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CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL

PUBLIC WORKS • TENDERS • ADVANCE INFORMATION • AND MUNICIPAL PROGRESS

EVERY SATURDAY

Vol. 3.

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No. 33

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

ADVERTISING RATES ON APPLICATION.

At its Convention held in Toronto, Nov. 20 and 21, 1889, the Ontario Association of Architects signified its approval of the CANADIAN CONTRACT RECORD, and pledged its members to use this journal as their medium of communication with contractors with respect to advertisements for Tenders.

The following resolution was unanimously adopted at the First Annual Meeting of the Province of Quebec Association of Architects, held in Montreal, Oct. 10th and 11th, 1890: "Moved by M. Perrault, seconded by A. F. Dunlop, that we the Architects of the Province of Quebec now assembled in Convention being satisfied that the CANADIAN CONTRACT RECORD affords us a direct communication with the Contractors,—Resolved, that we pledge our support to it by using its columns when calling for Tenders."

Subscribers who may change their address should give prompt notice of same. In doing so, give both old and new address. Notify the publisher of any irregularity in delivery of paper.

WANTED,

Boy about 14 years, to learn decoration, a knowledge of architecture preferred. Apply Box 122, office of CANADIAN ARCHITECT AND BUILDER.

Electric and Gas Fixtures.

Sealed tenders addressed to the undersigned and marked "Tenders for Fixtures," will be received until TUESDAY, THE 27TH INST., for the supply of Combination Gas and Electric Fixtures for the New Court House at Woodstock.

Specifications and conditions may be seen and all information obtained from the Architects, Messrs. Cuthbertson & Fowler, at their office in Woodstock, or they may be had on application by mail from the undersigned.

JAMES WHITE,
County Clerk.

Woodstock, 7th Sept., 1892.

TENDERS

Will be received by the undersigned, for the corporation of the township of York, for Grading and Macadamizing &c., MacKenzie Avenue, from Davenport Road southerly to the C. P. railway. MacKenzie Avenue is a short distance east of Davenport station.

Plans, specifications, &c., can be seen at the office of the undersigned, and tenders will be received up to 5 o'clock p.m. on Saturday, the 1st day of October, 1892. The lowest or any tender not necessarily accepted.

PETER S. GIBSON, C. E.,
York Tp. Engineer.
Willowdale, 16th Sept., 1892.

NOTICE OF REMOVAL.

The offices of the "Contract Record" have been removed to the Confederation Life Association's new building, Rooms 106, 107 and 108.

USEFUL HINTS.

From a French journal we gain another suggestion for a method of "deafening" floors, attributed to General Loyie, who proposes, instead of loading the floor with plaster, to fill in the space between the boarding and the plastering of the ceiling with shavings, which have been rendered incombustible by dipping them in a tub of thick whitewash. As it is known that soft substances inclosing air spaces form an excellent non-conducting material to sound, it is thought that the shavings so treated will be found of great service, and it is said they are so incombustible as to add considerable to the fire-resisting properties of the building. When it is desired to disinfect the space between the floor and ceiling, the shavings may be saturated with chloride of zinc, or the latter may be added to the lime wash.

W. H. Wakeman, writing to the *North-western Mechanic* on "What should and should not be Done in Steam Fitting," says: In piping for water it is a good idea to avoid the use of globe valves as much as possible, for they cause unnecessary friction, but this does not necessarily mean that we are to use either plug cocks or gate valves, for the former, if they are of the ordinary kind are an unmitigated nuisance, and the latter are more complicated and expensive. In looking over a certain job of piping we found that where the water of condensation from the heating pipes was returned to a receiver the arrangement was as follows: Short nipples were screwed into the receiver, globe valves were then put on, then followed more nipples and next came the elbows, etc. This is all wrong, for if the first nipples connected to the receiver had been made a little longer and angle valves put on next, there would have been less joints to make and instead of the crooked passage through the globe valves there would have been simply straight pieces of pipe. The outlet from this receiver was made up in very much the same way, for a short nipple was put in first, followed by a gate valve, then another nipple, then came an ell, etc. Here was another place where an angle valve would have been an improvement both in first cost and subsequent use.

CONTRACTS OPEN.

HALIFAX, N. S.—\$30,000 worth of street paving debentures were recently sold.

QUEBEC, QUE.—A company is being organized here to build an elevated electric street railway.

BROCKVILLE, ONT.—The Town Council are taking steps to secure the erection of an isolation hospital.

RENFREW, ONT.—The Village Council has decided to erect a fire hall, 30x40 ft. and two stories high.

