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CANADIAN CONTRACT RECORD

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

EVERY WEDNESDAY

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

VOL. II. JANUARY 2, 1901 No. 48.

THE CANADIAN CONTRACT RECORD,
PUBLISHED EVERY WEDNESDAY
As an Intermediate Edition of the "Canadian Architect and Builder."

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

G. H. MORTIMER PUBLISHING COMPANY
of Toronto, Limited,
Publishers.

CONFEDERATION LIFE BUILDING, TORONTO.
Telephone 2362.

Branch Office:
Imperial Building, Montreal.
Telephone Main 2299.

Advertising Rates on application.

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

Notice to Contractors

Sealed tenders, addressed to the undersigned, will be received up to 12 o'clock, noon, on MONDAY, JANUARY 28, 1901, for the Construction of a

BRICK CHURCH BUILDING

for the Presbyterian Congregation, Brandon, Man. Plans and specifications and full information as to conditions of tendering and form of contract may be obtained at the office of W. H. Shillinglaw, Architect, City Hall, Brandon, on and after Thursday, December 20. The lowest or any tender not necessarily accepted. Tenders for Steam Heating, Seating and Leaded and Plain Glass will be called for at a later date.

J. McDIARMID, M.D.,
Chairman of Building Committee.
Brandon, 23rd Dec., 1900.

Town of Pictou, N. S., Water Works

TO CONTRACTORS

PROPOSALS FOR

STAND PIPE

Sealed proposals, endorsed, "Proposals for Stand Pipe for the Town of Pictou," will be received at the office of the Town Clerk in Pictou, Nova Scotia, until 4 o'clock p.m. on FRIDAY, THE 18TH DAY OF JANUARY, A.D. 1901.

The amount of security required will be fixed by the Mayor and Council after the bids are opened, said amount to be not less than one-fourth nor more than one-half of the amount of the contract.

The Mayor and Council also expressly reserve the right to reject any or all bids should they deem it for the interest of the Town of Pictou to do so.

Specifications may be obtained of the undersigned Town Clerk, or of the engineers, Lea & Coffin, 53 State Street, Boston, Mass. by sending a deposit of two dollars for each specification, which deposit will be returned to any party making a bona fide bid accompanied by the cheque.

By order of the Town Council

FRED MACKRACHER,
Town Clerk.

Pictou, N.S. Dec. 29th, 1900.

TENDERS

The South Branch of the North Castor River, Silver Creek and Wylie Creek Drainage Work.

Sealed tenders, addressed to J. H. Moore, Civil Engineer, Smith's Falls, Ont., and designated "Tenders, Silver Creek," are invited up to one o'clock p.m. of SATURDAY, JANUARY 27TH, 1900, for the removal of earth, rock, and other obstructions from the streams known as "The Wylie Creek," "The Silver Creek," and "The South Branch of the North Castor River," together with the construction of new channels in connection with the above, all within the Townships of Mountain and Osgoode.

Parties tendering are requested to do so in each or all of the following ways:

1.—By stating a lump sum for which they will complete the whole work required within the Township of Mountain, also by stating a lump sum for which they will complete the whole work required within the Township of Osgoode.

2.—By stating a lump sum separately for each of the five sections.

(a) The Wylie Creek Branch, Station "O" to Station "43 x 40."

(b) The Silver Creek Main Drain from Station "O" to Station "276 x 85."

(c) The South Branch of the North Castor River from Station "276 x 85" to "338 x 13."

(d) The South Branch of the North Castor River from Station "338 x 13" to Station "719."

(e) Rock Excavation, price tendered to be per cubic yard, between Station "667" and Station "677."

3.—By stating a lump sum for sections as follows

Wylie Creek Branch, Station "O" to Station 20	20	43 x 40
Silver Creek Main Drain, Station "O" to Station 20	20	40
" " " " " " " " " " " "	40	60
" " " " " " " " " " " "	60	80
" " " " " " " " " " " "	80	100
" " " " " " " " " " " "	100	120
" " " " " " " " " " " "	120	140
" " " " " " " " " " " "	140	160
" " " " " " " " " " " "	160	180
" " " " " " " " " " " "	180	200
" " " " " " " " " " " "	200	220
" " " " " " " " " " " "	220	240

The South Branch of North Castor River, from Stations "276 x 85" to Stations "338 x 13," "338 x 13" to "719."

The Rock Excavations Stations "667" to Stations "677."

