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CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL

PUBLIC WORKS • TENDERS • ADVANCE INFORMATION • 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.

JUNE 4, 1896

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PETROLEA WATER WORKS

NOTICE TO CONTRACTORS

Sealed tenders will be received by the Chairman Water Works Committee, Petrolea, until 6 p. m. on MONDAY, JUNE 15, 1896, for the construction of a system of water works for the town, as follows:—

- Intake pipe at Lake Huron.
- Buildings, well and chimney.
- Furnishing cast iron pipe for eleven miles of force main.
- Laying the force main.
- Furnishing pipe and laying force main.
- Furnishing 7½ miles of pipe for distribution system.
- Furnishing hydrants and valves.
- Laying distribution system.
- Furnish materials for and laying distribution system.
- Water tower.
- Bulk bid.

Plans, specifications, contracts, etc., may be seen and forms of tender obtained at the Town Hall, Petrolea, or at the office of the Chief Engineer, on and after June 1st, 1896.

ALBERT DUNCAN,
Chairman W. W. Committee, Petrolea, Ont.

WILLIS CHIPMAN,
Chief Engineer, Toronto, Ont.

Dated May 27, 1896.



Sealed Tenders addressed to the undersigned, and endorsed "Tender for Hot Water Heating Apparatus, Victoria, B. C.," will be received until Friday, 10th July, for the construction of a Hot Water Heating Apparatus at the Victoria, B. C., Public Building.

Plans and specifications can be seen and form of tender and all necessary information obtained at this Department, and at the office of F. C. Gamble, C.E., Victoria, on and after Wednesday, 10th June next.

Persons are notified that tenders will not be considered unless made on the printed form supplied, and signed with their actual signatures.

Each tender must be accompanied by an ACCEPTED bank cheque, made payable to the order of the Honourable the Minister of Public Works, equal to FIVE PER CENT. OF AMOUNT OF THE TENDER, which will be forfeited if the party decline to enter into a contract when called upon to do so, or if he fail to complete the work contracted for. If the tender be not accepted the cheque will be returned.

The Department does not bind itself to accept the lowest or any tender.

By order,
E. F. E. ROY,
Secretary.

Department of Public Works,
Ottawa, 27th May, 1896.



NOTICE TO CONTRACTORS

Tenders for Sewer and Pavements

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to 5 o'clock p. m. on WEDNESDAY, JUNE 17th, 1896, for the construction of the following works:—

BRICK AND CEDAR BLOCK PAVEMENTS

On Dundas Street (track allowance), from Bloor Street to Humberside Avenue.

On Henry Street, from College Street to Baldwin Street.

On Prince Arthur Avenue, from Avenue Road to a point 623 feet westerly.

On Yorkville Avenue (brick on tracks and cedar block on sides), from Yonge Street to Avenue Road.

On Simcoe Street, from Front Street to Station Street, (cedar blocks).

A SEWER

On Manchester Avenue, from Shaw Street to Ossington Avenue.

Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto, on and after Wednesday, June 10, 1896.

A deposit in the form of a marked cheque, payable to the order of the City Treasurer, for the sum of 5 per cent. on the value of the work tendered for up to \$1,000, and 2½ per cent. on the value of the work tendered for over that amount, must accompany each and every tender, otherwise they will not be entertained.

Tenders must bear the bona fide signature of the contractor and his sureties, or they will be ruled out as informal.

Lowest or any tender not necessarily accepted.

BERNARD SAUNDERS,
Chairman Committee on Works.

R. J. FLEMING,
Chairman Board of Control,
Toronto, May 29, 1896.

Tenders for Sewers

Sealed tenders for Brick and Pipe Sewer Work in the town of Ferrierborough will be received at the office of the undersigned up to 4 o'clock p. m. on JUNE 10th, 1896. Plans, specifications, etc., may be seen at the office of John E. Belcher, Esq., Town Engineer, on and after June 2nd.

S. R. ARMSTRONG,
Town Clerk.

TENDERS FOR WATER METERS

The City of Vancouver, B. C., are prepared to receive offers for about

150 WATER METERS

from \$4 in. up to 4 in., delivered at their shops on Hastings Street free of all charges.

Full particulars of meters offered to be sent to the City Engineer, Col. T. H. Tracy, as soon as practicable.

Tenders to be in the hands of the undersigned on or before Wednesday, June 24th.

T. F. McGUIGAN, City Clerk.

TENDERS

Sealed Tenders, separate or bulk, addressed to the undersigned, will be received up to noon on the 15th DAY OF JUNE, 1896, for the work of

ENLARGEMENT AND REMODELLING OF THE PRESCOTT PUBLIC SCHOOL,

(including steam heating and drainage) in accordance with the plans and specifications which may be seen on and after Monday, 1st June next, at the office of E. L. Horwood, Architect, Bank Street Chambers, Ottawa, and at the store of A. Greenhill & Co., Prescott. The work to be completed on or before Saturday, the 29th day of August next. A deposit of ten per cent. to accompany each tender.

