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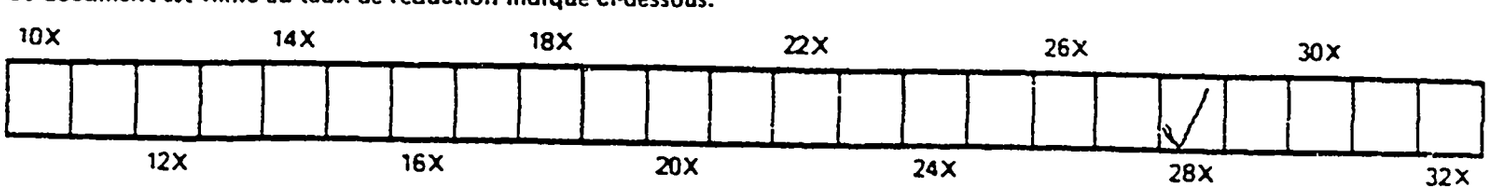

CANADIAN CONTRACT RECORD
A WEEKLY JOURNAL OF
PUBLIC WORKS · TENDERS · ADVANCE INFORMATION · AND MUNICIPAL PROGRESS
EVERY WEDNESDAY

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.

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PORTABLE HOUSES.

Portable houses are being used so extensively at the present day that it may not be without interest to briefly refer to a rather novel construction. The house is made in sections, so that any sized structure may be secured, the materials being fibre boards and angle irons, thus making the completed house of less weight than a portable wooden structure of the same size. One form of house was 16 ft. by 20 ft. in size, and the ridge of the roof 12 ft. from the ground, the side walls being 7 ft. in height. There is an air chamber between the inner and outer walls, for the purpose of maintaining a uniform temperature, and the claim is put forth that the house can be used in the Arctic regions as well as in tropical climates. The windows are of glass and swing open like a door. The weight of such a house as described is said to be 1,500 lbs.

CONTRACTS OPEN.

INNERKIP, ONT.—The C.P.R. contemplates building a station here.

WELLAND, ONT.-The corporation may purchase a steam road roller.

GOLD FISH LAKE, N.W.T.—It is proposed to erect a church here.

AMHERSTBURG, ONT.—The Ferry Co. will rebuild the Shipman dock.

BREAMER, ONT.—Robert Forbes is preparing to build a brick house.

PRESTON, ONT.—A new freight bridge across the Speed river is to be built.

REVELSTOKE, B. C.—A movement is on foot to erect a general hospital here.

MARSHALLTOWN, N.S.—It is expected that a poor-house will be built here in the spring.

LISTOWEL, ONT.— Lewis Bolton recently submitted to council a report on a proposed sewer.

GANANOQUE, ONT.— The McKenzie bonus by-law was defeated by the ratepayers last week.

MEAFORD, ONT.—A by-law to borrow $2,000 to meet current expenses has been passed in council.

BEECHMOUNT, ONT.—Chas Plumley wants tenders by February 1st for building a cheese factory.

PORT LAMBTON, ONT.-The proprietors of the washing machine factory purpose increasing their factory.

BRANDON, MAN.—The city engineer has recommended a general overhauling of the pumping station.

FORT WILLIAM, ONT.—The saw mill firm of Arpin, Scott & Finger purpose building two new tugs here.

STANLEYVILLE, ONT.—Improvements are to be made next spring to St. Bridget's church in North Burgess.

DARTMOUTH, N. S.— The Dominion Dry Dock & Construction Co. purposes establishing works at this place.

KINCARDINE, ONT.—A proposition has been made to the council for the erection of another furniture factory in town.

BELLEVILLE, ONT.— The by-law to bonus the King Shirt Co. was defeated by the ratepayers on the 7th inst.

SPRINGHILL, N.S.—It is proposed to borrow funds for putting in a sewerage system and an electric light plant.

WETASKIWIN, N.W.T.—Frank Hamilton purposes erecting a three storey building adjoining the Criterion hotel.

