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# CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL  
OF CONTRACTS, TENDERS, AND MUNICIPAL PROGRESS

PUBLIC • WORKS • TENDERS •  
ADVANCE • INFORMATION •  
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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.

NOVEMBER 22, 1899

No. 43

## THE CANADIAN CONTRACT RECORD, PUBLISHED EVERY WEDNESDAY

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For the Erection of about 32 Miles of Railway Fencing. For information apply Lock Box 313, Picton, Ont.



## TENDERS

FOR

## ANNUAL SUPPLIES

Tenders will be received, by registered post only, addressed to the Chairman of the Board of Control, Toronto, up to noon on

Monday, 4th December, 1899,

for the following supplies for the year ending December 31st, 1900: Lumber, Pit Gravel (screened and un-screened), Hardwood Lumber, Sand, Sewer Pipe, Brass and Bronze Castings, Brass Work for House Services, Coal and Wood Lead Pipe, Stop Valves, Special Castings, Iron and Steel, Paving Brick, Hydrants, General Supplies, Wire Nails, Cedar Paving Posts, Horse Feed, etc., Cast Iron Pipe, Lubricating Oils, etc., Lumber for w.w. purposes, Rubber Valves, etc., Iron Valves and Stop-Cock Boxes, Lake Gravel. Contents of envelopes containing tenders must be plainly marked on the outside. Specifications may be seen and forms of tender obtained at the office of the City Engineer, Toronto, on and after 21st of November, 1899. A marked cheque, payable to the order of the City Treasurer, Toronto, for 5 per cent. of the amount tendered for up to \$1,000 and 2½ per cent. of the amount over that sum, must accompany each and every tender, otherwise it will be ruled out as informal. The lowest or any tender not necessarily accepted.

JOHN SHAW (Mayor),  
Chairman Board of Control.

Toronto, November 15th, 1899.

## CONTRACTS OPEN.

LHOLT, B.C.—A Presbyterian church is to be built here.

PELIAM, ONT.—F. R. Chapple is about to build a new residence.

NEW HAMBURG, ONT.—It is proposed to build a skating rink here.

DUNDELA, ONT.—J. I. Pitts has purchased property and will erect a dwelling.

SYDNEY, C.B.—The ratepayers are in favor of the erection of a hall or opera house.

UNBRIDGE, ONT.—It is the intention of Geo. Beal to build a wing to his tannery.

CLANDFROYNE, MAN.—A new bridge will be built here by the provincial government.

MARDEN, ONT.—Councillor McDonald intends erecting a stone residence next spring.

AMHERST, N.S.—C. H. Peters & Son, of St. John, N.B., purpose establishing a tannery here.

TIVERTON, ONT.—Tenders have been invited for the erection of a Presbyterian brick church.

BLANCHARD, ONT.—Messrs. Creighton will build a brick residence on the base line next spring.

DUNGANNON, ONT.—A residence will be built by Henry Fowler on property recently purchased.

WINDSOR, ONT.—The council intends to construct a brick sewer on McKay street, to cost \$2,490.

REVELSTOKE, B.C.—Mr. Simons, of Ottawa, is said to be looking for a site for a saw mill near this place.

DUBLIN, ONT.—The Bishop of London has selected a site here on which to build a Roman Catholic church.

ROSSLAND, B.C.—The C. P. R. will shortly look into the question of establishing divisional facilities here.

PERTH, ONT.—The county council now in session here will consider the establishment of a House of Refuge.

PEMBROKE, ONT.—The new block to be built by J. W. Munro will have a foundation of tamarac piles.

TILBURY, ONT.—The English church congregation have decided to build a church, to cost about \$5,000.

PARRSBORO, N.S.—McKay & Dix, of New York, are arranging to commence the construction of a barque.

DUNDAS, ONT.—The congregation of Knox church are about to re-seat and otherwise improve the edifice.

DAUPHIN, MAN.—It is said that the C. P. R. will erect large buildings here for workshops and freight sheds.

EAST TEMPLETON, QUE.—McLaren & McLaurin purpose building a large addition to their saw mill this winter.

MORDEN, MAN.—A citizen is said to

have secured a block of land with the intention of erecting a large grist mill.

MEAFORD, ONT.—Josiah Perks is erecting a large greenhouse, which will be fitted with modern heating apparatus.

JORDAN, ONT.—E. A. C. Pew states that there is a strong probability of large steel works being erected at this place.

ORILLIA, ONT.—The council has requested the Government to lay a granolithic sidewalk in front of the post-office.

SCHOMBERG, ONT.—A. Smart has purchased property near the village and intends erecting a large slaughter house.

WATERLOO, ONT.—Extensive improvements will be made to the plant of the Waterloo Electric Light & Power Co.

SHERBROOKE, QUE.—The Stanstead & Sherbrooke Mutual Fire & Insurance Co. have commenced the erection of a large block here.

NORMAN, ONT.—It is expected that the Keewatin Power Co. will next spring proceed to further develop their water power here.

CARTWRIGHT, MAN.—H. Lawe, C.E., of the Provincial Public Works Department, was here last week in connection with bridge site.