The lowest or any tender not necessarily accepted.

W. H. GERALD,
Sec. Building Committee,
Board of Education.

Prescott, 27th May, 1896.

SWAYING OF CHIMNEY SHAFTS.—The superstition that factory chimney shafts sway and that this swaying is absolutely necessary for their safety, has, according to "The Surveyor" of London, Eng., been completely demolished by a paper read by F. J. Bancroft, before the Institution of Junior Engineers. Mr. Bancroft also pointed out that, as the velocity of gases up a chimney are proportionate to the square root of the height, increased duty is better obtained by larger diameter than by greater height. Ample area in designing and frequent inspection after building were the keynotes of the paper.

The machinery and manufactured stock of the Safety Barb Wire Company, Toronto, has been sold to the Ontario Lead & Barb Wire Co.

CONTRACTS OPEN.

TEESWATER, ONT.—The Episcopalians will erect a new church here.

SIMCOE, ONT.—A movement is on foot with the object of constructing a bicycle path to Port Dover.

BARTON, ONT.—Wm. Syer will erect an \$1,800 residence, from plans by E. B. Patterson, Hamilton.

BRUCEFIELD, ONT.—Plans have been prepared for a new hotel building for Mr. Dickson at this place.

COBOURG, ONT.—It is expected that the new Demill Ladies' College will be located in this town.

MANITOULIN, ONT.—It is stated that the Manitoulin Railway will be immediately pushed to completion.

TILSONBURG, ONT.—It is proposed to erect a new town hall and fire hall at an estimated cost of \$8,000.

MCLEOD, N. W. T.—The McLaren Company have been granted a bonus towards rebuilding their saw mill.

VANCOUVER, B. C.—The British Columbia Iron Works Co. propose to expend \$100,000 in new machinery.

MT. FOREST, ONT.—A by-law to authorize the expenditure of \$4,500 on waterworks improvements, has been voted down.

CHATHAM, ONT.—An order-in-council has been passed authorizing the expenditure of \$30,000 for water works improvements.

TAVISTOCK, ONT.—Mr. O. Stock will erect a new brick block adjoining his store, and Mr. F. Krug will build an addition to his store.

ST. THOMAS, ONT.—The estimated cost of the electric and railway plant for the proposed new street railway is placed at \$57,000.

MONCTON, N. B.—George Day, C. E., of the Public Works Department, is making an inspection of the proposed site of the Moncton dock project.

OSHAWA, ONT.—Tenders will be called shortly for improving the hills between Oshawa and Whitby. It is proposed to spend about \$800 on the work.

WINCHESTER, ONT.—The Township Council of Winchester has instructed Geo. L. Brown, engineer, to prepare plans and estimates for the construction of municipal drains.

PARRSBORO, N. S.—It is the intention of the Parrsboro Amateur Athletic Association to build this fall a large rink and club room on the grounds they have lately leased.

STREETSVILLE, ONT.—Tenders for mason, carpenter and plaster work for alterations to Trinity church are invited until noon to-day, (Thursday). Address, J. Hughes Jones.

DESERONTO, ONT.—Archbishop Cleary is making arrangements for the erection of a fine Roman Catholic church at this place, to take the place of the one destroyed in the recent fire.

WOODVILLE, ONT.—The construction of about 3 miles of drainage work will be let by tender at lot 14, 15th concession of Mariposa, on Monday, the 8th inst. G. Smith, O. L. S., Tp. Engineer.

PRESCOTT, ONT.—The Public School Board invite tenders until the 15th inst. for the enlargement, heating and draining of their school building, the work to be completed before the 29th of August.

INGERSOLL, ONT.—The Municipal Council of West Oxford invites offers until the 8th of June for repairing the Waite drain and branch, according to plans of F. J. Ure, P. L. S. W. G. Francis, clerk.

PETERBORO, ONT.—Tenders will be received by S. R. Armstrong, Town Clerk, until the 10th inst. for brick and pipe sewer work. Plans may be seen at the

office of John E. Belcher, Town Engineer.

RAT PORTAGE, ONT.—Mr. Head, architect, has prepared plans for a residence for Mr. Langford to be erected on Tunnel Island. Prospects are good for building in this town during the coming season.

ENNISKILLEN, ONT.—At the last meeting of the Township Council a resolution was passed sanctioning a by-law authorizing the township to contribute \$2,160 as its proportion of the cost of improvements to the Black creek.

GUELPH, ONT.—Separate tenders will be received by John Kennedy, Chairman of the Board of Works, until 6 o'clock on the 10th inst., for masonry, foundation and superstructure of a foot bridge over the River Speed at Heffernan street.