OAKVILLE, ONT.—The council will either spend about $6,000 on pavement walks or in providing fire protection.

WINGHAM, ONT.—Mr. Connor has asked for a free site and a loan of $5,000 to assist in establishing a stove factory here.

STEVENSVILLE, ONT.— A committee has been appointed by the village council to ascertain the cost of fire appliances.

PORT ARTHUR, ONT.—The ratepayers by a large majority voted in favor of developing the water power of the Current river.

PENETANGUISHENE, ONT.—The by-law to assist the Firstbrook Co. in building a box factory received the sanction of the ratepayers.

MUSQUASH, N. B.— The syndicate which purchased the Knight property at this place will build a sulphite mill and a paper mill.

NEWMARKET, ONT.—Ald. R. A. Smith has purchased property immediately south of W. A. Brunton's and intends to extend the building.

NEW WESTMINSTER, B. C.— Petitions asking government aid to build a bridge across the Fraser river at this place are being circulated.

PRINCE ALBERT, N. W. T.—Work on the location survey of the Canadian Northern Railway in Saskatchewan is being pushed ahead.

HARRISTON, ONT.—Separate or bulk tenders are wanted for the erection of a two-storey brick residence. Plans at office of Tribune newspaper.

RIVERVIEW, ONT.—William Brown invites tenders up to February 6th for building a brick school house in school section No. 10, Melancthon.

MORRIS, ONT.—M. M. Cardiff will erect a brick residence next summer.—It is intended to improve the school in S.S. No. 3 and put in a new furnace.

HULL, QUE.— The municipality of East Hull has decided in favor of the construction of a bridge across the Gatineau river near Farmer's Rapids.

SAULT STE. MARIE, ONT.—A company will ask authority from the Dominion Government to construct a bridge over the St. Mary's river at this place.

LONDON, ONT.—H. E. Matthews, architect, is calling for tenders for the fitting up of new shop fixtures in store on Richmond street for George Kennedy.

LINDSAY, ONT.—It is said that the promoters of the electric railroad are negotiating for the charter of the old Cobourg, Northumberland and Pacific railroad.

HAMILTON, ONT.—The Malcolm & Souter Furniture Co. has been incorporated and has secured the old Wanzer factory in which to manufacture furniture.

AURORA, ONT.—It is said that negotiations are on foot between the town and the Royal Electric Company looking to the installation of a new electric light plant.

STURGEON FALLS, ONT.—The municipal council has passed a by-law providing for the issue of $10,000 of debentures for the purpose of erecting a school house.

LEAMINGTON, ONT.—A company is being formed by the business people of the town to install an electric light plant, J.A. McDonald and W. T. Easton being interested.

PERTH, ONT.—As the by-law to provide for the building of a house of refuge was carried by the ratepayers of Lanark county, work will likely be commenced in the early spring.

HALIFAX, N.S.—The city council held a special meeting last week to consider the question of assisting a company which proposes establishing steel shipbuilding yards here.

ALMONTE, ONT.—The by-law to raise $10,000 for steet improvements was carried by the ratepayers and has been read a third time in council. The money will be raised by debentures.

MIDLAND, ONT.—Plans have been prepared for the erection of a new Methodist church to cost about $8,000. Some of the congregation favor remodelling the d building, at a cost of $2,000.

LAUZON, QUE.—The corporation proposes to build a bridge between the property of Miss Oliver and that of Joseph Dubois, to cost not more than $3,000. Particulars from P. V. Chaloult, attorney, Quebec.

COLLINGWOOD, ONT.—It is expected that the Cramp Ontario Steel Co. will let the contract this week for construction of four docks.—The town is negotiating with a Pittsburg syndicate to erect large wire works here.

GRAND MERE, QUE.—The corporation offers for sale $10,000 twenty year debentures issued for purpose of carrying out street improvements. Tenders received by A. Ballacey, secretary-treasurer, up to 18th inst.

VICTORIA, B. C.—The Bridge River Developing Co. has been granted a provincial charter.—Nine sets of plans have been submitted for the proposed government building, but a selection will not be made for a short time.

