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
- ☐ Covers damaged/ Couverture endommagée
- ☐ Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- ☐ Cover title missing/ Le titre de couverture manque
- ☐ Coloured maps/ Cartes géographiques en couleur
- ☐ Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- ☐ Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- ☑ Bound with other material/ Relié avec d'autres documents
- ☑ 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
- ☐ 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.

- ☐ Coloured pages/ Pages de couleur
- ☐ Pages damaged/ Pages endommagées
- ☐ Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- ☑ Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- ☐ Pages detached/ Pages détachées
- ☐ Showthrough/ Transparence
- ☑ Quality of print varies/ Qualité inégale de l'impression
- ☑ Continuous pagination/ Pagination continue
- ☐ Includes index(es)/ Comprend un (des) index

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

- ☐ 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
☐		☐		☐		☐		☐	☑	☐	

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.

VOL. 10. OCTOBER 25, 1899 No. 39.

THE CANADIAN CONTRACT RECORD,
PUBLISHED EVERY WEDNESDAY

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 PUBLISHING COMPANY of Toronto, Limited, Publishers.

CONFEDERATION LIFE BUILDING, TORONTO.
Telephone 2362.

Branch Office:
New York Life Insurance Building, Montreal.
Bell Telephone 2299.

Advertising Rates on application.

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

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

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.

CONTRACTS OPEN.

MITCHELL, ONT.—Fred. Davis intends building two stores on Main street.

DESERONTO, ONT.—The Methodist congregation will build a new parsonage.

NORTHAMPTON, N.B.—The Methodists have decided to build a new church next year.

ST. JOHNS, QUE.—The council has decided to issue bonds to the extent of $75,000.

ST. JOHN, N.B.—The plumbing in the Home for Incurables will require to be overhauled.

MELCOMBE, ONT.—The authorities of St. Patrick's church have decided to build a new rectory.

BELLEVILLE, ONT.—Tenders will be invited for an electric fire alarm system of twenty-five boxes.

ARNPRIOR, ONT.—The council is seriously considering the construction of a waterworks system.

LORETTE, QUE.—Craig, Reid & Company purpose converting their paper mills into a cotton factory.

SHERBROOKE, QUE.—The by-law to raise $100,000 for improvements was carried by the ratepayers.

LISTOWEL, ONT.—The work of reconstructing the G.T.R. station is to be commenced at an early date.

DIGBY, N.S.—The council is considering plans submitted by Mr. Fairn, architect, for fire and town hall.

HESPELER, ONT.—The Galt, Preston & Hespeler Street Railway Co. will build a new station at this place.

BRACEBRIDGE, ONT.—There is talk of an electric railway being built to connect Bracebridge with adjacent points.

WINCHESTER, ONT.—The corporation desires tenders by November 1st for 50 cords of stone for street purposes.

GEORGEVILLE, QUE.—It is rumored that the B. & M. Railway will erect a large summer hotel on Bay View Point.

SEVERN BRIDGE, ONT.—It is said that Mickle, Dyment & Son will probably supply electric lighting to the village.

HUNTSVILLE, ONT.—W. E. Hutcheson has purchased property on West street, and will likely build a dwelling next spring.

WESTON, ONT.—R. H. Leighton, village clerk, invites offers up to 25th inst. for purchase of $7,000 of electric light debentures.

GUELPH, ONT.—The Guelph Pavement Co. have reported to the council that the cement walks could be repaired at a cost of $5,270.

SUNDERLAND, ONT. Hugh Wilson and A. J. Reid, of Cannington, have purchased a site here on which to build a brick hotel.

BROCKVILLE, ONT.—A. McDougall is taking tenders this week for alterations and improvements to store occupied by Wm. Johnston.

BRANTFORD, ONT.—The Chelcraft Screw Co. has been formed into a joint stock company. It is intended to increase the plant.

SHELBURNE, ONT. — The council is still considering the taking over of the existing electric light plant or the installation of a new one.

ST. PAUL, QUE.—Tenders have been taken on the erection of a church, sacristy and presbytery. Particulars from H. Brisset, parish priest.

PEMBROKE, ONT.—Plans prepared by C. B. Chappell, architect, of Charlottetown, P.E.I., have been accepted for the proposed hospital at this place.

AMHERSTBURG, ONT.—It is rumored that the Avery Estate has purchased the upper half of Bois Blanc Island and will erect summer cottages thereon.

GREENWOOD, B.C.—Ald. Cameron has given notice that he will introduce a by-law to borrow $10,000 for streets and $5,000 for erection of a municipal building.

CHARLOTTETOWN, P.E.I.—C. P. Chappell, architect, is preparing plans for a large addition to the Sydney Hotel at Sydney, C.B., and for several residences.

WATERLOO, ONT.—The addition to Waterloo Manufacturing Co.'s establishment will be 200 × 60 feet, two storeys high. One storey will be completed this fall.

SHIPTON, QUE.—On the 30th inst. the ratepayers will vote on a by-law to grant a loan of $10,000 to A. J. Morrill, of Nicolet Falls, for the establishment of a pulp mill here.

SMITH'S FALLS, ONT.—It is estimated that 380,000 bricks will be used in the construction of the Frost & Wood warehouse.—S. Garret intends next spring to enlarge the Rideau hotel.

PARRY SOUND, ONT.—F. Johnston, of Cleveland, Ohio, was in town last week with a view of forming a joint stock company to build in this town a brick hotel, four storeys high, to cost about $30,000.

MEAFORD, ONT.—The council has decided not to undertake any sewer work until next year.—The Botsford Jenks Co. have entered into an agreement with the town to build an elevator to cost $115,000.

TIVERTON, ONT.—Architects Kinsey, of Port Elgin, and Fawcett, of Sarnia, have each submitted plans for new Presbyterian church to be built here. The building committee will make a selection immediately.

