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CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF 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.

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THE CANADIAN CONTRACT RECORD,
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DATE OF PUBLICATION.
 Architects, Engineers, Municipal Authorities and others are reminded that the CONTRACT RECORD is printed every Tuesday afternoon, and that advertisements should reach the office of publication not later than 2 o'clock p.m. on that day to ensure insertion in the issue of the current week. Advertisements are frequently received too late for insertion, to avoid which special attention is directed to this announcement.

to form a company, with a capital of \$50,000, to erect a knitting and thread factory in this town.
SELKIRK, MAN.—Thomas Pattington, town clerk, desires offers up to January 23rd, 1899, for the purchase of \$62,000 of debentures.

FOREST, ONT.—On January 2nd the ratepayers will vote on a by law to borrow the sum of \$7,000 to purchase an electric light plant.

LAKE BENNETT, B. C.—John Connelly and Oliver Rolston are each applying for permission to cut timber on berths about 960 acres in extent.

ATHENS, ONT.—The trustees of the Methodist church have decided to proceed with the erection of a new church, to be completed during 1899.

CARMAN, MAN.—The Carman Rink Company, capital \$2,000, is seeking incorporation, to build a club building, containing rink, reading rooms, etc.

WALNUT, ONT.—W. G. Willoughby, clerk of Brooke township, gives notice that the council propose issuing debentures for \$1,138, \$1,195 and \$612.85.

WINDSOR, N.S.—The Midland Railway Company will build workshops either at this place or at Truro. Both municipalities are endeavoring to secure the works.

SHELBURNE, N.S.—Thomas Robert-Son, M.P.P., and Engineer Locke were at Northeast Harbor recently, in connection with the building of a lighting station.

ALVINSTON, ONT.—The council has entered into an agreement with Mr. Reader by which he agrees to erect a town hall, to be completed by September, 1899.

GRAND MANAN, N.B.—The residents of Seal Cove are raising funds for the construction of a breakwater, towards the cost of which the government will be asked to contribute.

PORT ARTHUR, ONT.—D. F. Burk, of this place, is endeavoring to secure Dominion and provincial subsidies for the projected Thunder Bay, Nepigon and St. Joe Railway.

STRATHBURN, ONT.—There is talk of a new bridge being erected by the counties of Middlesex and Elgin, at the site of the low water bridge between Mosa and Aldborough.

BATTERSEA, ONT.—Power & Son, architects, of Kingston, have prepared plans for a new parsonage to be erected at this place, for which tenders will be invited at an early date.

HALIFAX, N. S.—Proposals are now being considered to sink a large shaft between Bridgeport and Glace Bay, and from that to raise the coal required by the Dominion Coal Company.

BARRIE, ONT.—Thomas Kennedy & Co., architects, are receiving tenders up to January 7th, 1899, for the various trades, including hot water heating and plumbing,

CONTRACTS OPEN.

GROVETON, ONT.—A. Clifford is preparing to erect a residence next season.

MITCHELL, ONT.—Hill & Co. purpose erecting additional buildings in the spring.

ESSEX, ONT.—C. E. Naylor intends putting in an incandescent electric light plant.

NELSON, B. C.—The C. P. R. are excavating for a large cold storage warehouse.

RUSSELL, ONT.—G. A. Paden has purchased property on which to build in the spring.

CASTNERVILLE, ONT.—John Busch is preparing to erect a large bank barn next summer.

NAPANEE MILLS, ONT.—A new iron bridge is to be erected over the Napanee river here.

HARRIETSVILLE, ONT.—Preparations are being made by J. Facey to build a new residence.

AMHERSTBURG, ONT.—There is an agitation in favor of the erection of a high school here.

SARNIA, ONT.—The Lambton County Council has granted \$800 to build a bridge over Fancher Creek.

PORTAGE LA PRAIRIE, MAN.—G. B. Housser & Company purpose erecting large lumber sheds.

PAKENHAM, ONT.—James Phee has purchased a site on which to build a residence in the spring.

HARRISTON, ONT.—Tenders have been invited for building the proposed pork-packing establishment.

MOOSE JAW, N. W. T.—The town is contemplating the construction of water-works and sewerage systems.

CHARLOTTETOWN, P. E. I.—The provincial government contemplate building some steel bridges in the near future.

STRATFORD, ONT.—The proposed pork packing establishment, to be founded by John Whyte & Son, will cost about \$50,000.

SMITH'S FALLS, ONT.—The School Board will likely purchase the Mylne property on which to build a new high school.

ST. JOHNS, QUE.—A project is on foot

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.

TENDERS To Bricklayers

Tenders will be received by the undersigned until 3 p.m. on FRIDAY, THE 30TH INST., for the Excavation, Mason and Brickwork only of three Detached Residences to be erected on the west side of Madison avenue.
 The lowest or any tender not necessarily accepted.
 F. H. HERBERT, Architect,
 9 Toronto street, Toronto.

NOTICE TO CONTRACTORS

Tenders Wanted for the Construction Complete of Sewerage and Waterworks Systems for the Town of Oshawa, Ontario.

