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CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF THE PUBLIC WORKS AND TENDERS ADVANCE INFORMATION AND MUNICIPAL PROGRESS EVERY SATURDAY

Vol. 3.

Toronto and Montreal, Canada, December 31, 1892.

No. 47

THE CANADIAN CONTRACT RECORD,

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G. H. MORTIMER, Publisher,

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Telephone 2362.

64 Temple Building, Montreal.
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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. 30 and 31, 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.

TENDERS WANTED.

Scaled tenders addressed to the undersigned will be received until JANUARY THE 5TH, 1893, for the various works required in the erection of SEVEN STORES AND DWELLINGS on St. Catherine Street. The lowest or any tender not necessarily accepted. Contractors will have to give sufficient guarantee for carrying out of the work.

CHRIS. CLIFT, Architect.

180 St. James St., Montreal
December 20th, 1892.

White lead has the greatest body or spreading capacity of all white pigments, but if used alone will powder and chalk off after exposure a short time. This defect can be remedied by the use of oxide of zinc, which is the most elastic and durable of white pigments. Therefore, by a combination of the two best pigments, we secure the best qualities of each and counteract the defects of each, the lead imparting the body or covering capacity, and the zinc giving the elasticity and durability. Linseed oil is conceded by all to be the best wood preservative, and the best bond for holding the pigments to the wood. It must be strictly pure, however, or the best paint applied with it will peel or chalk off.

CONTRACTS OPEN.

WINNIPEG, MAN.—Messrs. Archibald & Howell will build a large office building on Main street.

VANCOUVER, B. C.—Mr. Hoffar, architect, and Messrs. McCartney & Baner, engineers, recently surveyed the site for the proposed addition to the court house.

NORTH SYDNEY, N. S.—A meeting of rate-payers will be held shortly for the purpose of considering the advisability of building a new marine railway or dry dock.

LUNenburg, N. S.—The Town Council is asking for tenders until the 10th of January for the purchase of \$23,000 worth of debentures; Geo. H. Love, town clerk.

PORT ELGIN, ONT.—A vote of the rate-payers of the County of Bruce will be taken on Monday next on the question of erecting a House of Refuge for the County.

QUEBEC, QUE.—It is said that the Quebec, Montmorenci & Charlevoix railway will shortly be run by electricity, the motive power being obtained from the Montmorenci Falls.

TILSONBURG, ONT.—Plans have been accepted by the School Board for the new high school building. It will be three stories high, of red brick and Ohio cut stone and will cost \$6,000.

FOREST, ONT.—Tenders are invited until the 15th of January for the erection of a new brick church in this town. Full particulars may be obtained by addressing Rev. D. A. McRae, Box 16, Parkhill.

DESERONTO, ONT.—The Rathburn Company of this place and McMullen Bros. of Picton propose building a line of railway from Deseronto to Picton. The Bay of Quinte will be bridged at Capt. John's Island.

ST. HYACINTHE, QUE.—Tenders are asked by the Department of Public Works for the Dominion until the 8th of January for the construction of a hot water heating apparatus in the public building at this place.

YARMOUTH, N. S.—A company has been formed for the purpose of erecting a first class brick hotel. A committee appointed to select a site will report at an early date, and work will be proceeded with in the spring.

KINGSTON, ONT.—The sum of \$20,000 has been subscribed towards the proposed School of Mining and Agriculture.—Dr. Bryce and Dr. Vaux, of the Provincial Board of Health, were in the city recently in connection with the proposed new drainage system.

NIAGARA FALLS, ONT.—The directors of the Niagara Railway Suspension Bridge Company are thinking of constructing a new double track railroad suspension bridge across the gorge here. If the Grand Trunk Railway join them in the project, it is probable that the scheme will be carried out.

CAMPBELLFORD, ONT.—A dispute has arisen as to who is responsible for the maintenance of the Narrows bridge. At a recent meeting of the Counties Council it was decided to obtain legal advice on the subject, and should the council be pronounced liable they will proceed with the erection of a new bridge at an early date.

VICTORIA, B. C.—A project is on foot in which the Albion Iron-works Company of this city, and English capitalists are interested, for the development of the Sooke iron mines and the utilization of their ores by the establishment of a large manufactory. The company will seek incorporation with a capital of \$5,000,000.—Tenders for the construction of the Nelson & Fort Sheppard railway will be asked for about the 1st of February.

