

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

Coloured covers/
Couverture de couleur

Coloured pages/
Pages de couleur

Covers damaged/
Couverture endommagée

Pages damaged/
Pages endommagées

Covers restored and/or laminated/
Couverture restaurée et/ou pelliculée

Pages restored and/or laminated/
Pages restaurées et/ou pelliculées

Cover title missing/
Le titre de couverture manque

Pages discoloured, stained or foxed/
Pages décolorées, tachetées ou piquées

Coloured maps/
Cartes géographiques en couleur

Pages detached/
Pages détachées

Coloured ink (i.e. other than blue or black)/
Encre de couleur (i.e. autre que bleue ou noire)

Showthrough/
Transparence

Coloured plates and/or illustrations/
Planches et/ou illustrations en couleur

Quality of print varies/
Qualité inégale de l'impression

Bound with other material/
Relié avec d'autres documents

Continuous pagination/
Pagination continue

Tight binding may cause shadows or distortion along interior margin/
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Includes index(es)/
Comprend un (des) index

Title on header taken from:/
Le titre de l'en-tête provient:

Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

Title page of issue/
Page de titre de la livraison

Caption of issue/
Titre de départ de la livraison

Masthead/
Générique (périodiques) de la livraison

Additional comments:/
Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF THE PUBLIC WORKS AND MUNICIPAL PROGRESS

EVERY THURSDAY

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

VOL. 7.

NOVEMBER 26, 1896

No. 43.

THE CANADIAN CONTRACT RECORD,

PUBLISHED EVERY THURSDAY

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

Subscription price of "Canadian Architect and Builder" (including "Canadian Contract Record"), \$2 per annum, payable in advance.

C. H. MORTIMER, Publisher,

CONFEDERATION LIFE BUILDING, TORONTO.
Telephone 2362.

New York Life Insurance Building, Montreal.
Bell Telephone 2299.

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

Advertising Rates on application.

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.

Notice to Contractors

Canadian Contractor's Hand-Book

A new and thoroughly revised edition of the *Canadian Contractor's Hand-Book*, consisting of 150 pages of the most carefully selected material, is now ready, and will be sent post-paid to any address in Canada on receipt of price. This book should be in the hands of every architect, builder and contractor who desires to have readily accessible and properly authenticated information on a wide variety of subjects adapted to his daily requirements.

Price, \$1.50; to subscribers of the CANADIAN ARCHITECT AND BUILDER, \$1.00. Address

C. H. MORTIMER, Publisher,
Confederation Life Building, TORONTO.

TENDERS

Tenders for the construction of a 36 inch Brick Sewer on Evergreen Avenue and Hecher Street, will be received at the office of the undersigned up to 6 p.m. on

SATURDAY, DEC. 5TH.

Plans and specifications can be seen at City Engineer's Office, London, Ont.
Lowest or any tender not necessarily accepted.

ORMSBY GRAYDON,
City Engineer, London.
WILLIS CHIPMAN,
Consulting Engineer.

ELECTRIC LIGHTING

Sealed bids will be received by the City Clerk of the City of Guelph up till noon on

Friday, December 18th, 1896,

for lighting the city with 90 or more arc lights, in accordance with the specifications now on file in the Clerk's office.

The contract to be for a term of five or ten years from the first day of July, 1897
The Council reserves the right to reject any or all bids.

RICHARD MITCHELL,
City Clerk.

D. L. SCHULTZ,
Chairman Fire and Light Committee.

CONTRACTS OPEN.

MAXVILLE, ONT.—The residents are agitating for the erection of a High School building.

ORILLIA, ONT.—The utilization of the water power at Washago is under consideration.

PARIS, ONT.—The town have under consideration the purchase of an electric light plant.

FREDERICTON, N. B.—J. N. Tabor is arranging to erect a grist mill on Westmoreland street.

SUMMERSIDE, P. E. I.—The construction of a system of waterworks and sewerage is being agitated.

CARP, ONT.—Dr. Church has purchased a site and proposes building a residence in the spring.

ARNPRIOR, ONT.—It is stated that an Ottawa firm propose installing another electric plant in this town.

ALMONTE, ONT.—The Rosamond Woollen Company are about to establish a power plant to operate their mills.

BELLEVILLE, ONT.—An agitation is on foot to construct a line of railway to connect this city with the C. P. R. at Tweed.

CHATHAM, ONT.—Mr. N. W. Ford, proprietor of the Chatham Banner, proposes erecting next spring a large new building, the basement of which will be used as a press room, the ground floor as

SMELTING WORKS

City of Nanaimo British Columbia

BEING prepared to aid the construction of a Smelter, the City of Nanaimo invites correspondence in reference to the erection of Smelting Works in Nanaimo.

This City, with its Excellent Harbor, is centrally and favorably situated in regard to the quartz ledges of Alberni, Texada and Nanaimo Lakes; also the extensive coal fields and beds of iron ore, with cheap modes of transportation.

Further details furnished on application.

Adam Thompson,
City Clerk.

a business office and job room, the second floor as a lodge room, and the third floor for editorial rooms.

DESERONTO, ONT.—Mr. Dalton, reeve, is preparing to build a residence 29x30 feet, with kitchen, on his property on Mill street.

COWANSVILLE, QUE.—The Town Council have under consideration the question of constructing a waterworks system.

WINNIPEG, MAN.—The City Council have adopted the proposition to establish electric light and gas works, to be controlled by the city.

THOROLD, ONT.—A system of waterworks for the town will probably be constructed, the matter being now under consideration by the Council.

JOLIETTE, QUE.—The town has given a bonus of \$40,000 to the Great Northern railway, \$20,000 being for a branch between Joliette and Ste. Jovite.

ROSSLAND, B. C.—At the next session of the local legislature a company will seek incorporation to construct waterworks for Rossland and Trail.

BRIDGEBURG, ONT.—A by-law will be submitted to the ratepayers at the January elections to grant a waterworks and electric light franchise to D. A. Costé.

FENELON FALLS, ONT.—It is stated that J. W. Howry & Sons are having plans prepared for their new mill, which will probably be located at Peterboro.

