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# CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF  
PUBLIC WORKS • TENDERS •  
ADVANCE INFORMATION •  
AND MUNICIPAL PROGRESS

EVERY SATURDAY

Vol. 3.

Toronto and Montreal, Canada, December 10, 1892.

No. 44

## THE CANADIAN CONTRACT RECORD,

PUBLISHED EVERY SATURDAY

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

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64 Temple Building, Montreal.  
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Information solicited from any part of the Dominion regarding contracts open to tender.

ADVERTISING RATES ON APPLICATION.

At its Convention held in Toronto, Nov. 20 and 21, 1889, the Ontario Association of Architects signified its approval of the CANADIAN CONTRACT RECORD, and pledged its members to use this journal as their medium of communication with contractors with respect to advertisements for tenders.

The following resolution was unanimously adopted at the First Annual Meeting of the Province of Quebec Association of Architects, held in Montreal, Oct. 10th and 11th, 1890. "Moved by Mr. Perrault, seconded by A. P. Duntion, that we the Architects of the Province of Quebec now assembled in Convention being satisfied that the CANADIAN CONTRACT RECORD affords us a direct communication with the Contractors, Resolved, that we pledge our support to it by using its columns when calling for Tenders."

## MANTELS.

Bids are invited until DECEMBER 15TH for Thirty Mantels, Grates, etc., for the new Hospital here.

All information at the offices of

MOORE & HENRY, Architects,  
London, Ont.



## NOTICE TO ARCHITECTS.

Enlargement of St. Lawrence Market.

The Corporation of the City of Toronto hereby offer to architects three prizes, viz.—1st prize, \$500, 2nd prize, \$300, 3rd prize, \$200, for plans, specifications, and estimates of the following work, viz.:

- (1) The remodelling of St. Lawrence Market building by taking away the east and west wings of the southern end of the building
- (2) Remodelling of St. Lawrence Hall, by building a grand stairway, leading from the market to the south end of the hall, and provide public lavatories and other public conveniences.
- (3) Asphalted of the Market Place, together with the streets abutting on the same.
- (4) Providing suitable places in the present City Hall when the same becomes vacant, for selling butter, eggs and poultry.
- (5) The question of the conversion of the Council Chamber into a hall for meetings of agricultural associations, etc.
- (6) The Drill Shed to be also utilized when it reverts to the city, for market purposes.

Architects are not to consider themselves confined to these limits, but may use their own discretion as to best design. Prizes will be awarded for best plan at lowest cost.

JOHN BLEVINS,  
City Clerk.

City Clerk's Office,  
Toronto, November 25th, 1892.

## WANTED,

Well-educated youth as a pupil. EDWARDS & WEBSTER, Architects, 18 Victoria St.

## TENDERS

Will be received by the undersigned for the several trades for the erection of Three Houses on Church St. for Robert Thompson, Esq.

Plans and specifications may be seen at our office or 35 Church Street.

EDWARDS & WEBSTER, Architects,  
18 Victoria Street, Toronto.

## ELECTRIC RAILWAY.

### TENDERS WANTED.

Tenders will be received up to DECEMBER 15TH, 1892, for the erection of poles along the line of the Niagara Falls Park and River Railway. Plans and specifications for the work may be seen at the office of the Canadian General Electric Co., 65 Front St. West, Toronto. Tenders to be addressed to the undersigned company at the above address.

The company reserves the right to reject any or all bids.

THE CANADIAN GENERAL ELECTRIC CO.

## TENDERS WANTED.

Sealed tenders, addressed to the undersigned, will be received until

Tuesday, the 20th December inst.,

for the supply of the whole or any part of the furnishings required for the complete furnishing of the House of Refuge for the County of Oxford. Printed copies of conditions and particulars of requirements may be had by applying to the County Clerk.

JAMES WHITE,  
County Clerk.

Woodstock, Dec. 1st, 1892.

## CONTRACTS OPEN.

HALIFAX, N. S.—The City Engineer has recommended the construction of a number of new sewers.

KINGSTON, ONT.—A number of new cottages will be erected at Carlton Island Park in the spring.

GALT, ONT.—Messrs. Newlands & Co are having plans prepared for the enlargement of their works.

TOTTENHAM, ONT.—An engine house town hall and lock up will be erected for the town at a cost of \$2,000.

VANCOUVER, B. C.—Messrs. H. P. McCraney & Co. contemplate the erection of three large brick warehouses.