The tenders shall include the cost of everything necessary to complete the work according to the plans and specifications. Each tender must be accompanied by an accepted cheque amounting to 5 per cent. of the tendered price, made payable to the order of the Municipality of the Township of Mountain, for the portions of work lying within that Township. Where the work lies in the Township of Osgoode the cheques shall be made payable to the order of the Municipality of Osgoode. The cheques will be returned to those whose tenders are not accepted, and will be forfeited by those whose tenders are accepted and who decline to enter into the contract.

Plans and specifications may be seen at the offices of Hugh Martin, Esq., Township Clerk of Mountain, Hallville P.O.; Frank Iveson, Esq., Township Clerk of Osgoode, Metcalfe, G. H. Ferguson, Esq., Solicitor for Mountain, Kempville, G. F. Henderson, Esq., Solicitor for Osgoode, Ottawa, and J. H. Moore, C. E., Smith's Falls, Engineer for Mountain and Osgoode.

The lowest or any tender not necessarily accepted

J. H. MOORE, O.L.S., C.E.

Smith's Falls, Dec. 19th, 1900.

Mention the CONTRACT RECORD when figuring on municipal works advertised in this paper.

CONTRACTS OPEN.

GLENELLA, MAN.—Ed. Ramsay will build a store here.

COATICOOK, QUE.—There is some talk of the erection of a skating rink here.

PHOENIX, B.C.—It is expected that the city hospital will be built next spring.

FESSERTON, ONT.—Josiah Kean intends converting his saw mill into a stave mill.

ANNAPOLIS, N.S.—The ratepayers have decided to take over the electric light plant.

ALGONQUIN, ONT.—Hugh Walker is preparing to build a large addition to his dwelling.

FORT LAMBERTON, ONT.—Capt. Young has commenced work on the building of a new house.

BRANTFORD, ONT.—A movement is on foot to establish another binder twine factory here.

SAULT STE. MARIE, ONT.—C. E. Culhs is excavating for a new store to be built immediately.

PARRY SOUND, ONT.—The Conger Lumber Co. are preparing to erect a new brick engine house.

SEAFORTH, ONT.—J. E. Crealey purposes erecting a creamery building here, 45 x 65 feet in size.

AVLMER, QUE.—The council is at present moving in the direction of securing a fire alarm system.

RENFREW, ONT.—Alex. Fraser wants tenders by January 7th for carpenter work of Methodist parsonage.

BANCROFT, ONT.—The Rathbun Co., of Deseronto, are said to be considering the erection of a pulp mill here.

HANOVER, ONT.—It is said that Knechtel & Co. are undecided as to the rebuilding of their furniture factory.

AURORA, ONT.—James McDougal, C. E., is making another survey of the Schomberg-Aurora electric railway.

TWEED, ONT.—R. Sayers, president Victoria Cheese Co., desires tenders by 8th inst. for carpenter work of new factory

BRACEBRIDGE, ONT.—The planing mill and wood-working factory of J. D. Shier will be enlarged during the winter

VANCOUVER, B.C.—Work is about to be commenced on the contemplated improvements to Evans, Coleman & Evans' wharf.

CLINTON, ONT.—Over \$7,000 has already been subscribed for the new Methodist church to replace the Rattenbury building.

DARTMOUTH, N.S.—The council will apply to the local legislature for authority to borrow \$40,000 for electric lighting purposes.

WESTON, ONT.—A public meeting will be held this week to organize a pork packing company. The proposed capital is to be \$150,000.

WINGHAM, ONT.—A by-law to grant a bonus to Galt & Bullock to establish a brass foundry here was carried by the ratepayers last week.

HALIFAX, N.S.—A report is current that a company is being formed to establish works here for the manufacture of water and gas pipes, etc.

BROCKVILLE, ONT.—During this year the provincial government intends to have the asylum lighted by electricity. It is possible that a plant may be installed.

CARLETON PLACE, ONT.—It is expected that the by-law to grant a loan of \$10,000 to Findly Bros. to assist them in extending their stove works will receive the assent of the ratepayers.

LONDON, ONT.—William Wyatt has taken out a building permit for a double residence on Talbot street, and H. E. Boomer one for a brick residence on Colborne street.

CAMPBELLTON, N. B.—Chas. F. Fawcett, of Sackville, is negotiating for taking over the lines of the Campbellton Telephone Co. and extending the long distance system northward.

STURGEON FALLS, ONT.—Representatives of waterworks supplies have been in town recently in connection with supplying material for the waterworks system to be built here next spring.