SAULT STE. MARIE, ONT.—Additional accommodation is required at the Sault Ste. Marie hospital, and the Ontario government will be asked to grant financial aid.

HUNTINGDON, QUE.—A franchise for electric lighting has been granted to a company in which Mr. Tache is interested. Steps will be taken at once to install the plant.

BERLIN, ONT.—At a special meeting of the Town Council a bonus of \$5,000 was offered to Mr. Hibner towards rebuilding his furniture factory recently burned.

RENFREW, ONT.—B. Dillon, architect, of this town, will receive tenders until the 11th of December for erecting a stone church at Pakenham for the Presbyterian congregation.

LEAMINGTON, ONT.—The question of improving the ventilation of the High School building is under consideration and a committee has been appointed to take action in the matter.

EGANVILLE, ONT.—The Fourth Chute bridge near this village has been condemned, and Mr. J. L. Morris, C. E., recommends the building of an iron bridge in place thereof, at a cost of \$1,500.

LINDSAY, ONT.—At the last meeting of the Town Council a resolution was passed urging upon the Minister of Railways and Canals the necessity of making a grant for the improvement of the Scugog.

NIAGARA FALLS, ONT.—Mr. Black, manager of the street railway, recently returned from New York, where he interviewed the shareholders of the road regarding its conversion into an electric railway.

PORT ARTHUR, ONT.—Two schemes have been mooted, one to build a railway south of the C. P. R. through the Rainy river county, and the other to construct locks and canals from Port Arthur to Winnipeg.

PETERBORO', ONT.—The question of constructing permanent pavements is now being considered by the Town Council. The estimated cost of the work is \$50,000 per mile. It is probable that vitified brick will be used.

ST. MARYS, ONT.—A by-law will be submitted to the ratepayers for the purpose of raising the sum of \$35,000 for con-

structing a system of waterworks for the town. Surveys have been made by Messrs. Moore and Newman.

REVELSTOKE, B. C.—The Columbia & Kootenay Railway and Navigation Co. will construct a railway between some point on its present line between Nelson and Robson on the south, and Revelstoke on the north, together with branches.

SAYWARD, B. C.—Application will be made to parliament for the incorporation of a company to construct a railway from this town, extending through Trail and Midway, to a point on Okanagan lake, in the districts of West Kootenay and East Yale.

VICTORIA, B. C.—Hunter & Duff, solicitors, will apply to parliament for incorporation of a company to construct railways from Revelstoke northwards to a point near the junction of Canoe river, with branch lines, bridges, wharves and all other necessary works.

NELSON, B. C.—Bodwell & Irving, solicitors, of this city, are applying to the legislature for an extension of time for the commencement of the works contemplated by the Kootenay Power Company, and for authority to construct tramways from Nelson to any point within a radius of twenty-five miles, and to generate and transmit electricity.

WINDSOR, ONT.—Mr. R. Pence Dupuy, of New Orleans, was recently in the city seeking a location on which a sugar plantation could be established.—The directors of the Y. M. C. A. have received a proposition from the Grand Trunk Railway Co. regarding a site for their proposed building. No definite action in the matter has as yet been taken.

VANCOUVER, B. C.—A resolution has been passed by the City Council instructing the City Engineer to prepare a plan and estimate of cost for converting the market hall into a council chamber and civic offices.—Proposals will shortly be made to the City Council for constructing a smelter and refinery in this city, for which a bonus of \$150,000 will be asked.

OTTAWA, ONT.—The Department of Railways and Canals will let contracts for eight small bridges along the Trent Valley canal.—Another drainage proposition has been made to the City Council. It is proposed to expend the sum of \$50,000 for the construction of a new trunk sewer to drain Dalhousie ward.—The Grey Nuns have offered to take over the contagious hospital and remodel the buildings.

LONDON, ONT.—A local company is being organized for the purpose of building a new skating rink.—A large departmental store is to be established in this city. A company of outside capitalists have taken over the four stores recently erected on Dundas street by Mr. Higgins, and it is intended, besides connecting the stores, to make a main entrance and extend the buildings.—Moore & Henry, architects, are calling for tenders for a double brick residence for W. Ward.

QUEBEC, QUE.—Building permits have been granted as follows: Repairs of a house for M. Deschambault, 25x30 feet, three stories, brick front; contractor, Moise Cautin; cost \$3,500. Repairs of a house on St. George Hill, for M. H. Dorion.—Tenders for lighting the city with 320 arc lights, equal to 2,000 candle power, are invited until Wednesday, the 20th of December, and are to be addressed to W. D. Baillaige, Assistant City Inspector. A deposit of \$4,000 is required with each tender.

PORTAGE LA PRAIRIE, MAN.—The Town Council have taken up the slough improvement matter, and a by-law will be submitted to the ratepayers to raise \$40,000 for the purpose of damming the Assiniboine, flooding the slough and bridging it to the island, and developing water power. Engineer Webber, in his

report, estimates as follows: Dam across the Assiniboine river, \$22,000; canal from Assiniboine to slough, \$4,800; small bridge over the canal at Ogletree's, \$300; lower dam near outlet of the slough, \$3,000; excavation of dykes, \$500; bridge across the new bay to the island, \$5,000.

ST. JOHN, N. B.—Tenders are invited by C. H. Peters for the erection of a large warehouse, 170 feet long, on Rodney wharf. Mr. Peters has also secured a site for a large warehouse to be erected in the spring at the head of the same wharf.—Steps are being taken to organize another electric lighting company in this city.—In view of the collapse of the harbor improvements, it is probable that the council will build a solid wharf on the plans prepared by Mr. Hurd Peters, C. E., and that the work will be let by contract.—An application has been received from the commissioners of the free public library requesting the city to erect a new library building, at a cost of \$15,000.