SARNIA, ONT.—The ratepayers will be asked to authorize the expenditure of \$1,500 for the purchase of fire apparatus.

BROCKVILLE, ONT.—A special committee of the County Council has recommended the erection of a House of Industry.

LENOXVILLE, QUE.—Mr. Peyton, of Montreal, has made a proposition to the Town Council to construct a system of waterworks.

BELLEVILLE, ONT.—Mr. W. J. Smith, C. E., has prepared estimates for a system of sewerage for the town. The cost is placed at \$150,000.

KNOWLTON, QUE.—Mr. H. S. Foster contemplates the erection of a creamery and cheese factory on the old Lefebvre mill site near the lake.

BRANTFORD, ONT.—The plans for the proposed drill hall have been received from Ottawa. It will be a fine brick structure, the Government contributing \$50,000.

MORRISTOWN, ONT.—It is reported that the Chapman elevator has been purchased by Brockville parties, who will convert it into a factory for the manufacture of doors, sashes and chairs.

ORILLIA, ONT.—The corporation invites tenders until Saturday, the 2th inst., for the construction of the waterworks extension and improvements, the tenderer to furnish his own plans.

PORT ARTHUR, ONT.—Tenders are asked by the Department of Public Works, Ottawa, until the 15th inst., for the construction of a hot water heating apparatus in the public building in this town.

WINDSOR, ONT.—The Windsor Driving Park Association of this town hold a charter for a street railway along Ouellette avenue to the park and a movement has been commenced to have the road built in the spring. It is also proposed to erect athletic buildings at the park.

CALGARY, N. W. T.—At the next session of the Dominion Parliament the corporation will ask for power to build a bridge from the mainland to the island park of the Bow river, to dam the Bow and Elbow rivers for the purpose of creating water powers, and to construct a street railway.

BRAMPTON, ONT.—At a recent meeting of the Council of the County of Peel, the Commissioner on County bridges recommended the building of a new steel bridge over the Etobicoke river, between York and Peel.

LA PRAIRIE, QUE.—The Secretary of the Department of Public Works for the Dominion, will receive tenders until Monday next for the construction of a heating apparatus in the post office building in this town.

PETROLIA, ONT.—E. F. E. Roy, Secretary Department of Public Works, Ottawa, will receive tenders until Thursday, 15th inst., for the construction of a hot water heating apparatus in the public building at this place.

St. JOHN, N. B.—The plans for the proposed grain elevator to be erected by the C. P. R. have been completed and work will be commenced at once. It will be situated on the city property at Sand Point just above the C. P. R. wharf.

PRINCE ALBERT, N. W. T.—At a public meeting held last week, it was decided to ask the Council to submit a by law to the ratepayers for the purpose of raising the sum of \$3,000, as a bonus for the erection of a first-class flour mill.

ALBANY, B. C.—Messrs. Drake, Jackson & Helmcken have given notice of an application to be made to the Legislature at its next session, for an act incorporating a company for the purpose of constructing a system of waterworks at this town, with power to take and convey water from Sprout lake, Central lake, Somass and Stamp rivers, and other lakes or streams within a radius of twenty miles from the centre of the town.

HAMILTON, ONT.—Messrs. F. F. Dalley & Co. have purchased the J. M. Williams Foundry, and will have it enlarged and improved for their business.—The City Council has decided to construct

sewers on the following streets: Cannon street, cost \$1,500; Barton street, cost \$500; Burlington street, cost \$700. The following building permits have been granted: W. H. Woodhouse, two-story brick store, house and barn at the north west corner of Main and Wentworth streets, cost \$1,100; Thomas Lovejoy, two-story brick dwelling on Emerald street, between Wilson and Cannon streets, cost \$1,100.—The Board of Education are considering the question of enlarging the present Collingate Institute or erecting an entirely new building.

MONTREAL, QUE.—It has been decided to ask for designs for the proposed Sir John Macdonald memorial.—The Council of the municipality of Notre Dame de Grace have given the franchise for electric lighting and electric railway to a company represented by Mr. A. I. Corriveau.—At the annual meeting of the Windsor hotel company, held last week, it was decided to expend the sum of \$20,000 in thoroughly overhauling the building.—The nuns of the Sacred Heart have purchased that property of the Dow estate fronting on Alexander street and will erect a magnificent convent on the site.—A prominent Toronto contractor is said to have purchased 50,000 feet of property in Amherst park and is about to build a number of detached cottages upon it.