GRAND FALLS, N.B.—J. F. McCluskey intends to enlarge the building adjoining his store and fit it up as a public hall. —It is stated on good authority that work on the pulp mill to be built here will be commenced in the spring.

WINDSOR, ONT.— At a meeting held here last week it was decided to organize the Windsor, Essex & Lake Shore Railway Co., to build an electric railway. Wm. Currie and Wm. Newman, of this city, were elected directors.

THOROLD, ONT.—Although the by-law to raise $40,000 for street improvements was defeated by the ratepayers, it is thought that the question will not be allowed to drop, but that another vote may be taken in the near future.

RAT PORTAGE, ONT.—A meeting of the Keewatin Power Co. was held in Ottawa last week, at which it was decided to proceed at once with the erection of a pulp mill near this place. John Mather is managing director of the company.

MONCTON, N.B.—The Record Foundry & Machine Co. is about to enlarge its works.—The council is offering exemption from taxation for twenty years to any company starting a manufacturing concern here employing $50,000 capital.

GREENWOOD, B.C.—The British Columbia Copper Co. will install a converting plant at their smelter here, to cost $40,000. The plant will consist of a 40-ton electric crane, crushing plant, blowing engine, one stand of converters, and accessories.

INDIAN HEAD, N.W.T.—A company is seeking incorporation to build a railway from this place to Fort Qu'Appelle.—R. Williams, of Fort Qu'Appelle, is interested in the proposal to build an electric railway between this place and Fort Qu'Appelle.

VANCOUVER, B. C.—T. H. Davies & Co. have purchased the iron works in this city of Armstrong & Morrison. They will erect a foundry and spend a large sum of money in machinery.—Bell & Flett, Hastings street, have taken tenders for erection of two frame residences.

SHERBROOKE, QUE.—The plans of the proposed nurses' home are on view in Fraser's drug store.—Messrs. Crocker, manufacturers of paper making machinery, Fitchburg, Pa., were in town recently looking for a site on which to build a branch factory.

KINGSTON, ONT.—Steps are being taken looking to the erection of the smelter to be be built by the Cataraqui Mining Co.—Tenders will shortly be invited to rebuild the Government steamer Newfield.—H. P. Smith, architect, is preparing plans for a brick presbytery to be built at Erinsville.

METABETCHOUAN, QUE. —The Metabetchouan Pulp Co. is applying for a provincial charter, to acquire the water powers in the counties of Saguenay, Chicoutimi, Lake St. John, Montmorency and Quebec, and to erect a paper mill and other industries. C. A. Paquet and Joseph Samson, of Quebec city, are interested.

FREDERICTON, N.B.— The provincial government have under consideration the development of the coal fields of Queens and Sunbury.—The Department of Public Works invites tenders up to Monday, January 28th, for rebuilding McGregor bridge, Finger Board bridge and Cottage bridge, each in the parish of Dalhousie, Restigouche county.

BROCKVILLE, ONT.—B. Dillon, architect, is about to take tenders for the erection of an addition to the building of the Canadian Oak Belting Co. Same architect is preparing plans for other buildings to be built early in the spring.—B. Dillon, architect, invites tenders up to Saturday, 19th inst., for erection of a brick factory on Perth street.

SYDNEY, N. S.—It is understood that the Dominion Government contemplate making extensive changes in the railway station here.—It has been decided to erect a brick opera house here to cost $30,000. W. S. Harkins will be the lessee.—William Madden, of Westville, has purchased property here on which he will erect a large business block.

NIAGARA FALLS, ONT.—The by-law to raise $10,000 to install a third pump in the power house was defeated by the ratepayers last week.—The Cataract Land Co. has purchased tee property lying between Eastwood avenue and Bender avenue, and it is probable that arrangements will be made to erect buildings thereon.—N. A. Brigham has offered to donate $2,500 towards the erection of a hospital.