Tenders, by registered letter only, will be received by the undersigned, Chairman of the Fire and Waterworks Committee, up to the hour of 8 o'clock p.m. on WEDNESDAY, THE FOURTH DAY OF JANUARY, 1899, for the Construction of the Complete Systems of Sewers and Waterworks, comprising the following works, viz.:
SEWERAGE SYSTEM.—Mains, Sub-Mains and Lateral Sewers, including Manholes, Lamp Holes and Outfalls and their appurtenances.
WATERWORKS SYSTEM.—Dam at Raglan Springs; Supply Main from Raglan Springs to the Town of Oshawa; Elevated Storage Tank, 125 feet high; Supply Mains and Branches, together with all Hydrants, Valves and all Specials connected therewith. Specifications and Drawings may be seen at the Town Hall, Oshawa, Ontario, and at the office of John Galt, Esq., C.E. & M.P.E., 59 and 100 Canada Life Building, in the City of Toronto, from whom forms of tender and full particulars may be obtained on and after Tuesday, the 27th December inst. Tenders must be in a lump sum.
 A marked bank cheque, payable to the order of the Treasurer of the Town of Oshawa, Ontario, for seven per cent of the amount tendered, must accompany each tender, otherwise it will be ruled out as informal.
 The Corporation do not bind themselves to accept the lowest or any tender.
 C. FRENCH,
 Chairman of Fire and Waterworks Committee,
 Oshawa, Ontario, Dec. 19 1898.

for a brick presbytery for the Rev. Father Gearin, of Phelpston.

MERRITTON, ONT.—Rev. J. L. Robertson has been soliciting subscriptions in western Ontario towards the rebuilding of the Presbyterian church here.

FENELON FALLS, ONT.—Messrs. DeCew & Sons, who purchased the Thornton stove factory at this place, purpose increasing its capacity considerably.

BRACEBRIDGE, ONT.—A by-law to borrow \$5,000 by debentures for extending the waterworks system has been passed in council, and will be submitted to the Lieutenant Governor for approval.

ST. JOHN, N. B.—It is understood that the Canadian Pacific Railway Company is surveying the route for a railway from Mattawamkeag to Princeton, to connect with the Washington County Railway.

CHATHAM, N. B.—Should the town not undertake the construction of a waterworks system, it is believed that the private company holding a charter for that purpose will proceed with the work.

SOUTH FINCH, ONT.—A meeting of farmers was held here last week to discuss the project of establishing a cold storage plant. A committee was appointed to report at a meeting to be held on January 10th.

KAMLOOPS, B. C.—Engineer Gamble has presented his report on the proposed Thompson River bridge, in which he advocates the immediate carrying out of the work.

SAINT ANDREW'S, N. B.—The project to establish a cottage hospital is taking definite shape. A site therefor will probably be purchased from the estate of the late Dr. Todd.

HARRISTON, ONT.—W. D. Ebbels, town treasurer, invites tenders up to January 2nd next for the purchase of \$3,380 of local improvement debentures, bearing interest at 4%, and payable in twenty years.

NAPANEE, ONT.—The John R. Scott Company, which recently installed an electric light plant for lighting Napanee, Newburgh and Camden East, intend extending their line to Yarker and Colebrook next spring.

BROOKE, ONT.—L. Lindsay, lot 23, concession 9, wants tenders by January 9, 1899, for repairing of drain. James Lucas, lot 12, concession 14, wants tenders by same date for the construction of the Parker-Shirley drain.

ROSSLAND, B. C.—The Board of Trade has forwarded to the Minister of Public Works at Ottawa a petition asking for the erection of a federal building at this place, to contain post-office, custom house, and inland revenue offices.

TWEED, ONT.—A private company will, it is said, build a line of railway between this town and Belleville, a distance of 26 miles. The line will extend to the iron ore districts, and it is probable that blast furnaces will be built in the near future.

GRAND FALLS, N. B.—The Grand Falls Power Company are said to have spent \$18,000 in surveys and soundings, and are about to commence the work of construction. It is proposed to erect large paper and pulp mills, saw mills, etc.

DARTMOUTH, N. S.—A bill to empower the council to borrow \$150,000 for the purpose of establishing a tram car system in Dartmouth and vicinity has been sent to the legislature. A bill will also be asked for to provide \$50,000 for installing an electric light plant.

SHERBROOKE, QUE.—The authorities of St. Peter's church will shortly decide upon plans for a new building, construction to commence in the spring.—F. J. Griffith wants tenders on behalf of the corporation, up to January 2nd, for the supply of 4,000 yards of flagstone.

NEW WESTMINSTER, B. C.—The Ma-

sonic Temple Company are making preliminary arrangements for the rebuilding of their burned block, corner Columbia and Lorne streets.—J. Gerhardt Tiarks, architect, is preparing plans for the new Caledonian Hotel.

LONDON, ONT.—George V. Burwell, of Delaware, has abandoned his injunction proceedings against the building of a bridge over the Thames river at the Giles site, and the county of Middlesex and township of Caradoc are now in a position to proceed with the work.

BURNSTOWN, ONT.—The proposed Presbyterian church will be frame, veneered with brick, with stone basement and wood or iron roof, and will cost about \$2,400. The material is now being placed on the ground, and building operations will commence in the spring. John Forrest is chairman of the building committee.

BRIDGENORTH, ONT.—At a meeting held here recently to discuss road improvement, a resolution was passed recommending the council to purchase the necessary road machinery and proceed at once to carry out the plans advocated by Mr. A. W. Campbell, Provincial Road Commissioner.

