, Cornwall. A deposit in the form of a marked cheque on a chartered bank, payable to the order of the Town Treasurer, for the sum of ten per cent. of the value of the work tendered for, must accompany each and every tender. Tenders must bear the bona fide signature of the contractor. The lowest or any tender not necessarily accepted.

GEORGE S. JARVIS,
Town Clerk.

Cornwall, August 22nd, 1898.

TOWN OF OSHAWA Granolithic Sidewalks

Tenders will be received by the Town of Oshawa for the construction of about 500 lineal feet of 8-foot CONCRETE SIDEWALKS up to the 31st of SEPTEMBER, 1898. Specifications and forms of tender may be had on application to the Clerk of the Municipality.

All tenders to be addressed to the Chairman of the Board of Works, Mr. John Bailes.

The lowest or any tender not necessarily accepted.

THOMAS MORRIS, Acting Clerk,
Town of Oshawa.

CONTRACTS OPEN.

ANDOVER, N.B.—A new bridge will be built here.

EDMONTON, N.W.T.—K. A. Macleod is preparing to erect a store building.

WASHAGO, ONT.—D. Miller contemplates building a saw mill and stave factory.

GLADSTONE, MAN.—There is some talk of building a Presbyterian church here.

AMHERSTBURG, ONT.—A number of persons are figuring on erecting cottages here.

SEBRINGVILLE, ONT.—Symon Brickman has purchased property on which to erect a residence.

GRAND FORKS, B.C.—The C.P.R. is making arrangements to build two saw mills in this vicinity.

SEAFORTH, ONT.—It is understood that a company is being formed to operate a telephone exchange here.

HAMIOTA, MAN.—Tenders are invited up to September 10th for the erection of a council chamber and lock-up.

ST. LEONARDS, N.B.—H. A. Gagnon, of Van Buren, has purchased property here on which to build a store.

CASCADE, B.C.—McDonald & Flood are about to build a large hotel. The post-office is also to be enlarged.

ELORA, ONT.—Miss Foote, of Toronto, purposes rebuilding the dwelling house and barn destroyed by fire recently.

PORT DOVER, ONT.—It is probable that an addition will be made to the works of the Port Dover Vinegar Company.

CHATHAM, N.B.—The local government are preparing to make extensive repairs to the Ferry slips and approaches.

SUNSHINE, ONT.—Preparations are being made by Lewis Beavers for the building of a large residence on his farm.

TORONTO JUNCTION, ONT.—Ratepayers on Dundas street want a brick pavement between Mary and Midland streets.

GRANBY, QUE.—The sewerage system is being constructed under the supervision of McConnell & Marion, of Montreal.

THAMESFORD, ONT.—It is understood that Mr. Joseph Cawthorpe, whose grist and saw mills were burned recently, will rebuild.

NEWMARKET, ONT.—The town has voted to give \$5,000 to the Office Specialty Co. to assist them in extending their building.

ARNPRIOR, ONT.—The by-law providing for the construction of an iron bridge by the town was carried by the ratepayers last week.

SHERBROOKE, QUE.—The Waterville Furniture Company, which was recently burned out, is looking for a new location in this town.

NEWCASTLE, N.B.—J. H. Phinney will receive tenders up to Tuesday, September 6th, for heating engine house with steam or hot water.

PAKENHAM, ONT.—Alex. Murphy, of Antrim, has prepared plans for an inter-county bridge to be built over the Wabigoon river near this place.

KENTVILLE, N. S.—The town will grant a bonus to the Nova Scotia Carriage Co., Limited, to assist them in establishing works here.

LIVERPOOL, N. S.—Engineers of the Dominion government were in town recently and approved of the site for the proposed public building.

BRANDON, MAN.—Joseph J. Carruthers and Clark Christie are endeavoring to secure subscriptions for the erection of a skating rink, to cost \$5,000.

EIMVALE, ONT.—C. S. Burton, township clerk, is prepared to receive tenders up to September 2nd for the purchase of \$5,020 of drainage debentures.

THREE RIVERS, QUE.—Tenders are invited for roofing the new building now being erected on Champlain street, also for supplying the city with drain pipes.

TEESWATER, ONT.—Tenders are asked by John Farquharson up to September 12th for heating and ventilating the public school, wood furnaces to be used.

ROSENFELD, MAN.—The Northern Elevator Co. are talking of building an elevator.—The German Lutheran congregation are making preparations to build a church.

FORT WILLIAM, ONT.—The town wants applications for the position of superintendent of electric light and waterworks plant. Address T. Ed. Oakley, secretary-treasurer.

CARLETON PLACE, ONT.—Dr. Howard, of the Orient Medicine Co., has leased a large brick store opposite the Grand Central Hotel, and is having it converted into a laboratory.