NANAIMO, B.C.—S. Gough, city clerk, invites bids for the purchase of \$100,000 of debentures. The date limit will be given next week.

WINCHESTER, ONT.—Henry Johnston has purchased property, corner Main and St. Lawrence streets, and purposes erecting a business block.

WOLFFVILLE, N.S.—The ratepayers have authorized the council to borrow \$9,000 for the purchase of land and the erection of a town hall.

PARKHILL, ONT.—It is proposed to submit a by-law to the ratepayers to raise funds to establish an electric light plant and waterworks system.

CARMAN, MAN.—The Carman Telephone Exchange Co. has been organized, to build a telephone system in this village, with outside connections.

AILMER, QUE.—S. F. Ritchie, of this place, has purchased mining property near Eardley and will install an electric plant for working the mine.

BERLIN, ONT.—It is believed that the recently organized furniture trust have purchased property in this town on which to build a mammoth factory.

GORDON BAY, ONT.—A. Winter, of this place, has been commissioned to prepare plans for a large addition to the Hotel Montezum at Rosseau.

TRENTON, ONT.—On the 26th inst. the ratepayers will vote on a by-law to grant a bonus of \$10,000 to Gilmour & Co. for the establishment of a factory.

PETERBORO, ONT.—The town engineer has been instructed to prepare plans for construction of sewers on portions of George, Water, Harvey, Stewart and

Park streets.—It is expected that the new bridge will be built over the creek at Smith street.

WALLACEBURG, ONT.—Council will raise \$1,000 by debentures for purchase of park.—Council is discussing the question of building a new fire hall.

PETROLEA, ONT.—Tenders will be opened at the Iroquois Hotel on Saturday, 25th inst., for repair of Stafford drain. R. J. Park, commissioner.

PICKERING, ONT.—The Toronto General Trusts Co., of Toronto, have taken tenders on the erection of a large barn just west of this village for Geo. Stotts.

PARIS, ONT.—Members of the Board of Education last week visited London with a view of getting information to be used in connection with the proposed school building.

HULL, QUE.—\$30,000 has been subscribed towards the proposed boot and shoe factory.—The E. B. Eddy Company is about to build an iron bridge over Wright Bay.

SOUTHAMPTON, ONT.—It is expected that the old bridge over the Saugeen river near this place will be replaced at an early date by an iron structure, to cost about \$20,000.

SMITH'S FALLS, ONT.—H. A. Crate has purchased property on which he intends erecting eleven residences next spring.—Adam Foster is about to build a steam barge to ply on the Rideau.

NIAGARA FALLS SOUTH, ONT.—The municipality has granted the Michigan Central Railway the privilege of building a spur line from the freight house on Perry street to the metal works.

VICTORIA, B.C.—An addition will be made to St. Saviour's church, Victoria West.—Ald. Humphrey has given notice in council that he will move that Yates street be paved with wooden blocks.

NEW WESTMINSTER, B.C.—Fred J. Bauer, architect, is asking for tenders for the erection of a depot on Columbia street for the British Columbia Electric Railway Co. Building will be brick and wood, 62 x 132 feet.

GOBERICH, ONT.—Work on the granolithic sidewalks has been suspended until next spring.—The by-law to grant a bonus to assist in the establishment of glass works in this town was defeated by the ratepayers last week.

EAST TORONTO, ONT.—Tenders close at 7 p.m. to-day (Wednesday) for the extension of a 6-inch main, with hydrants, etc., a distance of 1,000 feet upon the Kingston road. Specifications at treasurer's office, Main street.

GRAND FORKS, B.C.—Council is figuring on building a fire hall, to cost \$2,000.—A boom across the north forks of the Kettle river gave way on Monday last, carrying with it a dam under construction and two bridges; loss, \$6,000.

LONDON, ONT.—A. M. McEvoy, treasurer of Middlesex county, will receive tenders up to December 5th for purchase of \$12,600 county debentures.—Alterations are contemplated by the Western Fair Board in the stock building at Queen's park.

GUELPH, ONT.—The members of the Board of Health are considering the erection of an isolation hospital.—The Guelph Pork Packing Co., Limited, has been incorporated, to take over and extend the present pork packing business. Thos. Hepburn is interested in the company.

PICTOU, N.S.—The ratepayers have voted \$500 to be used in making tests of the driven well system of waterworks, as recommended by Mr. Coffin, hydraulic engineer. The system will consist of driving some 40 wells, the water from which will be pumped to a central reservoir or stand-pipe.

GREENWOOD, B. C. The council is considering two electric lighting schemes. The proposal submitted by Mr. McIntosh, which includes a tramway to Phoenix, seems to meet with the greater favor. By laws sanctioning the borrowing of \$15,000 for further improvements were passed by the ratepayers last week.

NIAGARA FALLS, ONT.—It is understood that the Niagara Falls Park and River Railway power house, which was burned a short time ago, is to be rebuilt, but as yet no contracts have been let.—T. G. Nichols, architect, has completed the plans for J. L. McCartney's brick residence, and the contracts will be let this week.

ST. JOHN, N. B.—Weldon & McLean, barristers, of this city, invite tenders for the masonry work and material for stone pier for new bridge at Musquash, N.B., to be built by the Shore Line Railway.—A special committee appointed for the purpose, will recommend that the council purchase a modern hook and ladder truck for fire purposes.