WINDSOR, ONT.—The congregation of All Saints' Church has decided to erect a new edifice in the west end.

PENETANGUISHENE, ONT.—The summer hotel is to be enlarged next summer to accommodate 400 guests.

FREDERICTON, N. B.—Steps are being taken toward the erection of a suitable monument to the late metropolitan.

SARNIA, ONT.—J. D. Lowrie, township clerk, will receive tenders until the 1st of October for the construction of the Cox drain.

TILSONBURG, ONT.—The Town Council has passed a by-law to raise the sum of \$7,500 for a new high school building and site.

STRATHROY, ONT.—The Council contemplate spending the sum of \$2,167 in the construction of artificial stone sidewalks. F. J. Craig, town clerk.

VICTORIA, B. C.—It is said that Mr. W. H. Maudesley, of Plumper's Pass, has in contemplation the erection of a first-class hotel at that place.

BROWNSVILLE, ONT.—Tenders are asked until the 1st of October for the construction of the Pearce drain, in the township of Derelham. Geo. Lish, clerk.

GLENCOE, ONT.—R. Coad, Secretary Building Committee, will receive tenders until the 3th of October for the erection of a new Anglican church in this village.

PEMBROKE, ONT.—W. O'Meara, Chairman Finance Committee will receive tenders until the 30th inst. for the purchase of \$5,500 worth of public school debentures.

ST. MARY'S ONT.—J. D. Moore Chairman Fire and Light Committee, will receive tenders until the 30th inst. for lighting the town by electricity, arc and incandescent.

HESPELER, ONT.—Mr. Fred W. Mellish, architect, of Galt, invites tenders until the 30th inst., for the several trades required in the erection of a brick church in this town.

BRANTFORD, ONT.—The construction of an implement factory for the Farmer's Binding Twine and Agricultural Implement Company will be commenced at an early date.

PORT ARTHUR, ONT.—An agreement has been arrived at between the municipality of Port William and the promoters of the Port Arthur electric street railway whereby the company will extend their line to Fort William, a distance of eight miles.

WESTMINSTER, B. C.—The by-law to raise by way of debentures the sum of \$75,000 for the extension and completion of the waterworks has

passed the second reading in council and will be submitted to a vote of the ratepayers on the 12th of October.

VANCOUVER, B. C.—Mr. Stewart, C. P. R. engineer, has completed the survey for the proposed railway between Revelstoke and Nakusp, and the work of construction is to be commenced at once. The sum of \$3,200 per mile has been appropriated by the Dominion Government for this work.

TORONTO JUNCTION, ONT.—The Town Engineer has been instructed to purchase drain tile necessary for the construction of sewers, to advertise for tenders for grading and paving Glendonwynne road.—Mr. Willis Chipman, C.E. has submitted plans for the construction of the storm water sewer.

KINGSTON, ONT.—Mr. B. M. Braton has sent a communication to the City Council stating that a number of capitalists from United States and Toronto are willing to form a company to build a large hotel in this city, at a probable cost of \$150,000, provided the Murney Tower field can be secured as the site. The matter will be discussed at the next meeting of the council.

LONDON, ONT.—The City Engineer will receive tenders until the 3rd of October for the erection of a four-room addition to Princess avenue school.—An artificial stone walk is to be constructed on the north side of King st. west of Clarence street.—Tenders will be called shortly for heating the Collegiate Institute by hot air.—Mr. A. O. Graydon will receive tenders until the 3rd of October for the erection of two school buildings, one on Quebec street and one on Wortley road, for the Board of Education.

WINNIPEG, MAN.—The Board of Trade of this city is trying to secure the erection of the proposed Agricultural College in this district.—The City Engineer has been instructed to advertise for tenders for the supply of material required for a new system of waterworks. The amount required is estimated to cost about \$108,000. Mr. H. F. Carter, architect, of Minneapolis, was in the city recently in connection with the proposed opera house to be erected by the Ross-McKenzie syndicate at the corner of Main street and Portage avenue. He stated that the plans have been completed and contracts would be awarded within the next two weeks. The building is estimated to cost \$40,000.

OTTAWA, ONT.—Tenders will be received at the Department of Public Works until the 15th of October for the furnishing of sundry electric light supplies for the Parliament Buildings in this city.—A movement has been commenced in this city towards securing the erection of a Young Woman's Christian Association building. The sum of \$12,000 is required to be raised for building and site.—The City Engineer will receive tenders until Wednesday, the 28th inst., for the construction of a number of sewers. Tenders will be received by the Department of Public Works until the 11th of October for the extension of piers and dredging at Port Albert, Huron County.