WINNIPEG, MAN.—The Local Government has decided to proceed at once with the erection of a new court house, to cost \$80,000.—J. W. Cockburn, Chairman Committee on Works, will receive tenders until Thursday, 22nd inst., for the supply of 800 cords of cedar block paving wood.—Tenders have been asked during the past week for the construction of a sewer on Mayfair avenue and Main street south, also for the construction of sewer outlets.—The elevator committee of the grain exchange and the board of trade met on Monday last to discuss the question of the proposed grain elevator. Although nothing definite was decided, it is generally understood that the erection of an elevator of about 1,000,000 bushels capacity will be secured.—On Tuesday, the 20th inst., the ratepayers will vote on the following by laws: To provide the sum of \$100,000 for a new waterworks system, \$54,000 for a new bridge over the Assiniboine river at Main street, and \$10,000 for an overhead passenger bridge to cross the tracks of the Canadian Pacific Railway.—The residence of Sir Donald Smith, which was recently destroyed by fire, will be rebuilt.

VICTORIA, B. C.—The Trustees of the First Presbyterian church have decided to make extensive alterations to the church building. They are also considering the erection of a manse.—Messrs. McPhillips, Wootton & Barnard announce that at the next session of the Legislature application will be made for an act to incorporate a company for the purpose of constructing a line of railway, commencing at Ladreau city at the head of the northeast arm of the Upper Arrow lake, thence through Ladreau pass to some point on the northwest shore of Lake Kootenay.—The Columbia & Kootenay Railway & Navigation Co. will make application at the next session of Parliament to construct and operate a railway from some point on their present line to Revelstoke, and other branches not exceeding 30 miles.

TORONTO, ONT.—Messrs. Post & Holmes, architects, Manning Arcade, have been instructed

to prepare plans for the new ten-roomed Separate school to be erected on Bond street, a site for which has been granted by the Archbishop. It will be situated between St. Michael's Cathedral and Loreto convent.—F. B. Watson, architect, 36 Toronto street, will receive tenders until to-day (Saturday) for the erection of a pair of semi-detached brick and stone dwellings.—Mr. H. A. Massey has made a proposition to donate the sum of \$100,000 towards the erection of a large music hall, providing the city would guarantee the cost of maintenance. A site has been purchased at the corner of Victoria and Shuter streets, on which it is expected a fine building will be erected.—A deputation from Huntsville, Muskoka, interviewed the Commissioner of Public Works for Ontario recently asking for a canal and slide between Lake of Bays and Peninsula lake, a distance of three quarters of a mile. The cost is estimated at \$40,000.—The site is being prepared for the new buildings to be erected on Yorkville avenue by the Toronto Street Railway Company. The work of erection will be commenced in the spring.—The old Presbyterian church on Charles street is being pulled down, and a number of residences will be erected on the site thereof.—The Street Railway Company have stated their intention of having all the lines operated by electricity next year. This will necessitate the paving of some 30 miles of track, at a cost of \$300,000.—On the 29th inst., the ratepayers will vote on a by-law to provide for the issue of debentures to the amount of \$57,600, for the purchase of sites and erection of school buildings.—Mr. R. Lamb has purchased the property on the north-east corner of York and Wellington streets upon which stands the residence until recently occupied by Dr. Thornburn. It is expected that new buildings will be erected thereon.—Building permits have been granted as follows: Mrs. Clarke and Mrs. Cuttle, 71 Sully street, pr. s. d. two story and attic bk. dwellings, w. side Beatrice street near Arthur street, cost \$6,000. W. D. Hurd, pr. one story mansard b. f. dwellings, n. side Reid street, cost \$1,000. Western Manufacturing Co., large 1 story brick factory, s. side King street at subway, cost \$18,000.

### FIRES.

The residence of Peter Duncan, near Bridgen, Ontario, was destroyed by fire on Tuesday last. The loss is estimated at \$2,000, which is partly covered by insurance.—Ireneau's planing mill and sash factory, corner Papineau road and Rachel street, Montreal, was damaged by fire to the extent of \$4,000.—Ogilvie's large grain elevator at Virden, Man., was burned on the 5th inst., with all its contents.—G. R. Perry's block at Simcoe, Ont., was totally destroyed by fire on the 3rd inst., entailing a loss of \$20,000, insurance, \$14,000.—The Jewish synagogue at Winnipeg, Man., has been totally destroyed by fire.