POINT ST. CHARLES, QUE.—Those interested in the establishment of a general hospital have selected a site and secured an option on the property, and a committee has been appointed to solicit financial support.

CHATHAM, ONT.—J. L. Wilson & Son, architects, have prepared plans for new

hotel for Mr. Peltier, of Tilbury, to cost $5,000.—A petition has been presented to council asking for a macadam pavement on Colborne street.

AYLMER, ONT.—A meeting of persons interested in the erection of a beet sugar refinery at this place was held last week. Mayor Sinclair, W. S. Caron and D. H. Price were appointed a committee to further the scheme.

LA RIVIERE, MAN.—John E. Cayton, clerk municipality of Pembina, Manitou P.O., desires tenders by Thursday of this week for two steel bridges to span the Pembina river, one to be 75 feet and the other 135 feet in length.

SARNIA, ONT.—Plans are said to be in course of preparation for the new post-office to be built on the Alexander property.—It is expected that tenders will shortly be invited for construction of proposed electric railway.

WOODSTOCK, N.B.—The ratepayers have voted in favor of granting a bonus of $50,000 for the establishment of a pulp mill.—The Carleton Creamery Co. purpose erecting new buildings, and have asked for exemption from taxation.

WINDSOR, ONT.—The city council is taking steps to select a site for isolation hospital.—Wm. Newman, C.E., is preparing plans for a sewer on McEwan avenue.—Council has passed a by-law to borrow $25,000 to meet current expenses.

VERDUN, QUE.—Joseph Rielle has presented to the Church of England some property at the corner of Wellington street and Gordon avenue, and it is intended to erect a new church thereon, the work of building to be commenced this fall.

SYDNEY, C.B.—The Bank of British America have purchased property corner Dorchester and South Charlotte street, and will erect a building thereon next spring.—The Union Bank of Halifax will fit up part of the McIvor Block for bank purposes.

DUNDAS, ONT.—Work on the granolithic pavements has ceased, owing to a dispute between the contractor and the town authorities.—The Department of Militia at Ottawa have decided to have plans prepared for an addition to the drill shed at this place.

QUEBEC, QUE.—Plans will be prepared at once for a large building for the Jacques Cartier Electric Light & Power Co., to be built on the Lyons property, corner St. John and d'Aiteuil streets. Mr. Edward Slade has been appointed manager of the company.

GASPE, QUE.—The Bagnall Oil Co., with which is associated the Canada Petroleum Co., has arranged with the Dominion and Quebec governments to have subsidies guaranteed of $10,000 per mile of new railway connecting the oil fields with the neighboring railway.

VANKLEEK HILL, ONT.—M. K. Sylvester, secretary of building committee, desires tenders by November 15th for erection of stone Presbyterian church at this place. Plans at office of W. C. Sylvester & Son and McVicar & Heriot, architects, Canada Life Building, Montreal.

HULL, QUE.—M. Carrier is building a brick residence on Lake street, to cost about $2,000.—The council has adopted the report of Mr. Farley, city engineer, regarding the substitution of hydraulic for steam pumping for waterworks purposes. The necessary funds, $55,000, will be borrowed.

NEW WESTMINSTER, B.C.—It is understood that work will be commenced at an early date on the proposed tramway station and shed for the British Columbia Electric Railway Co.—The congregation of St. Peter's cathedral will take steps at once to rebuild the Orphanage of the Good Shepherd at Sapperton.

ROSSLAND, B. C.—The Knights of Pythias and Order of Eagles have purchased the Pacific hotel property, and intend expending about $2,000 in improvements.—McMillan Bros. have purchased additional property at the corner of St. Paul and Columbia ave., and it is thought that they will erect a large hotel on the site next spring.

GALT, ONT.—The McEachren Heating & Ventilating Co. will enlarge their moulding shop next spring.—Jaffray Bros. have purchased property on North Water street, and will likely erect an office building for the purposes of the Galt Reporter.—Plans are in course of preparation for a brick warehouse for the Massey-Harris Co.—A company is being formed to build a skating rink here.

LONDON, ONT.—The London Cold Storage Co. purpose enlarging their building, additional land having been secured for that purpose. T. H. Smallman and Dr. Niven are members of the company.—The council has decided to construct sewers on portions of Waterloo and St. James streets and Hellmuth avenue.—Moore & Henry, architects, have prepared plans for new building to be built on the site of the American hotel by Messrs. Cruickshank and Barker. The buildings will consist of three warehouses.

VICTORIA, B.C.—The Victoria & Sydney Railway Co. have had plans prepared for a new screw vessel, 90 feet long, to be built this winter.—H. Maurice Hill, solicitor for the E. & N. Railway Co., will make application at next session of legislature for incorporation of a company to construct a railway from Comox district to Cape Scott, the most northerly point on Vancouver Island.—At a meeting of the parishioners of St. Saviour's church, Victoria West, held last week, it was decided to build an addition to the edifice, for which plans have been prepared.

WINNIPEG, MAN.—Mr. Shaughnessy, of the C. P. R., stated recently that a double track between Winnipeg and Fort William would be constructed in the near future.—Geo. V. Hastings, local manager of the Lake of the Woods Milling Co., states that a meeting will be held in about three weeks to decide upon the proposed extensions to the buildings and plant of the company.—In connection with the proposed C. P. R. hotel, it is understood that either a viaduct or subway will be constructed at the Main street crossing.—The Market and Health Committee have recommended to council that a by-law be submitted to the ratepayers to raise $17,000 for a crematory.

VANCOUVER, B. C.—The trustees of Homer street Methodist church have not yet decided whether their new building on Georgia street will be constructed of wood or stone. A stone building is estimated to cost about $35,000. The sum of $16,000 has already been subscribed.—The new O'Toole block on Hastings street will be 40×60 feet, brick, two storeys high.—McLellan, McFeely & Co. are about to commence the erection of a new warehouse.—At last council meeting the city engineer called attention to the necessity of waterworks extension, and suggested that another by-law for $50,000 be submitted to the ratepayers.—A survey of that portion of ward 5 included in the proposed sewer improvements is being made by the city engineer, and as soon as plans and specifications are prepared tenders for the work will be invited.