MONTREAL, QUE.—Mr. Chazot has sent in a proposition to the Council to build an incinerator for \$12,000. The matter has been referred to the Finance Committee. The Road Committee has

recommended the construction of the following works, permanent pavement on Laval avenue St. Louis square and parts of Ontario and St. Catharines streets, estimated cost \$60,000; asphalt pavement on Pouscouros market; drain on Notre Dame street, from Papineau square to the cotton factory.—The Government will be asked to provide a new morgue built in an isolated place and fitted up with all modern appliances.—It is stated that Mr. Bickerdike, who succeeded in getting an Act of Incorporation empowering him to build electric railways in St. Henri and St. Cuneonde, will commence the construction of the roads early in the spring. It is also proposed to build a suburban line to Lachine and St. Anne's.—The City Surveyor will receive tenders until Wednesday, the 28th inst., for the construction of a sewer on Notre Dame street, from Lacroix to Monarque street.—Perrault & Lesage, architects, are preparing plans for a three story building on McGill street, for B. Columbian, also for a three story dwelling on Notre Dame street east for Jas. Deschatelets.—L. R. Montbriant, architect, is preparing plans for a residence at Long Point.—J. R. Gardner architect, is preparing plans for six cottages to be erected at Beaconsfield.

HAMILTON, ONT.—The Council has decided to construct a sewer on Emerald street, south of Stinson street, and a six-inch water main on Wood street.—Plans will shortly be prepared for new buildings for the Hamilton Exhibition Association. The City Council will be asked for a grant of \$50,000 towards their erection.—Messrs John Eustice and Adam Cook are said to have purchased land for a park at the top of the mountain, with the intention of erecting thereon a hotel, plans for which have been prepared.—A building permit has been granted to John Doherty for two two-story brick houses on Burlington street, between John and Hughson streets, to cost \$1,400.—Messrs. C. M. Counsell, Adam Zimmerman, J. H. Tilden, W. J. Copp, W. A. Wood, John Patterson and Thomas Patterson, of this city, and N. Dymont, of Barrie, are applying for incorporation as the Hamilton Radial Electric Railway Company, the object being to construct and operate an electric railway from this city to the following points: To the town of Mount Forest, running through the village of Waterdown and city of Guelph and the towns of Fergus and Arthur; to the town of Oakville, via Hamilton Beach and the villages of Burlington and Bronte; to the city of Brantford, running through the unincorporated village of Ancaster; to the town of Dunnville, Haldimand, or Welland, running through the village of Smithville.—The Board of Works have decided to arrange a conference with the G. T. R. authorities to secure the erection of a street bridge on Barton street.—In view of the heavy tolls collected by the owners of the several municipal road running into Hamilton, it is suggested that the city shall build a series of electric street railways to connect the city with the suburban districts.

TORONTO, ONT.—Mr. Arthur Burke, barrister, Freehold Loan Building, contemplates erecting a dwelling adjoining his residence on Gerrard street east, near Parliament street.—Mr. Wm Osgooby, with some of his friends, is said to contemplate the erection of a number of cottages in Muskoka.—Tenders are wanted for building three houses on Mutual street. Particulars at office of T. E. Washington, 28½ Victoria street.—Excavating has been commenced for a dwelling to be erected on the south side of Grosvenor street, immediately east of Surrey Place.—The City Engineer has recommended the construction of a sewer on Wallace avenue, to cost \$2,560, and the repairing of Brock street sewer, from Front street to its outlet, at a cost of \$10,000.—The Municipal Council of North Toronto has given notice of its intention to lay a six inch water main, with necessary hydrants, connections, etc., on Glencairn avenue, from Yongestreet to within seventy feet of the easterly limit of Chancellor st.—Petitions have been presented to Council for the construction of water mains on the following streets: Chatham street, 2,000 feet, cost \$3,000, Woodbine avenue, cost \$1,200; Dundas avenue, cost \$800; Macpherson ave., cost \$300.—Follows is the estimated cost of the proposed extensions of sewers into the bay: Berkeley street sewer to windmill line, \$3,400; Sherbourne street sewer to