ST. JOHN, N. B.—A. George Blair, jr., will apply to Parliament for permission for the Harbor Bridge & Railway Co. to erect a railway and general traffic bridge across the harbor.

PORT HOPE, ONT.—At the last council meeting, a motion was read from the Peterborough Navigation Co. regarding a proposed electric railway between Port Hope and some point on Rice Lake.

KEEWATIN, ONT.—The annual meeting of the Keewatin Power Co. will be held in Ottawa on January 9th, when it is expected some definite announcement will be made regarding the building of a pulp mill at Norman.

DANVILLE, QUE.—The council are in favor of granting a loan of \$20,000 to a company intending to erect a paper mill in the township of Shipton. The ratepayers will vote on the by-law on January 19th.

WINDSOR, ONT.—The Windsor, Essex, Lake Erie & Chatham Railway Co. will apply to Parliament for a charter to build a steam or electric railway from this city to Leamington and Chatham, also to construct wharves, piers and docks.

REGINA, N.W.T.—J. S. Dennis, Deputy Commissioner of Provincial Public Works, invites tenders up to January 15th for the construction of the sub-structure for a bridge to be built across Elbow river at the Mission crossing, Calgary.

COLLINGWOOD, ONT.—The Council has given notice of its intention to construct cement sidewalks along the east side of Pine and Peter streets, south side of Fifth, Huron and Simcoe streets, and north side of Fourth street, cost \$2,760.

OWEN SOUND, ONT.—R. L. F. Strathy is reported to have decided to establish a large factory here for the manufacture of wire fencing. The building to be erected will be 50 feet wide, about 120 feet in length and two stories high. The capital stock will be placed at \$200,000.

ST. CATHARINES, ONT.—A by-law will be submitted to the ratepayers on January 21st to grant a bonus of \$30,000 to Galt & Bullock, who propose establishing a foundry here for the manufacture of valves, etc., and agree to erect a building and plant to cost \$50,000.

ROSSLAND, B. C.—The C. P. R. have decided to extend a branch line into the Lardeau country during the current year.—Engineers are at work preparing plans

for developing additional water power at Bonnington Falls for the West Kootenay Power & Light Co., and the contracts are about to be let for additional machinery.

SYDNEY, C. B.—Messrs. Price Bros., John Day and others have formed a company to build lime kilns near Parson's bridge.—American capitalists have acquired large timber areas near North river, Victoria county, and are about to erect pulp mills. The syndicate will be known as the North River Lumber and Pulp Works.

LINDSAY, ONT.—The Board of Trade have petitioned the Minister of Railways and Canals to improve the navigation of Scugog river by repairing the lock and dam at Bobcaygeon. The question of taking steps to secure the erection of a summer hotel at Sturgeon Point is also under consideration by the Board of Trade. An offer to assist the project has been made by the G. T. R.

KINGSTON, ONT.—Fifteen architects submitted plans for the new buildings for Queen's University. It has been decided to accept the plans of Power & Son, of this city.—Next spring an additional story will be built to the Queen's Medical building in which three new class rooms will be fitted up.—John Sutherland, of Ottawa, is forming a company to establish a dairy plant here to cost \$25,000.

CHATHAM, ONT.—J. L. Wilson & Son, architects, invite tenders up to Friday, 4th inst., for the erection of a brick church near Pardoville.—Superintendent Jones has presented to the water commissioners a report on the cost of extending the mains throughout the city. He gives the total length of proposed extensions as 46,261 feet, and the cost \$22,479.17. The commissioners have filed the report.

NEW WESTMINSTER, B. C.—The provincial government is about to build a dyke and ditch across Lulu Island.—A. Ewen, president of the Victoria & Eastern Railway Co., states that it is the intention to commence construction as soon as the first permanent board of directors is elected, which will likely be in February. It is intended to build a bridge over the Fraser river, which will cost about \$600,000.

OTTAWA, ONT.—J. A. Cameron, J. C. Edwards, Hiram Robinson and others have formed the Ottawa and Hull Power & Manufacturing Co., the object being to manufacture lumber, pulp, paper, etc., and to develop water powers.—A pulp mill will be erected on the site of the Hull Lumber Co.'s mill at the Chaudiere.—In connection with the proposed railway, Galeita, to a point on the Pontiac and Pacific Junction railway, it is the intention to build a bridge over the Ottawa river.