HAMILTON, ONT.—Wm. & Walter Stewart, architects, have prepared drawings for the following: Office building for the Westinghouse Air Brake Co.; alterations to F. Turner's residence, Queen street south; mausoleum for the Hamilton cemetery.—In connection with the sewage interception works the City Engineer thinks that by tapping the Ferguson avenue sewer at the corner of Kelly and Cathcart streets with a 15-inch pipe, the dry weather flow could be conveyed to the east end sewer, at the corner of Cannon street and Victoria avenue, thus reducing the nuisance at the outlet of the Ferguson avenue sewer.—A London gentleman has been negotiating for the purchase of the stores on the south side of King street, between the Canadian Bank of Commerce and the Bank of British North America, the object being to secure the property as a site for a large hotel, to cost \$50,000.—Improvements are now being made to the Hamilton and Dundas railway, in connection with which a new steel bridge will be erected beyond Ainslie Wood.—Building permits have been issued as follows: E. & C. Truscott, two storey brick dwelling on East avenue north, cost \$1,000; Coleman Lumber Co., two-storey brick dwelling, corner York and Caroline streets, cost \$1,400.

TORONTO, ONT.—A committee of the York County Council visited York Mills for the purpose of examining the wooden bridge there. The County Engineer has recommended that it be replaced by a stone structure 220 feet in length by 18 feet wide.—The City Commissioner has recommended the extension of the city wharf at the foot of Yonge street a distance of 80 feet. The cost is estimated at \$5,000.—Improvements are to be made to the Rossin house, including the construction of a large and handsome rotunda, the tiling of the first and second flats, the introduction of electric light, new elevators, a new office, and a new grand staircase. The cost of the improvements will be about \$75,000, and plans are now in course of preparation. The hotel is owned by Dr. Wm. Chewett.—Mr. W. J. Gage, states that the main building of the Hospital for Consumptives at Gravenhurst is nearing completion, but it is proposed to erect some twelve cottages, each having accommodation for from four to six patients.—The Metropolitan Street Railway will probably be extended to Lake Simcoe, in which case an additional power house will be erected at Newmarket or Aurora.—The City Engineer has recommended the construction of the following: Sidewalks—six-foot concrete on the north side of Bloor, from Yonge to Jarvis; 4 foot wooden, Mutual street, east side, from Gerrard to Carlton street; 6 foot wooden, around Holy Trinity church, Trinity square; 6 foot wooden, Charles street, south side, from Jarvis to Church; 6 foot

wooden, Gerrard street, north side, Yonge to Mission avenue. Pavements—24 foot asphalt, Brunswick avenue, from Ulster to Bloor street; 24 foot brick, Elm Grove avenue, from King street to Queen street.—W. & J. Hunter will erect two stores on Danforth road, East Toronto.

MONTREAL, QUE.—A company has been organized here, with a capital of \$150,000, to manufacture moto-cycles.—It is stated that the Dominion government will purchase the Baie des Chaleurs railway and extend the line to Gaspé Basin. It is also stated that the Intercolonial railway will be extended.—It is probable that a re-arrangement of the customs and excise offices in this city will be made.—Fournier & Benoit, architects, are preparing plans for one house, three stories, pressed brick front, to be erected on the corner of Mount Royal avenue and Rivard street, for L. P. Dupré. Tenders will be invited shortly.—Gamelin & Huot, architects, are preparing plans for two houses on Quiblier street, Westmount, for the Estate Masson.—J. D. Davis has had plans prepared for alterations to his premises, corner Craig street and Temperance square. The contract will be let next week.—The City Council have passed a resolution to request the Dominion government to rebuild McGee's bridge across the Lachine canal at Seigneurs street, to accommodate the heavy traffic of that locality.—A report has been prepared by the various committees which shows that over two and a quarter million dollars are required for sewers and pavements in this city. Mr. St. George, City Surveyor, gives a detailed statement of the cost of permanent works, among which are the following: Renewing and repairing pavements, \$149,458; renewing and repairing permanent sidewalks, \$28,545; proposed new pavements, \$515,000; new street gullies, \$144,000. Sewers—intercepting Sherbrooke street and relieving St. James street sewer, \$253,190; main sewer, N. and E. district and St. Denis ward, called de Levis main, \$332,100; storm overflow for intercepting and Coteau Barron main sewer, \$24,330; outlet extension sewers at Customs house and McGill street, into the current of the river, \$88,540; Mountain street bridge, (\$107,000), half paid by the G. T. R. Co. and half by the city, \$53,500. For paving repairs the sum of \$149,458 is required, \$112,000 of which is for a block pavement on Craig street. The approximate cost of paving required for 1897 is: Victoria square, asphalt, \$30,000; Notre Dame street, brick and asphalt, \$114,000; St. Denis street, brick and asphalt, \$98,000; St. James street, brick and asphalt, \$82,000; Cherrier street, brick, \$31,000; Fortification lane, stone blocks, \$35,000; Ottawa street, stone blocks, \$75,000; Centre street, brick, \$50,000, making a total of \$515,000. The Water Committee asks for the necessary funds for the following improvements: Repairing low level reservoir, \$87,000; repairing high level reservoir, \$2,000; new pump, boilers, buildings and connections at the high level pumping station, \$44,500; alterations to water wheels, \$4,000; connecting the 30 inch main from No. 1 turbine to the two 24 inch main in the tunnel at the wheel house, \$1,200; connecting the 30 inch main of No. 1 engine to the 30 inch main of No. 1 turbine, \$1,600; connecting No. 2 engine to the 30 inch main of No. 1 engine, \$1,700; altering valves (pipe track) \$6,500; repairing valves, \$3,500; to lay mains in Maria Anne street, \$210; mains on Bonsecours street, \$2,200; mains in Plymouth Grove, \$688; mains in St. Urban street, \$4,000; mains in Seaton street, \$1,600; mains in Sydenham street, \$825; mains in Lasalle street, \$330; mains in Mount Royal avenue, \$1,700; mains in Chambord street, \$1,375; mains in Mount Royal and Chambord, \$275; unforseen pipe laying,

\$30,000, new service pipes, \$25,000, to relay pipes on Notre Dame street, \$20,000, repairing pavement on Notre Dame street \$3,400; mains on Lacroix street, \$825; complete main on Pince street, \$650; complete main on Ann street, \$850; lay main on St. Patrick street, \$4,400; lower main in Seigneur street, near Dorchester street, \$300; telephone service, \$500; new metres, \$1,500; laying mains in Delisle and Canning streets, \$1,500; laying mains in Maisonneuve and Lagauchetière streets, \$16,400; laying mains in Visitation, Craig to Logan, \$11,600; laying mains in Nazareth, William to Common, \$4,950; laying mains in Hotel de Ville avenue, Craig to Sherbrooke, \$15,600; placing 104 new hydrants, \$20,800.—Building permits have been granted as follows: One house, two stories, Bonaventure depot yard, 91 x 51 feet, brick, for the Grand Trunk Railway Co.—masonry, Amos Cowen; carpenter and joiner's work, by day labor; two houses, four tenements, 24 x 40 feet, stone and brick front, on Manufacture street, for Francois Barret—contractor, Jos. Marcotte.