end of Polson's dock, \$5,900; Church street sewer to end of present dock, \$8,300; Yonge street sewer to windmill line, \$13,000; Jarvis street sewer to end of dock, \$5,200; Brock street sewer to end of present dock, \$4,600.—At a meeting of the Board of Works held on Wednesday last, it was decided to proceed with the construction of the following pavements Avenue road, between Bloor street and northern city limits, cedar blocks with granite tooting, cost \$22,000; Gerrard street, from River to Parliament street, cedar on concrete, with granite or scoria tooting, cost \$9,800; Parliament st., from Gerrard to Carlton st., asphalt with granite or scoria tooting, cost \$5,900; Carlton st., from Parliament to Yonge st., asphalt with granite or scoria tooting, cost \$27,050; College st., from Yonge to Rathurst st., asphalt with granite or scoria tooting, cost \$44,100; College st., from Rathurst st. to Jameson ave., cedar on concrete, with granite or scoria tooting, cost \$39,340; Jameson ave., from College to Dundas st., cedar on concrete, with granite or scoria tooting, cost \$1,584; Queen st., from Yonge to Parliament st., asphalt with granite or scoria tooting, cost \$26,750; Queen street, from Parliament to River st., cedar on concrete, with granite or scoria tooting, cost \$9,800; Dundas st., from Queen to Arthur st., asphalt with granite or scoria tooting, cost \$12,700; Dundas street, from Arthur st. to the Dundas street bridges, cedar on concrete, with granite or scoria tooting, cost \$26,200; York st., from Front to King st., asphalt with scoria or granite tooting, cost \$7,830; George street, from Front to King st., granite block on concrete, cost \$2,370; Frederick st., from Front to King st., granite block on concrete, \$2,370; Front st., from Frederick to Sherbourne st., granite block on concrete, cost \$2,540; Sherbourne st., from King to Front st., granite block on concrete, cost \$2,370. In addition to the above pavements the City Engineer presented the following list of streets which require to be paved from kerb to kerb: Winchester street, from Parliament street to Ontario street; Prospect street, from Rose avenue to Parliament st.; Amelia st., Sumach to Parliament st.; D'Arcy st., Beverley to McCaul st.; Baldwin st., Beverley st. to Spadina avenue; Cecil st., Beverley st. to Spadina ave.; Henry st., Baldwin to Cecil st.; Bellevue st., College st. to Bellevue pl.; Orde st., 120 feet east of McCaul st. to east end, St. Patrick st., McCaul st. to Spadina Ave.; Sullivan st., Beverley st. to Spadina ave.; Grove ave., Dundas to Foxley st.; Northcote ave., Queen st. to Sunn ave.; Rolyat st., Dundas st. to Grove ave.; Lisgar st., Queen st. to Dundas st.; Argyle st., Dundas st. to Gladstone ave.; Saurin ave., Northcote ave. to Lisgar st.; Nassau st., Spadina ave. to Lippincott st.; Earl st.; Booth ave.; Melville ave., and lane in rear of Canada Permanent building.—The City Council have approved of the action of the architect, Mr. E. J. Lennox, in taking possession of the works in connection with the new Court house, and tenders will be invited for the completion of the entire work. The architect is desirous of having the masonry completed this fall, tenders for which will be asked immediately.—The following building permits have been granted: S. R. Warren & Son, 39 McMurrich st., r. c. add, to factory, cost \$1,000; G. F. Price, 172 Dalhousie st., new shop fronts and bk. foundations to stores, 232 and 234 Queen street w., cost \$1,200; John Maloney, mansard roof to Imperial hotel, cor. Jarvis st. and Commercial lane, cost \$1,000; Thos. Murray, 1524 Queen st. w., 3 story bk. store and dwelling, n. e. cor. Queen st. and Macdonnell ave., cost \$3,500; W. H. Pratt, 198 Jarvis st., det. 2 story and attic bk. residence s. w. cor. Bloor and St. George sts., cost \$9,000; T. Douglas, 4 story bk. warehouse, 122 Adelaide st. w., cost \$10,000; W. J. Bromley, det. 2 story and attic bk. dwelling, Bedford rd., first lot south of Bernard ave. Mrs. Baldwin, is about to erect a detached residence on the corner of Avenue road and Health street.—A new chapel is to be erected in connection with Mount Pleasant cemetery, also a new vault and conservatory.—Mr. John Ayre, of the Lakeview Hotel, contemplates the erection of a residence at Island Park.

FIRES.