NANAIMO, B. C.—A gentleman in town has offered to donate \$2,000 towards refurbishing the gymnasium of the Nanaimo Athletic and Literary Club. The city clerk has been instructed to issue \$125,000 of debentures for taking over the waterworks plant. In connection with the proposed establishment of a submarine long distance telephone line to Victoria, two routes are proposed, one from English Bay to Nanaimo via Babrial Island, a distance of 26 miles, and the other from Port Roberts to Sidney. It is estimated that the proposed line will cost \$100,000.

TORONTO, ONT.—J. Bairstow, 41 Essex street, wants tenders from all trades for erection of two story brick house.—The Consumers Gas Co., Toronto street, want tenders by January 4th for supply of between 2,000 and 2,500 tons of lime to be delivered 1901.—The committee appointed to report upon the necessary improvements to the Scottish Ontario & Manitoba Land Co.'s bridge in Rosedale are about to make a preliminary inspection

and estimate of cost of strengthening it to make it safe for the crossing of trolley cars.—It is said that the Canada Foundry Co. have decided upon the erection of a large machine shop and foundry next spring, the site for which has not yet been selected.—John Ewing will erect three brick dwellings at 135-137 North Beaconsfield avenue, to cost \$5,000.

VICTORIA, B. C.—Robertson & Robertson will apply to Parliament for the incorporation of a company for the transmission of electric power and the construction and operation of telephone lines within the districts of Esquimalt, Victoria City, and North and South Victoria.—The Chief Commissioner of Lands and Works has invited tenders for a school room at South Vancouver.—The plans for the Paardeberg Gate Memorial, referred to in last issue, were prepared by F. M. Rattenbury. The cost is estimated at \$25,000.—Information has been received that the Alaska Exploration Co., a syndicate capitalized in England, has laid plans before the Yukon council for the building of a million dollar line of street railways through the main street of Dawson and out to the creeks, while the Alaska Commercial Co. propose to build machine shops and boat building plants.

WINNIPEG, MAN.—The city engineer has estimated the cost of constructing a sewer on Furby street at \$3,139.—President Cameon, of the Rat Portage Lumber Co., states that his company have definitely decided on the construction of a large saw mill in this city.—Manager Whyte, of the C.P.R., when in the city last week, stated that no extensions to the railway would be built in the province this year. A large expenditure would be made in improving the main line road-bed across the prairies, and substantial gravel ballast would be put in on the entire transcontinental system. For this work about \$125,000 will be spent. There would also be a large expenditure, he stated, for strengthening bridges with steel superstructures and abutments. A new tunnel will be built at the loop on the west slope of the Rockies, and the British Columbia lines will be extended. Mr. Whyte said that the contract would likely be let in a few days for the new bridge over the Red river to replace the Louise.

FREDERICTON, N. B.—B. F. Pearson and Chas. Burrill, directors of the Dominion Iron and Steel Co., last week interviewed the New Brunswick Government regarding the establishment of a ship building plant. It is expected a subsidy will be granted.—Hon. C. H. LaBillois, Chief Commissioner of Public Works, is calling for tenders for the following bridges: Rockwell bridge, Burton, Sunbury county; King's bridge, over Swan Creek, Burton; Bairdsley Creek bridge, Burton; Gilchrist bridge, Northfield, Sunbury county; Stillwater bridge, over Digdeguash river, St. Patrick, Charlotte county; Vincent bridge, Greenwick, Kings county; Dumbarton bridge, over Digdeguash river, Dumbarton, Charlotte county; Ryan bridge, Eldon, Restigouche county; Copeland bridge, Addington, Restigouche county; steel superstructure Taylor's mill dam bridge, Rothesay, Kings county; steel superstructure Narrows bridge, Victoria county; steel superstructure St. Louis bridge, St. Louis, Kent county, and the steel superstructure of Upper Corner bridge, Sussex, Kings county.