### CONTRACTS AWARDED.

BLTHIK, ONT.—Messrs T. Kelly & Son have been awarded the contract for lighting the streets with electric light.

MOOSEJAW, N. W. T.—Mr. John Simmons, of Regina, has been awarded the contract for building the new court house in this town.

MONTREAL, QUE.—The Harbor Commissioners have accepted the tender of Mr. R. McIntyre of Calumet for the supply of 340,000 feet of hemlock plank required for next season's work.

NEW WESTMINSTER, B. C.—The Maple Ridge Dyking Commissioners have awarded the contract for dyking 9,000 acres of land, to T. W. Patterson, of Victoria. The contract price is between \$50,000 and \$60,000.

MAGOG, QUE.—Messrs. A. H. Moore & Co. have been awarded the contract for the D. C. M. Company's new warehouse and are preparing the site for the same. The same firm have also received the contract for the erection of a new terrace for the company, and will begin operations in the spring.

LONDON, ONT.—The following are the successful contractors for the erection of the pork-packing establishment for an English firm, represented by Messrs. Webb and Genge—masonry, Joshua Garratt; carpentry, Wright & Durand; iron work, Mr. Stevely; plumbing, Mr. Dennis. The total cost will be in the neighborhood of \$30,000.

### BEAMS AND GIRDERS.

It is often necessary to decide quickly what sort of girder or beam shall be used over a bay window or shop front, or across any wide span. Too many architects neglect to calculate the required strength, and so fail in some cases to economize materials. To ascertain the required strength, we should first estimate the amount of walling, whether brick or stone, which the beam will have to carry. Remembering that when the load is evenly distributed the beam will carry twice as much as when it is concentrated in the middle, we shall guard against taking the amount of walling, deducting the window openings, and then regarding the net amount of walling as an evenly distributed load. When there is a central pier between the windows, it is obvious that a large proportion of the weight comes upon the centre of the beam, and ought to be provided for. A safe and sufficiently accurate plan is to regard such a pier as being concentrated upon the centre of the beam, and to take all the rest of the walling as an evenly distributed load. A rough estimate of the weight will do, and whether the walling is of brick or stone it may be calculated as 1 cwt. per cubic foot.

Next we have to consider what the beam will carry besides the walling which rests upon it. It will have to carry its share of any floor whose joists take their bearing upon the beam itself or upon the wall when it carries. Half the entire load upon any such floor will be carried as a distributed load upon the beam. For the weights per square foot which floors should be calculated to sustain, including the weight, in each case, of the floor itself, Hurst's "Handbook" gives the following: Ordinary dwelling-house floors, 1½ cwt.; public buildings, etc., 1½ cwt.; and warehouses, factories, etc., 2½ cwt. to 4 cwt. Now in the opinion of some experienced architects, these weights are excessive; however, it should be remembered that the weights upon a floor are partly moving weights, and produce more strain than the same weights would if stationary. Viewed in this light, the weights quoted above cannot, we think, be deemed excessive. Next we have to consider what roofing abuts upon the wall carried by the beam. We shall probably have a sloping surface of roof, one half of which is supported by a purlin or a ridge, while the other half rests upon the wall. The weight of this latter portion may be calculated at 40 lb. per square foot, to include the weight of timbers and roofing, with all necessary allowance for occasional stress caused by weight of snow and high winds.

Having made these preliminary calculations, we have to decide what sort of beam will serve our purpose. Suppose we require a beam to carry a 13½ in. wall over a 10 ft. opening, the total distributed load upon the beam being six tons. Reckoning the safe load upon a beam at one-fifth of its breaking weight, we shall find by the usual calculation for fir, that three pieces 10 in. by 4 in. bolted together will exactly do the work. Giving each end of the beam a bearing of 1 ft. 3 in., and allowing for ¾ in. wrought-iron bolts, 14 in. long, and not less than 18 in. apart, we shall find that we have 10½ cubic feet of timber, and 10 bolts weighing, with their heads and nuts, 23 lbs. If the timber costs 2s. 3d. per foot cube, including delivery and fixing, and the bolts 1d. per pound, our beam would cost us 25s. 6½d. The same weight could be carried by two rolled iron joists, each 7 in. by 2½ in., weighing 14 lb. per foot run, placed side by side, 6 in. from center to center. If these could be supplied and fixed at 8s. 6d. per cwt., they would cost, if the same length as the beam, 26s. 6d. There would have to be a cover-stone, which might be dispensed with in the case of a beam so that the latter would in this instance be preferable.