OTTAWA, ONT.—The Privy Council has approved of the application of the C. P. Railway for permission to build a branch railway from Ayr Station, on the Ontario and Quebec line, to Goldies Mills.—The Ministers of Railways and Canals was waited upon recently by a large deputation from St. Hyacinthe, Que., who urged that the Government grant a subsidy to the United Counties railway for an extension from St. Hyacinthe to Sorel.

WINDSOR, ONT.—The Government has decided to make extensive alterations to the post office building. Plans for the work have been prepared.—The syndicate of Detroit capitalists who purchased the Boomer street railroad are considering the question of purchasing an electric light plant.—Mr. Willis Chipman, C. E. of Toronto, has prepared plans for securing a better water supply. He recommends that the intake pipe be extended to a point above Walkerville, and estimates the cost of the proposed alterations at \$46,000.

HALIFAX, N. S.—Mr. W. H. Ross, C. E., has returned to the city from Cape Breton, where he has been surveying a line of railway from Orangedale to Broad Cove, a distance of about 38 miles. He has been working in the interests of a Nova Scotia company, operating under the charter of the Richmond & Inverness railway. The work of construction will be commenced in the spring.—Tenders are asked by the Board of Works until the 7th of January for the construction of a new road in the neighborhood of the Chain Lakes.

HAMILTON, ONT.—The Finance Committee of the City Council have reported in favor of granting the request of the Hamilton Fair and Agricultural Society for a grant towards the cost of erecting new buildings, the estimated cost of which is \$82,000.—The City Engineer has completed his report on the proposed mountain drive project. The following is the estimated cost of carrying out the work. Earthwork excavation, \$11,104, rock excavation, \$40,000, drainage of roadbed, etc., \$5,000, Macadam, 20 feet wide, 10,000, wooden bridging near the asylum and north of the Jolley Cut road, \$15,500, dry stone retaining walls, \$5,600, removing overhanging rock and quarry debris, \$1,209, fencing, one side, \$1,600, ditching and culverts, \$1,000.—The capital stock of the Hamilton & Barton Incline Railway will be increased to \$100,000.—Plans have been prepared for the erection of a new House of Refuge. The specifications call for a building 154 feet x 60 feet, two stories high, with attic and basement, to accommodate 150 to 175 inmates. The cost is estimated at \$10,000.

TORONTO, ONT.—Mr. G. W. Hunter, 86 Czar street, is about to erect a two-story brick store and dwelling house at 203 Spadina avenue, cost \$3,800.—The by-law to raise the sum of

\$57,000 for the purchase of sites and the erection of new school buildings was defeated by the rate-payers on Thursday last.—The following building permits have been granted. S. Sanderson & Co., s. w. cor. Bloor and Dundas sts., a story attic and basement bk. hotel, and to remove back and brick case existing building, cost \$6,000. J. J. Graham, 306 Dovercourt Rd., pr. s. d., a story and attic bk. dwellings, e. side Huron st., near Dupont st., cost \$16,000; G. W. Hunter, 86 Czar st., 3 story bk. store and dwelling, 203 Spadina ave., cost \$3,000, David Rands three s. d. 2 story and attic bk. and stone dwellings, 531-35 Sherbourne st., cost \$22,000; Canada Permanent Co., 2 story bk. stable, rear Northern hotel, Yonge st. and Shaftsbury ave., cost \$1,800.

FIRES.