NEWCASTLE, N.B.—R. Lingley, town clerk, invites tenders, on behalf of the corporation, up to 8 p.m. of November 29th, for construction of an electric light plant for the municipality, consisting of masonry dam, power house, transmission line eight miles long, and hydraulic and electrical machinery. Plans at clerk's office and on application to C. H. Mitchell, C.E., Niagara Falls, Ont.

NELSON, B. C.—The owners of the North Star Mine are about to install a water power plant, the power to be obtained from a creek about two miles away. They have just let a contract for a double wire rope tramway 6,000 feet in length for the purpose of handling the ore.—The Kootenay Railway & Navigation Co. have completed arrangements for building a new steamer next spring.

WOODSTOCK, ONT.—Ald. Karn will introduce in council a by-law to raise \$4,000 for a fire alarm system.—Dr. Mearns has introduced a by-law to raise \$7,000 by debentures.—Town council has resolved to engage the services of an electrical engineer to value the plant of the Woodstock Electric Light Co. prior to a vote of the ratepayers being taken on the question of municipal ownership.

KINGSTON, ONT.—Power & Son, architects, are preparing plans for enlarging the skating rink.—Warden Platt, of the penitentiary, was in Ottawa last week, his mission being, it is understood, in connection with a new electric light plant for the penitentiary.—Power & Son, architects, will at once prepare plans for a new opera house to be built on the site of the old building.—The Kingston & Pembroke Railway Co. is considering the extension of its road to Bryson.

QUEBEC, QUE.—Works for the manufacture of calcium carbide will probably be established the mouth of the Shipshaw river. Negotiations with the government to that end are now in progress.—The Harbor Commissioners have leased from the C.P.R. the grain elevator on the Louise bank and propose to carry the chute to the end of the breakwater, a distance of over 2,100 feet. It has also been decided to build a two story shed 500 feet long on Point Carcy wharf, and to construct a new coal wharf in the inner basin.

TORONTO JUNCTION, ONT.—There has lately been a marked revival in the real estate market. W. Hoag has purchased 50 feet of property on High Park avenue, between Annette and Dundas streets, on which he proposes to erect a residence next spring. Mr. Shultz has purchased 40 feet near Annette street with the intention of building thereon. A. M. Gable is having plans prepared for a house to be built on High Park avenue, south of Annette street, and Hon. N.

Clark Wallace has purchased 100 feet on High Park avenue, south of Annette street, presumably for building purposes.

WINNIPEG, MAN.—Chief Buchanan, of the Fire Department, has submitted to council the following estimate for repairing plant: Machine shop, electric power, \$3,620; gasoline engines, \$4,120; blacksmith shop, \$400; boiler work, \$175; carpenter and pattern shop, \$1,045; paint shop, \$100; total using gasoline engine \$5,840, and using electric power \$5,340.—On December 12th the ratepayers will vote on a by-law to raise \$17,000 by debentures for the establishment of a crematory.—J. H. G. Russell, architect, has taken tenders on masonry, carpenter work, galvanized iron, plumbing, steam heating and painting required in alterations and improvements to brick building, north-east corner McDermott avenue and Albert street.

HAMILTON, ONT.—Bruce, Burton & Bruce, solicitors, invite tenders up to December 1st for the purchase of \$50,000 city of Hamilton debentures.—A. W. Peene, architect, invites tenders up to 1 p.m. to-day (Wednesday) for erection of dwelling house on Bay street south.—Building permits have been granted as follows: W. P. Witton, brick addition to laundry at city hospital, cost \$1,200; S. S. King, barrelling station for Sun Oil Refining Co., cost \$3,000; J. H. Larkin, two-storey brick dwelling on Wellington street south, cost \$1,600; R. M. Poag, three brick dwellings on Chatham street, between Locke and Garth, cost \$2,300; T. H. & B. Railway Co., one storey frame building on Maria street, cost \$1,000.—T. Beasley, city clerk, desires tenders by noon of Friday, 24th inst., for repairing Ferguson avenue sewer.—The capitalists interested in the nickel steel works expect to complete organization shortly. It is said that an option has been secured on 500 acres of land east of the city for a site.

MONTREAL, QUE.—Tenders close at noon to-day (Wednesday) for the construction of sewers on portions of Butler, Cardinal and Iroquois streets.—L. O. David, city clerk, wants tenders by noon of 23rd inst. for the supply of 100 revolvers for the Police Department.—Hon. Mr. Duffy, Minister of Public Works of Quebec, is said to have under consideration the erection of a large wing to the court house, the present accommodation being inadequate.—At last meeting of the Delorimier municipal council it was decided to call for tenders for the construction of drains and other work to be done on Green, Shaw, Bordeaux and Rachel streets.—Tenders have been called for the construction of a subway under the C.P.R. tracks at Delorimier.—Negotiations with the Minister of Public Works and the Montreal Board of Harbor Commissioners with a view to the erection of large elevators in this city and at Port Colborne, Ont., by a syndicate of Canadian and American capitalists, are reported to have been completed.—It is probable that tenders will be invited at an early date for heating and lighting the Windsor street depot of the C.P.R.