VANCOUVER, B. C.—It is announced that the Hastings mill, destroyed by fire last October, is to be rebuilt.—The main building will be 400 feet long and 82 feet wide, and the mill will have a capacity of 200,000 feet per day. The contract for machinery has, it is understood, been awarded to the William Hamilton Manufacturing Company, of Peterboro', Ont.

LINDSAY, ONT.—At the municipal elections a vote will be taken on the question of erecting a House of Refuge for the county, to cost, including land, building and equipment, \$20,000.—The town has offered to grant to Rider & Kitchener, of Brampton, exemption from taxation for two years and a bonus of \$10,000 towards a site and buildings for their proposed excelsior and veneer factory.

COLLINGWOOD, ONT.—A conference was held here last week between representatives of the Georgian Bay and Lake Superior Steamship Line and the Grand Trunk Railway. The business discussed was the question of deepening the harbor and the erection of an elevator. The Grand Trunk is willing to construct the elevator if the Dominion government deepens the channel to 20 feet.

WINNIPEG, MAN.—The three money by-laws were defeated by the ratepayers on the 20th inst. These were as follows; \$20,000 for building a free public library, \$15,000 for establishing a crematory, and \$50,000 for installing a municipal electric light plant.—The C.P.R. have decided to put in a connecting switch between the Brandon branch of the N. P. railway and the southwestern branch of the C.P.R. at Methven.

QUEBEC, QUE.—The Great Northern Railway Company is understood to have made arrangements to construct at once the remainder of its line, in order to give Quebec district connection with the Parry Sound Railway. It is further stated that a contract has been entered into with Mr. McDonald, railway contractor, for the construction of the last 88 miles of the line, and that preparations are being made to proceed with the work.

HAMILTON, ONT.—The Hamilton, Chedoke & Ancaster Railway Co. will apply for an amended charter, to build a line to Brantford.—The Hamilton & Toronto Sewer Pipe Company purpose erecting a three-storey building, to replace the one destroyed by fire recently.—The city engineer has prepared specifications of the required dredging work in Burlington channel. These will be forwarded to the government with a requisition that the work be carried out.

MONTREAL, QUE.—The sum of \$10,000

is required for certain improvements to the outside buildings of the eastern abattoir.—The directors of the Richelieu & Ontario Navigation Co. decided, at a recent meeting, to place new boilers and an electric light plant in the steamer Saguenay. At the same meeting, it is believed that the question of building a large summer hotel at Murray Bay was favorably considered.—Lord Strathcona has offered to purchase a new organ for St. Paul's Presbyterian church.

VICTORIA, B. C.—Alderman Wilson will move at the next council meeting that the fire wardens be empowered to purchase a steam fire engine, at a cost of \$5,000.—Wellington J. Dowler invites tenders on behalf of the city, up to 4 p.m. today (Wednesday), for the purchase of \$4,300.43 of debentures. The city engineer has reported that the portion of Point Ellice bridge supported on piles could, at a comparatively small cost, be made sufficiently strong for tramway traffic. As regards the truss span, he recommends that a new truss be erected.—Frank Higgins, solicitor for applicants, is applying for incorporation of a company to utilize water from Surprise Lake, and to construct flumes, pipes and drains on both sides of Pine creek.

PENBROKE, ONT.—The report of the Public Works Committee, which has been adopted by the city council, recommended the building of an iron bridge, with stone piers, at a cost of \$7,500. It was agreed that a by-law should be submitted to raise \$10,000 to build the bridge and the Witt embankment.—The special committee appointed to consider the question of installing a municipal electric light plant have recommended that if satisfactory arrangements can be made with the present company for an increased number of lights at a lower rate, consideration of the advisability of installing a municipal plant be postponed for the present. If this is not effected the committee recommends the council to submit a by-law to provide funds for the installation of a plant.

OTTAWA, ONT.—M. C. Edey, architect, this city, wants tenders for the erection of a presbytery at March Corners. Plans on view from 21st to 30th inst.—The Bernard Fish & Game Club has decided to purchase a game preserve at the Lievre river, and construct on it a club house with all modern conveniences. The secretary is Mr. J. A. Lemieux.—Alderman Cluff advocates the purchase of a site in New Edinburgh for a new contagious diseases hospital.—The E. B. Eddy Company are about to commence the erection of a new pulp mill.—It is stated that the work of completing the Church of the Sacred Heart on Cumberland street will be proceeded with next spring. The addition will consist of a large spire and bell tower, and an entrance. It will cost in the vicinity of \$30,000.—The capital has been subscribed for the Klondike Telegraph Company, promoted by Sir Adolph Caron and Sir James Grant, and operations will be commenced immediately. W. Young, 64 Victoria street, London, Eng., is the secretary of the company.—The Royal Telegraph Company is seeking incorporation, with a capital of \$100,000, to build and operate telegraph and telephone lines in Canada.—The French Committee of the Separate School Board have decided to purchase property at the corner of Dalhousie street for the erection of a new school.