PRESTON, ONT.—Mr. J. D. Webster has commenced excavating for a new store building on his property on King street. The building will be of brick, 46 x 22 feet, two stories high. Mr. Webster also proposes to erect for himself a new residence.

LONDON, ONT.—Herbert Matthews, architect, will receive tenders until the 6th inst. at 5 p. m., for the erection of a residence on Wolfe street, for Thomas B. Higgins.—The enlargement of the Christian church, East London, is in contemplation.

TRURO, N. S.—Tenders for the construction of a waterworks reservoir, dam and head works, and the laying of half a mile of 14 inch pipe, also separate tender for half a mile of cast iron water pipe, will be received by N. D. McCallum, Town Clerk, until noon of the 13th inst.

KINGSTON, ONT.—Plans are being prepared for the remodelling of the old Merchants' Bank building into a Catholic theological college.—The Kingston Yacht Club will commence the erection of a new club house as soon as they receive their charter.—Dr. Curtis will erect a residence on the south east corner of King and Earl streets.

EDMONTON, N. W. T.—Mayor Wilson, who has just returned from Ottawa, states that legislation has been passed and subsidies promised for a new bridge and railway connection at this point. A by-law will be submitted to the ratepayers to authorize an appropriation of \$50,000 by the town towards this object. The voting of this amount is a necessity in order to receive government aid.

QUEBEC, QUE.—The City Engineer has prepared plans of the bridge intended to connect the new park with St. Sauveur. It will be a turning bridge, with arches of 60 foot span each. Estimated cost, \$15,000. There still remains a smaller bridge to be built, to connect with St. Roch's at the foot of Parent street.—The Governors invite tenders until the 15th inst. for the new Jeffrey Hales Hospital building.

ST. CATHARINES, ONT.—Messrs. Raymond & Hoswell, theatrical architects, were recently in the city estimating the cost of rebuilding the opera house.—Tenders for lighting the streets of the city by electric light are invited until 4 p. m. to-day, (Thursday). Address J. Rollison, City Clerk.—The time for receiving tenders for supplies required by the sewers department has been extended until the 8th inst.

HALIFAX, N. S.—W. F. Whiteway, architect, has completed plans for Gordon & Keith's new building, and tenders will be called for in a few days. Mr. Whiteway has been engaged by W. E. Taylor, of Robert Taylor & Co., to prepare plans for a residence to be built on Spring Garden Road this summer.—The Mayor will receive sealed proposals until noon on the 9th inst. for the purchase of 14 buildings on the east side of Lockman street and for moving back a number of buildings on

the east side of Lockman street and on both sides of Quinpool road.—W. T. Whiteway, architect, invites tenders until 4.30 p. m. of the 9th inst., for the erection of a building on Barrington street for Mr. Donald Keith.

GALT, ONT.—Tenders will be received by the Town Clerk until Wednesday, June 10th, for the construction of about 2,000 feet of pipe sewers.—A. J. McPherson, Town Engineer.—The specifications for the work on the Main street sewer call for 1,122 ft. of trench for main pipes, of which 942 ft. is in rock. The trench will be about 11 ft. deep and 4 ft. wide. There are 30 branch trenches, averaging about 33 ft. long each. There will be 1,122 ft. of 12 inch main pipe; 470 ft. of 10 inch, and 652 ft. of 6 inch, besides the branch pipes, which will be 6 inch and 4 inch. The tanks for the precipitation system will be built of brick, one of them being 10x12x5 ft., and the other 4x5x5 ft.

MONTRÉAL, QUE. A syndicate is said to be considering the erection of a large factory on Delorimier ave.—The Harbor Commissioners have recommended that steps be taken at once to complete the guard ship in the harbor and that the Chief Engineer and City Surveyor present a report thereon to the Minister of Public Works for approval.—The Lachine Rapids Hydraulic Co. will proceed at once to construct underground conduits for transmission of light and power.—It is proposed to open a new avenue from St. Lawrence to St. Denis st., between St. Catharines and Dorchester streets.—Mr. Eric Mann, architect, is preparing plans and specifications for a first-class summer residence at Vaudreuil for M. M. S. Foley.

WINNIPEG, MAN.—Dr. Robertson is having plans prepared for a brick residence on his property on Tupper street.—Tenders have been invited for the grading of the first hundred miles of the Lake Manitoba Railway & Canal Co.'s line, from Portage la Prairie. Particulars may be obtained from Mackenzie, Mann & Co., Manitoba hotel, Winnipeg.—Geo. Browne, architect, will receive tenders until the 6th of June for the erection of a stone and brick addition and alterations to the residence of J. S. Stewart, Q. C.—The Board of Trade has passed a resolution urging upon the council the necessity of improving the condition of the streets of the city, which have been in a disgraceful condition. The council propose to act in the matter, and an expenditure approaching \$100,000 will be necessary for the work.—As soon as the condition of the roads will permit of hauling the foundation stone, work will be commenced on the erection of the new opera house building.