MONTREAL, QUE.—His Grace Archbishop Bruchesi has pointed out the necessity of a larger and more modern building for Notre Dame hospital.—It is said that the new Bank of Montreal building will cost about \$750,000.—L. McFarlane, solicitor, has given notice that application will be made for a charter of incorporation for the Canada Cold Stor-

age Co., to construct and operate cold storage plants.—The water committee have decided to ask the city council for an appropriation of \$153,377 for the year 1901, to include the following items: Aqueduct, \$3,000; wheel house, \$2,494; engine house, \$11,475; pipe track, \$900; reservoirs \$2,075; engine house, \$5,800; distribution pipes, \$29,100; meters, \$3,824; public fountains, \$1,200; hydrants, \$8,085; shop, Lagouchetiere street, \$5,725; shop, St. Gabriel Ward, \$2,060; St. Jean Baptiste Ward shop, \$1,950; office, Hochelaga Ward, \$908.—Building permits have been issued as follows: C. Ladouceur, two storey building, St. Andre street, cost \$1500; Lake of the Woods Milling Co., one storey warehouse, St. Denis street, cost \$25,000, architect, Hutchison & Wood; C. Gravel, three two storey houses, 61 Dorchester street, cost \$2500.

FIRES.

Hill's bakery and McFadden & McQuade's stove store, at Collingwood, Ont.—Warehouse of Watt, Scott & Goodacre, 22 St. Francis Xavier street, Montreal, damaged to extent of \$6,000.—Building at Roland, Man., owned by Frederick Smith, totally destroyed.—Four storey brick building at 33-37 Pearl street, Toronto, occupied by the Adamson Moulding Co., and owned by the Toronto Mortgage Co.; loss on building \$1,000, on stock \$10,000.—Residence of Douglas Maine, at Regina, N.W.T.—Fire at West Lorne, Ont., on December 30th, destroyed \$100,000 worth of property. Burned buildings include McColl Bros., grocery store, H. J. Hale's, butcher shop, J. Keifer's bakery, Mrs. Alton's millinery, the post-office, the telephone office, P. J. Lindenman's general store, Shippey Bros.' tailor shop, Harvey & Jamieson's drug store, Duncan McKillop's residence, E. Cahill's carriage shop and Hugh McCallum's residence.

CONTRACTS AWARDED.

WINGHAM, ONT.—A contract has been let for erection of new Methodist church to cost \$14,000.

VICTORIA, B. C.—The contract for improvements to the Rock Bay school house has been let to H. R. Sellick.

NEW WESTMINSTER, B. C.—Excavation and laying of foundation for new block for Dr. A. J. Holmes: Wm. Cooper, contractor.

WINNIPEG, MAN.—The tender of W. F. Lee, at \$1,555, has been accepted for the construction of sewer on Flora river and Schultz streets.

SHAWINIGAN FALLS, QUE.—It is reported that W. J. Hill, M.P.P., of Toronto, has secured the contract to build a pulp mill at this place for a Belgian syndicate.

TORONTO, ONT.—The city engineer's department have reported to the council that the totals of the tenders submitted for sewer pipe, figured upon the basis of the pipe used last year, are as follows: Ontario Sewer Pipe Co., \$6,251.25; Toronto Pottery Co., \$6,810.96; J. New & Co., \$7,039.85. The tender was awarded to the lowest tenderer.

OTTAWA, ONT.—The Ottawa Produce Co. have let contracts for their cold storage building as follows: Brick and stone work, Mr. McEvela; painting and glazing, Wm. Howe; carpenter work to be done by day labor.—The Ottawa Improvement Commission last week let the following contracts: 4,300 cubic yards of earth filling to Louis Carisse, of 299 Clarence street, at 50 cents per cubic yard; 4,000 toise of rubble stone, to same contractor, at \$4 per toise.

VANCOUVER, B. C.—A. Wallace, of his city, has secured the contract from the Dominion Government for building a

rge cruiser to be used on the Pacific coast; price, between \$60,000 and \$70,000. The contract for a small cruiser to cost about \$8,000 has been secured by the Albion Iron Works, of Victoria.—Mr. Choate, formerly bridge inspector for the C.P.R., has secured the contract for building the Vancouver and Lulu Island railway bridge over False Creek, which will be 1,900 feet in length, with steel draw in the centre.

BIDS.

BRACEBRIDGE, ONT.—Only one tender was received by the council for power extension work, that of C. W. Dill, whose tender was \$12,215 with pine timber dam, \$11,850 with hemlock, or \$21,930 for concrete dam, he agreeing to take over supplies and plant on hand. The council have decided to do the work by day labor.

DURABLE WOODS.

In some tests made with small squares of various woods buried 1 in. in the ground, the following results were obtained: Birch and aspen decayed at three years; willow and horse chestnut in four years; maple and red beech in five years; elm, ash, hornbeam, and Lombardy poplar in seven years; oak, Scotch fir, Weymouth pine, and silver fir decayed to the depth of 1/2 inch in seven years; larch, juniper and arbor vitæ were uninjured at the expiration of seven years. In situations so free from moisture that they may be called practically dry the durability of timber is almost unlimited. The roof of Westminster Hall is more than 450 years old. Scotch fir has been found in good condition after a known use of 300 years, and the trusses of the roof of the basilica of St. Paul, Rome, were sound and good after 1,000 years of service.