TORONTO, ONT.—The Board of Control has decided to advertise for new tenders for general supplies for the Works Department.—The Oddfellows' Society is soliciting subscriptions towards the erection of an Oddfellows Home for orphans and the aged. The building will be located in the city or town from which the most liberal contributions are

received.—A company will ask power from the Ontario legislature to construct a railway between the towns of Pembroke and Bancroft.—The city council has given notice that it is proposed to construct the following local improvement works: Macadam roadway on Gerrard street east, from Yonge to Jarvis street, cost \$4,110; macadam roadway on Washington avenue, from Spadina avenue to Huron street, cost \$1,832; cement concrete sidewalks on Yonge street, from Yorkville avenue to Davenport road, cost \$656, and on Sussex avenue, from St. George to Huron street, cost \$360.—The Fire & Light Committee has recommended the enlargement of the Cowan avenue fire hall, at a cost of \$4,000. It is probable that a hook and ladder truck will also be purchased.—Mr. Wallace Nesbitt, solicitor for the Canadian Niagara Power Company, states that the company will deliver power in Toronto from Niagara Falls before November, 1899. The plan, he says, is to build the plant below Peter Island, on the Canadian side, at a cost of \$2,500,000. The cost of poles and wire necessary is placed at \$600,000.—Building permits have been granted as below: Church Society of Quebec, three three-storey brick stores, 342-46 Queen street west, cost \$12,000; trustees Toronto General Hospital, two-storey brick addition to houses, 446 and 448 King street east, cost \$1,500; George M. Bryan, two storey and attic brick building on Walker avenue, cost \$2,000.—The McCormack Manufacturing Company, of Chicago, the largest concern of its kind in the United States, purpose establishing a branch factory in this city. Mr. W. Stanhope, the company's Canadian representative, is now looking for a suitable site.—Mr. F. H. Herbert, architect, 9 Toronto street, invites tenders in this issue up to Friday next, for the excavation, masonry and brickwork of three detached residences to be erected on the west side of Madison avenue.

FIRES.

Recent fires include the following: D. Mace's residence at Tamworth, Ont.; loss \$8,000, insurance \$3,000.—Millar Bros.' flour and feed store at Regina, N.W.T.—Building at 138 King street west, Toronto, owned by the Baldwin Estate, partially damaged. The agent is Charles Miller.—The large drygoods warehouse of S. Green-shields & Co., Montreal, and the adjoining buildings, occupied by McIntyre, French & Co., totally destroyed; loss nearly \$1,000,000.—The Allison House at Sackville, N.B., owned by the University of Mount Allison, and occupied by Dr. J. Calkin, totally destroyed.—Haldane's printing establishment on Elgin street, Ottawa, damaged to the extent of \$12,000.

CONTRACTS AWARDED.

CHATHAM, ONT.—Blonde Bros., this city, are successful contractors for residence for J. M. Park.

HULL, QUE.—The Jacques Cartier Bank purchased the \$8,000 of electric light debentures, at par.

VICTORIA, B.C.—The contract for A. E. Haynes' residence at Oak Bay has been let to T. H. Matthew.

MITCHELL, ONT.—The town has sold \$7,028 of debentures to O'Hara & Co., of Toronto, at a premium of \$192.

DESERONTO, ONT.—Boyle & Son have the contract for putting a galvanized iron roof on the chemical works.

OWEN SOUND, ONT.—The tender of Parker & Co. has been accepted, at \$1,350, for twelve electric fire alarm boxes.

WALKERTON, ONT.—H. O'Hara & Co., of Toronto, secured the \$20,000 of debentures, payable in twenty years, and drawing 4 per cent. interest; price \$21,160.

TORONTO, ONT.—The contract for

erecting shelters at the Queen street subway has been let by the city to the Shipway Manufacturing Company; price, \$558.

PETROLEA, ONT.—The contract for the erection of the new Methodist church has been given to George Proctor, of Sarnia, at the price of \$15,600, exclusive of seating.

NEW WESTMINSTER, B.C.—J. G. Tarks, architect, has let the contract to George Bishop for a new building in this city for the Douglas estate. It will be in half timbered style, and will cost about \$10,000.

LONDESBORO, ONT.—M. Mains, of this place, has been awarded contracts for building barns for the following during 1899: James Graham, Goderich township, 54 x 76 feet; William Graham, Stanley, 60 x 80 feet; David Mountain, Hullett, 59 x 74 feet, and Guy Hicks, Goderich, 52 x 52 feet.

VANCOUVER, B. C.—Thomas Tompkins has completed arrangements with the C.P.R. for the construction of several new buildings for the company in this province. Work will be commenced in a few days on an addition of 150 rooms to the Hotel Vancouver, from plans by Edward Maxwell, architect, Montreal. The new station at New Westminster will be commenced at an early date, while Mr. Mr. Tompkins will also have charge of the erection of an hotel at Sicoumas Junction.

OTTAWA, ONT.—The Canada Atlantic Railway Company will heat their new shops by the fan system, as supplied by the Buffalo Forge Co. The contract has been awarded to their Canadian representative, Mr. E. A. Wallberg, of Montreal.—The government has let the contract for building the power house at the Soulages Canal to William Stewart, of this city. It is understood that the contract for the electrical equipment has been awarded to the Canadian General Electric Company, of Toronto.—Butterworth & Co. have been awarded the contract for installing steam heating apparatus in the Eclipse Manufacturing Company's building on Albert street.