COLDWATER, ONT.—J. A. Harvey, M. D., wants tenders by September 5th for the erection of a brick-clad church for the Presbyterian congregation. Plans at office of W. J. Leatherdale.

ACTON, ONT.—The building at the corner of Mill street has been torn down, and if the site is not utilized for the proposed Baptist church, it is understood that a brick block will be erected thereon.

WILLOWDALE, ONT.—Peter S. Gibson & Sons, civil engineers, ask tenders up to

Saturday, September 3rd, for repairs to stone bridge near Mr. Anderson's, on Yonge street, in the town of North Toronto.

HAWKESBURY, ONT.—The pulp mill now in course of erection by the Riordan Pulp Company will cost in the neighborhood of \$250,000. It is said to be the intention of the company to erect paper mills also.

POINTE AU PIC, QUE.—On September 9th the ratepayers will vote on a by-law to grant a bonus of \$2,000 to secure the erection of a large hotel, with 75 rooms. David Roy is secretary treasurer of the municipality.

TRURO, N.S.—Last week the ratepayers voted on a by-law to grant a bonus of \$30,000 to the Midland Railway Co., to build a line of railway from Shubenacadie to Truro. The result of the vote has not yet been learned.

BOTHWELL, ONT.—The ratepayers will vote on a by-law to raise the sum of \$1,500 by debentures to assist in building a fire-hall and council chamber. The new addition will cost \$2,000, the county council contributing \$500.

BRANTFORD, ONT.—The Paris Electric and Power Co., represented by Messrs. Carroll and Smith, have requested permission to distribute electric power in this city. The company purpose utilizing the power of the Grand river by the construction of a dam.

CALGARY, N. W. T.—Tenders have been taken for the erection here of round house, repair shops and turn-table for the C.P.R. The engineer estimates that \$50,000 will be required for the work, and fully \$50,000 more to lay the tracks in and about the yard.

GALT, ONT.—It is expected that work on the new G.T.R. station will commence in the early fall, as plans and specifications are now being prepared.—There is a movement in favor of issuing debentures for \$12,000 for a new fire hall, waterworks extension and bridge repairs.

VANCOUVER, B. C.—The English syndicate who have been negotiating with Armstrong & Morrison for the construction of a marine railway have a capital of \$500,000. If satisfactory arrangements can be made, it is proposed to build a dock, to cost \$125,000.

ST. CATHARINES, ONT.—As a result of an order from the Department of Railways and Canals, the Niagara Central Railway was last week closed for traffic. Before the railway can be again operated, it will be necessary to carry out some quite extensive improvements and repairs.

WILLOWDALE, ONT.—Messrs. P. S. Gibson & Sons, engineers, are preparing plans and specifications for two large stone abutments for a steel bridge to be built over west branch of river Humber in township of Gore of Toronto. Tenders close at noon on 10th of September.

ST. THOMAS, ONT.—It is understood to be the intention of Mr. J. H. Stull to immediately rebuild his handle factory. It is improbable that the pipe foundry will be rebuilt.—The People's and the Bell Telephone companies have each been asked to submit new propositions for a telephone franchise.

LINDSAY, ONT.—The question of building a bridge on Lindsay street has been left in the hands of the Mayor. Ryder & Kitchener, manufacturers of veneering and excelsior at Brampton, have written to the town council as to the possibility of securing a river site and sufficient quantities of timber.

PARRY SOUND, ONT. Plans are being prepared for additions and alterations to St. Peter's R.C. church at Parry Harbor.—The members of Granite Lodge A.F. & A.M. have about completed arrangements for building a three-storey addition to

their block.—Active steps are being taken to improve the roads of this town.

DUNDAS, ONT.—The by-law granting a bonus of \$12,000 to John Bertram & Sons to assist them in enlarging their premises and constructing a railway switch received the sanction of the ratepayers last week.—The Dundas Electric Company has made a proposition to the town for lighting the streets by electricity. The company purpose utilizing the power formerly used by the Webster mills, and ask for a 15-year franchise.

LONDON, ONT.—John M. Moore, superintendent of waterworks, has invited tenders for a tile conduit on the Sherry property at Springbank.—William Smith, 193 Clarence street, has secured a building permit for a brick veneer store and dwelling, corner Clarence and Simcoe street, to cost \$1,000.—John Wilkey is building four 1½-story brick houses on south side of Princess avenue, between Ontario and Quebec streets.

HALIFAX, N. S.—Herbert E. Gates, architect, this city, has prepared plans for a Presbyterian church at Charlo, N.B.; also a residence on Lucknow street, this city, for T. N. Baker; extensive alterations to premises of Jas. Simmonds & Co. at Dartmouth, N.S., and a dwelling for E. H. Whelpley at same place.—R. J. Wilson, secretary School Commissioners, will receive tenders up to 31st inst. for the purchase of \$9,500 of debentures.