OTAWA, ONT.—During the coming winter a barf 400 feet long will be built opposite the Hotel Victoria, and jutting into Lake Deschenes.—The County of Carleton Law Association will ask the county council to build a new wing to the court house.—Property owners on the east side of the Rideau river have asked that the main sewer be diverted from the present course across the river and thence down the east bank through Janeville. It is estimated that this change would cost about \$30,000 additional.—The C.P.R. will make application to parliament at next session for an act authorizing the construction or purchase of the following railways. From Deloraine, Manitoba, thence southwesterly to a point in town—

ship 1 or 2, thence westerly one hundred miles; from a point on the Manitoba Southwestern Colonization Railway between Manitou and Pilot Mound, in a southerly direction to a point at or near the international boundary, from a point on the last mentioned railway in township 1 or 2, thence easterly fifty miles; from a point in township 1 or 2 between the Manitoba Southwestern Colonization Railway and a point at or near the international boundary, thence westerly fifty miles; from McGregor, on the company's main line, thence westerly and northwesterly to Varcoe, about fifty-six miles; from West Selkirk, in a northerly and northwesterly direction to some point on the west shore to Lake Winnipeg; from a point on the company's main line at or near Molson Station, Manitoba, thence northerly and northeasterly to a point on Lac du Bonnet or Winnipeg river, about twenty-six miles; from a point on the company's line at New Westminster, thence to Vancouver.—The Ottawa Forwarding Company purpose rebuilding and thoroughly refitting with new machinery the vessel Welshman, at a cost of about \$10,000.—A smelter having a daily output of 250 tons of iron will be erected next spring at Ironsides in connection with the reopening of the West Hull Iron Works. It is said that the necessary plant, consisting of hoisting engines, derricks, tramways, etc., will be installed at the mines by J. H. Ratford & Co., of Cleveland, Ohio.

**TORONTO, ONT.**—The details have been completed in connection with the organization of the National Cycle & Automobile Co., which will have a capital of \$2,500,000. F. S. Evans, of the E. & D. Bicycle Co., has been appointed manager. It is the intention to erect next year a building 300x200 feet, at a cost of \$100,000, but in the meantime the works will be located in the old carpet building at the foot of Jarvis street. Machinery to be installed therein will be purchased immediately.—Plans for new car shops to be built by the C.P.R. in Western Ontario are understood to be nearing completion by the company's architect. The building will cost about \$40,000. It is reported that they will be built in this city, and that they will be situated at the foot of Spadina avenue.—The council has given notice of its intention to construct the following works: Asphalt pavement on Lowther avenue, Spadina to Walmer road, cost \$2,430, and on Howland avenue, Bloor street to Barton avenue, cost \$8,780; cedar block pavement on Bellwoods avenue, Queen to Mansfield, cost \$5,440, and on Henderson street, Manning avenue to Clinton, cost \$460; concrete sidewalks on Huron street, cost \$772; College street, Beverley to Huron, cost \$551; St. Vincent street, Breadalbane to St. Joseph, cost \$1,379; Huron street, Lowther to Bernard, cost \$1,890; Bernard avenue, cost \$638.—In a report presented to the Board of Works last week, the city engineer again urged the necessity of installing another 10,000,000 gallon pumping engine at the pumping station. The recommendation was endorsed by the Board of Works at a meeting held on Friday last, and was forwarded to the Board of Control.—The city engineer advises that tenders be invited immediately for the construction of a 16-inch steel water main across Don river on Queen street bridge, and a 12-inch steel main over Eastern avenue bridge, at cost of \$2,062. The following local improvements are recommended: Asphalt—College street, Yonge to Spadina, cost \$52,670; Front street, Church to Jarvis, cost \$15,650; North street, St. Mary to Bloor, cost \$6,010; Glen road, Howard street to bridge, cost \$2,940. Cedar block—Avenue road, C.P.R. tracks to city limits, cost \$5,350; Avenue road, Davenport road to C.P.R. tracks, cost \$3,040, Augusta avenue,

Oxford to College, cost \$740; Metcalfe street, Winchester to Amelia, cost \$795. Concrete walks—West side Hazelton avenue, Yorkville avenue to Davenport road; north side Wellington place, Spadina avenue to Portland street. Brick walk—East side Robert street, Harbord street to Sussex avenue.—Building permits have been granted as follows. James Henderson, Q. C., two-storey and attic brick residence, south side Maple avenue, Rosedale, cost \$5,000; Dr. G. S. Ryerson, pair semi-detached two storey and attic brick residences, north side Bloor street, opposite Spadina avenue, cost \$8,000, and pair similar houses, east side Howland avenue, near Lowther, cost \$5,500, Allen McLean, three attached two storey and attic brick and stone dwellings on Davenport road, near Avenue road, cost \$3,000, Edward Fisher, two storey and attic brick residence, 166 Crescent road, cost \$9,000; R. J. Tackaberry, two-storey and attic brick dwelling, No 144 Park road, Rosedale, cost \$5,000.—Tenders are wanted at 52 Roxboro' west for brick and mason work.—Tenders for gravel roofing will be taken at 94 Oxford street up to Thursday of this week.—Next year it is the intention of the C.P.R. to double track a large portion of the road between this city and Montreal.