Sullivan's carriage works, 12 Alice street, Toronto, was damaged by fire recently to the extent of \$7,000.—The power house of the Sandwich, Windsor and Amherstburg Electric railway at Windsor, Ont., was destroyed by fire on Monday last. The loss is estimated at between \$15,000 and \$20,000.—The Methodist church at Burlington, Ont., was entirely consumed by fire on the 25th inst. Loss, \$12,000, insurance, \$9,000.—A large stone dwelling at Brockville, Ont., owned by A. S. Ault and occupied by Mr. Pringle, manager of the Bank of Toronto, was destroyed by fire on Sunday morning last. There was no insurance on the building.—G. H. Gardner's grist mill at Brownsville, Ont., was burned on the 27th inst. Loss, \$4,500, insurance \$300.—Fire at Orillia, Ont., on Thursday last, totally destroyed the Coldwater street skating rink, and Mr. Thomas Phillips residence, together with a number of sheds and stables. Mr. Phillip's loss is estimated at \$1,600, the insurance being \$600. The rink was owned by Wm. Thomson.—The following business establishments on St. Paul st., Quebec, were destroyed by fire on the 29th inst.: Reid, Craig & Co., marine stores, loss \$40,000, insurance, \$25,000. A. B. Dupuis, biscuit factory and confectionery, loss \$40,000, insurance, \$18,000. Mrs. McAneeny, second hand furniture, Francois Drouin, cabinetmaker, and William Hackett, steamboat agency office. The aggregate loss amounts to somewhat over \$100,000, one half of which is covered by insurance. The residence of Mr. T. G. Shaughnessy, of the Canadian Pacific Railway Company, situated on Dorchester street, Montreal, was damaged by fire on Sunday last to the extent of \$10,000. The extensive saw mills of the Michigan Lumber Co. at Vancouver, B. C., operated by Morse & Boggs, were completely destroyed by fire last week. Loss \$75,000, insurance \$32,000.—J. M. Green's planing mill at St. Thomas, Ont., was totally destroyed by fire on the 23rd inst. The loss on machinery is placed at \$6,000, and on building and contents \$4,000.

CONTRACTS AWARDED.

SELKIRK, MAN.—The contract for supplying the machinery for the fish hatchery has been awarded to Mr. Andrew S. Smith, of Winnipeg.

OTTAWA, ONT.—Messrs. Smart & Co., of Brockville, have been awarded the contract for supplying the furniture for the new Normal school in this city.

CHILLIWACK, B. C.—Contracts have been

awarded for new Indian Institute buildings at this place. They will be of brick, with stone foundation, and will have accommodation for 100 resident pupils. The estimated cost is \$18,500.

PELKE ISLAND, ONT.—The contract for the marsh drain has been awarded to Allister McKay, of Chatham, who has commenced the work of dredging. This drain when completed will be the largest in Canada, and will have eleven miles of canals.

GENERAL PRINCIPLES OF CONSTRUCTION.

The objects of construction is to adapt and combine fit materials in such a manner that they shall retain in use the forms and dispositions assigned to them. If an upright wall be properly constructed upon a sufficient foundation the combined mass will retain its position, and bear pressure acting in the direction of gravity, to any extent that the ground on which it stands and the component materials of the wall can sustain. But pressure acting laterally has a necessary tendency to overturn a wall, and therefore it will be the aim of the constructor to compel, as far as possible, all forces that act upon an upright wall to act in the direction of gravity, or else to give it permanent means of resistance in the direction opposite to that to which a disturbing force may act. Thus when an arch is built to bear against an upright wall, a buttress or other counterfort is applied in a direction opposed to the pressure of the arch. In like manner the inclined roof of a building, spanning from wall to wall, tends to thrust out the walls; and hence a tie is applied to hold the opposite sides of the roof together at its base, where alone a tie can be fully efficient, and thus the roof is made to act upon the walls wholly in the direction of gravity; or where an efficient tie is inapplicable, buttresses or counterforts are added to the walls, to enable them to resist the pressure outward.

A beam laid horizontally from wall to wall, as a girder to carry a floor and its load, may sag or bend downward, and tend thereby to force out the walls; or the beam itself may break. Both these contingencies are obviated by trussing, which renders the beam stiff enough to place its load on the walls in the direction of gravity, and strong enough to carry it safely. Or if the beam be rigid in its nature, or uncertain in its structure, or both (as cast iron is) and will break without bending, the constructor, by the smith's art, will supply a check and insure it against the possible contingency.

Perfect stability, however, is not to be attained with materials which are subject to influences of that nature. The influences mostly to be contended against are heat and humidity, the former of which produces movement of some kind or to some extent in all bodies; the latter, movement of all kinds of matter; whilst the two acting together contribute to the disintegration of materials available for the purpose of construction. These pervading influences the constructor seeks to counteract, by the selection and disposition of his materials accordingly.