THE WORK OF A REFUSE DESTRUCTOR.

Some interesting results as to the work of refuse destructors are given by Engineering. The plant in question is a 12-cell Horsfall destructor, and the duration of the test was 278 hours; the fuel was midden, market, and dry refuse, and 12 furnacemen and six chargers were engaged. The total quantity of refuse burnt was 1,293 tons, or 9.3 tons per cell per 24 hours. This was equal to 34 lbs. per square foot of grate per hour, the cost for labor per ton destroyed being 9d. There was evaporated by the boilers 743 lb. of water per pound of refuse; but the boilers themselves are so constructive as to be of high evaporative efficiency. The steam pressure maintained was 60 lbs., the equivalent evaporation from and at 212 degs. being .882 lb. of water per

pound of refuse. The power per ton of refuse burned was 83.2 indicated horse-power hours.

The clinker produced by the destructors is used in making mortar, there being eight mills, which turn out 12,000 tons per annum; and during the year screened clinker has been sold to the value of £500. To cart this away would have cost £1,060, without the cost of tipping. Artificial stone (for making which there is a competent hydraulic plant), bricks and ornamental tiles are also made from the clinker. Tins and scrap iron are readily disposed of.

In this destructor the usual pit was abolished, the refuse being tipped direct into the furnaces, the mouth being closed by a heavy cast-iron door perfectly air tight. The clinker is removed by an overhead railway, and, after being cooled, is taken to the crushing machine, which has a capacity of 20 tons per hour. The destructor, adds our contemporary, is capable of destroying ashpit refuse at a cost of 5 1/2 d. per ton for labor only, owing to the abolition of tipmen and chargers and to the increased efficiency of the furnace.

TESTS OF CONCRETE.

In some recent tests made by United States engineers, a plan was adopted for determining the real tensile strength of cement when used in concrete.

During the construction of the concrete footing blocks samples of the concrete were taken from the mixing platform as mixed, from which briquettes were made. These briquettes were treated as nearly as possible to conform to the treatment of the concrete in the footing blocks. The results obtained were satisfactory. In making these briquettes it was necessary to remove pebbles more than 3/4 inch in their greatest diameter to permit the concrete to be compacted into the briquette moulds. It was found on breaking those briquettes that at twenty-eight days and thereafter pebbles imbedded in the mortar at the breaking section were almost invariably broken. It will be seen from the table that the mean tensile strength of five briquettes, one year old, was 643 pounds. Assuming a coefficient of 7 for strength in compression would give 4501 pounds per square inch, or 324 tons per square foot, as the ultimate resistance to destructive stress in compression. The following table shows the tensile strength of briquettes at different ages:

Age	Pounds per square inch.
7 days	222.4
28 days	388.4
6 months	414.6
1 year	643.0

REMOVING A BRIDGE BY ELECTRICITY.

A novel use for electricity developed recently in an Indiana town. It was in wrecking an old-fashioned bridge that had been declared unsafe. The country authorities had purchased the stone piers and approaches on the agreement by the bridge owner that he would remove the wooden part of the bridge, leaving the masonry intact for the new bridge. After making the trade the bridge owner found himself in a dilemma. He could contract with no one who would agree to remove the bridge in the manner required by the contract. Contractors, bridge builders and house wreckers were consulted, but none of them were willing to undertake the job. Letters and telegrams sent to contractors at a distance failed to bring any good result. The owner was in despair. His thirty days' time allowed for removing the bridge expired, and by making a desperate appeal he secured an extension of a week. Many suggestions were offered, among them to blow the bridge up with dynamite or to destroy it by fire, but nothing that seemed feasible, or that would take down the wood-work without destroying the piers, was proposed. Finally at the last minute a proposition was made to him to remove the bridge by electricity. It was accepted at once and work begun. The method adopted was perfectly simple, and this is the way it was put into execution: Each span of the bridge was composed of nine chords, each consisting of three timbers. Therefore, if these twenty-seven sills were cut simultaneously the span would drop between the piers to the river beneath. This was what was actually done, the cutting being accomplished by burning through the wood by loops of iron resistance wire made red hot by the passage of an electric current and weighted down by sash weights. The timbers were of yellow poplar and nine inches square. Each one was burn-

ed simultaneously in two places. Thus the mass of timbers dropped well inside the piers without injuring them. It took one hour and forty minutes to wreck each span.