#### FIRES.

Martimas Hotel at Copetown, Ont., owned by J. A. Bigley; no insurance.—Legrow's Hotel at Byng Inlet, Ont., totally destroyed; loss \$3,000.—Alden saw and grist mill at South Poxton, Que., owned by E. Bradford, of Granby; loss \$2,000, no insurance.—The village of Port Essington, B.C., was partially destroyed by fire recently, the loss being \$70,000.

#### CONTRACTS AWARDED.

**BRACEBRIDGE, ONT.**—Building for Sheriff Bettes: Wm. Head, contractor. The foundation only will be completed this fall.

**WINDSOR, ONT.**—The city council has decided to award the contract for limestone to J. C. Ingles, of Hagersville, at \$1 per ton.

**ABBOTTSFORD, B.C.**—F. Holt, of Vancouver, has been awarded the contract to build double section house and station here for the C.P.R.

**HULL, QUE.**—Chas. Desmarais has secured contract to furnish 1,500 cedar posts for the extension of the Montmorency and Charlevoix railway.

**BRADFORD, ONT.**—John Rogers is about to build a two storey brick residence

on Holland street. The mason work has been given to Thomas Saint.

**NIAGARA FALLS, ONT.** Store for J. M. Pattinson: Mason work, 1 Blair; carpenter work, James Harriman; plumbing and tin-smithing, T. J. Henderson

**MONTREAL, QUE.** The Montreal Pipe & Foundry Co. have secured from the Dominion Iron & Steel Co., of Sydney, C. B., the contract for 5,000 tons of water pipe.

**HALIFAX, N.S.**—W. Stairs, Son & Morrow have the contract to supply cement to the Dominion Iron & Steel Co., Sydney, C.B. They are importing 10,000 barrels.

**HAMILTON, ONT.**—Addition to factory of Ontario Lantern Co. (L. B. Patterson, architect), Peter McKay, contractor. Building will be brick, three storeys, 98 x 38 feet, cost \$3,500.

**WADDINGTON, ONT.**—John Rutherford has the contract for buildings on J. W. Allison's Island. The barns will be completed first, and in the spring the house and several cottages will be built.

**LONDON, ONT.**—Contract for Brighton street sewer has been let to Benjamin Johnston, at \$505, and that for College avenue sewer to Moses Cox, at \$415. It is now stated that John Purdom is the successful tenderer for steam heating, plumbing, gas fitting, etc., at the Normal School building in this city. The price is said to be \$10,559.

#### PERSONAL.

Just as we go to press we learn of the death of Mr. William Mortimer Hamilton. Deceased was one of the brightest young business men of the city, and died after a lingering illness at the early age of thirty-nine years. For a number of years he has been manager of the St. Lawrence Foundry Company, conducting the business with vigor and success.

#### BUSINESS NOTES.

Lloyd & Richardson, plumbers, Montreal, have registered partnership.

The assignment is announced of the Montreal Roofing Co., of Montreal.

C. H. Payton & Co., contractors, Granby, Que., have dissolved partnership.

Dempsey & Dauth have registered partnership as plumbers at Coteau du Lac, Que.

Dosithee Auburton and Gustave Deschamps have registered proprietors of the business of Auburton & Deschamps, contractors, Montreal.

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Coatings of cement have been employed by certain railway companies in France for some years past to protect the metallic portions of bridges crossing their lines from the rapid destruction to which such parts are liable by reason of oxidation, through being continually exposed to the action of steam and gas, products of combustion escaping from the locomotives. A method of applying the cement which is used in Austria, and is highly spoken of, is described in "La Revue Technique." It consists in brushing down the ironwork with a leather broom, damping it with a whitewash brush, and afterwards applying two coats of Portland cement wash made rather thick, and having added to it a proportion of fine sharp sand. At Zeebrugge, in Belgium, where a deep-water harbor is now in course of construction, a portion of the pier of 300 metres in length is being formed of open work, and the steel piles of this part are covered with a coating of semi-fluid cement mortar, applied by means of an apparatus worked by compressed air; the piles having first been subjected to a preliminary cleansing by means of a sand-blast projected by the same air pressure apparatus.



### PAVEMENTS BETWEEN STREET RAILWAY TRACKS.

An account of the paving between the street railway tracks at Toronto, Ont., was given by Mr. Charles H. Rust, city engineer, in a paper presented to the recent convention of the American Society of Municipal Improvements, from which the following abstract has been taken:

In 1891 the exclusive privilege of operating the street railways in Toronto for a period of thirty years was disposed of to the Toronto Railway Company. The agreement made between the city and the company included, among other things, that when a street on which the tracks were then laid was to be paved in a permanent manner on a concrete or other

like foundation, the company should remove the old tracks and substructure and replace them under the supervision of the city engineer and to his satisfaction. Also, when the company desired or was required to change any existing tracks or substructures for the purpose of operating by electricity or other motive power, approved by the city engineer and confirmed by the council, the city would lay a permanent pavement in conjunction therewith on the track allowance to be occupied by such new tracks and substructures. Under the terms of the agreement the company pays the city \$1,600 per year per mile of double track and eight per cent. of the gross receipts. When the receipts exceed \$1,000,000, ten per cent. is to be paid.