From the tenacity of wrought iron and its almost plastic character in the hands of the smith, it is employed to tie together other more bulky but less costly and more rigid materials, but on account of its exceeding susceptibility to heat, and its consequent expansion and contraction, wrought iron must be used in short lengths only, unless where protected from great heat and cold.

The rapid decay, too, of wrought iron when exposed to humidity, and especially when it is alternately wet and dry will teach the constructor not to expect enduring stability in his works if he makes them dependent upon wrought iron. Cast iron is brittle, and may not be exposed with impunity to transverse strain, especially if such strain be attended by action tending to induce vibration. It expands and contracts under the influence of heat, but it resists compression in every direction, and if used in small bodies, is valuable as a means of connecting other

materials. Timber, being particularly unchangeable in the direction of its length from the mere absorption of either heat or humidity, and at the same time practically both inextensible and incompressible in that direction, and being also readily wrought and easily combined alike with other timber and iron, is a valuable material in the hands of the constructor. But it shrinks and swells in the direction of its thickness, and in consequence is subject to rapid decay when exposed to alteration of moisture and dryness; and although in many varieties timber is perfectly durable and unchangeable in form it it be kept either altogether free from moisture or always wholly wet, its quality of intensibility is greatly diminished in value to the constructor on account of the comparatively slight resistance it offers to compressing power, and the comparative ease with which its fibrous structure is torn asunder. From this cause it cannot be otherwise held so that its power of resisting extension may be made available in any degree proportioned to its strength; whilst its quality of incompressibility in the opposite direction is of less value to the constructor for many purposes which require that quality in the material, because it absorbs moisture by the ends of the fibre more readily, and with a far more mischievous effect, than it does in the direction in which it is compressible. Hence timber rots more rapidly by the ends than by the sides.—*Eastern Contractor.*

IRONWORK IN SPECIFICATIONS.

Every contractor meets with instances of ill-drawn specifications, which are regrettable if only on the ground that they show either ignorance or want of care on the part of those in authority, for whom there should be well founded respect. An instance that came before us during the past few days will suffice. The architect for new work at the General Post Office has issued a specification in which the clauses relating to the ironwork are in some parts inapplicable and not up to date. The rolled girders and joints are very wisely stipulated to be of English steel, but the tests that are to be applied to ascertain the quality of the material are not at all well defined in extent. The clause is rendered impracticable by reason of a stipulation that on fracture the steel shall only show a certain moderate percentage of crystalline or granular fracture. How a crystalline appearance can be avoided in fractures of mild-steel manufactures we should like the architect to explain. In laying down conditions to govern the supply of wrought-iron, various people have endeavoured to avoid the risk of receiving or using "cold-short" material by specifying that the iron shall be "fibrous," and in large sizes and sections, that the wrought-iron when broken shall only show 15 per cent. or 20 per cent. of crystalline structure in its fracture. We have no concern to question the wisdom or unwisdom of such a stipulation when applied to wrought iron. But when such a clause is tacked on to a steel specification, it is clear that the draughtsman is either careless or ill informed. Stipulations that are impracticable, or that are inapplicable, have invariably one result—they render the cost of material dearer than would be the case if specifications were well drawn or carefully compiled on an intelligent practical basis. Competition is limited, for the best class of manufacturers, who, from superior production have a good repute, will not look at impracticable specifications. Conditions that are peculiar, unusual, or unfair, or all three combined, cause work to get into the hands of those less reputable, or possessing less scruple than the average. Architects' specifications for ironwork, we are assured by contractors, show only too frequently a want of care in getting accurate information. So far as concerns architects, it is clear that there is necessity for them to take counsel with a brother in the engineering profession when matters involving the use of iron or steel, cast or wrought,

or of engine work are concerned. Such an alliance in the preparation of specifications and in the superintendence of work done would not only avoid errors, but would have the effect of raising the standard. In a general way, the ironwork used in buildings is of a low average in quality and workmanship. Amongst iron founders and iron manufacturers "builders' castings" and "builders' ironwork" are expressions employed to indicate contempt for an inferior type of work. There is no valid reason why the riveted girders and cast iron-columns used in the building of a factory built to the specification of an architect should be inferior in quality and workmanship to similar articles used in the construction of an engine shops. But these are matters of agreement on the part of all who have an opinion on the subject; the only difficulty is in the commencement of reform.—*Contract Journal.*

USEFUL HINTS.