FIRES.

A residence at Amherst, N. S., owned by Mayor Smith, was destroyed by fire on the 15th inst.—Three stables at the exhibition grounds, Toronto, were burned on Tuesday last, at a loss of \$8,000.—The residence and barns of Thomas K. Scovil, at Portland, Ont., were burned last week. The loss is \$6,000, partially covered by insurance.

CONTRACTS AWARDED.

ST. JOHN, N. B.—Robert Maxwell has been awarded the contract for a new biscuit factory for R. D. Boss.

WINNIPEG, MAN.—The C. P. R. have just let large contracts for ties to Geo. Strelvel and Buchanan & Keith.

ST. LOUIS DU MILE END, QUE.—The Citizens Light & Power Co. have been awarded the contract for lighting the streets for the next thirteen years.

NEW WESTMINSTER, B. C.—The contract for constructing an automatic can factory, 250 x 90 feet in size, has been let to D. Bain. The sides and roof will be of corrugated iron.

ST. CATHARINES, ONT.—Newman Bros., of this city, have secured the contract for erecting a building for the Niagara Falls Metal Works Co.—The McEachren Heating & Ventilating Co., of Galt, have the contract for heating apparatus for the Demill Ladies College.

LONDON, ONT.—Messrs. Moore & Henry, architects, have awarded to the Metallic Roofing Co., Toronto, the contract for fireproof metallic doors for the new Y. M. C. A. building in this city.—Tenders for the purchase of \$180,000 of city debentures were recently invited.

The highest bid received was equivalent to 3/4 per cent. interest per annum, and this will be recommended to Council for acceptance.

BUSINESS NOTES.

Maille and M. Beauchamp, masons and roofers, of Montreal, have formed a new partnership.

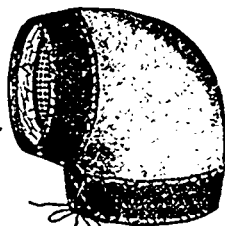
Edwin B. Corey, plumber, of Sherbrooke, Que., is announced to be in financial difficulties, with liabilities of \$2,000.

The assignment is reported of J. C. Goddard, contractor, and John Plewes, plumber, both of Toronto.

MASONRY IN COLD WEATHER.

In this age of rush, when people are no longer satisfied with the operation of methods and conditions which have formerly been accepted as satisfactory in almost all industrial departments, many indeed of these methods being founded on natural laws from which any deviation was supposed to be disastrous, but which nevertheless have been compelled to succumb to the progressive spirit of the age, there is no branch of industry which is more affected by these changes than the building business. When I was a boy, it was a very unusual thing to lay either stone or brick in the winter; as everybody seemed satisfied that frost destroyed the adhesive properties of the mortar, and necessarily impaired the walls. Again it was supposed that it was unsafe to rush a building up too fast, and so it was customary when the stone mason or bricklayer had got the building story high, to go some place else to work, and give the carpenter a week or two to get the joists on. I need not use any argument to convince any one, that in this department methods and usages are changed. I do not remember in what year Mr. Gillespie's building on Wood street was put up. But I believe it was the first on which I saw bricklayers work on through severe freezing weather. This idea was not confined alone to house building, but applied to bridge masonry as well. In August, 1857, Mr. Roebeling commenced the construction of the Sixth street, then St. Clair street, suspension bridge, on which I worked as foreman for Mr. Robert Swan, contractor for masonry. Mr. Roebeling belonged to the old school of belief, as to natural law in its application to masonry; and as soon

(Concluded on Page 4.)



ELBOW

MICA BOILER AND STEAM PIPE COVERINGS

The Highest Non-Conductor and the Cheapest Covering on the Market

Full Particulars from

The Mica Boiler Covering Co. 9 Jordan St., Toronto

The G. & J. BROWN MFG. CO., Ltd.
BELLEVILLE, ONT.

Hoists of all Descriptions + Stone Breakers Derrick Fittings

WRITE FOR PRICES AND CATALOGUE.

as the frosty weather came in November, he stopped the work, not for a few days or weeks, until the weather might improve, but till spring; and this was repeated the next fall, for the bridge did not go as things go now, and while it was commenced in August, 1857, it was not completed till the summer of 1859. Now, the fact that usages and methods have changed does not discount the wisdom which in the past recognized these inflexible natural laws as affecting masonry, whether stone or brick, as these laws can only be ignored at the expense of the work. There is another evil inseparable from this system of rush, when applied to bridge masonry, or heavy engine or pump foundations, where grout is used, and where under the operation of this system emphasized by a specific requirement that the work must (under a penalty) be completed in a time which will admit of no delay on any account; and so as soon as a course is laid and grouted the steam derrick is planting the next course, and as soon as this is finished the grouting begins again. And the same process is repeated with the result (possibly) of finishing the work in the specified time, and with the further result of 15 or 20 per cent. of cavities caused by the evaporation of water from the grout; and then the owner and engineer, or architect, as the case may be, condemn the mason, because the work is not water-tight. This bad result of rush is most apparent in dimensioned work, where there is no backing or hearing. In such case as the joints are close the grout must be thin, or it will not go into the joints, and so the joints are filled with this thin grout and covered at once with the next course, and while in ordinary bridge masonry the grout from a second course may to some extent

reach the cavities in the lower course, in dimensioned work this is impossible, and the result of evaporation of water will probably be 50 per cent. in these joints; and though, of course, the percentage of unfilled joints will vary, yet to a greater or less extent the cavities

are inevitably under this system of working, and it seems a pity that where every other precaution has been used to secure the best character of work there should be failure on account of this pernicious system of Building.—J. P. Knox, in the Journal of Building.