A great diversity of opinion has arisen as to the meaning of the word permanent used in connection with pavements. It was finally agreed that, in connection with the agreement between the city and the railway company, it should refer to pavements with a concrete foundation. In the spring of 1892 plans and specifications for paving the track allowance on a number of streets were prepared and 29.9 miles of track were taken up and relaid that season. The method then adopted is shown in the illustration on next page.

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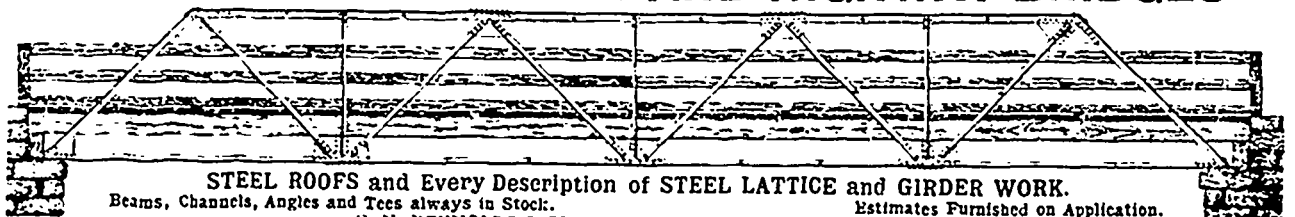
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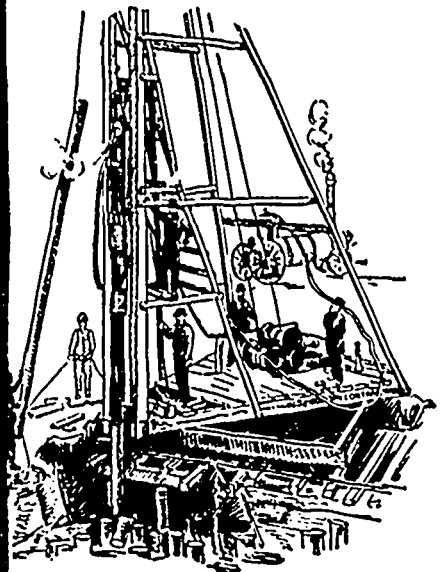
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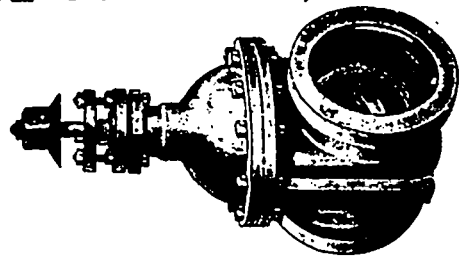
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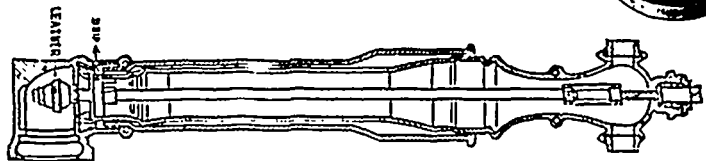
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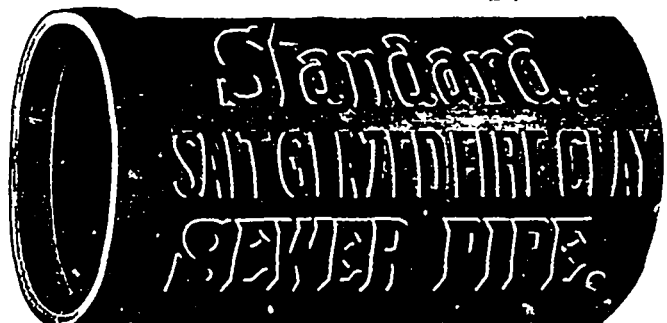


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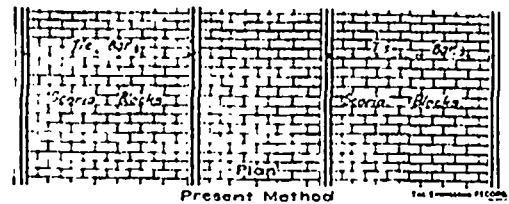
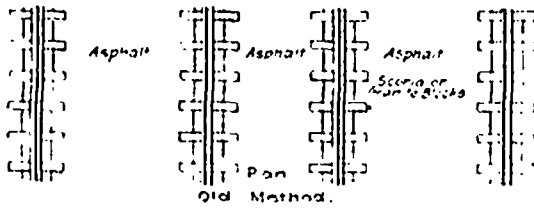
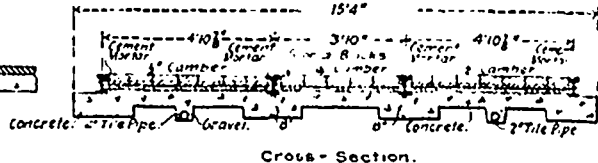
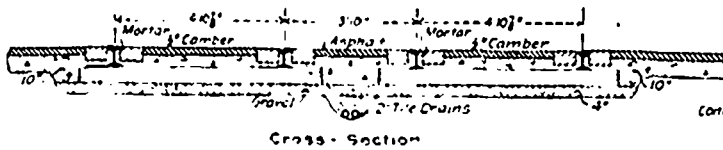
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The rail adopted by the company, and approved by the city, was a 6½ inch steel girder rail, weighing 70 pounds to the yard, and having a web ⅜-inch thick and a base 4½ inches wide. A slight alteration was afterward made in the size of the base, making it 5 instead of 4½ inches. The rail now weighs about 73 pounds to the yard. From experience since gained, a heavier section of rail should have been used. The following are the quantities of materials and weights required to build one mile of single track. 114 714 tons of 73 pound rails; 5.85 tons of fish plates, weighing 17 pounds per pair; 1,800 cedar ties; 1 ton of spikes, weighing ¾-pound