PETERBORO', ONT.—The George Matthews Co. has decided to double the capacity of its factory by enlarging the building and equipment, on condition that the town grant exemption from taxation.—The town council has resolved that no new pavement work be placed under contract this fall, but that the present contractors be given the work of laying the Charlotte street pavement. It is proposed to have a large quantity of work ready for tenders early in the spring.

HAMILTON, ONT.—The city engineer's department last week laid out two new lines for the Mountain drain. One line will require about 2,700 feet of trench, and the other about 3,000 feet.—Property owners on Victoria avenue have requested to have the cedar block pavement on that street replaced by a macadam roadway.—It is probable that a by-law will be submitted to the ratepayers to provide the sum of \$150,000 for the construction of certain pavements.

KINGSTON, ONT.—The report that the Richlieu & Ontario Navigation Company would build a summer hotel here is not confirmed by the company.—The Portland township council have taken steps to apply at the next session for legislation to amend the Napanee River Improvement Company's charter, so as to prohibit the maintenance of any dams on waters in Portland, and to enable the municipality to proceed, under the Ditches and Water Courses Act, to reclaim and improve marsh lands.

ST. JOHN, N.B.—T. S. Sims has purchased the Hayden mill property at Hardingville, and will install machinery for the manufacture of brush and broom handles.—It is hoped to commence work at an early date on the new mill to be built by the Cushing Sulphite Fibre Co., in which Thomas McAvity, George S. Cushing, C. M. Bostwick and others are interested.—The city council will issue \$3,700 of debentures. At the last meeting it was decided to proceed with the laying of the 24" water main in connection with the west side water works.

STRATFORD, ONT.—The City Council has decided to grant exemption from taxation to the Whyte Packing Co., of Mitchell, who agree to erect a pork-packing and curing factory here, at a cost of \$40,000.—The Stratford Water Supply Co. will commence next week to lay 3,000 feet of 18-inch pipe on the north side of the

river. A reservoir will be built to contain 9,000 gallons of water.—The Sewer Committee have reported that they are not yet in a position to recommend any particular system of sewage disposal, every system appearing to be too expensive.

OWEN SOUND, ONT.—A company, composed of George Deisenroth, Henry Ahrens, and others, purpose establishing a large furniture factory in some town on the Georgian Bay, and have written to Mayor Thompson asking what inducements this town would offer. The company agree to build a brick factory, 50 x 150 feet, three storeys high, and an addition, 18 x 50 feet, with power house.—A by-law to raise \$10,000 by debentures was carried last week. The money will be expended in constructing permanent macadam roadways and concrete walks, and in purchasing a steam road roller.

MONTREAL, ONT.—Mr. L. J. Forget, president of the Richlieu & Ontario Navigation Company, is at present looking into the question of improving the summer resorts of the lower St. Lawrence. It is probable that an addition of 60 feet will be made to the Tadousac Hotel, that a modern hotel will be built at Cap a l'Aigle, and that the St. Lawrence Hall at Cacouna will be improved. An effort is being made to induce the Minister of Public Works to provide a sum for the building of a wharf at the latter place.—Joseph Venne, architect, is preparing plans for a new church to be erected at Maissonneuve.—S. D. Valheres is about to build several houses on Montana street.—The Shawinigan Water & Power Co., 1724 Notre Dame street, this city, ask tenders up to October 1st for the construction of a head race, including rock and earth excavation, concrete masonry, crib work, booms, steel inlet tubes, through bulk head, lead gates and racks, excavation for wheel pits and tail race, and concrete power house foundations. The approximate quantity of rock excavation is 140,000 cubic yards, of concrete 15,000 cubic yards, and of steel framing 150 tons. Further information may be obtained from the engineers, T. Pringle & Son, Imperial Building, and tenders are to be addressed to J. E. Aldred, treasurer of the company.

WINNIPEG, MAN.—The Fire, Water and Light Committee will recommend to the city council that an electric wiring inspector be appointed, at a salary of \$60 per month.—The city council has decided to invite tenders from local contractors for the sinking of a supply well for a water works system, according to plans prepared by the city engineer.—Tenders are wanted by September 1st by the executors of the McIntyre Estate, for plumbing of the new McIntyre block. Tenders are also invited until same date for heating the McIntyre block and Criterion restaurant. Plans at 230 Portage avenue.—Mr. George Browne, architect, has taken tenders for the erection of a stone and brick bank building at Neepawa, Man., for the Union Bank of Canada.—Application has been made to the local government for the incorporation of a company to build a public hall at Foxwarren.—The Bell Telephone Co. have in view the establishment of a telephone line between this city and Brandon. Material is now on the ground for a line between Carberry and Neepawa.—Two tenders were received by the Water & Light Committee for sinking of wells in connection with the proposed water works system. T. H. Maxwell tendered at \$8,940, \$149 per lineal foot; and \$24 extra for bricking. Kelly Bros. tendered at \$102 per lineal foot, and \$25 extra for bricking. The committee has recommended that the work be done by the city, and that the tenders be returned.