JOSSON CEMENT .. Manufactured at.. NIEL ON RUPELL

Is the Highest Grade Artificial Portland Cement and the Best for High Class Work. Has been used largely for Government and Municipal Works.

TO BE HAD FROM ALL CANADIAN DEALERS

C. I. de Sola, Manager in Canada .. 180 St. James Street, MONTREAL

FOR ARTIFICIAL STONE PAVEMENTS, ROOFING GRAVEL, CONCRETE, ETC.

USE CRUSHED QUARTZITE

SILICA SAND & GRAVEL CO.

Telephone 2444

MONTREAL

15 Mill Street

..... Write for prices delivered in your town.

Drummond McCall Pipe Foundry Company,

Canada Life Building - MONTREAL.

MANUFACTURERS OF

CAST IRON WATER AND GAS PIPES

WORKS: LACHINE, QUE.

PRICES ON APPLICATION.

THE THREE RIVERS IRONWORKS CO.

Montreal Office: IMPERIAL BUILDING.

THREE RIVERS, P. Q.

MANUFACTURERS OF

Cast Iron Water and Gas Pipes

of best quality, from 2 inches in diameter.

HYDRANTS, VALVES and GENERAL CASTINGS.

ST. LAWRENCE FOUNDRY COMPANY, LTD. Manufacturers of

CAST-IRON WATER & GAS PIPES.

ARCHITECTURAL IRON & STEELWORK.

Front St. East
TORONTO, ONT.

ARTIFICIAL STONE PAVEMENTS

SIDEWALKS A SPECIALTY

CORPORATIONS Will do well to consider our work and prices before letting contracts

The Silica Baritic Stone Company of Ontario, Ltd.

WALTER MILLS, General Manager.

Head office: INGERSOLL, ONT.

CAST IRON WATER PIPES

From 4 in. to 36 in. Diameter.

BELL AND SPIGOT • TURNED AND BORED

AND EVERYTHING NECESSARY FOR

A Complete Water or Gas System

SUPPLIED BY

The LONDONDERRY IRON CO., Ltd.

LONDONDERRY, NOVA SCOTIA

THE MOST COMPLETE IRON WORKS IN CANADA (ESTABLISHED 1852.)

Send for Drawings and Estimates of our work.

ALL PIPES CAST VERTICALLY

--- BRAND "SIEMENS" ---

WE MAKE

- FIG IRON
- WATER PIPES
- PUDDLED BAR
- HYDRANTS, VALVES
- PIPE SPECIALS
- HEAVY CASTINGS
- STRUCTURAL WORK
- ARCHITECTURAL WORK
- MACHINE WORK
- HYDRAULIC MACHINERY
- TURBINES
- BAR IRON

MUNICIPAL DEBENTURES

wanted for foreign clients. We can place Debentures direct with foreign clients without charge to municipalities.

: : : Commission allowed to persons introducing new business : : : :

ÆMILIUS JARVIS & CO. (Member Toronto Stock Exchange) Stock and Bond Brokers. Investment Agents. 23 King St. West, TORONTO

ELECTRIC RAILWAY BONDS PURCHASED.

STOCK EXCHANGE ORDERS PROMPTLY EXECUTED

MUNICIPAL ENGINEERS, CONTRACTORS AND MATERIALS

DEBENTURES BOUGHT

Municipalities saved all possible trouble.

G. A. STIMSON & CO.

Investment Dealers

9 Toronto Street - TORONTO

MUNICIPAL DEBENTURES

BOUGHT AND SOLD . . .
ON FAVORABLE TERMS.

A. E. AMES & CO.

- Bankers and Brokers -

10 King Street West - TORONTO

**EVERY ENGINEER
AND CONTRACTOR**

Should possess a copy of the Second Edition of the Canadian Contractor's Hand-Book, a compendium of useful information for persons engaged on works of construction, containing upwards of 150 pages. Price \$1.50; to subscribers of the CANADIAN ARCHITECT AND BUILDER, \$1.00.

Address

C. H. MORTIMER, Publisher,
Confederation Life Building, TORONTO

Branch office:
New York Life Building, Montreal.

THE HAMILTON AND TORONTO SEWER PIPE CO.

(LIMITED.)



- FOR -
**SEWERS,
CULVERTS
AND
WATER PIPES.
INVERTS**
For Brick Sewers

Write for Discounts

HEAD OFFICE AND FACTORY: HAMILTON, CANADA

THE STANDARD DRAIN PIPE CO.

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



Manufacturers of
Salt-Glazed
Vitrified
**SEWER
PIPES**

Double Strength
Railway Cul-
vert Pipes,
Inverts, Vents,

AND ALL KINDS OF FIRE CLAY GOODS

JOHN McDOUGALL

CALEDONIAN
IRON WORKS

MONTREAL, P. Q.

WORTHINGTON PUMPS



**BOILERS
ENGINES**

. . . . MACHINERY OF ALL KINDS

STEAM AND POWER

FOR ALL DUTIES



NORTHEY Co.
LTD.

TORONTO, ONT.

THE LAURIE ENGINE CO., MONTREAL
Sole Agents for Province of Quebec.

The Central Bridge and Engineering Company, Ltd.

Capital Stock



PETERBOROUGH, ONT.



\$200,000.00

WM. H. LAW - Manager and Engineer.

Manufacturers of
**RAILWAY and
HIGHWAY BRIDGES**

Viaducts, Pier, Roofs, Turntables,
Girders and Architectural Work.

:: CAPACITY: 5,000 TONS PER ANNUM ::

G. N. REYNOLDS,
Toronto Agency, 118 BAY STREET.
Telephone 2194.



MUNICIPAL DEPARTMENT

BRICK FOR PAVEMENTS.