to be used between street railway tracks. After having been down only four years the asphalt commenced to disintegrate. This was at first more noticeable where the asphalt joined the tothing, but it was not long before the rest of the material between the rails commenced to wear into holes. This was due probably to the lack of proper foundation under the ties, which was shown by the settlement of the rails in several places, to the impossibility of properly tamping the asphalt between the tothing, to the constant watering of the asphalt rendered necessary by the dust caused by the passage of the cars, and to the climatic conditions. On one street

with the contractors whereby they substituted brick for the asphalt and were paid \$1.50 per square yard, but when the guarantee had expired the price paid for substituting scoria for asphalt averaged about \$2.40 per square yard. This includes taking up the old asphalt and 4 inches of concrete.

Granite is no doubt the most durable material to use between street railway tracks, but owing to the strong opposition of the cyclists to this material not so much of it was used as the department would have liked, and scoria blocks imported from England were used instead. On streets where there was not a great deal



OLD AND NEW TYPES OF PAVEMENT BETWEEN STREET RAILWAY TRACKS AT TORONTO.

each, and 1 ton of bolts and nuts, weighing 1 pound each. The work of constructing these permanent pavements and the laying of new rails was carried on continuously until the work was practically completed in 1894. In constructing these new pavements the street railway company took up the old rails, tamped the gravel under the ties, put down new rails and lined and levelled them, and the paving contractor did the rest of the work.

In 1893 and 1894 the amount of track relaid was 26.1 and 4.8 miles, respectively. The width of paving for double track was 15 feet, and the average cost per linear foot for the different classes of pavement laid during the years 1892, 1893 and 1894 was \$5.23 for asphalt, \$2.43 for granite, \$4.21 for brick, and \$3.83 for cedar blocks. This covers the cost of stone or scoria tothing, but where granite was used the contractor was allowed to re-lay the blocks that were on the streets. The average length of double track paving laid per day was, for asphalt, granite, brick and cedar blocks, 131, 56, 73 and 96 feet, respectively.

In 1894 on one street the method of laying the granite or scoria tothing was slightly altered. It was found that when the blocks were laid as headers and stretchers the water lodged next the block and assisted in destroying the asphalt. To prevent this it was decided to lay scoria blocks, 4 x 5 x 9 inches, parallel to the rail, and then lay the asphalt. The practice had been to lay the first 6 inches of concrete up to the bottom of the rail, then lay the scoria blocks in mortar, and finally put in the remainder of the concrete. On this street a change was also made in this respect. The whole of the concrete was put in at once and while still wet scoria blocks were pounded into it and left to consolidate with the concrete before the asphalt was laid down. In any extension constructed since 1895 wooden ties have been dispensed with, and steel tie bars, 2 x ½ inches, placed 6 feet apart, are used, the rails being laid on a solid bed of concrete 8 inches deep by 20 inches wide. This method of construction is much superior to the first type adopted, and is largely used in other cities. It is shown in the accompanying illustration.

After an experience of six years with the different materials used, it is evident that, with the conditions existing in Toronto, asphalt is not a suitable paving material

where the asphalt was laid without tothing, a rut was soon formed, rendering necessary constant repairs.

As previously mentioned, the first pavements were laid in 1892, and in 1897 it became necessary to commence tearing up the asphalt and replacing it with granite, scoria or brick, depending on the amount of travel on the street. By 1900 all the asphalt between the rails will have been replaced by a more permanent material. Up to the present time seven and one-half miles of this work have been done. As these asphalt pavements were guaranteed for five years, arrangements were made

of travel Canadian bricks were used. Cement grout was almost entirely used for this work, although some filling was done with paving patch, but cement was found to be the more satisfactory. Owing, however, to the impossibility of stopping street car traffic while this work was in progress, it was very difficult for the filling to become properly set. On one street, during the past summer, where scoria block was substituted for the asphalt, a portion of the pavement between the tracks was laid with concrete. It has been down now some two months, but not long enough to know the result.