A fine cement for stonework is made of equal parts of resin, yellow wax, and Venetian red, mixed up together while in a melted condition.

You will find it a good thing to paint iron with its own oxide, and zinc with its own, also. Iron, lead, and zinc paints all stick well on wood, but iron paint will not do well on zinc, nor zinc on iron.

To join broken fire-brick, use powdered soapstone, which may be procured of a druggist, mixed with an even quantity of common salt and wet to a paste with water. This hardens very rapidly after it is put on, and, as the soapstone is fire-proof, it is lasting. Do not substitute powdered pumice stone or rottenstone for it, as they will not last as long as soapstone, though various things, even sifted ashes, may be mixed with salt in this way, to form a temporary cement in case of emergency.

J. J. Blaine, contractor, Ontario street, Toronto, has assigned to E. R. C. Clarkson.

Messrs. Archibald and Foster give notice of application for the incorporation by letters patent of the Bostwick Metal Lath Company, limited, to manufacture and sell laths composed of metal, as well as plaster and other materials for building purposes. The applicants are Messrs. Walter Whitfield Bostwick, manufacturer, of New York, and Messrs. John W. Allison, Thomas A. Morrison, George Hiram Kendall and Rienzi A. Manwaring, of Montreal. The capital of the company is to be \$50,000.

It is a noticeable fact that the best success has been attained in the construction of ground floors for machine shops when good practice in street paving has been imitated. The Straight Line Engine shops, above referred to, are floored with what is practically a Telford paving of extra thickness, on which a two-course wooden floor is laid. Wood block paving and asphalt paving, both sheet and block, laid exactly as in street work, are all in successful use. The foundation of concrete which is now a recognized essential to good street paving work, is being largely used as the base of shop floors, and if laid on well rolled earth properly drained allows ordinary machines to be located wherever convenient without special foundations. Where wooden floors must be laid, trouble is generally experienced from decay. Moisture is apt to accumulate to some extent on the underside of the floor; and if it does not and the wood is not perfectly dry, dry rot will occur, the air being excluded. In this connection Mr. C. J. H. Woodbury calls attention to the value of slaked lime as a preservative of such floors. Its antiseptic qualities are well-known, and experience shows that wood when laid in contact with dry lime will last indefinitely.—*Engineering News.*

MUNICIPAL DEPARTMENT.

LEGAL DECISIONS AFFECTING MUNICIPALITIES.

NEWSOM & CO. v. COUNTY OF OXFORD.—Osler, Q.C., for the defendants, moved for an order removing this action from a Division Court of the County of Oxford to the High Court. The action is brought by a firm of law stationers to recover the value of certain blank forms and other stationery supplied for the use of the judge and registrar of the Surrogate Court of the County of Oxford. The defendants contend that they are not liable for the forms, as the judge and clerk should supply forms themselves. The present motion is made on the ground that the action cannot be properly tried by any of the county judges, they being all interested in this or other possible claims. Order to go removing case upon the defendants undertaking to save the plaintiffs harmless from all costs over and above Division Court costs. If the defendants do not elect within a week to give the undertaking, the motion to be dismissed with costs.

VILLAGE OF NEW HAMBURG v. COUNTY OF WATERLOO.—Judgment on appeal by the plaintiffs from the judgment of the Queen's Bench Divisional Court (22 O.R. 193) reversing the judgment of Ferguson, J., which was in favor of the plaintiffs, and dismissing the action unless the plaintiffs elected to have a new trial. The action was brought for a mandamus to compel the defendants to repair a bridge over the River Nith in the village of New Hamburg. The plaintiffs contended that it was a bridge which the county corporation were bound to build and repair as the river was over 100 feet in width. The court below held that the place at which the width of a stream is to be ascertained is the place at which the bridge crosses, and the width is to be determined by the width of the natural channel of the stream, taking it at its highest ordinary state. This court was equally divided in opinion. Hagarty, C.J.O., and Burton, J.A., agreed with the opinion of the Divisional Court. Osler, J.A., agreed with the opinion of the trial judge. MacLennan, J.A., held that the stream should be measured at flood water. In the result the appeal was dismissed with costs.