HAMILTON, ONT.—The proposed addition to the Sawyer-Massey works is estimated to cost $11,000.—E. B. Patterson, architect, has prepared plans for an addition to the Ontario Lantern Co.'s factory, to be 97 feet long and three storeys high. Tenders will be let at once.—Building permits have been granted as below: Richard Tope, brick dwelling on Hanna street, between Queen and Kent streets, cost $1,050; G. M. Miller & Co., architects, Toronto, brick addition to the Sawyer-Massey Company's factory, cost $11,000; Stewart McPhie, two-storey brick building on Main street, between Bay and Park, for City Steam Laundry, cost $3,500; Thomas Allen, four brick dwellings on Baillie street, and one on Augusta street, cost $5,500.—At the coming municipal elections a by-law may be submitted to the ratepayers to provide $150,000 by debentures for roadway construction during the next two years.

MONTREAL, QUE.—Plans of a Presbyterian church to be built at Vankleek Hill, Ont., are on view at the office of McVicar & Heriot, architects, Canada Life Building.—The shareholders of the Merchants Cotton Co. have authorized the directors to increase the capital stock to $2,000,000. It is intended to build a mill near the present structure, to be 250 x 110 feet and four storeys high. An engine-room will also be erected.—The municipality of Westmount will probably negotiate a loan of $250,000.—The city Medical Health Officer and the Provincial Board of Health have submitted reports concerning the proposed abating of the nuisance of emptying sewage into the St. Pierre river. For this work the Federal government has voted some $40,000. The reports on the subject recommend that the river be turned into a huge covered sewer, the cost to be borne by the Federal government and the municipalities interested.

OTTAWA, ONT.—The Kettle River Valley Railway Co. have announced their intention of again making application for a charter at next session of parliament.—The Ottawa Car Company have purchased property on Albert street for the purpose of building an extension to their car shops.—Plans will be prepared this winter for the proposed drainage of the Glebe, contracts to be let early in the spring.—The Metropolitan Electric Co. expect to commence the construction of their power house this week. Tenders are invited for delivering 1,000 yards of blue clay at their works at Britannia Bay.—Building permits have been granted as follows: H. C. Avery, frame dwelling Keefer street, cost $1,200; W. J. Atkins, frame dwelling Hickey street, cost $800; James S. Oakley, frame dwelling James street, cost $600.—Mr. McLeod Stewart, promoter of the Ottawa and Georgian Bay canal, states that the money to start the work has been deposited in the Bank of Ottawa, and that construction will begin at French river and Ottawa next spring. It is intended to build elevators at North Bay.

TORONTO, ONT.—The Department of Public Works of Ontario invites tenders up to noon on Wednesday, November 1st., for steam heating, plumbing and electric lighting of the Normal school building in course of erection at London.—A committee of the city council has recommended that a new 75 horse power boiler be installed at the jail, and additional boiler-room provided, cost $1,200, also fire escapes for the women's quarters, cost $800.—The city commissioner has recommended the construction of a crematory on the main pumping station property, cost $8,000.—W. R. Strickland, architect, 35 Adelaide street east, invites tenders up to noon of the 30th inst. for the purchase and removal of a pair of frame stores and dwellings, Nos. 1268 and 1272 Queen street west.—The council has given notice of its intention to construct the following work: Asphalt pavement on College street, Bathurst to Clinton, cost $20,630, and on Spadina road, Bloor to Bernard, cost $16,700; brick pavement on Trinity

street, King street to G. T. R. tracks, cost $10,260, and on Balmuto street, Bloor to Czar, cost $2,800; cedar block pavement on College street, Clinton to Lansdowne, cost $13,250, and on Yonge street, Davenport road to C. P. R. tracks, cost $9,860. —The city engineer has recommended the construction of the following works. Asphalt pavements. Lowther ave., Spadina to Walmer road, cost $2,430; Huron street, Lowther to Bernard, cost $10,300. Concrete walks: Huron, west side, Bloor to Lowther, cost $772; College, south side, Beverley to Huron, cost $551; St. George street, opposite Nos. 92 to 112, cost $552; Bernard ave., south side, Avenue to Bedford road, cost $638; Huron street, both sides, Lowther to Bernard, cost $1,890; St. Vincent, both sides, Breadalbane to St. Joseph, cost $2,379. — Building permits have been granted as follows: A. S. Nichols, three-storey brick dwelling, north-east corner College and Robert streets, cost $2,000; A. Frank Wickson, two-storey brick residence, Macpherson ave, near Yonge, cost $2,400; Thos. Downing, addition to No. 13 Waterloo ave., cost $250; Toronto General Trusts Co., alterations to store, south-east corner of Yonge and Charles streets, cost $1,000; I. Gratistian, two-storey brick store-house, No. 67 Centre ave., cost $500.—Gouinlock & Baker, architects, want tenders by November 4th for alterations and additions to 25 Wellington street west.—Mr. Cable, of the firm of Alexander & Cable, has recently purchased 80 feet of land on the elevation at the head of Bathurst street. It is understood to be his purpose to erect thereon a residence.—The city engineer will recommend that an experiment be made in this city with the septic tank system of sewage disposal.

FIRES.