SUGGESTIONS AS TO SCAFFOLDING.

There are three main considerations that compel close attention and careful study to scaffolding. It should be built upon as economical a plan as possible; the system, or plan, should be simple in all its details, easy of erection, and easy of demolition; and, finally, it should possess strength sufficient for any load it may be called upon to bear. The conditions are so varying, every change in the plan of the structure demand an alteration in the work, that no fixed rules can be laid down. Almost every builder has methods of his own, little secrets of his trade learned by years of experience. But in scaffolding for large buildings, while the question of safety should never be lost sight of, the timber ought to be so used as to permit of their being sold or used after the work shall have been completed. When circumstances allow they should be kept in marketable lengths, and as free from disfiguration as is consistent with the work in hand. Timber of straight grain, clear, and of a good kind, is cheaper in the end than that, not having these qualities, although first cost may be more. The architect, when computing his strains, figures upon the strength of the best timber; but the builder in his scaffolding is sometimes forced to use timber that is imperfect, and it is then that his past practice comes to his aid. The quality of the material changes the whole aspect of the affair, and its successful use, whether good or bad, can only be learned by actual handling. One of the most important divisions of scaffolding is that in bridge erection; and it is here that peculiarities of education are best illustrated. A long span bridge over a deep ravine or river requires an elaborate system

of bracing, and a new factor in the problem now comes forward. It is not every engineer who can design a first class bridge, and then go and erect it in unfavorable situations. Every year the designer and constructor are occupying more widely divergent and independent stations, similar to the architect and builder. As a whole the science of this class of works, which are used to-day and destroyed to-morrow, is becoming one of great importance, increasing in the same ratio as the magnitude of the works, and it is becoming a distinct profession, demanding specialists to master its ever-varying conditions.

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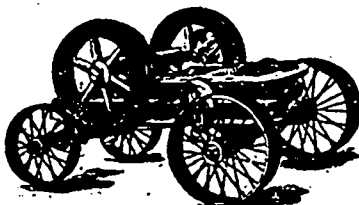
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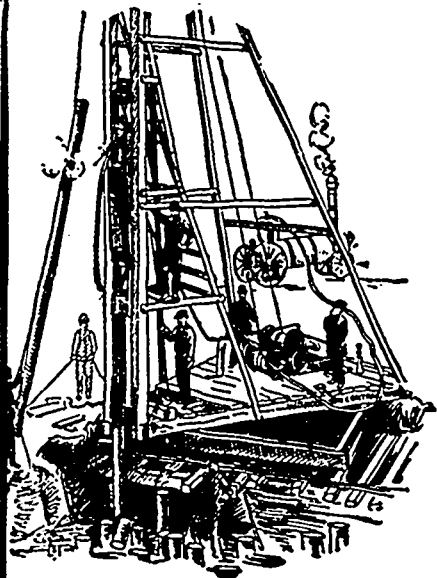
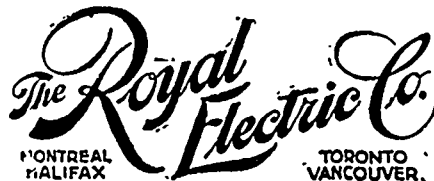
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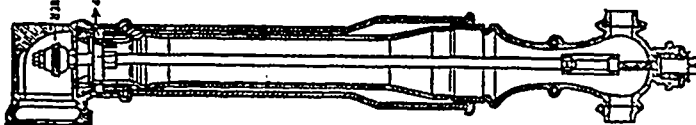
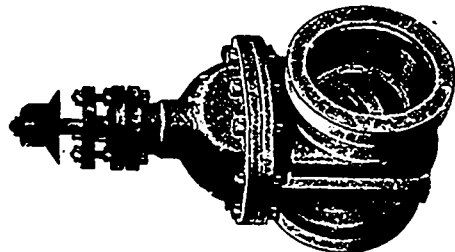
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ENGLISH METHODS OF GRANITE PAVING CONSTRUCTION.

Granite paving, when properly laid, will outlast any other form of roadway, more especially when subjected to very heavy wear. Its chief objection is that it is naturally very noisy; but this defect does not appear to have affected its general use upon roadways over which heavy merchandise is conveyed. Cost of maintenance is a great deal less than with ordinary macadamized roadways, and needless to say it is exceptionally clean compared with a macadamized road. The latter point alone is a very serious question in a large town.