BASKERVILLE v. CITY OF OTTAWA AND CANADA ATLANTIC R. W. CO.; BASKERVILLE v. CANADA R. W. CO.—Judgment on appeal by the defendants the railway company from the judgment of MacMahon, J., in the first action in favour of the plaintiff as against the defendants the city corporation with relief over for the city corporation against the railway company; and upon appeal by the defendants the city corporation from the judgment against them in the first action; and upon appeal by the plaintiff from the judgment of MacMahon, J., dismissing the second action. The actions were brought to obtain damages for injuries to the property of the plaintiffs by reason of a grading and embankment erected near Britannia terrace, in the City of Ottawa, in front of the plaintiffs' lands. Separate actions were at first brought against the city and the company, but on the application of the city the company were added as defendants in the first action. The majority of the court held that the city corporation were not liable as tortfeasors, but that the railway company, who actually did the work, were liable. Appeals of both defendants in the first action allowed with costs. Appeal of the plaintiff in the second action allowed with costs. MacLennan, J.A., dissenting, held that both defendants were liable, the city corporation for negligence in not removing

MUNICIPAL ENGINEERS, CONTRACTORS, AND MATERIALS.

the obstruction, and that the railway company were also liable over to the city corporation. The judgment of the court directs that the city corporation shall pay the costs of bringing in the railway company as defendants in the first action.

Wm. G. Whittier, Town Clerk of Trenton, Ont., is dead, aged 55 years.

A report prepared by the City Engineer of St. Thomas, Ont., shows that upwards of three miles of streets were permanently improved and five and four-fifths miles of sidewalks and crossings laid during the year 1892 by a frontage tax, at a total cost of \$32,028; that there are now altogether about thirty miles of travelled streets in the city, of which upwards of four miles are gravelled and 7,170 feet block paved, and that there were 40 miles of sidewalk and eight and a half miles of sewers.

A vegetable growth in the water mains at St. Paul, Minn., has been giving some trouble recently. The first case was discovered by Superintendent Overton in one of two service pipes in a single trench suppling a double house. A complaint was made of bad water, which flushing failed to improve. One of the pipes delivered pure water, and one supplied a muddy liquid that was of no use. This fact led to the conclusion that one of the services was foul, and the remedy applied on this supposition proved effective. The boiler of a portable engine was connected with the faucet of the kitchen sink from which the muddy water came, and a steam pressure of 70 pounds forced against the 35 pounds water pressure for 30 minutes, thereby driving the water out of the pipe. Since that time the pipe has always delivered clear water, and 12 similar cases have been successfully treated in the same manner. Great care has to be taken that there are no leaks in the service pipes or that none of the house fixtures are open during the steaming process.

DEBENTURES WANTED.

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

R. E. H. BUGKNER,

29 Adelaide St. East, TORONTO.

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Vitrified Clay Sewers - Dust Bins - Sewer Pipe
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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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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 necessity 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,
THOROLD, ONT.
Manufacturers of

QUEENSTON CEMENT

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

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HAMILTON, ONTARIO

ALEX. GARTSHORE, Proprietor

Manufacturer of

CAST IRON WATER, GAS AND SEWER PIPES.

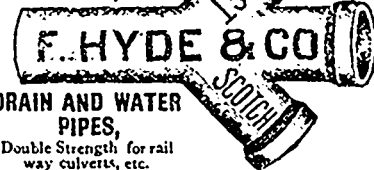
— ALSO —

Special Castings of every description.

CAPACITY: 50 TONS PER DAY.

In use from Vancouver to Sydney, Cape Breton.
Correspondence solicited

DIRECT IMPORTERS AND DEALERS IN
SCOTCH FIRE CLAY BRICK,

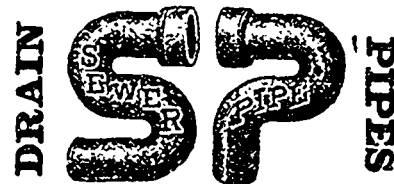


DRAIN AND WATER PIPES,

Double Strength for rail way 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. Office: 31 Wellington St., Montreal.



For SEWERS, CULVERTS; also WATER PIPES, INVERTS, VENTS, &C.
Goods shipped by water or rail to all points.

The Thos. Nightingale Pressed Brick Co.