OTTAWA, ONT.—The property committee will call for tenders for electric lighting of all buildings under civic control.—The time for receiving tenders for the Iroquois division of the St. Lawrence canals has been postponed to Friday, 20th June. J. H. Balderson, Secretary Department of Railways and Canals.—Tenders are asked by Hayter Reed, Department Indian Affairs, until the 12th inst. for the construction of a breakwater in the Kaministiquia river, on the foreshore of the Fort William Indian reserve. Specifications may be seen at the Department of Indian Affairs, Ottawa, or on application to J. P. Donnelly, Port Arthur.—Mr. E. L. Horwood, architect, has the following work in progress: Public School, Prescott; alterations to Town Hall, Prescott; Floral Hall, Prescott. Three storey pressed brick block for D. O'Connor, jr., Ottawa; double house on Gilmour street for E. L. Brittain, Ottawa; residence for C. O'Connor, Bay street, Ottawa; residence, A. Holland, Maria street, Ottawa; residence, J. Shipman, Stewart street, Ottawa; alterations for C. W. Mitchell, Chapel

street, Ottawa; alterations for W. J. Kennedy, Victoria street, Ottawa; residence (double) for A. P. Johnson, Concession street, Ottawa; additions, D. O'Connor, sr., Bay st., Ottawa.—A petition has been received by the Board of Works for surface sewers on the Glebe Lands. The request will be complied with.—A project is on foot for the construction of an electric railway from the town of Richmond to the boundaries of this city, the object being to transport garden produce and other freight from the surrounding districts to Ottawa. The Messrs. Conroy, of Conroy's Mills, are said to be interested in the project.

HAMILTON, ONT.—W. A. Edwards, architect, has prepared plans for the following: Residence for R. E. Gallagher on Hughson and Maria st's., to cost \$5,000; residence and stable on John street south, for James Dunlop, cost \$4,000; residence on Robinson street for Sam. McKay, cost \$4,000; residence on East ave. south; residence on Ellen street for L. K. Pars; alterations to three stores on King street, and residence on Herkimer street for Major Riley, also residence in the south east portion of the city.—E. B. Patterson has prepared plans for the following buildings: E. W. Gage, East ave., residence, to cost \$2,100; H. B. Vaughan, Emerald st., residence, cost \$1,300; alterations to A. Rutherford's two houses, cost \$800.—A. W. Peene, architect, is preparing plans for alterations to the store of James Scott, also for the hot air and hot water heating of the Hamilton club.—The Ontario Rolling Mills Company have prepared plans for putting in a new steel plant, to cost \$30,000.—Plans are being prepared by Wm. & Walter Stewart, architects, for a new Y. W. C. A. building, which will also be used for domestic science purposes. The present building will be torn down, and the new one will be four stories in height, 70 x 140 feet, and built of Credit Valley brown stone.—The City Clerk is receiving tenders for the annual supply of brick, waterlime, Portland cement, sewer pipe, sand and casting.—Mr. John G. Gauld, chairman of the Interclub League, is receiving subscriptions for the construction of a cinder path to Burlington Beach.—The projectors of the Hamilton, Grimsby and Beamsville Electric Railway have decided to extend the line from Grimsby Park to Beamsville.—W. P. Witton, architect, invites tenders until noon of the 9th inst., for the erection of a Sunday school building for Erskine church.—The city clerk invites tenders until noon of the 8th inst., for annual supplies required by the Sewer Committee.

TORONTO, ONT.—The Harbor Master has written to the City Council favoring the construction of a trunk sewer emptying into Ashbridge Bay.—The property-owners on Adelaide street between Yonge and York streets are petitioning for an asphalt pavement.—A brick pavement with gravel foundation will be recommended for Robert street.—The Property Committee of the Public School Board have recommended the expenditure of \$13,000 on repairs to the schools.—The Toronto Suburban Bicycle Club is said to have purchased at the Humber a site for a club house, plans for which have already been prepared.—The city engineer has just recommended the repaving of 96 streets. He recommends that 39 streets be re-paved with brick; 11 with asphalt; 12 with asphalt or brick; 17 with cedar blocks, and 12 with macadam.—The cost of the groynes, which it is proposed to construct for the protection of Toronto Island, will be about \$2,500.—Building permits have been granted as follows: G. R. R. Cockburn, 1 storey brick add. to warehouse, 60 Bay st., cost \$1,500; Dr. J. L. Davidson, 2 storey and attic bk. dwelling, 22 Charles st., cost \$4,500; J. L. Ramsay, two det. 2 storey and attic bk. dwellings, Macpherson ave., nr. Castle

Frank, cost \$8,000; Allen Mfg. Co., 4 storey bk. add. to factory, Simcoe st., cost \$1,500; Miss Corty, 2 storey bk. add. to dwellings, 168 George st., cost \$3,000; Mr. Worthy, Berryman st., 2 storey bk. dwelling 91 Cumberland st., cost \$12,000; John Carson, 685 Ontario st., 2 storey bk. faced dwelling and store, 395 Sackville st., cost \$900; Tlios. Wilkins, St. Lawrence Market, 3 storey bk. add. to building, No. 34 West Market st., cost \$4,000.