TORONTO, ONT.—An architect is said to be preparing plans for the proposed meat curing establishment to be built at

Weston by the Canada Meat Company. Mr. W. P. Bull is solicitor for the company.—The city engineer is preparing plans for the ferry to be used at the Queen's wharf, to convey passengers from the mainland to Hanlan's Island.—A proposition is on foot to establish a large athletic park in the eastern portion of the city. It is understood that the Toronto Railway Company are the promoters.—Residents of Caer Howell street have petitioned against a macadam pavement between Simcoe and McCaul streets.—Building permits have been granted as follows: Massey-Harris Company, one storey brick moulding shop and a two storey brick core shop, south side King street, west of Massey street, cost \$9,000; James Fox, brick dwelling west side Markham street, near Arthur, cost \$2,000; A. McLean Howard, new front to store, 278 Yonge street; Canadian Bank of Commerce, three storey brick building, northwest corner of Bloor and Yonge streets, cost \$12,000; C. Scadding, two storey and attic brick building on Bloor street, cost \$4,000; J. B. Kay, four-story brick warehouse, 36 King street west, cost \$30,000.—The contracts for the reconstruction of the Clifton House at Niagara Falls have not yet been awarded by the architects, Messrs. Darling & Pearson.—The Ontario government has granted to J. A. Powers a lease of falls on Mississauga river, in order to develop a copper mine in the township of Gould. Other applications for water powers on the Severn, Wabigoon and Seine rivers have also been received.—The City Council, at a meeting on Monday last, resolved to refer back to the Board of Control the report recommending the acceptance of the tender of the Sprague Electric Co. for elevators for the municipal building. It was also decided to substitute Pavanazzo marble for Italian marble in the corridors of the new building.—The city engineer has been instructed to report upon the cost of constructing cribwork in front of the Exhibition grounds.

OTTAWA, ONT.—The Lutheran church congregation are erecting a new school on Nelson street, brick veneer, 58x32 feet.—E. F. E. Roy, secretary Department of Public Works, will receive tenders up to Tuesday, September 6th, for the supply of four tubular boilers for the Parliament buildings in this city. Mr. Roy will also receive tenders up to Monday, September 19th, for heating apparatus for public building at Windsor, N. S.—The Chairman of the Property Committee of the city council has been instructed to call for tenders for placing a new roof on the city hall, to be of lumber with galvanized iron covering. The date limit is Thursday, September 6th.—The Baptists of the Glebe will shortly commence the erection of a new church on Fourth avenue, near Bank street. Arrangements are now being made for the purchase of the property.—J. Y. Caldwell has recently negotiated the sale of the block of property owned by Mrs. Nicholson, on the northwest corner of Bank and Maria streets. It is said to be the intention of the purchaser to erect a block of stores the soon next spring.—It is understood that the promoters of the abattoir project desire the city to give them Porter's Island as a site.—The question of the necessity of an auxiliary steam pumping plant at the waterworks is now under consideration by the city council. For this purpose the sum of \$60,000 was raised last year by debentures.—Alderman Strond is of the opinion that a special engineer should be employed to supervise the construction of the new main sewer, provided the work receives the sanction of the ratepayers.—The Ottawa & New York Railway Company have had plans prepared for the new shops to be erected in this city. As soon as these are approved of, the work will be commenced.—The following building permits have been

issued: L. N. Poulin, alterations to store on Sparks street, cost \$1,000; Geo. F. McCormick, brick veneer dwelling, Wilbrod st., cost \$2,800; Robt. Dixon, brick veneer dwelling, Frank street, cost \$1,100; A. M. Douglas, solid brick bake-house, Rideau street, cost \$1,000; J. A. Jackson, solid brick dwelling, south side McLaren street, cost \$6,000; Wm. J. Clease, frame dwelling, 3rd avenue, cost \$700; Chas. Hopewell, brick addition to houses, No. 90 and 92 O'Connor street, cost \$1,000.

FIRES.