67 Adelaide St. East, Toronto.
Telephone 449. Works at Port Credit.

A. & E. LOIGNON,
CIVIL ENGINEERS.

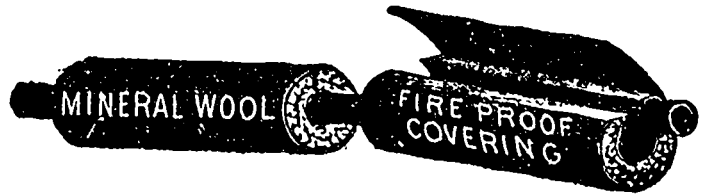
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should see to it that in the erection of town and city PUBLIC BUILDINGS, the installation of water works plant, etc., the advantages of

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are made use of for deadening sound in floors and partitions, insulation of heat and cold, fireproofing, etc., also SECTIONAL MINERAL WOOL COVERING for steam pipes, boilers, exposed water pipes, etc.

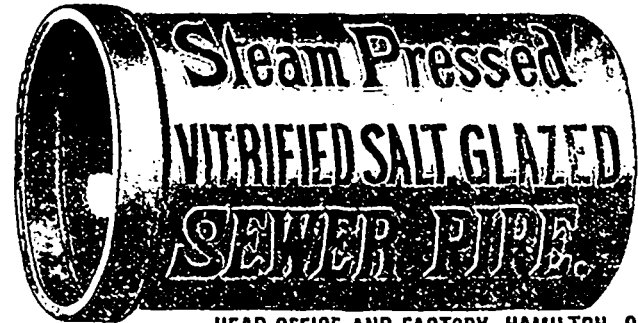
Montreal Agent:
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HAMILTON AND TORONTO SEWER PIPE CO.

— FOR —

SEWERS, CULVERTS, AND WATER PIPES. INVERTS
Fire Brick Sewers



Write for Discounts.

HEAD OFFICE AND FACTORY, HAMILTON, CANADA.

Drummond McCall Pipe Foundry Company,

MONTREAL
MANUFACTURERS OF

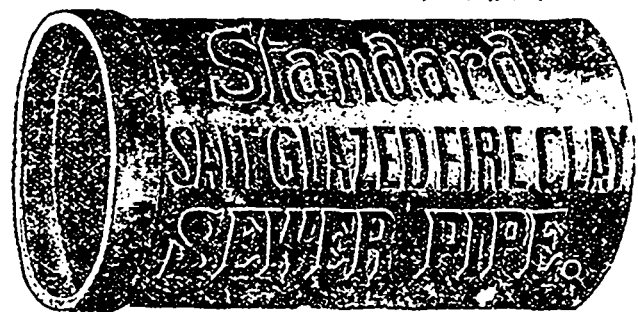
CAST IRON WATER AND GAS PIPES

WORKS: LACHINE, QUE.

PRICES ON APPLICATION.

THE STANDARD DRAIN PIPE CO.

OF ST. JOHNS, P. Q., (LIM.)



Manufacturers of
Salt-Glazed,
Vitrified
SEWER PIPES

Double Strength
Railway Culvert Pipes,
Inverts, Vents,

AND ALL KINDS OF FIRE CLAY GOODS.

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Vitrified Terra Metallic Paving Brick

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

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

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Over 5000 Gulleys are now in use in the following towns: Montreal, Toronto, Ottawa, Quebec, St. Catharines, St. Henri, Peterboro', Owen Sound, Sarnia, Cote St. Antoine, Sherbrooke, London, New Glasgow, N. S. A saving of \$23 on each gulley over the brick gulleys.



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Prices of Building Materials.

LUMBER. CAR OR CARGO LOTS.

Table with columns for Toronto and Montreal prices for various lumber types like clear picks, dressed, and various sizes of planks and shingles.

Table with columns for Toronto and Montreal prices for various building materials including bricks, tiles, and roofings.

Table with columns for Toronto and Montreal prices for various building materials including cement, lime, and plaster.

Table with columns for Toronto and Montreal prices for various building materials including nails and iron.

INDEX TO ADVERTISEMENTS In the "Canadian Architect and Builder."

Large index table listing various architectural and construction firms and their services, categorized by type of work like architects, contractors, and plumbers.