The woollen mills of Messrs. Roben & Fils at Beauharnois, Que., were entirely destroyed by

fire on Thursday of last week.—E. S. Edmonson & Co's. flour mill at Oshawa, Ont., was burned to the ground on Tuesday last. The electric light plant situated in the building was destroyed.—The residence of Mrs. J. Hogg, at Wingham, Ont., was burned recently. Insurance \$1,000.—The paint shops of the Canadian Pacific Railway Company at Toronto Junction, were destroyed by fire on Tuesday last. The loss on the building is estimated at \$4,000.—Slaughenwhite Bros.' mill at the head of St. Margarets Bay, N. S., was totally destroyed by fire last week. The loss is estimated at \$5,000.—The Richelieu and Ontario Navigation Co's. steamer Corinthian, was totally destroyed by fire in Cedar Rapids a few days ago. Insurance, \$40,000.—St. Andrew's Roman Catholic church at Port Arthur, was damaged by fire on Thursday last, to the extent of \$3,500.—About thirty dwellings and fifteen places of business were destroyed by fire at Bucouche, N. B., on the 22nd inst. The loss is estimated at from \$60,000 to \$90,000.

CONTRACTS AWARDED.

TORONTO, ONT.—Mr. Benjamin Kerr has secured the contract for enlarging the Island Park pavilion, at the price of \$1,684.

LONDON, ONT.—Mr. W. Walterworth, of Ingersoll, has secured the contract for the erection of the new C. P. R. station in this city.

OTTAWA, ONT.—The Government has awarded the contract for sections 1 and 2 of the Soulanges Canal to Mr. A. Stewart, of this city, the works to be constructed of concrete.

TORONTO JUNCTION, ONT.—The Hamilton Bidge Company have secured the contract for the construction of the overhead foot bridge on McMurray avenue, their tender being \$4,976.

KINGSTON, ONT.—Tenders for Judge Price's house have been awarded as follows: carpentry, E. M. Storey, masonry, H. Sleeman; painting, Robinson Bros.; plumbing, Jameson & Son; tin-smithing, Nugent & Taylor.

HAMILTON, ONT.—The City Council has awarded contracts as follows for the construction of sewers: Chatham street, John Harris, 79 cents per lineal foot; Ferguson avenue, from Barton to Robert streets, J. C. Kent, 94 cents per foot.

BRANTFORD, ONT.—The contract for the new bridge across the river for the Toronto, Hamilton and Buffalo Railway has been awarded to the Dominion Bridge Company, of Montreal.—The Royal Electric Co., of Montreal, have purchased from the Waterous Engine Co., of this place, one of their church pulleys, 93 x 52 feet, for street railway purposes.

GUELPH, ONT.—The Guelph Silica Barytic Stone Company have been awarded the contract for the construction of permanent sidewalks on a number of streets.—Mr. C. M. Reynolds has awarded the contract to Mr. Chubb and Mr. Wideman for the erection of a two story double brick residence on the corner of Dublin and Paisley streets.

WINNIPEG, MAN.—Mr. J. A. McDermid of this city has been awarded the contract for the erection of the new barracks at Fort Osborne, the price being \$28,000. The contract for stone work has been sub let to Messrs. Shaw & Co.—The contract for repairs to Jas. Robertson & Co's. warehouse has been let to Messrs. Laird & Hazel, at the contract price of \$3,800. Mr. C. H. Wheeler has charge of the work.

MONTREAL, QUE.—A. C. Hutchison, architect, has awarded contracts as follows for a three story building on Bleury street for H. Lyman, masonry, J. B. St. Louis; carpentry, L. Piton & Son; roofing, Campbell & Co.; plastering, L. Phillips; brick work, A. McArthur; plumbing, Hughes & Stephenson.—J. R. Gardner, architect, has awarded the contract for a cottage at Lachine, for W. Kavanaugh, to D. Legault, Montreal; also two cottages, for C. P. Salter, and W. G. Slack, to H. Brunet, of St. Anns.—Perrault & Lesage, architects, have awarded contracts as follows, for a three story residence for R. Prefontaine: masonry, Plant & Dubuc, brick work, Jos. Brunet & Son, carpentry, plastering, roofing and plumbing, Bourgoin & Cadieux.—L. R. Montbriant, architect, has awarded contracts for a residence for B. Lefebvre, on Ontario st., as follows: masonry, P. Lecompte; brickwork, plastering and painting, A. Racette; roofing and plumbing, Geo. Von, carpentry, E. Gauthier.

MUNICIPAL DEPARTMENT.

FOUNDATIONS FOR BRIDGES.*

By P. MOGRSEN.

(Continued from last week.)

When the wells have been sunk to the required depth, they should be filled with cement concrete up to ground level, where neat work may conveniently be commenced. Small arches should be built to support the body of the pier where it overhangs the openings caused by the curvatures of the wells.