Latter reports show that the damage to the works of the Jenckes Machine Co., at Sherbrooke, Que., by fire on the night of the 13th of August, was very much exaggerated. The fire was confined to the machine shop building, and the other departments, foundry, boiler shops, etc., were in operation as usual on the following Monday. A few days later a portion of the machine shop was started up, and the whole was in running order by the 23rd of August. The patterns, drawings and office records were preserved practically intact, and all orders for work are being accepted as usual. The principal item requiring replacement is the roof of the machine shop; this, however, is well under way. The whole of the work is being pushed with much energy, and the numerous orders in hand will suffer comparatively slight delay.—The fires of the past week included the following: Bakery of R. Kettle at Lachute, Que.; loss \$3,000, covered by insurance.—Residence of John W. Thompson near Gananoque, Ont.; loss \$1,000.—Small saw mill two miles northwest of Fargo, Ont., owned by Henry Fields.—Residence of John Huffman, near Belleville, Ont., second concession of Sydney. The building was owned by Henry Rowe.—Saw and grist mills of Joseph Cawthorpe, and copper shop of James McKay, at Thamesford, Ont.; heavy loss.—Zeilliax's hotel, Christman's hotel and C. Hahn's dwelling house at Elmira, Ont. The total loss is about \$16,000.—Extensive handle works of J. H. Still and the factory of the St. Thomas Pipe Foundry Company at St. Thomas, Ont., totally destroyed. Mr. Still estimates his loss at \$50,000. The pipe foundry was owned by a stock company, and was valued at \$10,000.—House at Bowmanville, Ont., owned by H. Wilcox.

CONTRACTS AWARDED.

QUEBEC, QUE.—Parish church at Beauport: Edward Matte, of Quebec, general contractor; sub-contractors, Mr. Deau-

cage, masonry, Ge.vais & Pouliot, decorative work; cost \$23,500.

ASHBURNHAM, ONT.—The tender of McQuillan & Co., of Toronto, has been accepted for constructing a waterworks system; price, \$6,295.

WINNIPEG, MAN.—Sewer on Maryland street. W. F. Lee, contractor, \$1,055. Granolithic walks on Main street. Dobson & Jackson, contractors, \$1,392.

TORONTO, ONT.—The Metallic Roofing Co., Limited, has received the contract for metallic ceilings for the new building, corner Yonge and Temperance streets, Toronto. A. R. Denison is architect.

ST. JOHN, N.B.—James McDade has received contracts as follows: Roofing of Presbyterian church, Douglas avenue; roofing of James Byrne's brick block at Sussex; heating of Jewish Synagogue with hot air.

CHARLOTTETOWN, P. E. I.—Contracts have been awarded as follows in connection with the sewerage system: Section No. 1, John P. Nicholson; manhole covers and casings, J. Matheson & Co., New Glasgow, N.S.

HAMILTON, ONT.—John E. Riddell has been awarded the contract for asphalt roofing, galvanized iron work and metallic ceilings for the new Pratt & Watkins building.—Repairs and alterations to pumping engines at the Beach. A. J. Nic \$2,850, (accepted); Killey-Beckett Engine Co., \$3,500.

LONDON, ONT.—The Hospital Building Committee have recommended the acceptance of the following tenders: Plumbing, Smith Bros. & Co., \$3,233.17, with \$447.06 for children's pavilion; (to place marble in main building, \$2,249, and in children's pavilion, \$250); tiling, Martyn & Hammett, \$2,100; electric generators, Canadian General Electric Co., \$1,800, engine, E. Leonard & Sons, \$1,350; switchboard, London Electric Co., \$420.

MONTREAL, QUE.—It is rumored that William Gibson, M.P., of St. Catharines, will be awarded the contract for the stone work of the new Grand Trunk offices. It has been decided to use granite in the building.—The following tenders were received for the construction of a drainage ditch alongside the aqueduct: H. Bourgois & Co., \$4,495.17; E. Gauthier & Co., \$3,227.50; L. A. Dufresne & Co., \$2,034; Walter E. Wood, \$1,800; Nap. Laporte & Co., \$4,230; P. Brunet, \$5,233; J. B. Gauthier and S. Dusablon, \$3,859; O. Martineau, \$5,915; Z. Per-

(Continued on page 4.)

THE HAMILTON BRIDGE WORKS CO., LIMITED.
HAMILTON - CANADA

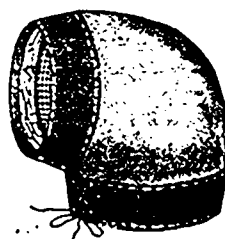
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rault & Son, \$2,449; Francois Lemoine and A. H. Chagnon, \$3,900. It is probable that the tender of Dufresne & Co. will be accepted.