Residence of D. B. McLachlan in Brooke township, near Petrolea, Ont.; loss about $2,000.—Chapel of L'Islet church at L'Islet, Que., partially destroyed.—General store of J. T. Humphries at Bracebridge, Ont., damaged to the extent of $9,000.—Manning's steam saw mill and barrel factory and J. D. Smith & Co.'s rattan works at Falmouth, N.S.—Several buildings at Ridgetown, Ont., were destroyed by fire on October 17th, including the Livingstone block, owned by J Kenney. Among the other losers are Thos. Craig, four stores; Hays' bookstore, owned by Routledge & Co.; G.N.W. Telegraph, Customs and Inland Revenue offices; Mr. Nelson, jeweller; P. Brawden, druggist; Bawden & Thorold, merchant tailors; C. E. Dauphin, confectionery; B. Dodman, barber and billiard parlors; Dr. Coyne, dentist; Smith & Jeffries, grocers; P. R. Campbell, Arlington Hotel; L. Reycroft and H. D. Smith, barristers; I. N. North, photographer. — Bridge shops of the Record Foundry & Machine Co. at Moncton, N.B.; loss $3,000.—Geo. W. Murray's planing mill and sash factory at Winnipeg, Man.; loss about $15,000, insurance $6,000.—Pacific Hotel at Sault Ste. Marie, Ont.; loss $2,000.—Joseph Bedard's steam saw mill about one mile from the town of Richmond, Que., totally destroyed.—Departmental store of J. B. Farand at Hull, Que.; loss $35,000.

CONTRACTS AWARDED.

PERTH, ONT. — Skating rink; W. J. Rabb, contractor.

WESTON, ONT.—Building for electric light plant: J. Barker, contractor.

PALMERSTON, ONT.— Brick residence for F. Wilson: M. Woolridge, contractor.

NELSON, B. C.—Warehouse for Lawrence Hardware Co.: Nelson Saw & Planing Mill Co., contractors.

ORILLIA, ONT.—The council has sold $75,000 debentures to G. A. Stimson & Co., of Toronto, at premium of $4,505.

TORONTO, ONT.— W. Mashinter & Co. have the contract for plumbing and steam heating of Brown Bros.' new warehouse on Wellington street west.

WASHAGO, ONT.—Contracts for building two school houses, one at Severn Bridge and the other at this place, have been awarded to Mr. Switzer, of Orillia.

GALT, ONT.—Building for E. A. Smith: A. McAuslan, contractor. — Storehouse for Maxwell & Sons: Masonry, Wm. Edmonds; carpenter work, Peter Nicol; painting, A. G. Bruce.

CHARLOTTETOWN, P. E. I.—The contract for the new wing to the asylum at Falconwood has been let to Parkman, Crabbe & Jenkins, at price about $35,000. C. B. Chappell is architect.

FREDERICTON, N. B.—W. Kitchen, of this place, has been awarded the contract for straightening the curves on the Prince Edward Island railway between Loyalist and Colville. The work is to be completed by June, 1900.

COLCHESTER SOUTH, ONT.—School debentures for $2,500 have been sold to H. O'Hara & Co., at premium of $61; police village debentures to G. Stimson & Co., Toronto, and Hicks' drain debentures to Chas. Bell.

MONTREAL, QUE.—The contract for two electric passenger elevators for the new Merchants' Bank building has been awarded to the Sprague Elevator Co., through their Canadian agents, Jack & Robertson, of this city.

AMHERRTBURG, ONT. — Tenders for sewer construction were received last week as follows: Wm. Wilson, brick, $2,767, (accepted), rock, $2,706; Flook & Babcock, $2,882; Chas. Smith, Windsor, $3,065.60; Geo. Sewell, Windsor, $3,113.68.

WINDSOR, ONT.-- For construction of main on Church street tenders were received as follows: Jas. E. Purser, 11½c. per foot; Geo. Sewell, 11½c.; Cole & Shaw, 11c.; John Chick, 9½c.; Wm. Lyons, 9c. (accepted). About 3,000 feet of pipe will be laid.

OTTAWA, ONT.—New Blyth building on Sparks street: A. Garvock, contractor for brick and stone work. Plans prepared by M. C. Edey, architect, show a building 198×43 feet, containing elevators, prismatic glass and other modern improvements. — Iron rack at pump house: Baldwin Iron Works, successful tenderers, $510. Other tenderers: Thos. Lawson, $515.42; Alex Fleck, $526.40; A. E. Campbell, $600; P. Latour, $621.31.—McKinley & Northwood have been awarded the following contracts in this city. Plumbing and hot water heating George Goodwin's house, Theodore street; steam heating All Saints church, Chappelle street; plumbing and heating new house for Captain Wood, McLeod street; plumbing and hot water heating new house for W. Ahearn, Somerset street; plumbing and steam heating and setting up laundry machinery of new extension to Windsor hotel, plumbing and heating new house for J. E. Edwards, Theodore street; hot water heating, M. C. Edey, Somerset street; hot water heating, H. C. Monks, Lisgar street; hot water heating, James Hote, Elgin street.

HAMILTON, ONT.—The Hoepfner Refining Co. have accepted tenders as follows for erection of new buildings. Main building, Wm. Hancock; chimney, bleach house and other buildings, G. Webb; carpenter work, Thos. Reid; roofing, Findlay & Son, iron work and crane, Hamilton Bridge Works Co., painting, Turnbull & Morris and P. Thompson; tanks and shafting, Smart-Eby Machine Co., all local contractors. The above contracts amount to about $70,000.

MARKET CONDITIONS.

The market for building supplies has undergone no important changes during the past week. The advance in the price of cut and wire nails has not checked the demand, and from Montreal in particular comes the report that enquiry has been brisk. In the metal market galvanized iron is the most active, and prices are held firmer under light stocks. Prices of iron pipe show a tendency to advance, but as yet no change in quotations has been made. In view of the serious shortage in ores, the price of Hamilton pig iron has reached $24 per gross ton f.o.b. cars Hamilton. The movement of paints and oils has been heavy at both Toronto and Montreal, and an unusually brisk demand for plate glass is reported. Only a moderate trade is doing in cement.