PETERBORO', ONT.—The town council received the following tenders for the supply of a steam road roller: W. C. Oastler, Aveling & Porter roller, \$3,200; Sawyer & Massey Co., Russell roller, \$3,250; Buffalo Pitts Co., \$3,450; R. E. H. Buckner, Aveling & Porter roller, single engine, \$3,150; R. E. H. Buckner, Aveling & Porter roller, compound engine, \$3,575; Harrisburg Foundry & Machine Works, \$2,800. At a meeting held to consider the tenders it developed that the Russel roller could be purchased for \$3,000, and a resolution to accept same at that price received a majority vote. It is stated, however, that some of the aldermen intend protesting the awarding of the contract.

BIDS.

ORILLIA, ONT.—Tenders for the proposed electrical power transmission plant were opened by the council last week. For the electrical machinery three tenders were submitted, from the Canadian General Electric Company, Toronto, Royal Electric Company, Montreal, and Westinghouse Electric & Manufacturing Company, of Pittsburg, Pa., through the Central Construction Company, of Buffalo, N.Y. For the transmission line supply and construction, tenders were submitted by the Canadian General Electric Company, Central Construction Company and P. H. Patriarche, contracting electrical engineer, Toronto. Three tenders were also submitted for the hydraulic machinery and construction, from William Kennedy & Sons, of Owen Sound, Ont., Central Construction Company, and P. H. Patriarche. No decision has been reached as yet, but it is believed that the council

favor the tenders of P. H. Patriarche, for the whole equipment, including electrical apparatus of the Royal Electric Company's manufacture, at \$66,680, and the Central Construction Company, of Buffalo, including Westinghouse electrical apparatus, at \$67,200.

GEOMETRY FOR MASONS.

Although the simpler operations in preparing plocks of stone for building purposes may be performed by a careful use of the tools provided, none of the intricate forms required in the details of architectural construction can be successfully worked out or produced with certainty, so as to avoid the clumsy wasting of material, without application of the elementary rules of geometry. The square, the straight edge, will indeed enable the mason to reduce his blocks to level faces, and to render these parallel or rectangular, as may be desired, but they will not enable him to strike out correct curves, to determine the alterations produced in regular or irregular figures by their transference to planes at various angles. For these, and indeed nearly all the problems he will be required to solve, in working out each portion of the general designs upon the individual block, the mason must refer to the rules of practical geometry; and in proportion to his own practical acquaintance with them will he be able to apply, and, if necessary, combine them, so as to arrive at the particular solution he requires. For measuring and laying down angles, the mason uses a bevel, which consists simply of two legs or sticks, jointed in the manner of a 2-ft. rule, but so that each leg may pass freely over or within the other, and thus form acute or obtuse angles with it. They should work rather stiffly, or have a clamp screw for fixing the bevel to any desired opening, without danger of disturbance. Some bevels are furnished with an arch, on which the degrees of the circle are graduated, and by which any desired angle may be correctly ascertained. Besides the compasses for describing circles, the trammel is a useful instrument, by which the mason describes ellipses for arches, &c. This consists of two pieces of wood fixed together at right angles to and crossing each other. These have slits cut nearly throughout their whole lengths, in which two pins or studs, attached to a separate stick or piece of wood, may be moved along. The studs are capable of adjustment in their relative positions on the piece to which they belong. A pencil or pointer at the other end of this piece will describe true ellipses, the proportion of the axes of which depend on the position of the studs. Besides the square for setting out right angles up to 2 ft. or 3 ft. in length of side, the long square or level is used in trying long lines. This is provided with a plumb-bob, or weight of lead or brass, etc., suspended by a string for indicating when the upright part of the level is vertical, and the long frame, which is fixed truly at right angles with the upright part, is consequently truly horizontal or level. This instrument is sometimes furnished

with a spirit level, by which a horizontal level may be ascertained independently of the plumb-bob. For testing the uprightness of the work a plumb-bob is used, which consists only of the bob or weight, suspended by a string from the top of a strip of wood. This strip is of exactly parallel width throughout, and the point of suspense of the bob and the gauge mark below are exactly in a line with each other, and equidistant from the edges of the strip. Particular sectional forms, to which many blocks have to be prepared, are the most readily and truly multiplied by using moulds or templates. Zinc is a very suitable material from which to cut these templates. An exact correspondence in form of the surfaces which, when combined, are jointed together, and requiring to coincide, is thus secured; the only thing necessary to secure this being that the mason shall mark the outline of his template or pattern correctly upon the levelled surface of the block, and direct his chisel accordingly.

ROOF TIMBERS.

The following instructions have been circulated to all officers of the P. W. Dept., Madras, India, by the Chief Engineer, and may be of general interest:—(1) It should be a standing rule that no timber supporting a roof should ever be built into masonry. A space of not less than half inch in width on either side should be always left between the two for the circulation of air. (2) The ends of all timber in contact with masonry should be invariably tarred two coats. (3) Rolled steel beams should always be used, when possible, instead of timber. (4) In new buildings danger from white ants can always be avoided by moving the top 6 inches of soil over an area exceeding by 20 feet all round the site of the buildings. If a white ant's nest exists on the site, the removal of the soil will betray its presence in a day or two, and it can then be dug up and removed. It is a well ascertained fact that white ants do not infest a building unless their nest is under its site.

It is reported that Mr. J. E. Vanier, town engineer, of St. Lambert, Que., will be asked by the council to resign.