The report of the committee appointed by the City Council of Toronto to visit the American Society of Mutual Improvements at Chicago has been prepared.

From the discussion it was gathered that the sense of the meeting was that the specifications respecting the repair of asphalt pavements should be rigidly drawn; that paving bricks should be tested, and the laying of them on concrete foundation was most favored; that wood pavements are not favored, and the breaking up of or the making of openings in the streets for any purpose other than by civic officials was condemned.

At Chicago the delegation made the acquaintance of a new asphalt, known as the "Assyrian lime rock," from the Wasach Mountains of the State of Utah. This pavement, which has been laid on Southpark avenue for a distance of one mile, has been in use about two months, and is in excellent condition. A combined curb and gutter of Portland cement concrete is also in use upon this street, the cost, completed and finished, being 75 cents per lineal foot.

An experiment on Michigan avenue was tried some two years ago by paving several blocks with vitrified brick and square white pine blocks. The bricks on concrete with sand filling have worn well, but the blocks are decaying and wearing.

The opinion of the Detroit officials is in favor of cedar on concrete on streets where traffic is not heavy; it is reasonable in cost, easily and cheaply repaired, and practically noiseless, but it is not so easily cleaned as brick or asphalt. Brick pavements are smooth, easily cleaned, adapted alike to light and heavy traffic, of minimum cost, and although objectionable on account of noise, perhaps are the best all round pavements in use in that city to-day, although they say a sufficient length of time in which to determine their durability has not elapsed since their introduction, as brick has only been used by them as a paving material since 1890, the greater part of the pavements having been laid during 1895-6.

City Engineer Keating went on an independent tour of inspection to Indianapolis, Columbus, Cincinnati, Cleveland and Buffalo. From the notes taken by him the following comparative statement of the mileage of asphalt, brick and wooden pavements is compiled:

	Asphalt.	Brick.	Wood.
Indianapolis....	33	20	6
Cincinnati.....	20	35	1
Columbus, O....	15	80	0
Cleveland.....	5	32	0
Buffalo.....	197	5	0
Detroit.....	19	15	175

At Indianapolis, Cincinnati, and Buf-

falo the bricks are laid on concrete foundation; at Columbus, Ohio, 3 inches of gravel, and at Cleveland a similar depth of sand forms the foundation. Cleveland, owing to the cheap foundation, composed of sand thoroughly rolled with a six-ton roller, is able to construct a good brick pavement at an average cost of \$1.08 per square yard, and in some instances 90 cents has been the cost. From this city comes the report that wooden pavements have been abandoned. The oldest brick pavement in Cleveland has been down seven years, and is in good condition. At Columbus, where a foundation of broken stone is used, the brick pavement is reported, after eleven years' trial, as "in pretty good condition." The further information is offered that the traffic on it is not heavy. The cost of this pavement is reported at \$1.15 per square yard.

In connection with the test to which paving brick is subjected, it is reported that the percentage of abrasion allowed in those cities where this test is made varies from 20 to 30 per cent. The average percentage of absorption accepted by Buffalo is three per cent. The cost of brick delivered on the street varies from \$10 to \$14 per thousand, and the period of guarantee for the pavement from three to five years, the latter being the most general.

TIRES.*

It is not only necessary to make good roads; it is also necessary that they shall remain good. For this reason all European countries advanced in road-making have laws regulating the width of tires used on wagons, carts and vehicles for heavy draught.

In France the width of tires ranges from three to ten inches, usually from four to six. Every market wagon and tonnage wagon is a roller; the forward axle is about fourteen inches shorter than the rear axle, so that the hind wheels run in a line outside the level rolled by the fore wheel.

In Germany, wagons used for drawing earth, brick, stone and similarly heavy loads must have a width of tire at least four inches.

In Austria all wagons built to carry a load of more than two and one-quarter tons must have tires at least four and one-third inches in width. In lower Austria a rim of four and one-half inches is required for wagons drawn by two horses.

In the State of Michigan persons using wide tires receive a rebate of one-fourth their road-tax. The States of New York, California, Ohio, Indiana, Kentucky, Vermont, Pennsylvania, Massachusetts and Connecticut have laws pertaining to the width of tires.

Experience goes to show that broad tires are very much to be preferred for drawing loads through fields and on farm roads, as they sink less deeply into the soft earth and employ less draught to move them. On rough, rutted roads, the

advantage is slightly in favor of the narrow tire in point of draught, but when wide tires are used by all there will be no rutted roads. One farmer using tires as narrow as four inches says that in the spring time he has only to drive up and down his lane a few times to change it into a smooth, level driveway. Those who will observe the occasional wide track made on our country roads will understand this result.

Towns and cities are no less affected by narrow tires than are rural districts, and it is little short of absurd that property owners should go to the expense of laying expensive pavements while those most benefitted by them continue to destroy them with narrow tires. Coal carts, drays, tonnage and express wagons on narrow tires should soon become a thing of the past. The city of Ottawa has recently adopted a wide tire by-law, and this example it is to be hoped will soon be followed by others.

To understand the evil effects of narrow tires one has only to observe an empty, springless wagon jolting along the highway, or a loaded wagon ploughing its way through the crust of a gravel road in fall or spring. At all times narrow tires on wagons of heavy draught are the greatest destroyers of roadways. To get the most benefit from the statute labor and other road expenditure in the province, to lessen the cost of roadmaking and maintenance, narrow tires must be discarded by those engaged in heavy teaming on our roads.

Broad tires, on the contrary, are in a way a benefit rather than a detriment to roads. Their broad surfaces perform the work of rollers in keeping a smooth and compact roadway free from ruts. Wide tires more than any other means that can be adopted, distribute wear over the surface of the road. Narrow tires do the work of a pick on a roadway, while broad tires do the work of a pounder. The one tears up, the other consolidates.

LEGAL DECISIONS AFFECTING MUNICIPALITIES.