BUSINESS NOTES.

Pepin, Henri & Co., builders, Montreal, have dissolved partnership.

Clayton Bros. have started business as fire brick manufacturers at St. Henri, Que.

A winding up order has been granted to the Anglo-Canadian Asbestos Co., Montreal.

The dissolution is announced of the firm of Sicard & Lepine, builders, St. Henri, Que.

MUNICIPAL DEPARTMENT

THE FLOW OF WATER THROUGH VALVES.*

The most casual observer in looking at an ordinary valve must have noticed the contracted and tortuous passages of the globe-valve, and the breakwater-like projections in the passageway of a gate valve. While engineers are universally of the opinion that a gate-valve will pass more water at a given pressure than will a globe-valve of the same nominal size under like condition, yet, so far as is known to the writer, no one has attempted accurately to compare their relative flows. Considered from the point of view of design, the hydraulic engineer readily perceives that the reasons for the above opinion are the losses of head due to hydraulic friction at no less than eleven places in globe-valves and at a less number in angle and gate-valves. Referring to the sectional elevation of a globe-valve, you will notice that hydraulic losses are occasioned by: (1) The enlargement of the steam as it leaves the pipe for the body of the valve—always providing that the end of the pipe has been finished and the burrs produced in cutting have been removed; (2) the contraction of the steam as it goes through the passageway to the underside of the valve seat; (3) the enlargement at the underside of the valve seat; (4) the contraction in passing through the valve-orifice; (5) the still further contraction in passing between the valve-seat and the valve; (6) the enlargement in passing through the top of the body of the valve; (7) the enlargement or contraction, as it goes through the passageway towards the the pipe from the top side of the valve-seat; (8) the enlargement of the stream just before meeting the end of the pipe; (9) the contraction of the stream on entering the pipe; (10) skin-friction, due to rough surfaces and unfilleted angles; (11) by the turning its main direction of flow through at least 360 degrees of arc.

Referring to the diagram of the straightway or gate-valve, you will perceive that its hydraulic losses are due to the first, second, third, fourth, eighth, and ninth of these reasons or their equivalents, and also to a less extent to the tenth. The angle and cross valves have losses due to the first, fourth, sixth, seventh, ninth and tenth, and to the turning of its main direction of current through ninety degrees.

In these three classes of valves, the area of valve-orifice is never as large as the actual area of the pipe connected to it. With most valves the diameter of the valve-orifice is the same as the nominal diameter of the pipe, while with some valves the area of the orifice is even less than the area due to the nominal size of the pipe. With many globe and angle-valves the valve-disk does not rise sufficiently high to give equal areas through the orifice and between the valve seats and valve-disk, and in many of even the smallest of the older designs of valves the valve is guided to its seat by lugs projecting down into the orifice, thereby decreasing its area and causing additional eddies. In some of the forms of globe and angle valves of the latest designs, it will be found that the disk does not lift high enough for a free passage, but that the nut of the valve-disk hangs down like a uvula in the throat of the passageway; and similarly with gate-valves, that, while the orifice is always much less in area than the actual area of the pipe, it is sometimes still further decreased by the projecting lugs used to screw the valve-seats into their places; and, furthermore, that the vavle-discs of some gate-valves, not lifting high enough, hang down into the passageway, and so obstruct the flow of the water.

The investigation to which your attention is called is one suggested by the writer and made under his direction. It formed the graduating thesis for the degree of M. E. in 1897 of Mr. C. W. Damron and Mr. Horace Judd, of this city (Columbus), and to them much credit is due for their patient and painstaking experimentation and the care with which they worked up the results, which cover fifty-one pages of tabulated figures and plates of forty four curves graphically illustrating the same. For your understanding of the results of this investigation, the discharge curves of the different valves tested have been redrawn to a scale of five gallons equal to one inch and one pound pressure equal to .266 inch. From the diagram before you you will perceive that five sizes were tested of seven makes of valves, each at six different pressures. Some of the more instructive data have been tabulated with reference to the weights of the valves with and without hand wheels—the actual interior diameters and the equivalent areas of the standard black pipe, the actual areas of the valve-orifices, and the pressure of the gauge at the valve for each size and make of valve corresponding to a pressure of eighty pounds at the standpipe.

The investigation was made in the hydraulic laboratory of the department of Mechanical Engineering at the Ohio State University. Water from one, two, or three pumps was led into a twenty-four-inch standpipe twenty-four feet high, closed at the top, whence it passed through a fifteen-inch opening into one

(Continued on page 6.)

*Paper read by W. T. Magruder, Professor Mechanical Engineering, State University, Ohio, at the nineteenth annual convention of the American Water Works Association, Columbus, Ohio, May, 1899.

end of a twenty-two-inch drum four feet long. The opposite end of this drum was flush, and into it the pipe nipple six inches long was screwed, and on the end of which the valves were screwed, so that the pressure came on the underside of the valve. Each valve was left open at the outlet end, and no nipple or pipe was screwed in the discharging end. The water was delivered by the valve directly into a catchall which returned the water into a tumbling bay, from which it flowed through combing boards into the fore bay and so to the weirs. Two sizes of weirs were used six inches by eight inches, and eight inches by twenty one and one half inches.

The above was the procedure in testing valves when passing the largest quantities of water. With the medium sized valves the water was allowed to discharge into a 3,000-gallon cistern, where its quantity was measured directly by volume. With the smallest sizes, the water flowed into one or the other of two collecting barrels and weighed directly on platform scales. A pressure-gauge connected to the twenty-two-inch drum measured the pressure of the water, while a second pressure-gauge, connected by a nipple screwed into the pipe-nipple which connected the drum with the valve, gave readings of what is entitled the "pressure at the valve." The quarter-inch pipe-nipple from the pressure-gauge was screwed into the other one sufficiently far so that its end was filed off flush and smoothly with the interior wall of the nipple through which the water flowed. Readings were taken of the pressures and height of water in the cisterns and on all the weirs once per minute. Most of the runs were of twenty minutes duration and were timed by a stop-watch which had been calibrated at the observatory. In order to convert pounds of water to gallons or to cubic feet, the specific gravity of the water used was accurately determined and found to be 1.00074 (231 cubic inches were taken to be a gallon). The weirs, cisterns, scales and pressure-gauges had all been accurately calibrated and calibration curves drawn to a large scale from which corrected readings were taken.