Instead of brick wells iron cylinders are advantageously employed where they can be procured at a relatively low price, and especially where a large diameter is required, and in this case the brick wells are liable to collapse. The iron cylinder has the further advantage of presenting a smaller annulus to be cleared at the bottom, and having a smoother outside surface its own weight is often sufficient to force it through the ground. The methods of sinking iron cylinders and masonry wells are essentially the same.

Where the river bed consists of layers of sand and rough gravel mixed, with or without a certain amount of smaller and larger stones interspersed, it will be found cheapest and quickest to make an open excavation without lining or shoemg of any kind except in the pump-well. This can be done by giving the sides a slope of one half or three-quarters to one. The excavated material can be taken out either with a crane or with wheelbarrows, and should be placed in such a position as to offer additional security against and breakage in dams, floods caused by heavy rains, or other natural agencies.

The pump-well should be made in one corner of the excavation, and for a hump of from five to ten inches bore a well with an area of twenty to twenty-five feet is required. This can be sunk advantageously by placing planks about six feet long on end and outside of two wooden frames, one about a foot from the bottom end and the other close to the top.

As excavation inside this lining proceeds, the suction tube should be lowered, and whenever the lower end of a plank has been left free by picking out the obstructing material, it should at once be driven down as far as possible. By giving the part of the well above the lining a slope of about one-half to only one length of planks will be required, and this method will be found the cheaper and more convenient than lining the well throughout the whole depth. The well should be continually at least two feet lower than the excavation so that this may be the better drained.

Many engineers, when not directly interested in the cost of the work, disapprove of the idea of making an open excavation in water-bearing ground without lining, and generally suggest some more complicated method. It is true that the open excavation requires of the constructing engineer his personal supervision of details, which means hard work; but it is also true that, when at all practicable, this is by far the cheapest way of doing the work.

Under circumstances such as those described it is customary to place the brick or stone masonry on a concrete foundation of from one to two inches in thickness, and with an offset of nine or twelve inches on all sides. When, therefore, the excavation is down to its proper depth and the bottom has been made as nearly as possible the exact size of the concrete foundation, the latter can be made very satisfactory by letting concrete, mixed in the ordinary way, down a chute to the bottom of the excavation. To prevent the inflowing water from washing the cement of the concrete into the pump-well, the water should be allowed to rise to a convenient height so as to become calm with no applicable current towards the well. When good Portland cement or its equivalent is used and the earth acts as a casing, it will be quite safe to commence building on the top of the concrete foundation twelve to eighteen hours after it has been made.

Before any masonry is started the work should be carefully marked off. If the pier has a base with one or more offsets, as is usually the case, no great accuracy is necessary until the level of neat work is reached, but if at any stage of the

*Read before the Civil Engineers' Club of University of Illinois.

MUNICIPAL ENGINEERS, CONTRACTORS, AND MATERIALS.

work below ground-level it is necessary to mark off the work, this should be done in accordance with some convenient method. I have found the following process simple, rapid and reliable: A thin wire is stretched between two center line points, across the excavation; and with a plummet this line is projected on the work below. The centre of the pier is found by measuring along the center-line the required distance from the nearest fixed points. This measurement can be accurately made with a steel tape held as nearly level as possible, on which the distance is read off and projected on the center line in the usual way. The pier can now be marked off with an ordinary wooden square or a straight edge.

Another way of marking the cross center lines of the piers is to place stakes on both sides of the excavations and at right angles to the center line of the bridge, before work is commenced. But as these stakes are much exposed and likely to be disturbed during the progress of the work, they should be used only for marking off excavations, foundations, and such work as does not require any great accuracy.

A good centrifugal pump is very efficacious for drawing the water from the wells and excavations. As it occupies little space, it is simple to erect, easy to move, and seldom gets out of order. It is more suitable for this kind of work than any other form of pump.

An easy-working, sliding suction and a simple, effective foot-valve are essential to a successful and economical management of the work. The sliding suction usually consists of a pipe or cylinder having a stuffing-box at one end and a flange for the foot-valve at the other. It is preferably made of sheet-iron, so as not to be unnecessarily heavy. Inside this cylinder is placed a pipe of the same bore as the pump. The gland of the stuffing-box should run easily on the pipe, so that the cylinder may be moved freely up and down when the gland is loosened. A good foot valve is made of an ordinary valve-chamber with an iron flap on hinges, moving freely, and with a leather edge to make a water-tight joint with the valve-seat.