North Wales granite setts are considered very good for use on roads used for heavy traffic, and are of course the most economical for ordinary traffic; but the cost is slightly more than that of Irish and other granites.

The following description of the method of construction will give a fair idea: If the roadway is an old one, the excavation would be taken out to the depth required for the foundation and setts, say a minimum of 12 inches. The bottom of the foundation would be parallel with the finished surface line of the setts. The foundation should be a bed of concrete at least six inches thick (covering the whole of the portion to be paved), composed as follows, namely, six parts of screened ballast or gravel, all of which will pass through a screen of 2½ inch mesh, and one part of portland cement, all thoroughly mixed upon a platform and used while in a semi-liquid state. Concrete made with lime instead of cement is equally good and very much cheaper. The proportions would be the same if lime were substituted for cement.

The lime should be ground blue lias, Abertaw, or other similar lime, and sieved through a screen of 2,500 meshes to the square inch. The cost of ground lime as above is about one-half that of cement. If the old material on the road be ordinary metalling, this will, after being screened, make a proportion of the concrete, instead of using ballast or gravel.

It would be well to note that the depth of the foundation varies according to the nature of the ground, and would be all the better by being nine inches or even twelve inches deep instead of six inches. Should the ground be very soft, the roadway would be improved by the addition of a bed of stones, say twelve inches deep, laid under the concrete foundation.

One ton of cement equals exactly one cubic yard, and, when mixed in the proportions of six to one, the resultant mixture is about seven cubic yards of concrete. This will cover an area of 42 superficial yards six inches deep.

*From "The Builders' Journal and Architectural Record."

One ton of ground lime mixed in the proportion of six to one will cover 50 superficial yards six inches deep. Fourteen laborers, mixing and laying concrete, will complete about 135 superficial yards per d

A the concrete foundation is laid, the surface is well rammed with large flat rammers, in order that the concrete may get thoroughly consolidated, and so that the top surface may be brought to a fairly smooth face. The curvature of the concrete bed must be the same as that which is intended for the finished road-surface of the paving. The concrete foundation should have at least forty-eight hours to set before the paviors commence their work.

A bed of sand one inch in depth is spread over the concrete foundation when ready for the setts. This sand acts as a bed for stones. The size of granite setts varies. Those frequently used are 7 inches by 5 inches, 5 inches by 3 inches, 6 inches by 4 inches. Paviors will lay an average of about 27 superficial yards each day of nine hours.

After the stones are laid they are well rammed with heavy rammers, in order that they shall have a good solid bed, after which gravel (nothing smaller than ¼ inch and nothing larger than ½ inch gauge) is spread over the surface and brushed into the joints previous to the running of the grouting mixture. This process has the effect of wedging the stones and keeping them in place.

Grouting material composed of lime and sand or of cement and sand in equal proportions if often used, the mixture being made into a liquid state, spread over the surface of the roadway, and brushed into the joints.

(To be continued.)

LEGAL DECISIONS AFFECTING MUNICIPALITIES.

Ranne vs. Crowley.—This case was disposed of in the Trial Court, Osgoode Hall, Toronto, before Mr. Justice Rose, recently. —Judgment in action tried at Stratford brought against the township of Elma and their contractors for certain drainage works for an injunction, etc. The plaintiff claims that the work is not being prosecuted in accordance with the plans and specifications prepared by the engineer, Mr. Van Buskirk, and the by-law for the work, nor built upon the line he indicated, and that in consequence a portion of his land has been taken and the remainder damaged. Held, that there is nothing in the drainage act, R. S. O. ch. 226, requiring a municipality to employ the surveyor who draws the plans and specifications and makes the report to supervise the work. They may employ a competent person to do so. It devolves upon the court in cases of this kind to ascertain from the plans, and so forth, the true drain line determined by the municipality, and the intention of, except as so ascertained, cannot be received as evidence. In this case, after an examination of the plans, profiles, specifications, report and stakes shown as planted by the surveyor, the learned judge is of opinion that the plaintiff has failed to show that the work on the ground is not in accordance with the report adopted by the council of the defendant township and the work authorized to be done.

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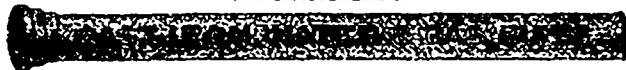
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