The following results and conclusions were drawn :

The amounts of water passed under given conditions by the gate and angle valves which were tested were approximately double and one and one-half times respectively the amounts of water passed by the globe valves of exactly the same nominal size under the same conditions.

By the efficiency of the valve is meant the ratio of the number of gallons of water per minute that it actually discharged to the number of gallons which theoretically flow through a frictionless pipe of an area equal to the actual area of standard black pipe and at the velocity due to the head. For fourteen of the valves tested there was apparently one pressure at which there is a maximum efficiency of flow of water ; for ten of the valves the efficiency seems to be constant at all pressures ; while, with five of the valves tested, the efficiency decreased as the pressure increased. With valves of certain makes the efficiency of the different sizes vary greatly. For example, while the ½-inch and 1-inch gate valves of a certain make have an efficiency of 71.9 per cent. and 72.2 per cent. respectively, the efficiency of the ¾-inch valve of the same make is only 58.9 per cent. By a comparison of the weights of the valve with the current market price of them, it would seem that the amount of water passed by a valve of a given size is approximately directly proportional to its cost. In other words, that, if you pay 45 cents for a ¾-inch valve and 90 cents for a ¾-inch valve of a different make or type, the amounts of water passed by these two valves will be approximately in the proportion of 45 : 90, or as 1 : 2. We are of the opinion that the relative efficiency of valves may be determined by the relative drops in pressure from the standpipe to the valve. In other words, that, of two valves discharging water from a standpipe at eighty pounds pressure, the one having the greater efficiency will have the least pressure at the valve. This is, therefore, suggested as a rough test by which to determine the relative efficiency of valves.

A few experiments were made with one of the valves at six different pressures with a nipple four diameters long in the outlet of the valve, and from which it was concluded that nipples of this length caused an increased loss of about two per cent.

From the above it will be seen to be advisable to use a gate valve when the full capacity of the valve is always desired and a globe valve should only be used in a water line when excessive throttling of the quantity or pressure is immaterial. A three-fourth gate valve will pass more water than will any of the one-inch globe valves tested, while a one gate valve of a certain make will actually pass more water than will a certain one and one-half inch globe valve at the same pressures. As the pressure is a direct measurement of the h.p. exerted in pumping water, it will be readily seen that when it takes upwards of 200 pounds pressure to get 100 gallons per minute through a one-half gate valve or three-quarter globe valve, and that from seventy to ninety pounds pressure is required to get the same amount of water through three-quarter gate valves, and from fifty to eighty pounds pressure to get that amount of water through one-inch globe valves and only from ten to twenty pounds pressure to get that amount of water through one and one-half gate valves, it would seem that, in the best practice, water valves at least one size larger than the nominal size of the wrought iron pipe should always be used. There is apparently much chance for the manufacturers of small valves to improve the water discharging capacity of their valves and at but a slight increase in first cost to the purchaser. In the opinion of the writer, this subject should come home to the members of this association, and these facts, it is thought, may be of some slight value when complaints are made by householders that they are unable to draw water fast enough, and for the very good reason that not only the pipes in their houses are too small, but that valves are used whose chief duty, it would seem, was to throttle the discharge ; and, furthermore, that an increase in pressure of from forty to eighty pounds at the pumping station may be required, in order to force the desired amount of water through the small valves and faucets which may be found in many dwelling houses and other buildings of cheap construction

To deduce from these data conclusions as to the relative expenses of using small valves and those of adequate size is almost impossible, and, except in some definite case, would be valueless. If one wanted a bucket of water with which to quench an incipient conflagration, the value of a valve which would give the desired amount of water in the least time would be inestimable. Generally speaking, this investigation would show that by the use of gate valves of the proper size, pressures one-quarter to one-half of those that would be needed with smaller valves would be sufficient. This may not hold true and exact with the large valves of city water works, but it doubtless does hold true with the smaller pumping plant and hydraulic elevator service of office buildings and the like. In any particular plant, knowing the cost of steam delivered at the pump, some approximate estimate can be made as to the cost of using small valves and large steam cylinders and high steam pressures as compared with valves of more generous discharge and small steam cylinders and lower steam pressures.

It is reported that T. H. Wiggins, C.E., has tendered his resignation as town engineer of Cornwall, Ont.

INDEX TO ADVERTISEMENTS

In the "Canadian Architect and Builder."

Architects.
Ontario Directory .. III
Quebec Directory . viii

Architectural Sculptors and Carvers.
Holbrook & Mollington i

Architectural Iron Work.
Dominion Bridge Co. I

Art Woodwork
Southampton Mfg. Co. II

Artists' Materials
Hearn & Harrison.. xi
The Art Metropole III

Builders' Supplies.
Bremner, Alex. i
Montreal Directory xii
O'Neil, Wm vii
Ontario Lime Association....... xii
Rice Lewis & Son IV
Toronto Directory... xii

Building Stone Dealers.
Amherst Red Stone Quarry Co........ x
Brodie, James x
Credit Forks Mining & Mfg. Co......... x
Essery W H. . x
Hood & Son vii
The Longford Quarry Co x

Builders' Hardware.
Rice Lewis & Son IV
Vokes Hardware Co. xi

BRICKS.
Beamsville Brick & Terra Cotta Co ... vii
Toronto Pressed Brick & Terra Cotta Co v