BRANTFORD, ONT.—The following tenders were received by the City Council for work in connection with the flood prevention scheme: Section "A," stone abutment and concrete pier—Elliott, Workman & Bogue, \$14,491; Elliott & Wingate, \$14,348; W. L. Innes, Peterboro', \$10,000. Section "B," iron span of Lorne bridge—Elliott & Wingate, \$3,184.50; Hamilton Bridge Co., \$2,895; King Bridge Co., Cleveland, \$3,996; Dominion Bridge Co., Montreal, \$2,797. Section "C," excavation at Lorne bridge and rip rap walls—Elliott, Workman & Bogue, \$7,172.90; Elliott & Wingate, \$9,045.85; W. L. Innes, \$7,400; W. E. Phinn, sections "C" and "E," \$8,794. Section "D," dam and sluiceway—Elliott, Workman & Bogue, \$18,746; W. E. Phinn, \$10,958; Elliott & Wingate, \$12,560; W. L. Innes, \$9,675. Section "E," rip rap walls south of dam, east side—Elliott, Workman & Bogue, \$4,807.25; W. E. Phinn, "C" and "E," \$8,794; Elliott & Wingate, \$4,048. Section "F," filling on flats and rip walls against T. H. & B. railway—Elliott & Workman, \$6,884.90; Elliott & Wingate, \$4,600. Section "G," filling and work in Eagle place—Elliott & Workman, \$2,715.20; Elliott & Wingate, \$2,436.80. Section "H," work at Two Fish Islands—Elliott & Workman, \$8,572.06; W. E. Phinn, \$7,234; Elliott & Wingate, \$8,059.40; Schultz Bros., \$7,203. Contracts have been awarded as follows: Section "A," W. L. Innes, Peterboro', \$10,000; section "B," Dominion Bridge Co., \$2,770; section "C," Elliott & Workman, \$7,172; section "D," W. L. Innes, \$9,675; section "H," W. E. Phinn, \$7,234. It was decided that the Board of Works should complete sections "E," "F" and "G."

We regret to learn that Mr. James Hutcheon, city engineer of Guelph, Ont., met with a serious accident recently. He was engaged in superintending the fixing of a block and tackle to take down railroad rails in the old rolling mills, when a board upon which he was standing gave way and he fell some 50 feet to the floor below. Although his injuries are quite serious, it is believed that he will recover.

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TESTS OF MATERIALS.

The testing of materials is commonly a slow process and one which needs costly machines if the tensile and torsion strains are to be accepted as trustworthy. The loss of time is grievous to Americans who try to do all work in a hurry, and consequently impact tests are coming into favor in the States. At the last meeting of the American Society of Civil Engineers the experience with a newly-invented machine was described. From what was said about experiments by Mr. L. L. Buck, one of the members, it would appear as if wide divergence between results is likely to arise unless a uniform system of testing is adopted. It appears that a No. 7 wire, 100 feet long, with a normal strength of 60,000 pounds per square inch, was suspended from one of the towers of the Brooklyn bridge. It was provided with a large, strong washer at the lower end, supported by a nut screwed on at the extremity. Above the washer was a 50-pound weight with a hole in the centre, through which the wire passed loosely. The weight was first raised 4 feet and dropped on the washer, then raised to 8 feet and dropped, the distance increasing by increments of 4 feet. Considerable extension of the wire was caused, but it was not broken until the weight was dropped 36 feet. Afterward a 1-inch rod, 94 feet long, was suspended from the tower with a wire, nut, washer and weight attached. The wire was cut from the same piece as that previously tested, but was only 6 feet long. The weight was dropped as before, first from a height of 1 foot, the drop increasing by 1 foot at each test. The wire broke with a fall of 6 feet. The subject is worth investigating, for the

laws of impact have been hitherto expounded only in class-rooms.

The dissolution is announced of Baillancourt & Barbeau, painters, Quebec.

Horner Bros., contractors, Kirkfield, Ont., are said to be involved in financial difficulties.

John Butler, brick manufacturer, Waterford, Ont., is reported to have assigned to O. F. Duncombe.

Mr. James Morley Mowat-Biggs, C. E., who was the first engineer of the town of Toronto Junction, died recently, of malaria fever, in Central Africa, where he was sent by the British government on an important mission.

Ice, often the bridge builder's dangerous enemy, may sometimes be made his servant, says The Engineering Record, as is the case in a bridge recently commenced across the Ottawa river at Nepean Point, Canada. Work was being vigorously pushed to secure a bonus, and the solid ice across the river was advantageously utilized as a working platform. From it soundings were made, and on it materials were hauled and stored and men have worked to build the pier cribs. The cribs were sunk through holes cut in the ice and through 30 feet of water to a deposit of sawdust and water-logged timber 15 feet thick. In two cases the cribs have been carried down to solid rock by means of dredging through open wells. Another crib is to be sunk 75 feet deep by the same process, and the fourth pier may have a pneumatic caisson foundation. Permanent concrete filling is chiefly used for ballast and to sink the cribs, and is deposited under water by a special bucket designed by Mr. E. S. Jarrett, M. Am. Soc. C. E., of SooySmith & Company, New York city, who are contractors for the substructure.

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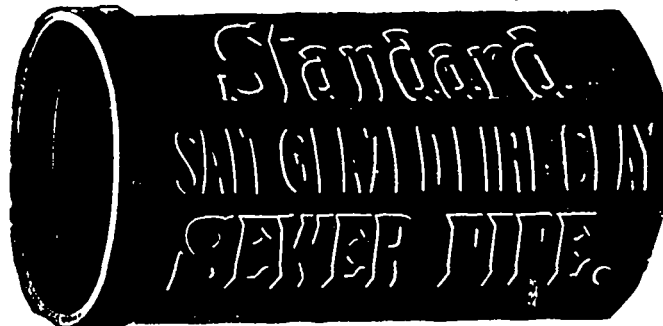


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MUNICIPAL DEPARTMENT

THE CHEMICAL AND BACTERIAL EXAMINATION OF WATER.*

By PERCY F. FRANKLAND, Ph D., B.Sc., Lond., F.R.S.,
Professor of Chemistry in Mason University
College, Birmingham.