Mr. T. H. Allison, civil engineer, of New York, is spending his Christmas holidays with his father, Mr. James Allison, 52 Murray street, Toronto.

The firm of Curry Bros. & Bent, contractors, Bridgetown, N. S., will hereafter be known as the Curry Bros. & Bent Co., Limited. The capital is \$30,000.

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CONVENTION OF CIVIL ENGINEERS.

The thirteenth annual meeting of the Canadian Society of Civil Engineers will be held in the city of Montreal on Tuesday, Wednesday, Thursday and Friday, January 10, 11, 12 and 13. The following is the official programme:

TUESDAY, JANUARY 10TH.—11 a.m., meeting for the election of scrutineers in the society's rooms, 112 Mansfield street, Montreal. 2 p.m., excursion to the Bonaventure station to the new Victoria bridge, by courtesy of the Grand Trunk Railway. 8 p.m., meeting in the society's rooms. Paper upon the construction of the new Victoria bridge, prepared under the direction of Mr. Joseph Hobson, Chief Engineer Grand Trunk Railway, illustrated by lantern projections.

WEDNESDAY, JANUARY 11TH.—Excursion of the Society to visit the works of the Laurentide Pulp Company, Grand Mere. A special train, which will leave Place Viger station at 8 a.m., has been placed at the disposal of the society by the management of the Canadian Pacific Railway.

THURSDAY, JANUARY 12TH.—10 a.m. and 2 p.m., technical meetings in the society's rooms, at which the following illustrated papers will be read: The Soulanges Canal, by Thos. Monro, past president Can. Soc. C.E.; The Trent Canal, by R. B. Rogers, M. Can. Soc. C.E.; The Georgian Bay and Ottawa Ship Canal, by H. K. Wicksteed, M. Can. Soc. C.E. 8 p.m., members' annual dinner at the Windsor Hotel.

FRIDAY, JANUARY 13TH.—10 a.m. and 2 p.m., business meeting and an address by the retiring president, Mr. W. G. McN. Thompson.

Some idea of the extent of Ottawa's waterworks system may be learned from the annual report of the city engineer. The city has over 97 miles of pipes in use, with 11,955 services. During the past year nearly two miles of main pipes were laid, and 533 new services put in. Forty-two hydrants were put in in 1898, making 751 in all. The average number of gallons pumped daily was 8,481,499. The total waterworks receipts for the year to December 1st were \$157,000, and the expenditure to the same date \$153,759.63, as compared with \$186,559.89 for the whole of 1897.

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WATER SUPPLY FOR MONTREAL WEST.*

By WILLIAM THOMPSON.
(Concluded).

There is still one method of securing supply with which I wish particularly to deal—the method of securing supply by what is known as driven wells. This type of well is nearly always sunk into a gravel deposit, and the ultimate source of the ground water in this, as in rock wells, is the rain. The advantages to be derived from the adoption and use of such wells as these in particular localities is becoming more and more apparent, and they have already proved of immense value. For instance, during the Abyssinian expedition in 1867-68, they were extensively used by the British army, and again by Sir Herbert Kitchener's expedition against the Khalifa just so successfully closed.

Many advocates of the driven well system claim that such a supply is inexhaustible, that well after well can be driven in any given locality with impunity; but with regard to the absolute amount of water that can be obtained and utilized in any given locality, common sense, as well as science, tells us that the amount of water which a given deposit can yield must be a definite quantity, although to us unknown and varying in accordance with locality. While we cannot agree with all the claims of the enthusiasts of the driven well system, there are many strong points in its favor that render it worthy of close consideration; it has wonderful advantages over surface wells or ordinary surface supply. A driven well ordinarily takes its water from a lower point than that to which a surface well could possibly be sunk in the same locality, and for this reason is less liable to pollution; and moreover, the driven well usually passes

(Continued on page 6).

* Paper read by special request as a farewell address to the residents of Montreal West, Que.

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The CONTRACT RECORD is desirous of publishing, as far as possible, advance information regarding projected works of construction in all parts of Canada, such as sewerage and waterworks systems, railways, street pavements, public and private buildings, etc. Municipal officers would confer a favor upon the publisher by placing at our disposal particulars of such undertakings which are likely to be carried out in their vicinity, giving the name of the promoter, character of the work, and probable cost. Any information thus furnished will be greatly appreciated.

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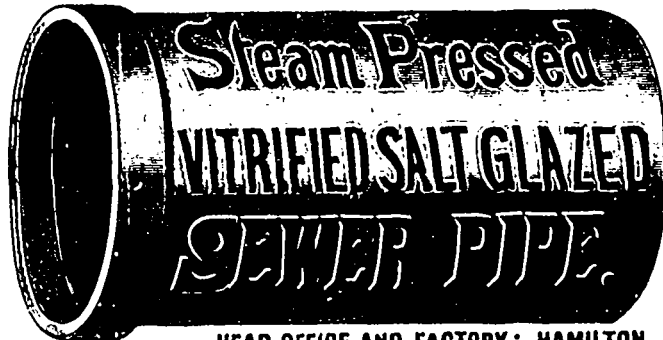
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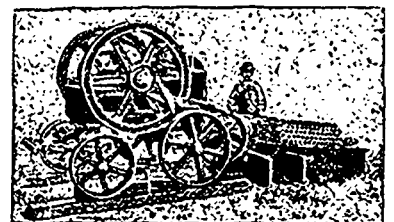
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through an impervious stratum of clay, and the water obtained is entirely distinct from the ground water of the locality. And in this way good water may be obtained where the surface conditions are very unfavorable. Again, the water obtained by sinking a well into a stratum of sand or gravel which has not been artificially disturbed is as a rule bright, clear, and free, or nearly so, from organic matter. Although originally coming from the atmosphere, in its slow passage into and through the ground the water has been subjected to a long process of sedimentation and filtration, combined with processes of oxidation; and in this sense the water may be said to have been purified by natural filtration. This process is not brought about by means taken to collect the water, but has been completed before the demand was made upon it.