FIRES.

A saw and chopping mill at Burgessville, Ont., operated by Mollins & Co., has been destroyed by fire. Insurance, \$2,000.—The Lindsay saw mill at Aylmer, Que., leased by R. H. Klock & Co., was destroyed by fire on the 29th ultimo. Loss partially covered by insurance.—S. B. Morris' residence at Rodney, Ont., has been burned.—At Kingsville, Ont., on the 29th inst., the large roller process flour mill, owned by Jaspersion & Co., was totally destroyed by fire. Loss, \$22,000, insurance, \$6,000.—Edwards' Carriage shop and dwelling at Coaticook, Que., have been consumed by fire. The village of St. Hyacinthe, Que., was damaged by fire on the 27th inst. to the extent of \$25,000, thirteen houses being destroyed. The following properties were burned: Joseph Roy, one house; A. Vegina, one house; Joseph Hogue, two houses; Madam Baron, one house; Alfred Godbout, one house; Duclos & Payan, tannery.—Messrs. W. A. Johnson & Company's flour mill and electric lighting plant at Dresden, Ont., were totally destroyed on the 1st inst., and Mr. North's carriage works adjoining were gutted. Both properties insured.—The Cedardale hotel at Oshawa was totally destroyed on the morning of the 31st ult. Loss, \$2,500; partly insured.

CONTRACTS AWARDED.

TORONTO, ONT.—A. B. Ormsby & Co. has been given the contract for ceilings for P. W. Ellis & Co.'s new warehouse.

LISTOWEL, ONT.—Bamford Bros., of this town, have been given the contract for the erection of the new Christ Church building.

WINNIPEG, MAN.—The contract for the machinery hall for the Exhibition Association has been let to McLeod & Murray, at \$2,425.

HARRIETSVILLE, ONT.—The contract of building a new Methodist church in this place has been awarded to Mr. Harry Goble, of London, Ont.

WINDSOR, ONT.—The Windsor Storage Co. has accepted the tender of Mr. George A. Goodman, for the erection of their new building. The price is \$3,200.

BROCKVILLE, ONT.—It is understood that the contract for the medical superintendent's residence at the Asylum for the

Insane has been let to F. H. Fitzgibbon of this town.

WOODSTOCK, ONT. — Twenty eight tenders were received for the erection of the Presbyterian church. McIntosh & Griffith receive the whole work except heating and seating. Contract price, \$28,250.


LONDON, ONT.—Debentures to the amount of \$270,292.77, bearing interest at 3½ and four per cent., have been purchased by the Bank of British North America. The amount paid was \$268,079.96 and accrued interest.

KINGSTON, ONT.—Five tenders were received for constructing a granolithic walk on Princess street, between Sydenham and Clergy streets. The tender of George Wilson has been accepted, at 21¼c. per lineal foot for curbing and 27c. per square foot for the walk.

HAMILTON, ONT.—The Hamilton Brass Manufacturing Co. have been awarded the contract of making 150 cash registers for the Hamilton Ready Change Maker Co.—A. Piggott, of this city, has been awarded the contract to build the spur line to connect the Grand Trunk and Toronto, Hamilton & Buffalo Railway. The cost of the work will be about \$250,000, the time for completion being fixed at four months.

GUELPH, ONT.—Mr. W. T. Tanner, architect, has let contracts for the erection of a two storey brick house for Mrs. Patton, as follows: carpentering, John Beckman; stone and brick work, S. R. Rundle; painting, A. Cormie; plastering, T. Robinson; plumbing, Feek & Phillips.—Thomas Matthews has secured the contract for the erection of the chemical laboratory and sewerage disposal works at the Agricultural College.

MONTREAL, QUE.—Eric Mann, architect, St. John street, has awarded contracts as follows: One tenement building on Cadiéux street for R. Keough—Masonry, Barbeau & Fournier; carpenter and joiner's work, R. Neville, jr.; roofing, Montreal Roofing Co.; plumbing, John Watson; brick, R. Dubie & Co.; plastering, Knott & Gardner; painting and glazing, O. Cauchon.—Building contracts have been granted as follows: House, 4 stories, 31x45 ft. on St. Denis st., Viger Square, for Alphonse Brazeau—Masonry, Martineau & Prenoveau; carpenter and joiner's work, L. Lolliot. House on Laval avenue, 2½ stories, stone and brick, for Madame Joseph Levy—Masonry, Barbeau & Fournier; carpenter and joiner's work, Geo. Roberts. Estimated cost, \$12,000.—Wm. McLea Walbank, architect, has awarded contracts as follows: Repairs of a house on Berri street for J. G. Kennedy—Masonry, O. Frappier; carpenter's and joiner's work, R. Neville; brick, D. Marsan & Co.; plumbing and heating, Drapeau & Savignac, roofing, Campbell & Co.