If we suppose the distributed load to be 12 instead of six tons, the same fir beam, in three sections bolted together as described, will do, with the addition of two ½ in. wrought-iron fitches in between the sections of the beam. These fitches

should be 1 in. less deep than the beam, so that the timber may shrink a little without throwing the whole weight upon the iron, which would have a disastrous effect upon the brickwork. There would therefore be 18½ ft. super of ½ in. iron plate, weighing 20½ lb. per foot, which would amount to 3 cwt. 44 lb., and, if priced at 8s. per cwt., would cost about 27s. Then we have to allow for drilling 20 bolt holes, at, say, 4d. each—amounting to 6s. 8d.; so that the timber, fitches, and bolts complete, would cost £2. 19s. 2½d.—say, £3. The same weight could be carried by two 6 in. by 5 in. rolled joists, weighing 29 lb. per foot run each, and costing £2 15s. 4d., at 8s. 6d. per cwt.—*Contract Journal.*

### CARPENTRY.

**PARTITIONS.** In modern carpentry there is no part of a building so much neglected as the partitions. A square of partitioning is of considerable weight, seldom less than half a ton, and often much more, therefore a partition should have an adequate support; instead of which it is often suffered to rest on the floor, which, of course, settles under a weight it was never intended to bear, and the partition breaks from the ceiling above.

A partition should, if practicable, be supported by the walls with which it is connected, in order if the walls settle that it may settle with them. This would prevent the separation of the plastering at the angles of the room. For the same reason a firm connection with the ceiling is an important object in the construction of a partition.

**DESIGNING JOINTS.** In designing joints the following principles, as laid down by Professor Rankine, should be considered:—

1. To cut the joints and arrange the fastenings so as to weaken the pieces of timber that they connect as little as possible.

It is through a knowledge of the composition and resolution of forces alone that the carpenter can expect to arrive at excellence in the art of designing frames of timber, for the purposes of building for machines and other uses, and without this knowledge it would be impossible for him to understand clearly what is to be aimed at in such designs or even to know if a design of his own would answer its intended purpose or not. The strength to resist a weight that will produce fracture is as the area of the section consequently, multiply the area of the section in inches by the weight that will tear asunder a bar an inch square of the same kind of wood, and the product will be the weight in pounds that the piece will just support. But the greatest constant load any piece should be allowed to sustain ought not to exceed one-fourth of this. The same rule applies to iron and to the cohesion of timber when it is pulled asunder at right angles to the direction of the fibers.

2. To place each abutting surface in a joint as nearly as possible perpendicular to the pressure which it has to transmit.

3. To proportion the area of each surface to the pressure which it has to bear so that the timber may be safe against injury under the heaviest load which occurs in practice, and to form and fit every pair of surfaces accurately, in order to distribute the stress uniformly.

4. To place the fastenings in each piece of timber so that there shall be sufficient resistance to the giving-way of the joints by the fastenings shearing or crushing their way through the timber.

**SCARFS.** With respect to the length of scarfs, this will depend on the object in view, and force causing the fibers to slide upon each other must be considered by adopting a long table. The bolts may be increased in number, and the cohesive strength of a compound piece is not diminished, but the transverse is affected. For soft woods, as fir, a scarf of a length of about four times the depth of the timber has been recommended when there are joints and bolts, and for hard wood twice the depth if bolts are omitted. The scarfing may be twelve times for soft wood, and six times for hard wood.

## MUNICIPAL DEPARTMENT.

### LEGAL DECISIONS AFFECTING MUNICIPALITIES.

**MASON V. TOWN OF PETERBORO.**—Counsel for the defendant, moved for judgment of non suit subsequent to disagreement of the jury in an action for damages for injuries to plaintiff resulting from a fall caused by slipping on a sidewalk in the town of Peterboro'. The plaintiff alleged that the accident was caused by an inequality in the sidewalk, one board sloping from the level to the extent of from three-quarters of an inch to an inch and one-half as variously estimated. The defendants contended that such a degree of inequality could not be held sufficient to make them liable for negligence. Motion dismissed with costs.