My object in thus referring to the technicalities of water supply is that we may more clearly understand a description of local conditions, and I hope to be pardoned for having referred to it at extreme length. During the summer of 1892, Messrs. Armstrong & Cook decided that some method of water supply must be provided, and spent a great deal of time and money in determining how this could be brought about. In December of that year, or just six years ago, an experimental well was bored on a site chosen at random, and at a depth of 500 feet a quantity of water sufficient to supply the requirements of that time was obtained. After careful experimenting, a pumping plant was installed and distributing mains laid, and water turned on to the customers' houses on November 1st, 1893.

From the outset it was realized that the question of future extensions and enlargements both of supply and system must be considered, chiefly because the water bed was at such a low level that the cost of power for pumping was a serious drawback. During the year 1893, while constructing a sewer on Gazette ave., we came across a flow of water that gave us serious trouble owing to great volume of supply and sandy nature of subsoil. It was supposed that this flow would cease in course of time, but our anticipations were not realized, and from being a source of trouble primarily it became a source of great interest, particularly when it was seen that the water was of excellent quality and unremitting flow. Attention was soon attracted to the possibility of securing from this or surrounding points a secondary supply. This involved serious difficulties, owing to the nature of the subsoil in what was supposed to be water-bearing strata. During 1897 the idea forcibly presented itself that it would pay to investigate the whole strata to the surface of the rock or first layer of impervious stratum, with a view of arriving at actual conditions. Messrs. Armstrong & Cook saw at once the reasonableness of the suggestion, and agreed to employ an expert well borer, Mr. Wallace Bell, to do the work. As you all know, work was commenced quietly, but with determination to make it a success if possible. A type of drive well now generally adopted

was chosen, and after passing through an almost impervious bed of clay, 20 feet in thickness, water was found in abundance, but so inter-mixed with fine sand that it could not be used. It was decided, nevertheless, to try and find a gravel bed which was supposed to exist as water-bearing stratum at some point below. After passing through 35 feet of sand, gravel was found, and the success of the venture so far assured. The tube was driven 10 feet further, and on to face of an impervious stratum of hard pan. A pumping test was then made, which exceeded my most sanguine expectations, both as to quantity and quality. Two more tubes were sunk, and the combined wells to-day show a capacity of over 200,000 gallons in the 24 hours, without in any way affecting either level of water or flow from former exit. I have the strongest faith in the success of the present plant and its ability to furnish abundance of excellent water for years to come. While this is only an opinion, it is based on some knowledge of the whole subject and a fairly thorough and intimate acquaintance of the locality.

In conclusion, allow me to refer for a minute to the danger of contamination from surroundings. I refer to this because so many pessimistic views are held and the question is so often compounded. An analysis of the water shows it to be remarkably free from both organic matter and chlorine, the two great indicators of contamination by sewage and other objectionable matters. This water contains less than one-half of the organic matter contained in deep wells formerly in use, and at time of analysis less than one-tenth of the organic matter contained in the water supplied to the citizens of Montreal. So much for present conditions. What, then, of future contamination? I can only express an opinion upon the question so often asked regarding the sewer on Gazette ave., and say in reply, it is almost impossible for contamination to occur from this source; the hydrostatic pressure is in the opposite direction, and it is simply impossible for the weaker pressure to overcome the stronger, leaving the question of filtration out of the question.

Montreal West is to be congratulated on having such a supply, and I hope to see this source of supply developed as its importance and reliability demands.

Important as were the engineering difficulties to be overcome in the sinking of the wells, there yet remained the question

of providing a suitable pumping plant, which of necessity must be of such a nature and arrangement that cost of pumping must be reduced to a minimum, in order to place the waterworks system on a paying basis. Other conditions and requirements, such as the necessity of guarding against the erection of a building that would either offend the aesthetic taste of the adjoining property owners or be a nuisance by reason of the noise and smoke, were also to be met. After mature consideration, wind power was decided upon. It was felt that to be successful the question of capital investment must not enter too largely into consideration, and it was decided to get the best the market afforded. Inquiry showed a wide range of difference in opinion as to the likelihood of a wind engine plant being successful. It was felt, however, that if a plant could be secured with the three following conditions fulfilled, successful operation would be assured: 1st, operation without objectionable noises; 2nd, operation with very light breeze; 3rd, successful operation under high wind velocities.