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CAST IRON COLUMNS.

Even when the most careful calculations have been made, and the details have been scrupulously worked to, cast-iron columns are sometimes subjected to improper treatment before being fixed on buildings, which may seriously impair their strength and safety. The American Machinist refers to the attempt made to straighten columns that were not true by heating and bending them by placing them on their convex side up over a fire and loaded by pig iron, the effect of which treatment was to stretch the iron on the lower side and make it thinner, and to render the column in one case weaker under a dead load. An attempt made to straighten a column by the reverse process, of placing the concave side up and loading the overhanging ends, and then applying the fire underneath the centre of column, is said to have been attended with better results, as it "permits the column to be made stronger instead of weaker," as the heating thickens the side of the column which has been stretched. It cannot be denied that any tampering with cast iron must be riskful, as the reheating and loading tends to develop internal strains in the metal. That cast iron columns are sometimes subjected to such treatment to straighten them is to be feared. Architects and engineers probably know little of these processes; the columns thus strained are set up and loaded to a degree which may be dangerously near the breaking point. We think it well that those entrusted with the ironwork of our buildings, engineers and inspectors, should be aware of these endeavors to rectify cast-iron columns and girders, and refuse to accept all constructional iron work that has been subjected to these processes. The action of heating a column or girder at a particular point, and then subjecting it to strain, must necessarily tend to cause internal elongation of some fibres and compression on others, causing unequal power of resistance, or even fracture. The metal also on the heated and compressed side must be increased, while that on the contrary is made thinner; and this unevenness, under certain conditions of loading, would be really dangerous.

WATERPROOFING BRICK AND SANDSTONE.

A number of experiments were recently made to ascertain the length of time that brick and sandstone are rendered waterproof or protected by oil. The three oils used were linseed oil, boiled linseed and crude mineral oil. The amount of oil and water taken up by the sandstone was very much less than that absorbed by the brick, although the area of the sandstone cube was much greater. Equal amounts of the raw and boiled oil were absorbed. The mineral oil, however, was taken up in much greater quantities by both brick and sandstone. By the end of twelve months the mineral oil evaporated from the bricks, but such was not the case when the other oils were used. After an exposure of four years the bricks practically retained all their oil, inasmuch as they had not lost any of their weight, and were also practically impervious to moisture. It was noticeable that the sand-

stone cubes treated with linseed oil returned to their original weights, but do not appear to have lost the beneficial effect of the oils, being also practically waterproof.

LEGAL DECISIONS.

In Mills v. Dominion Construction Company, an action to recover balance of contract price for building the new T. H. and B. railway station in Hamilton, his Lordship gave judgment for amount claimed, some \$1,013.

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AN INTERESTING SUIT.

The town of Barrie, Ont., recently asked for tenders for paving, the specifications calling for offers at so much per square yard. Mr. W. H. Jones, of Toronto, was one of the tenderers, and the form which he filled in contained the words "lineal foot," opposite which he wrote by mistake \$2.25, thus tendering for the work at \$2.25 per square yard. The lineal foot tender embraced the whole width of the street, some 40 feet, which made the difference of \$1,600 in the price. Mr. Jones saw his mistake and asked for a release, which the authorities of Barrie refused, retaining his deposit of \$200. Action has been taken by Mr. Jones to recover the sum.

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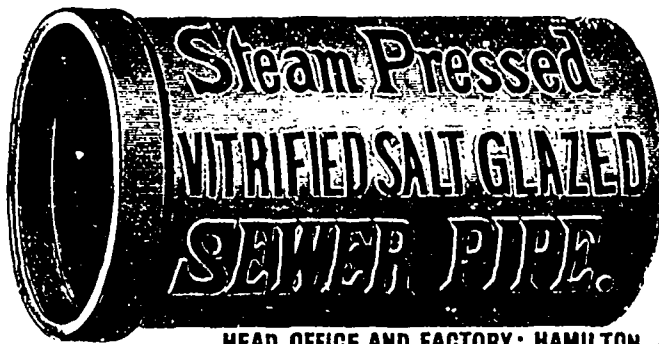
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ROAD MAKING.*

Requisites for permanency.—In order to make and maintain a permanent roadway, two rules must be followed:

1. Take the water out.
2. Keep the water out.

Underdraining.—Where a road is to be constructed on a wet and retentive soil, a perfect system of underdraining must be provided. This is best done by cutting ditches diagonally across the roadbed with discharge into side ditches. These diagonal ditches should have a good fall and good outlet, and should be from eighteen inches to two feet deep and about one foot wide at the bottom, with a slight slope outward. In these should be laid coarse broken stones, broken bricks or other material suitable to form a drain, filling them up to the level of the sub grade.