Contractors' Plant and Machinery
Rice Lewis & Son.... IV

Cements.
Bremner, Alex.. i
Commercial Wood & Cement Co IV
Owen Sound Portland Cement Co........ IV
The Rathbun Co vii

Creosote Stains
Cabot, Samuel.. IV

Drying Apparatus
Cummer & Son Co . 189

Drain Pipe
Bremner, Alex..... .. i
Hamilton and Toronto Sewer Pipe Co. .. ix

Elevators
Fensom, John........ I
Leitch & Turnbull.. I
Miller Bros & Toms.. vi
Morse, Williams & Co. xi

Embossed Moulding
Boynton & Co....... vii

Engravers.
Can. Photo-Eng. Bureau. viii

Folding Partitions.
Seaman, Kent & Co.. 209
Springer, O. T xi

Fireproofing.
Montreal Terra Cotta Lumber Co........ xii
Rathbun Co. vii

Flagstaffs and Windmills.
Gould, Shapley & Muir............. II

Grilles and Railings.
Dennis Wire & Iron Co. vi
Toronto Fence & Ornamental Iron Work. vi
Southampton Mfg. Co II

Granite
Brunet, Jos......... x
Brodie, James........ x
Stanstead Granite Quarries Co....... x

Heating.
Boston Blower Co.. III
Clare Bros & Co..... iv
Dominion Radiator Mfg Co............. I, iii
Darling Bros 209
General Engin. Co .. II
Gurney, Tilden Co .. ii
James Smart Mfg. Co... v
Leonard & Sons, E. IV
McClary Mfg Co .. v
Ormsby & Co., A. B.. I
Robb Engineering Co vii

Interior Decoration
Elliott & Son Company vi

Lime.
Ontario Lime Association.............. xii

Luxfer Prisms.
Luxfer Prism Co....... x

Legal.
Denton Dunn & Boultbee III
Quinn & Morrison.. III

Mantles, Grates, and Tiles.
Chas. Rogers & Sons Co............... vi
Holbrook & Mollington I
Rice Lewis & Son....IV

Mail Chutes.
The Cutler Mfg Co..viii

Mortar Colors and Shingle Stains.
Cabot, Samuel IV
Muirhead, Andrew.... i

Ornamental Iron Work.
Dennis Wire & Iron Co vi
Toronto Fence & Ornamental Iron Works. vi

Painters.
Montreal Directory... xii
Toronto Directory.... xii

Plasterers
Hynes, W. J........ 209

Paints & Varnishes
Muirhead, Andrew ... i

Parquetry Floors
Elliott & Son Company vi

Plate Glass
Lyon, N. T.. i
The Consolidated Plate Glass Co ix
Toronto Plate Glass Co............... vi

Plumbers
Montreal Directory.. xii
Toronto Directory.... xii

Reflectors
Frink, I. P......... III

Roofing Materials
Ormsby & Co., A B.. I
Metallic Roofing Co. 210

Roofers
Campbell & Gilday... xii
Duthie & Sons, G..... xii
Forbes Roofing Co.... xii
Nicholson & Co D. . xii
Ormsby & Co., A B.. I
Rennie & Son, Robt . xii
Stewart & Co., W.T.. xii
Williams & Co., H. .. xii

Sanitary Appliances
Ideal Mfg. Co........ x
The James Morrison Brass Mfg Co ... i

Stained and Decorative Glass
Bloomfield & Son, Henry...... i
Horwood & Sons, H. i
Lyon, N. T..........
Leonard, B.......... i
Mackey Stained Glass Co i
McKenzie's Stained Glass Works........ i
The Robert McCausland Stained Glass Co i
Wood & Co.......... i

Shingles and Siding
Metallic Roofing Co.. 210
Ormsby & Co., A B.. I

Soil Pipe.
Toronto Foundry Co. III

School and Church Furniture.
Can. Office & School Furniture Co.. viii
Globe Furniture Co.. xi

Typewriters.
Archbald, Chas E.....ix

Ventilators
Boston Blower Co... III
Wood & Co......... i

Wall Plaster
Albert Mfg Co...... IV
Alabastine Co....... IV
Bremner, Alex ....

Wall Paper.
Scantlebury, C.B..... vi

Wire Lathing
The B. Greening Wire Company.......... xi

Prices of Building Materials.

PRESSED BRICK, Per M.

TORONTO PRESSED BRICK AND TERRA COTTA WORKS.

	F.O.B. Milton, Ont.	F.O.B. Montreal.
Red No. 1	$12 50	$18 00
" 2	11 00	16 0
"	6 00	3 0
Buff No 1	14 0	20 00
" 2	1 00	8 5.
Brown	20 00	25 50
Roman Red	2 0	30 50
" Buff	18 0	33 5
" Brown	5 0	40 00
Hard Building	0	1 50
" Sewer	6 00	1 50

Roofing Tiles, $20 00 per 1,000, $2 00 Montreal.

DON VALLEY PRESSED BRICK WORKS.

	F.O.B. Don Valley.	F.O.B. Montreal.
Red A	18 0	24 0
Red B	16 0	20 00
Red C	13 0	17 00
Trojan and Corinthian	21 0	28 0
Pompeiian	22 00	29 00
Athenian and Egyptian	25 00	31 0
Tyrian	5 0	41 00
Sicilian	40 00	45 00
Roman	35 00	40 00
Carthaginian	42 45	45 00
Ornamental	0 ? 100 00	30 0 10 00
Common insides	6 0	
Hard sewers	7 50	
Vitrified pavers, 1sts	16 00	22 00
" " 2nds	1 00	15 00

COMMON BRICK, Per M.

	F.O.B. Toronto.	F.O.B. Montreal.
Common Walling	7 00 8 0	7 50 8 00
Good Facing	8 00 9 0	8 50
Sewer	8 0 9 0	8 50 0 00

STONE.