The bacterial purification which takes place in the different layers of the sand filter is, perhaps, most instructively exhibited in the following results, which were obtained by Remish at the Altona Waterworks (see Table A).

amination, shows how necessary it is that the practice should be adopted of running to waste the filtrate until the sand has acquired the power of retaining the micro-organisms in the water, a practice which is at present, I regret to say, but little adopted by waterworks engineers.

From the facts which I have brought before you, it is obvious that the only available method of ascertaining whether filtration is being efficiently carried out is by submitting the water before and after filtration to bacteriological examination. It is, moreover, essential that the performance of each individual filter bed should be submitted to this bacteriological control. Unfortunately, it is too frequently the case, especially at old waterworks, that separate samples cannot be obtained of the filtered water from each separate bed, but only an average sample from the general filter-well of a group of beds, and it is

Thus the average efficiency of the six beds, as measured by the number of bacteria present in the mixed filtrate, was good, yet it is practically certain that No. 2 bed, which had only been in operation a single day, must have been working with very indifferent efficiency.

Just as the bacteriological examination has enabled us to ascertain the real value of artificial purification processes, so also by its means we can discover whether natural purification processes are operating with efficiency or not. Thus the safety of deep-well water depends upon the exhaustive filtration to which it has been subjected in the porous strata of the earth, and if the water gaining access to such a well has already been thus filtered, it should be almost entirely free from bacteria, and this in the case of properly constructed wells is found actually to be the case. It is desirable, therefore, that wells should be frequently submitted to the control of bacteriological examination, and this control is especially necessary after heavy rains, as it is at such times that there is the greatest possibility of the ingress of surface water taking place.

In the following table are recorded the results which I have obtained in the bacteriological examination of a number of deep-well waters, some of which I have had under periodical observation since 1886:

TABLE A—NUMBER OF MICRO-ORGANISMS FOUND IN ONE CUBIC CENTIMETRE OF WATER.

Date.	Raw Water.	No. 1 pipe 30mm. below layer of slime.	No. 2 pipe 60mm. below layer of slime.	No. 3 pipe 160mm. below layer of slime.	No. 4 pipe 430mm. below layer of slime.	No. 5 pipe 600mm. below layer of slime.	No. 6 pipe 790mm. below level of slime.	No. 7 pipe 90mm. below level of slime.	No. 8 pipe 130mm. below level of slime.	The water, drawn from the delivery pipe of the whole filter.
June 16.....	28,881	3,596	2,976	824	446	314	306	304	1,280	2,212
" 21.....	52,328	1,860	752	321	244	152	140	160	592	624
" 26.....	60,310	1,994	216	163	40	48	48	62	143	164
July 2.....	36,320	1,876	446	176	44	46	48	44	86	98
" 5.....	36,810		1,148	281	56	34	28	28	80	96
" 17.....	13,824		2,946	386	102	122	108	116	208	236
" 20.....	34,224		4,960	242	124	24	22	—	60	58
" 24.....	11,840	Liquefied	3,472	102	7	11	10	13	11	12

* This pipe was placed at the boundary between the sand and gravel layers. This pipe was placed in the layer of stones of about the size of a walnut. † The filter was cleaned on July 12, in which operation 30mm. of sand were removed from the surface, so that no further samples were obtainable from No. 1 pipe, whilst No. 2 pipe, instead of being 60mm. beneath the surface slime, was now only 30mm. below. Even when samples were taken five days later (on July 17th), although the number of micro-organisms in the raw water was considerably smaller than on the previous occasion, the disturbance is reflected in all the samples collected on that day by an increase in the number of bacteria present.

SERIES OF DEEP WELLS IN THE CHALK UNDER PERIODICAL OBSERVATION.

	Works at	Number of bacteria in one cubic centimetre of water.			
		1892.	1896.	1897.	1898.
A.	No. 1 well	16	—	14	—
	No. 2 well	13	—	19	5
B.	No. 3 well	4	—	24	—
	No. 4 well	76	—	43	46
C.	No. 1 well	11	13	75	37
	No. 2 well	21	10	31	—
D.	No. 1 well	21	—	115	9
	No. 2 well	—	—	—	—
E.	No. 1 well	44	—	8	30
	No. 2 well	54	—	10	—
F.	No. 1 well	18	—	9	18
	No. 2 well	74	—	80	20

It is unnecessary for me to further enlarge upon the great advantages which are to be derived from the use of the bacteriological method for ascertaining the efficiency of purification processes, whether natural or artificial, but it is very necessary that I should point out that the results obtained in such an investigation will only be of value if the samples have been collected in the proper manner and with the exercise of sufficient judgment. Indeed, there are a number of details which unless rigidly adhered to may lead to the most erroneous results being arrived at. The water must invariably be collected in sterilized bottles and submitted to examination with the greatest possible dispatch, whilst during any unavoidable delay the samples should be packed in ice to prevent multiplication of the bacteria. Much discredit has already been brought upon the method through inattention to such details by persons who might have been expected to be better informed.