CARON et al. vs. THE CITY OF ST. HENRI.—In this case the defendant had been condemned by the court below in damages for an accident which occurred in consequence of the breaking of a wire belonging to the city's fire alarm system. The wire in breaking had fallen across the electric light wire immediately below, and became charged with the current. The husband of the plaintiff, seeing the broken wire laying on the street, had attempted to roll it round a pole. He rolled up one end without suffering any injury, and then proceeded to roll up the other end, but this portion of the wire having become charged with the current from the electric light wire, the result was that he was killed by the shock. The question was as to the negligence of the city, defendant. The court below held that there was sufficient proof of negligence in the fact that the city had notice that a break had occurred in its system more than twelve hours before the accident, and had not used diligence in discovering where the break occurred; and, further, that it had received notice by telephone of the spot where the break occurred, about an hour before the accident. The Court of Review maintained this judgment, the damages allowed being \$750 to the mother, and \$750 to the minor child.

* From Bulletin No. 2, issued by the Provincial Road Instructor for Ontario.

MUNICIPAL ENGINEERS, CONTRACTORS AND MATERIALS

ENGINEERS

INDEX TO ADVERTISEMENTS

In the "Canadian Architect and Builder."

WM. NEWMAN, C. E.
A. M. Can. Soc. C. E., M. Am. W. Wks. Assn.
CITY ENGINEER OF WINDSOR.
Civil and Sanitary Engineer
Waterworks, Sewerage, Drainage, Pavements, &c.
Fleming Block - WINDSOR, ONT.

G. H. MASSY, B. E., M. C. S. C. E.
CIVIL ENGINEER
Railways, Waterworks, Foundations,
Drainage, &c., &c.
180 St. James Street - MONTREAL

GEO. WHITE - FRASER
C. E., D. T. S., A. AM. INST. ELEC. ENG
CONSULTING
ELECTRICAL ENGINEER
Electric Railways and Electric Light.
SPECIALTY: Specification and Superintendence of
MUNICIPAL PLANTS.
18 Imperial Loan Building - TORONTO.

VAUGHAN M. ROBERTS
Civil and Sanitary Engineer
Waterworks, Sewers, Electric Light,
Electric Railways.
Plans and Specifications prepared.—Work Superintended.
18 Ontario Street,
ST. CATHARINES

E. GARL BREITHAUP
CONSULTING
Electrical Engineer
MEM. AM. INST. E. E.
Electric Lighting and Railway Work
BERLIN, ONT.

DAVIS & VAN BUSKIRK
Graduates Royal Military College of Canada.
Civil Engineers
SPECIALTY Municipal Engineering, including
Drainage, Sewerage, Sewage Disposal, Water-
works, Roadways and Bridges.
W. F. Van Buskirk, A. M. Can. Soc. C. E., Stratford.
Wm Mahlon Davis, M. Can. Soc. C. E., Woodstock.

ALAN MACDOUGALL
M. CAN. SOC. C. E. M. INST. C. E.
CIVIL AND SANITARY ENGINEER
ABERDEEN CHAMBERS,
35 East Adelaide St. - TORONTO

Architects.
Ontario Directory... III
Quebec Directory... II
Architectural Sculptors and Carvers.
Beaumont, H... II
Carroll, Robert... II
Dom. Art Woodwork Company... VII
Hollbrook & Mollington... I
Lamar & Meigs... II
McCormack, W N... II
Architectural Iron Work.
Dominion Bridge Co. I
Art Woodwork
Dom. Art Woodwork Company... VII
Southampton Mfg. Co. VI

Boiler Covering
Mica Boiler Covering Co... VII
Bricks (Pressed)
Beamsville Pressed Brick Co... I
Brockville Pressed Brick Co... XI
Builders' Supplies.
Bremner, Alex... IV
Currie & Co., W&F.P. XII
Lawrence & Wiggin... IV
Montreal Directory... X
Ontario Lime Association... III
Rice Lewis & Son... IV
Toronto Directory... X

Building Stone Dealers.
Credit Forks Mining & Mfg. Co... VIII
Builders' Hardware.
Gurney, Tilden, Co... V
Rice Lewis & Son... IV
Church and School Furniture.
Can. Office & School Furniture Co... I

Orcosoto Stains
Cabot, Samuel... IV
Chimney Topping.
Bremner, Alex... IV
Currie & Co., W&F.P. XII
Contractors' Plant and Machinery
Rice Lewis & Son... IV
Cements.
Bremner, Alex... IV
Currie & Co., W&F.P. XII
Owen Sound Portland Cement Co... IV
Drawing Tables.
Laughlin-Hough Drawing Table Co... II
Drain Pipe
Bremner, Alex... IV
Currie & Co., W&F.P. XII
Hamilton and Toronto Sewer Pipe Co... XII
Elevators
Darling Bros... II
Fensom, John... I
Leitch & Turnbull... I
Miller Bros & Toms... VI
Electrical Engineer
Heathcote, W... II
Engravers.
Can. Photo-Eng Bureau... II
Fire Brick and Clay
Bremner, Alex... IV
Currie & Co., W&F.P. XII
Galvanized Iron Workers.
Ormsby & Co., A. J... I
Granite
Brunet, Jos... III
Grates, Mantles, and Tiles.
Hollbrook & Mollington... I
Rice Lewis & Son... IV
Rogers & Sons Co., Charles... XI