Common Rubble, per toise, delivered	10 0	11 0
Large flat Rubble, per toise, delivered	14 0	18 00
Foundation Blocks per c. ft	5	0
Granite (Stanstead) Ashlar in. to 12 in., rise per ft.		25
Amherst Red Sandstone Amherst N S., per cub. ft	1 00	75
Kent Freestone Quarries, Moncton, N.B., per cu. ft.	1 00	95
River John, N. S., brown Freestone, per cu. ft	95	95
Port Philip, N. S. Brown Sandstone	90	
"Scoriæ" Paving Blocks, 8"×3½"×5"	55	
"Scoriæ" Paving Blocks, 8"×3½"×4"	45 00	
Masillon	30 00	
Quebec and Vermont rough granite for building purposes, per c.ft. f.o.b. quarry	40	1 00
For ornamental work, cu. ft.	40	
Granite paving blocks, 8 in. x 12 in. x 6 in. x 4½ in. per M.		50 00
Granite curbing stone, in. x 20 in. per lineal foot		70

CREDIT VALLEY STONE

		F.O.B Quarries.
Rubble, per car of 15 tons.		7 00
Brown Coursing up to 0 in., per sup. yard	1 50 to	1 75
Brown Dimension, per cub. ft.		60
Grey Coursing, per sup. yard		1 00
Grey Dimension per cub. ft.		45

LONGFORD STONE.

Rubble, per 30 M. car	5 00
Ashlar, per cub. yd.	2 00
Dimension, per cub. ft	18

SLATE.

	Toronto.		Montreal.
Roofing (Per square).			
" red	17 50		20 00
" purple	8 5		10 00
" unfading green	8 50	7 00	8 00
" black	7 50		6 50
Terra Cotta Tile, per sq.	20 0		25 00
Ormsby's Steel Slate Roofing	8 80		6 80

CEMENT, LIME, etc.

	Toronto.		Montreal.	
Portland Cements —				
German, per bbl.	2 90	3 10	2 55	2 65
London "	2 95	3 00	2 25	2 45
Newcastle "	2 70	3 00	1 95	2 10
"Josson Bros Portland"	3 05	3 25		2 80
"Dyckerhoff" "	3 05	3 25	2 75	2 90
North's "Condor"	2 95	3 1	6	2 80
English, artificial, per bbl.	2 85	3 00	2 25	2 45
Belgian, natural, per bbl.	2 50	2 75	2 00	2 20
Canadian, artificial, "	2 85	3 00	2 60	2 70
Roman "			2 10	2 25
Parian "	5 25	5 25	5 75	5 75
Superfine "	1 25	7 10	8 25	9 00
"Karlstadt" (German)	3 05	3 25	2 75	2 90
"Germania" (German)	3 95	3 25	2 75	2 90
"Rooster" (Belgian)			2 15	2 20
"Keystone" (Belgian)			2 15	2 20
"Anvil" (Belgian)			1 95	2 05
"Burham" (English)	2 95	3 00	2 25	2 45
Hydraulic Cements.—				
Thorold, per bbl.		1 50		1 65
Queenston, "		1 50	1 50	1 60
Napanee, "		1 50		1 50
Hull, "		1 50		1 50
Ontario, "		1 25		

	Toronto.		Montreal.	
Keene's Coarse "Whites"	5 50	6 00	5 00	5 50
Fire Bricks, Newcastle, per M	30 00	35 00	16 00	21 00
" Scotch "	30 00	35 00	19 00	21 00
Lime, 100 lbs., Grey		25		
" " White		30		30
Plaster, Calcined, N. B.		2 00		1 50
" " N. S.		2 00		1 55
Hair, Plasterers', per bag	80	1 00		0 0

HARDWARE.

The following are the quotations to builders for nails at Toronto and Montreal:

	Toronto	Montreal
Cut nails, 50d & 60d, per keg	2 10	1 85
Steel " " "	2 60	1 95

CUT NAILS, FENCE AND CUT SPIKES.

	Toronto	Montreal
40d, hot cut, per 100 lbs	2 60	1 85
10 to 12d, hot cut	2 35	1 95
8d, 9d, " "	2 40	2 10
6d, 7d, " "	2 55	2 15
4d to 5d, " "	2 65	2 25
3d, " "	2 90	2 85
2d, " "	3 25	2 85

Cut spikes, 10 cents per keg advance.
Steel Nails, 10c. per keg extra.
Wire nails, 3.40 base price.

Iron Pipe:

	Toronto	Montreal
Iron pipe, ⅜ inch, per foot	6c.	6c
" " ⅜ " "	7	7
" " ½ " "	8½	8½
" " ¾ " "	12	12
" " 1 " "	17	17
" " 1¼ " "	24	24
" " 1½ " "	30	30
" " 2 " "	43	43

Toronto, 65 per cent. discount.
Montreal, 70 per cent. discount.

Lead Pipe:

Lead pipe, per lb.	7c.	25 per cent. dis
Waste pipe, per lb.	7½	

Galvanized Iron:

	Toronto		Montreal
Adam's—Mar's Best and Queen's Head and Apollo:			
16 to 24 guage, per lb.	4½c.	4¾c.	4¼
26 guage, "	4¾	5	4½
28 "	5	5¼	4¾
Gordon Crown—			
16 to 24 guage, per lb.	4¼	4½	4¼
26 guage, "	4½	4¾	4½
28 " "	4¾	5	4¾

Note.—Cheaper grades about ¼c. per lb. less.

Structural Iron:

	Toronto	Montreal
Steel Beams, per 100 lbs	2 75	2 0
" channels, "	2 85	2 30
" angles, "	2 50	2 61
" tees, "	2 80	2 65
" plates, "	2 55	2 00
Sheared steel bridge plate		2 30

CORRECTED UP TO OCTOBER 24TH.