It is very important that close and constant attention be given to the pumping machinery, as any interruption in the discharge of the water will cause it to rise in the excavation, and when it is afterwards pumped out it is likely to wash down the material of the sides and entail considerable loss.

These remarks have been written with reference mainly to work on new railways. Other conditions will often suggest changes to be made in the methods of working, of obvious advantage.

DATES TO BE REMEMBERED.

October 1—Last day for returning Assessment Roll to clerk, in cities, towns and incorporated villages, where assessment is taken between 1st July and 30th September.—Assessment Act, Section 52.

October 1—Last day for delivery by Clerks of Municipality to Collectors of the Collectors' Rolls, unless some other day be prescribed by by-law of the Local Municipality.—Assessment Act, Section 120.

October 1—Notice by Trustees of cities, towns, incorporated villages and township boards to Municipal Clerks to hold Trustee elections on same day as Municipal elections due.—P. S. Act, Section 103, (2)

The city of Montreal maintains its own crushers for furnishing broken stone for macadamizing, and finds the outlay for machinery has been a very profitable one, according to City Surveyor Percival W. St. George. During 1891 the quarry was kept open all the year and furnished 37,350 tons of stone, at an average expense of \$1.14½ delivered at the work. The lowest contract price for the stone was \$1.65 a ton, hence there is a saving of 50½ cents, which is probably more than enough to cover the depreciation and interest on the plant. The city of Toronto proposes to follow the example of Montreal in this matter.

THOROLD CEMENT

WELLAND CANAL ENLARGEMENT,
RESIDENT ENGINEER'S OFFICE,
WELLAND, April 17th, 1884.

JOHN BATTLE, Esq., Thorold.

Dear Sir,—Yours of yesterday, relative to Thorold Hydraulic Cement, is received. In reply, I beg to say that my tests of the Thorold Hydraulic Cement have extended over a period of twenty-eight years, and have been on a large scale, as exemplified in the locks, bridges, culverts and other masonry on the Welland Canal and Welland Railway, and that the record, which has been invariably satisfactory, is to be found in examination of the structures. The necessary tearing down of masonry and concrete, during the Welland Canal Enlargement, has afforded abundant evidence of the reliability of the Thorold Hydraulic Cement, both in masonry and concrete, and above and under water. I desire no better cement for the class of work referred to

I am, dear sir, yours truly,

W. G. THOMPSON,
Resident Engineer.

ISAAC USHER & SON,
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Manufacturers of

QUEENSTON CEMENT

Proved by Government tests to be the best Canadian natural cement. Write for prices, &c.

DEBENTURES WANTED.

Municipalities issuing debentures, no matter for what purpose, will find a ready purchaser by applying to G. A. SIMMONS, 9 Toronto Street, Toronto. N.B.—Money to loan at lowest rates on first mortgage.

R. E. H. BUGKNER,

32 Adelaide St. East, - TORONTO.

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Vitrified Clay Sewers - Dust Bins - Sewer Pipe
Cements - Steam Road Rollers - Stone
Breakers - Street Scrapers
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ASPHALT PAVING

We are prepared to do first-class work on WALKS, FLOORS, CELLAR BOTTOMS, &c., with ROCK ASPHALT, which is conceded to be the best for this class of work.

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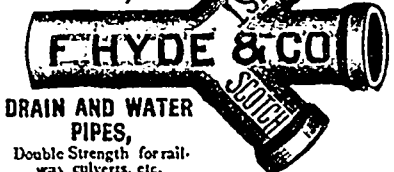
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SCOTCH FIRE CLAY BRICK,



DRAIN AND WATER PIPES,

Double Strength for railway culverts, etc.

Sewer Bottoms or Invert Blocks, Cement.

NOTE.—Only pure SCOTCH unglazed Fire Clay Linings will be kept in stock; any other quality is worthless for resisting heat. Correspondence invited. Quotations promptly furnished.

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Bridge and Structural Iron Work. Steel Beams kept in stock.
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This improvement marks an era in sanitary reform. Universal certificates in its favor from Arch. tests, plumbing inspectors, master plumber associations, and others. Costs no more; more economical to use.