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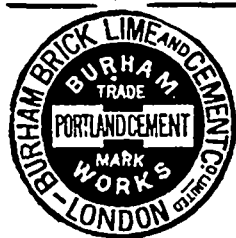
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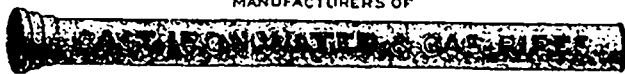
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Common Rubble, per toise, delivered.....	10 00	11 00
Large flat Rubble, per toise, delivered.....	14 00	18 00
Foundation Blocks, per c. ft.	30	50
Granite (Stanstead) Ashlar, 6 in. to 12 in., rise 0.11, per ft.		25
Amherst Red Sandstone, Amherst, N.S., per cu. ft.	1 00	75
Kent Free stone Quarries, Moncton, N.B., per cu. ft.	1 00	95
River John, N. S., brown Freestone, per cu. ft.....	95	95
Port Phillip, N. S. Brown Sandstone.....	90	

" Scorin" Paving Blocks, 8" x 3 1/2" x 5".....	55	
" Scorin" Paving Blocks, 8" x 3 1/2" x 4".....	45 00	
Masilion.....	30 00	
Quebec and Vermont rough granite for building purposes, per c. ft. f.o.b. quarry	40	L.C.
For ornamental work, cu. ft.	40	
Granite paving blocks, 8 in. t. 12 in. x 6 in. x 1/2 in. per M.		50 00
Granite curbing stone, 6 in. x 20 in. per lineal foot.....		70

### CREDIT VALLEY STONE.

F.O.B. Quarries.	
Rub'le, per car of 14 tons... per sup. yard.....	7 00 1 50 to 1 75
Brown Coursing, up to 10 in., per sup. yard.....	60
Brown Dimension, per cub. ft.	1 00
Grey Coursing, per sup. yard	45
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 (1/2 square).	
" red.....	17 50 20 00
" purple.....	8 50 10 00
" unslating green.....	8 50 7 00 8 00
" black.....	7 50 6 50
Terra Cotta Tile, per sq.....	20 00 25 00
Ornamental Black Slate Roofing.....	8 80 6 80

### CEMENT, LIME, etc.

Portland Cements -	
German per bbl.....	2 90 3 10 2 55 2 65
London.....	2 95 3 00 2 25 2 45
Newcas le.....	2 70 3 00 1 95 2 10
" Joseph Bra Portland.....	3 05 3 25 2 70 2 90
" Dyckerhoff.....	3 05 3 25 2 75 2 90
North's "Condor".....	2 95 3 10 2 65 2 80
English, artificial, per bbl.....	2 85 3 00 2 35 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 20 2 25
Farin.....	5 25 5 25 5 75 5 75
Superfine.....	1 25 1 75 8 25 9 00
" Karlsruhe" (German).....	3 05 3 25 2 75 2 90
" Germania" (German).....	3 05 3 25 2 75 2 90
" Keystone" (Belgian).....	2 15 2 30
" Anvil" (Belgian).....	2 05 2 20
" Durham" (English).....	1 95 2 05
Hydraulic Cements -	
Thorold, per bbl.....	1 50 1 65
Queenston, ".....	1 50 1 50 1 60
Napanoc, ".....	1 50 1 50
Hull, ".....	1 50 1 50
Ontario, ".....	1 25

Keene's Coarse "Whites"...	7 50	8 00	6 50	7 00
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 50
Hair, Plasterers', per bag...	50	1 00		0 00

### HARDWARE.

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

Cut nails, 50d & 60d, per keg	2 65	2 65
Steel " " " "	2 75	2 75

CUT NAILS, FENCE AND CUT SPIKES.

40d, hot cut, per 100 lbs....	2 65	2 65
10 to 12d, hot cut.....	2 75	2 75
8d, 9d, " " " ".....	2 80	2 80
6d, 7d, " " " ".....	2 95	2 95
4d to 5d, " " " ".....	3 05	3 05
3d, " " " ".....	3 30	3 30
2d, " " " ".....	3 65	3 65

Cut spikes, 10 cents per keg advance.  
Steel Nails, 1cc. per keg extra.  
Wire nails, 3-4 base price.

### Iron Pipe:

Iron pipe, 1/2 inch, per foot..	6c.	6c
" " 3/4 " " " "	7	7 1/2
" " 1 " " " "	12	12
" " 1 1/2 " " " "	17	17
" " 2 " " " "	24	24
" " 2 1/2 " " " "	30	30
" " 3 " " " "	43	43

### Lead Pipe:

Lead pipe, per lb.....	7c.	25 per cent. ds
Waste pipe, per lb.....	7 1/2	cent. ds

### Galvanized Iron:

Adam's-Mar's Best and Queen's Head and Opollo:	
16 to 24 gauge, per lb.....	4 1/2c 4 3/4c
26 gauge, ".....	4 1/2 5
28 ".....	5 5 5 1/2
Gordon Crown-	
16 to 24 gauge, per lb.....	4 1/2 4 1/2
26 gauge, ".....	4 1/2 4 1/2
28 ".....	4 1/2 5

Note.-Cheaper grades about 1/2c. per lb. less.

### Structural Iron:

Steel Beams, per 100 lbs.....	2 75	2 75
" channels, ".....	2 85	2 75
" angles, ".....	2 50	2 50
" tees, ".....	2 80	2 80
" plates, ".....	2 55	2 55
Sheared steel bridge plate...		1 75