Another important fact connected with waterworks filtration which has been revealed by the bacteriological method of examination is that a new sand filter, or a sand filter which has just been scraped, possesses but very little power of removing bacteria. In this connection I may refer to the following result which have been obtained in the laboratory of the Massachusetts Board of Health.

	Percentage Removal of bacteria.
First three days	25
Second three days	70
Second week	96
Third week	98

A particularly striking example of the comparative inefficiency of a sand filter which had just been started after scraping came under my personal notice in connection with the waterworks of a large city only a few weeks ago, and is exhibited by the following figures:

Filtration works at No. X.	Unfiltered water. No. of bacteria in one cubic centimetre.	Filtered water. No. of bacteria in one cubic centimetre.	Rate.	Age of bed. Days.
Jan., 1898	639	78	3'6in.	36
Feb., 1898	3,042	57	4'9in.	17
Mar., 1898	2,111	59	5'3in.	18
Ap., 1898	1,300	528	3'1in.	1

It will be observed that in April, when the bed had only just been started, the efficiency of the filtration was much less than on any of the other occasions, although the rate was the slowest.

This comparative inefficiency of a new sand filter revealed by bacteriological ex-

evident that the examination of such average samples is of very much less value, as it does not enable the delinquencies of a particular filter bed to be detected. It will, however, be generally found that existing works can be modified by some simple and inexpensive contrivance so as to permit of samples from each bed being obtained, whilst in all new works ample provision for this purpose should be made.

As an example of the unsatisfactory nature of an examination made of the mixed water from several beds, I may cite the following instance, in which I was able to examine the water coming from no less than six beds:

Filter beds yielding mixed water.	Age of bed	Unfiltered water supplying beds.	Filtered water from beds.
No. 1.....	3 days	1,230	66
No. 2.....	1 "		
No. 3.....	15 "		
No. 4.....	14 "		
No. 5.....	10 "		
No. 6.....	7 "		

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* From a paper presented to the British Association of Waterworks Engineers.

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	\$	\$	\$	\$
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Shipping cull boards, pro-				
miscuous widths.....	12 00	13 10		13 00
Hipping cull boards, stock	13 00	16 00		16 00
Hemlock scantling and joist				
up to 16 ft.....	12 00			10 00
Hemlock scantling and joist				
up to 18 ft.....	11 00	2 00	12 00	13 00
Hemlock scantling and joist				
up to 20 ft.....	12 00	13 00		14 00
Cedar for paving, per cord....		5 00		5 00
Cedar for kerbing, 4 x 14,				
per M.....	14 00			14 00
Scantling and joist, up to 16 ft		14 00		14 00
" " " " " " " " " " " "		15 00		16 00
" " " " " " " " " " " "		16 00		16 00
Scantling and joist, up to 22 ft		17 00		17 00
" " " " " " " " " " " "		19 00		19 00
" " " " " " " " " " " "		20 00		21 00
" " " " " " " " " " " "		22 00		23 00
" " " " " " " " " " " "		24 00		25 00
" " " " " " " " " " " "		27 00		27 00
" " " " " " " " " " " "		29 50		29 50
" " " " " " " " " " " "		31 00		31 00
" " " " " " " " " " " "		33 00		33 00
" " " " " " " " " " " "		35 00		36 00
Cutting up planks, 1½ and		25 00	28 00	25 00 30 00
thicker, dry.....				

(Continued on Page 8.)

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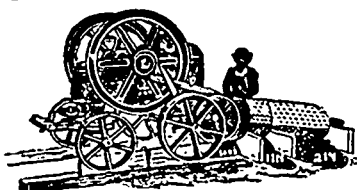
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CREDIT VALLEY STONE.

Table listing Credit Valley stone prices for Rubble, Brown Coursing, etc.

LONGFORD STONE.

Table listing Longford stone prices for Rubble and Ashlar.

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In the "Canadian Architect and Builder."

Large index table listing various categories of advertisements such as Architects, Cement, Interior Decoration, Reversible Windows, etc., with corresponding page numbers.

Toronto. Montreal.

Table listing prices for various building materials like Hydraulic Cements, Slate, Paints, Oment, Lime, etc., with columns for Toronto and Montreal prices.