Heating.
Gurney Foundry Co... IV
King & Son, Warden III
McEachren Heating & Ventilating Co... VIII
Ormsby & Co., A. B... I
Pease Furnace Co... XII
Toronto Radiator Mfg Co... III
The James Smart Mfg. Co... II
Interior Decoration
Castle & Son... VIII
Elliott, W. H... VI
Lime.
Currie & Co., W&F.P... XII
Mills Roches Lime Co., The... XI
Ontario Lime Association... III
Legal.
Denton & Dods... IX
Machinery
Petrie, H. W... III
Mortar Colors and Shingle Stains.
Cabot, Samuel... IV
Muirhead, Andrew... I
Ornamental Plasterers.
Hynes, W. J... VIII
Painters.
Montreal Directory... X
Toronto Directory... X
Plasterers
Hynes, W. J... VIII
Paints & Varnishes
Cottingham Walter H vi
Muirhead, Andrew... I
Parquetry Floors
Elliott, W. H... VI
Plate Glass
Hobbs Glass Works... II
The Consolidated Plate Glass Co... II
Prismatic Glass.
Prismatic Glass Co... V
Plumbers
Montreal Directory... X
Toronto Directory... X
Roofing Materials
Ormsby & Co., A. B... I
Metallic Roofing Co... VII
Pedlar Metal Roofing Co... V
Roof Snow Guards.
Gunn, R. A... IV
Reflectors
Friuk, I. P... V
Roofers
Ormsby & Co., A. B... I
Montreal Directory... X
Toronto Directory... X
Sanitary Appliances
Dakin & Co., F. B... IV
Toronto Steel Clad Bath & Metal Co... IX
The Young & Bro. Co., Ltd... VIII
Shingle Stains
Cabot, Samuel... IV
Stained and Decorative Glass
Castle & Son... IX
Horwood & Sons, H... V
Hobbs Glass Works... II
McKenzie's Stained Glass Works... V
Lyon, N. T... V
Prismatic Glass Co... V
Shingles and Siding
Metallic Roofing Co... VII
Ormsby & Co., A. B... I
Pedlar Metal Roofing Co... V
Soil Pipe.
Toronto Foundry Co... V
Wall Plaster
Albert Mfg. Co... II
Alabastine Co... VIII
Window Blinds
Semmens & Evel... VII

WILLIS CHIPMAN, B. A. Sc.,
M. Can. Soc. C. E.; M. Am. Soc. C. E.;
M. Am. W. W. Ass'n.
CIVIL AND SANITARY ENGINEER
Water Works - Sewerage
Sewage Disposal
103 BAY STREET - TORONTO.

JOHN GALT, C. E. & M. E.
(Member Can. Soc. C. E.)
CONSULTING ENGINEER AND EXPERT
Specialties:
Water Supply and Sewerage, etc.
Electric Power, Lighting, Railways, etc.
Offices:
CANADA LIFE BUILDING - TORONTO

BELLHOUSE, DILLON & CO., 30 St. Francois Xavier Street MONTREAL
Sole Agents in Canada for the COMPAGNIE GENERALE DES ASPHALTES DE FRANCE (ROCK ASPHALT)
PORTLAND CEMENT NORTH'S CONDOR SITTING LION and... WHITE CROSS BRANDS
Paving and Fire Brick a Specialty

J. McDougall, C. E.,
ENGINEER OF THE COUNTY OF YORK
GENERAL MUNICIPAL ENGINEER
Consulting Engineer for Municipalities in regard to
Electric Railway and other Franchises.
Specialties: Bridges, Foundations, Electric Railways, and Roads. Surveys made; Plans, Specifications and Agreements prepared, and work superintended.
COURT HOUSE, - TORONTO.

Paving Granite
Granite Sets for Street Paving. — CURBING cut to any shape ordered. — Fine Rich Colors for Building and Monumental Purposes.
Quarries, St. Philippe d'Argenteuil, P. Q.
Address all communications to
JOS. BRUNET - COTE DES NEIGES, MONTREAL

ALEX. GARTSHORE, PRESIDENT. ESTABLISHED 1870. THE GARTSHORE-THOMSON PIPE & FOUNDRY CO. LTD. MANUFACTURERS OF SPECIAL CASTINGS AND ALL KINDS OF WATER WORKS SUPPLIES. HAMILTON, ONT. J. G. ALLAN, SECY & TREAS. JAS. THOMSON, VICE-PRES'T & GEN'L MGR. INCORPORATED 1896

Prices of Building Materials.

Toronto. Montreal.

Toronto. Montreal.

CONDITION OF THE MARKET.

TORONTO: The volume of business in building material remains about the same, with perhaps a falling off in demand for brick and stone. Lumber is in more request, and prices have advanced, while indications point to a further rise before the end of the year. Building paper is moving freely, cement is quiet, and galvanized iron is firm and in light supply. A Chicago paper states that the wire nail trust has collapsed, and goods are being sold at \$1.70 per keg, which is \$1 less than the trust's circular price.

MONTREAL: A little more enquiry for some lines of builders' supplies is reported, and trade is in as good condition, as might be expected at this season of the year. Nails are selling well, also building paper and small hardware. The heavy metal trade is firm. An active business has been done in paints and oils, but cement is weaker and orders limited. The arrivals last week were 2,950 English and 6,922 Belgian, making a total to date of 85,452 and 76,443 respectively. Firebricks are steady.

LUMBER.

CAR OR CARGO LOTS.

Toronto. Montreal.

Table listing lumber prices for various types of wood, including clear picks, dressing, and shingles, with prices for Toronto and Montreal.

Table listing brick prices under the heading 'BRICK-M M', including common walling, good facing, and pressed brick.

Table listing sand prices under the heading 'SAND', including per load of 1 1/2 cubic yards.

Table listing stone prices under the heading 'STONE', including common rubble, large flat rubble, and various types of granite and freestone.

Table listing Ohio freestone prices under the heading 'OHIO FREESTONE, FROM THE GRAPTON STONE CO.'S QUARRIES', including various buff and blue dimensions.

Table listing slate prices under the heading 'SLATE', including roofing and terra cotta tile.

Table listing paint prices under the heading 'PAINTS. (In oil, per lb.)', including white lead, red lead, and various colors.

Table listing cement and lime prices under the heading 'CEMENT, LIME, etc.', including Portland cements and hydraulic cements.

Table listing hardware prices under the heading 'HARDWARE', including cut nails, steel, and various types of nails.

Table listing casing and box, flooring, shook and tobacco box prices under the heading 'CASING AND BOX, FLOORING, SHOOK AND TOBACCO BOX', including various types of nails.

Table listing slating and common barrel nails prices under the heading 'SLATING NAILS' and 'COMMON BARREL NAILS', including various sizes and types.

Table listing steel wire nails prices under the heading 'STEEL WIRE NAILS', including iron pipe and various sizes.

Table listing galvanized iron prices under the heading 'Galvanized Iron', including steel beams, channels, and plates.