Surface Draining.—Open ditches should be cut on each side of the roadbed at a distance of about twelve feet from the outsides of the metalling. They should be deep enough to drain the foundation; at least eighteen inches below the sub-grade.

Tile Preferable.—Where tile is cheap and a good outlet obtainable, tile side drains are preferable to open ditches. Shallow gutters should be made over the tiles to catch the surface water and conduct it to catch basins placed at convenient distances apart. The catch basins should be made of durable materials of sufficient size to be freely cleansed and should be covered with iron gratings. The basins should extend at least two feet below the bottom of the tile to provide space for the deposit and they should be cleaned at least twice a year.

The Roadsides.—The strips of ground between the metalled road and the open ditch should be properly graded to conform with the crown and grade of the metalling and should be seeded and kept in sod. This will always be pleasing to the eye, is cheap and very largely useful in preventing the carrying of mud on to the metalling. Moreover, the uniformity of the grade facilitates the passing of meeting teams.

Location of Sub-drains.—In a soil that is gravelly and pervious to water, the open ditches on each side of the road, even of a 66 feet wide road, are sufficient for draining the road-bed. If there be any springs under the road, a sub-drain leading directly to the side ditch will be required. Should the road be on a side hill, a deep open ditch on its upper side, to arrest the flow from the adjacent land, may be sufficient, the water being at intervals conducted across and under the road by an ordinary stone culvert.

Outlets. Mistakes are often made by giving insufficient outfalls to the drains. Under the Ditches and Watercourses act a municipality has the same power as an individual to enforce the natural outlet for the drainage water of the land. But municipal officers are apt to shrink from forcing an outlet through private lands, and to leave their road drains with insufficient outlets rather than incur the ill will of possibly influential constituents. This should not be so. Municipalities should insist upon their rights, and the owners of lands interfered with should pay the same proportion of the cost of the work as if only private individuals were concerned.

Bad Drainage and Frost.—Imperfect drainage is the cause of badness of our roads in nearly all cases. The inexperienced are not apt to appreciate the paramount necessity for the maintenance of a perfectly dry foundation of earth for their surface of broken stone, gravel, etc., to lie upon. A protracted rain will soften an undrained road, and on the passing of a heavy load injurious ruts are the consequence. In these latitudes the soil water freezes and the consequent expansions and contractions quickly ruin the road-bed.

Destructiveness of Ruts.—It matters not whether a road be earth or macadam if attention is not given to the preservation of the finished crown. If ruts are allowed to form water is admitted. Every depression is a centre of destruction. The power of resistance to the water becomes less and less until the roadway becomes actually impassable.

Road Machines.—In constructing earth roads a plow should not be used except where actually necessary, because a plowed surface is only with great difficulty made hard and smooth, and the plow is likely to cut too deeply into the earth. A good road machine should be procured if possible, for by the use of a machine the natural foundation of the ground is not disturbed in rounding up the road, as is done with common plows and scrapers. Every municipality should have a road machine and should have a man especially instructed and constantly in charge of it. With a road machine in skilled hands, there will be no question raised as to the economy of construction and repairs and the efficiency of the work done.

Width of Roadway.—The roadway should be twenty-six feet between the ditches and the metalling for ordinary roads eight feet wide; where more than a single line of travel is required the metalling should be sixteen feet wide.

Height of Crown.—A roadway of this width should have a crown of at least ten inches and should always be maintained in this shape.

Rolling.—After the road machine has completed its work, the whole grade should be rolled with a roller weighing about five tons. Rolling is essential in making the foundation and surfacing to form permanent or gravel roads. The roller should follow closely upon the grader or scraper so that the loose earth may be consolidated while it is yet moist.

The roller should pass many times over the softer portions of the road, and where the road is very dry and not inclined to pack, it may be slightly moistened to facilitate the consolidation of the earth. The rolling should begin at the sides of the road and proceed gradually towards the centre; that is, the roller should be passed from end to end along the side of the road and then in the second passage the roller should slightly lap the first passage until the centre of the road is reached.

Metalling.—After the formation of the road and the draining are completed, the mass of broken stone or gravel which is to form its wearing surface should be laid, packed and so consolidated that it will be practically water-tight. Such a road will be durable and easily maintained. It will shed water rapidly. Its hardness will prevent the formation of ruts, which is the first stage of destruction.