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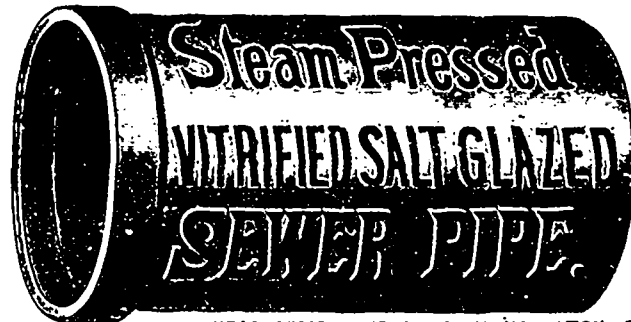
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Write for Discounts.



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MANUFACTURERS OF

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Double Strength
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Architectural Ironwork a Specialty. Pleased to furnish estimates.

THE J. C. EDWARDS

Vitrified Terra Metallic Paving Brick

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STABLE, COACH HOUSE, BOILER HOUSE, BREWERY FLOORS AND YARDS,
Also all places of heavy and light traffic.

The only Genuine Vitrified Brick. The best in the world for Sidewalks & Street Crossings

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RAILWAY AND HIGHWAY BRIDGES

Viaducts, Piers, Roofs, Turntables and Girders in Steel and Iron.

Tension members forged without welds. Riveting done by hydraulic or compressed air machinery. Specialties: Good workmanship and strict adherence to specifications and drawings.

CAPACITY: 2,000 TONS PER ANNUM.

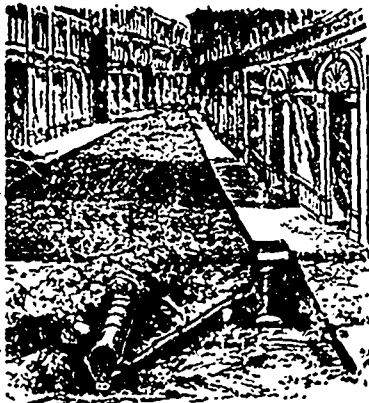
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VITRIFIED CLAY SEWER

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CAST IRON STREET GULLEY.

Over 5000 Gulleys are now in use in the following towns: Montreal, Toronto, Ottawa, Quebec, St. Cune-gonde, St. Henri, Peterboro', Owen Sound, Sarnia, Cote St. Antoine, Sherbrooke, London, New Glasgow, N.S. A saving of \$22 on each gulley over the brick gulleys.



LEWIS SKAIFE, Engineer and Contractor,

New York Life Building, - MONTREAL. AGENT.

Prices of Building Materials.

LUMBER.

CAN OR CARGO LOTS.

Toronto. Montreal.

Table listing lumber prices for various grades and sizes, including clear pickets, dressed planks, and shingles.

YARD QUOTATIONS.

Table listing yard quotations for mill cut boards, shipping cut boards, hemlock scantling, and various sizes of planks and girders.

Toronto. Montreal.

Table listing prices for cutting up planks, cedar for block paving, and cedar for keelings.

Table listing prices for various types of flooring, including dressed and undressed planks, and sheathing.

Table listing prices for common walling, good facing, and sewer pipes.

Pressed Brick, Per M.

Table listing prices for plain brick, hard building, and ornamental bricks in various quantities.

SAND.

Per Load of 1 1/2 Cubic Yards

STONE.

Table listing prices for common rubble, large flat rubble, foundation blocks, and granite ashlar.

Concrete.

Table listing prices for concrete blocks, slabs, and various types of concrete work.

SLATE.

Table listing prices for roofing slate in various colors and grades.

PAINTS. (In oil, 1/2 lb.)

Table listing prices for various types of paint, including white lead, red lead, and yellow ochre.

Toronto. Montreal.

Table listing prices for black lamp, blue ultramarine, oil, linseed, and Paris white.

CEMENT, Etc.

Table listing prices for various types of cement, including Portland, Thortold, and Queenston.

HAIRDWARE.

Table listing prices for cut nails, steel, and various types of hardware.

Toronto. Montreal.

Table listing prices for cold cut, not polished or blued, per 100 lbs., and various types of nails.

FINISHING NAILS.

Table listing prices for finishing nails in various sizes.

SLATING NAILS.

Table listing prices for slating nails in various sizes.

COMMON BARREL NAILS.

Table listing prices for common barrel nails in various sizes.

CLINCH NAILS.

Table listing prices for clinch nails in various sizes.

SHARP AND PLAT PRESSED NAILS.

Table listing prices for sharp and plat pressed nails in various sizes.

Structural Iron.

Table listing prices for structural iron, including steel beams, channels, and plates.

INDEX TO ADVERTISEMENTS

In the "Canadian Architect and Builder."

Large index table listing various companies and services under categories such as Architects, Cement, Galvanized Iron, Plastering Fibre, and more.