**VILLAGE OF NEW HAMBURG V. COUNTY OF WATERLOO.** This was an appeal from the judgment of the Queen's Bench Divisional Court (22 O. R. 103), reversing the judgment of Ferguson, J., which was in favor of the plaintiffs, and dismissing the action, unless the plaintiffs elected to have a new trial. The action was brought for a mandamus to compel the defendants to repair a bridge over the river Nith in the village of New Hamburg. The plaintiffs contended that it was a bridge which the county corporation were bound to build and repair, as the river was over 100 feet in width. The court below held that the place at which the width of a stream is to be ascertained is the place at which the bridge crosses it; the width is to be determined by the width of the natural channel of the stream, taking it in its highest ordinary rate.

### ELECTRICAL RAILWAYS IN SMALL TOWNS.

The stupendous growth of the modern street railway is often pointed out, so often in fact that investors are beginning to fear that the business of organizing companies for the purpose of building electric railways is almost being overdone. Nothing can be more important, in deciding beforehand the desirability of a street railway in a certain town, than a knowledge of about what proportion of that population are likely to be regular patrons of the intended road and how many passengers are needed per annum to make the investment pay.

The commercial benefits that a new street railway brings to a growing town are so well known as not to need mention, and the practical aspect settles itself into the question as to how small a town would be profited by the building of a street railway. In treating this it is necessary to know just what part of the population are likely to ride daily. The following figures, which have been carefully prepared, will show what past experience has proved. The average of nine towns with a population ranging from 3,500 to 18,000 shows that each person takes on an average 29 rides per annum. It has been estimated by such able engineers as Mr. Crosby that, in order to pay 5 per cent. on the investment, an electric car must earn an average of 15 cents per mile. At a fair rate of paying expenses this would require about 3 or 4 passengers per mile. With the low average of 110 miles per car per day about 400 passengers would thus be needed to make the road pay. If a population of a certain town be 12,000, according to the above figures 348,000 fares would be collected per annum, and this would support no more than 2

MUNICIPAL ENGINEERS, CONTRACTORS, AND MATERIALS.

cars regularly. By the same average, a population of 20,000 would support three cars in such a way as to earn 5 per cent. on the capital invested, the calculation including cost of building and equipping a new power station. Nearly every town that would be included in the above list already has an electric lighting station, and almost always has two or three streets that would yield a heavy traffic; thus a plant already in operation would strike off from the expenses of the above estimate the cost of power house and nearly all its effects, with the exception of generating equipments and possible increase in boiler and steam plant. There are in the United States more than 250 towns with a population ranging from 8,000 to 20,000, a very small fraction of which have a street railway installation. It is not to be wondered at, then, that the present electric lighting equipments are made use of by investors seeking a profitable return. We think the hue and cry that trolley roads are becoming overestimated would be less frequently heard if all of the advantages which street railways bring with them were also taken into account.—Street Railway Gazette.

A decision of the Supreme Court, of Washington, in regard to street grading in Tacoma is attracting considerable attention in the Pacific coast press. In effect it is that streets must follow the natural contour of the land, and that if highways cannot be made without cuts or fills which would damage abutting lands by reducing their value, the improvement should not be undertaken unless abutting owners waive damages or public necessity will justify paying the cost of the lower or higher grade.

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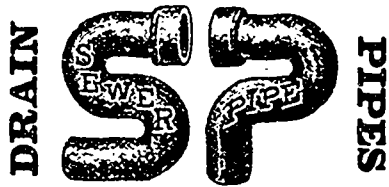
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WELLAND CANAL ENLARGEMENT, RESIDENT ENGINEER'S OFFICE, WELLAND, April 17th, 1884.

JOHN BAILEY, Esq., Thorold

Dear Sir,— Yours of yesterday, relative to Thorold Hydraulic Cement, is received. In reply, I beg to say that my tests of the Thorold Hydraulic Cement have extended over a period of twenty-eight years, and have been on a large scale, as exemplified in the locks, bridges, culverts and other masonry on the Welland Canal and Welland Railway, and that the record, which has been invariably satisfactory, is to be found in examination of the structures. The necessary tearing down of masonry and concrete, during the Welland Canal Enlargement, has afforded abundant evidence of the reliability of the Thorold Hydraulic Cement, both in masonry and concrete, and above and under water. I desire no better cement for the class of work referred to.

I am, dear sir, yours truly,

W. G. THOMPSON, Resident Engineer.

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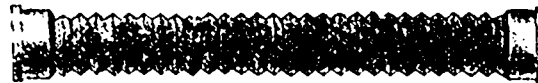
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