Width of Tires.—If all wagons used in country roads could be provided with tires four inches wide, they would roll the surface more smoothly and more quickly, and the road would be in fairly good condition all the year round.

THE VALUE OF WATERWORKS.

The destruction by fire recently of a large section of the town of Deseronto, should direct the attention of municipalities having a population of say 1000 and upwards to the necessity of an efficient waterworks system. We understand that the subject of a public water system for Deseronto was up for consideration some time ago, and that the plans for such a system are on paper in the hands of the town authorities, but this was of no value when the conflagration came.

The following towns between Toronto and Montreal are without waterworks: Whitby, Oshawa, Bowmanville, Newcastle, Colborne, Trenton, Deseronto and Prescott. Port Hope was badly scorched by fire during the time a system of waterworks for the town was under construction. Many of the towns which now possess waterworks, suffered partial destruction once or oftener before they would see the necessity for adequate fire protection.

In addition to its value as a protection from fire, a public water system greatly tends to promote the health of the community, and especially is it a safeguard against typhoid and other forms of disease which are largely due to the use of impure water.

Mr. James A. Bell has been appointed city engineer of St. Thomas, vice A. W. Campbell, who resigned to accept the appointment of Road Commissioner of Ontario.

Messrs. Aemilius Jarvis & Co., of Toronto, whose offer for municipal debentures of the city of Ottawa, was accepted, refused to sign the agreement with the city on the ground that the corporation are prevented by their charter from issuing debentures of this class. A settlement of the matter is still pending.

* Prepared by the Ontario Good Roads Association.

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CONDITION OF THE MARKET.

TORONTO: The demand for lead pipe is fairly active. Prices for window glass are steady and the demand fair. By agreement the majority of American glass factories will cease operations for three months in order to prevent the accumulation of surplus stocks and consequent depreciation in prices. Paints and oils are very active. A drop of 1 cent per gallon has occurred in price of linseed oil and spirits of turpentine. Stocks of iron pipe are low, as also staple sizes of galvanized iron. The advance in price of spelter has stiffened prices of galvanized plates. Reports are current of violations of agreement as to prices on the part of some handlers of plate glass.

MONTREAL: The present season thus far has been a quiet one for cement. There is a fair demand for small lots. English brands are selling at \$1.80 to \$1.90 per barrel, ex-wharf. Fire bricks are in fair demand at prices ranging from \$16 to \$22 per 1,000. Turpentine has declined 42 cents per barrel. Linseed oil has also declined 1 cent per gal.

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Table listing lumber prices for various types of wood, including clear picks, three uppers, pickings, and different sizes of cull boards and joists.

VAID QUOTATIONS.

Table listing mill cull boards and scantling prices for various dimensions and materials like hemlock and cedar.

Table listing floor and ceiling materials, including dressed and undressed lumber, beaded sheeting, and sawn shingles.

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

SAND.

Table listing sand prices per load of 1 1/2 cubic yards.

STONE.

Table listing various stone products including common rubble, large flat rubble, foundation blocks, and granite ashlar.

OHIO FREESTONE, FROM THE GRAPTON STONE CO.'S QUARRIES.

Table listing Ohio freestone products such as buff promiscuous, buff dimension, blue promiscuous, and sawed ashlar.

SLATE.

Table listing roofing slate products including red, purple, and unflading green slate.

PAINTS. (In oil, @ lb.)

Table listing various paint products including white lead, red lead, yellow ochre, and vermilion.

CEMENT, LIME, etc.

Table listing cement and lime products from different manufacturers like Portland Cement and German cement.

Table listing Portland Cements from various manufacturers like Newcastle, Belgin, and Canadian.

Table listing Hydraulic Cements including Thorold, Queenston, and Napance.

Table listing Keene's Coarse Whites, Fire Bricks, Lime, Plaster, and Hair products.

HARDWARE.

Table listing cut nails and steel products.

CUT NAILS, FENCE AND CUT SPIKES.

Table listing various sizes of cut nails and spikes for different applications.

FINE BLUED NAILS.

Table listing fine blued nails in different sizes.

CASING AND BOX, FLOORING, SHOOK AND TOBACCO BOX NAILS.

Table listing casing and box nails for various uses.

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Table listing finishing nails in different sizes.

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Table listing slating nails in different sizes.

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Table listing common barrel nails in different sizes.

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Table listing clinch nails in different sizes.

SHARP AND FLAT PRESSED NAILS.

Table listing sharp and flat pressed nails in different sizes.

STEEL WIRE NAILS.

Table listing steel wire nails with a discount from printed list.

Iron Pipe:

Table listing iron pipe prices for various diameters and lengths.

Lead Pipe:

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Galvanized Iron:

Table listing galvanized iron products like Adam's-Mar's Best and Queen's Head.

Structural Iron:

Table listing structural iron products like steel beams and sheared steel bridge plate.