The methods of governing and arrangement of parts of many windmills were found on examination to be such that either one or more of these conditions could not be complied with. Eventually, the present plant received my recommendation, and I am pleased to say has in practice quite come up to expectations and standard laid down. After having studied carefully the question and possibilities of wind engine service for small towns, I am strongly convinced that with proper care exercised in the choice of machinery, and conditions of service being such that this kind of motive power can be recommended for use, that the use of wind motors is to be recommended; in fact, I may go still further, and say that the possibilities of a service of this kind are but vaguely understood, and too much importance is attached by inexperienced men to what may be termed enforced hours of idleness due to lack of wind. With properly proportioned storage facilities, such plants as I have had the pleasure to lately erect will give the best service at lowest possible cost, by simply utilizing waste forces of nature's energy; and without wishing to appear egotistical, I say with pleasure that I am prouder of this my last piece of work in your town than of any of former efforts. I feel assured that the citizens of Montreal West will be equally proud when they realize fully what changed conditions mean to them and to the future success of their town.

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Table with 2 columns: Name, Address. Row: Duval & Co.

Roofers.

Table with 2 columns: Name, Address. Rows include Campbell & Gilday, Duthie & Sons, Forbes, D., Nicholson & Co., Ormsby & Co., Rennie & Son, Reggin, John., Stewart & Co., Williams & Co.

Roofing Materials.

Table with 2 columns: Name, Address. Row: Ormsby & Co.

Metallic Roofing Co.

Sanitary Appliances.

Table with 2 columns: Name, Address. Rows include Garth & Co., Toronto Steel Clad Bath & Metal Co., The James Robertson Co., The James Morrison Brass Mfg Co.

Stained and Decorative Glass.

Table with 2 columns: Name, Address. Rows include Horwood & Sons, Lyon, N. T., Leonard, B., Mackey Stained Glass Co., McKenric's Stained Glass Works, Reardon's Art Glass Works, The Robert McCusland Stained Glass Co., Wood & Co.

Shingles and Siding.

Table with 2 columns: Name, Address. Rows include Metallic Roofing Co., Ormsby & Co., A. B., Toronto Foundry Co.

Storm Doors.

Table with 2 columns: Name, Address. Row: Hillock & Co., John.

Typewriters.

Table with 2 columns: Name, Address. Row: Archb'd, Chas E.

Ventilators.

Table with 2 columns: Name, Address. Row: Boston Blower Co.

Wall Plaster.

Table with 2 columns: Name, Address. Row: Albert Mfg. Co.

Table with 2 columns: Description, Price. Rows include For ornamental work, Granite paving blocks, Gran to curbing stone, Slate.

SLATE.

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include Roofing, White Lead, Zinc, Red lead, Venetian, Vermillion, Indian, Yellow ochre, Yellow chrome, Green chrome, Paris, Black lamp, Blue, ultramarine, Oil, linseed, raw, by bbl., Imp. gal., Oil, linseed, b'd, by bbl., Imp. gal., Oil, linseed, refined, Imp. gal., Putty, Whiting, dry, Paris white, Eng., dry, Litharge, Eng., Sienna, burnt, Umber, Turpentine.

PAINTS. (In oil, 1/2 lb)

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include White Lead, Zinc, Red lead, Venetian, Vermillion, Indian, Yellow ochre, Yellow chrome, Green chrome, Paris, Black lamp, Blue, ultramarine, Oil, linseed, raw, by bbl., Imp. gal., Oil, linseed, b'd, by bbl., Imp. gal., Oil, linseed, refined, Imp. gal., Putty, Whiting, dry, Paris white, Eng., dry, Litharge, Eng., Sienna, burnt, Umber, Turpentine.

CEMENT, LIME, etc.

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include Portland Cements - German, London, Newcastle, "Jossen" Brand Portland, North's "Condor", English, artificial, Belgian, natural, Canadian, artificial, Roman, Parian, Superfine, Hydraulic Cements - Thorold, Queenston, Napanee, Hull.

Toronto. Montreal.

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include Ontario, Keene's Coarse Whites, Fire Bricks, Newcastle, Lime, Per Barrel, Grey, White, Plaster, Calcined, N. B., Hair, Plasterers, per bag.

HARDWARE.

The following are the quotations to builders for nails at Toronto and Montreal: Cut nails, 3/4 & 6/8, per keg, Steel " 3/4 " " "

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include CUT NAILS, FENCE AND CUT SPIKES, 4/8, hot cut, per 100 lbs, 10 to 12 1/2, hot cut, 8/8, 9/8, 10/8, 11/8, 12/8, 13/8, 14/8, 15/8, 16/8, 17/8, 18/8, 19/8, 20/8, Cut spikes, 20 cents per keg advance, Steel Nails, 1 1/2, per keg extra, Wire nails, 1 1/2 base price.

Iron Pipe:

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include Iron pipe, 1/2 inch, per foot, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/2, 3, 3 1/2, Toronto, 65 per cent. discount, Montreal, 70 per cent. discount.

Lead Pipe:

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include Lead pipe, per lb., Waste pipe, per lb.

Galvanized Iron:

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include Adam's-Mar's Best and Queen's Head, 16 to 24 gauge, per lb., 26 gauge, 28 gauge, Gordon Crown, 16 to 24 gauge, per lb., 26 gauge, 28 gauge, Note.-Cheaper grades about 1/2 c. per lb. less.

Structural Iron:

Table with 4 columns: Description, Price in Toronto, Price in Montreal, Price in Montreal (continued). Rows include Steel Beam, per 100 lbs., channels, angles, tees, plates, Sheared steel bridge plate.