ESSEX, ONT. — F. A. Hough will ask the Ontario government to amend the charter of the South Essex Railway Co. so as to enable them to continue the railway from Leamington to Point Pelee.—E. A. Wisner will apply for the incorporation of the Talbot Road & Lake Shore Electric Railway Co., to construct a railway from Windsor through the town ships of Sandwich West, Sandwich South and Maidstone to the towns of Essex, Kingsville, Leamington, and Blenheim to Chatham.

OTTAWA, ONT.—It is the intention of H. N. Bate & Sons to erect a two-storey stone addition to their present structure. —A company is seeking incorporation to build a railway from New Glasgow to County Harbor, N.S. It will be known as the Nova Scotia Central Railway Co.—The Gaspe & Western Railway Co., to build from Fraserville to Gaspe Basin, Que., is seeking incorporation.—D'Arcy Scott will ask for the incorporation of a company to develop water powers.—The Public Works Department has sent five engineers to North Bay to investigate the possibilities of a 20 foot navigation along the French river from the upper lakes.—Excavation is in progress for the new mill to be built at the Chaudiere by J.R. Booth.

QUEBEC, QUE.—The Quebec Central railway has purchased the Temiscouata railway, running from River du Loup to Edmundston, N.B. A connecting link is to be built between Levis and River du Loup, shortening the distance between Quebec and St. John, N.B., 120 miles.—G. E. Tanguay, architect, of this city, is asking for tenders for the construction of a church and sacristy in the parish of Mille Vaches, Baie des Bacons, in the diocese of Chicoutimi.— Hayter Reid, manager of the Chateau Frontenac hotel, went to Montreal last week to confer with the C.P.R. authorities regarding the proposed additions to the hotel. Should the plans now under consideration be approved, an expenditure of $300,000 will be made.

WINNIPEG, MAN.—It is understood that the owners of the property on the corner of Portage avenue and Main street, which was damaged recently by fire, are considering the advisability of building a new block there.—E. S. Harrison is about to purchase the equipment for an electric testing laboratory to be established in the Y.M.C.A. building.—It is reported that the property on Portage avenue adjoining George Clement's tailoring establishment has been purchased by S. Spence, of the Gault house, who intends to erect a new hotel there early in the spring.—The Hebrew citizens intend to build a Jewish school, to be brick, with stone foundation, to cost $3,000.—Wm. McKenzie reports that he will build a new railway from this city to Portage la Prairie, to connect with the South Eastern and Dauphin lines of the Canadian Northern system.

ST. JOHN, N.B.—A canvass is being made to obtain funds for building a new Y.M.C.A. building.—J. T. C. McKean, architect, is preparing plans for extensive alterations in the Bank of New Brunswick. It is understood that the whole interior arrangement will be changed.—The Congregational church is considering the question of erecting a new church or extensively repairing the present one. Rev. R. Morson is pastor.—The Board of Trade will petition the Minister of Railways and Canals to undertake the promised dredging at the entrance to the harbor here.—W. H. Thorne states that a decision has not yet been reached regarding the re-building of the Coldwater rolling mills.—A $35,000 Baptist college will be built near this city.—At the last meeting of the city council the proposed construction of a bridge across the harbor was considered.

TORONTO, ONT.—Tenders are wanted at 18 Czar street for erection of two brick dwellings.—Engineers last week began an inspection of the Glen road bridge in Rosedale with a view of strengthening it. —It is understood that improvements to the provincial council chamber are contemplated, but that these will not be commenced until after the approaching session.—At the inaugural meeting of the city council the following notices of motion were given : By Ald. Burns, that the Property Committee report on a scheme for the reconstruction of the cattle market, and that an engineer be instructed to prepare plans for a foot bridge over the railway tracks at the foot of Yonge street ; by Ald. Woods, that a committee be appointed to report upon the advisability of filling in and grading Harrison street ; by Ald. Bell, that the Property Committee include in its estimates a sum to provide for placing an illuminated clock in the tower of the Ossington avenue fire hall.—Dr. R. A. Reeve, president of the Toronto University Alumni, has offered to contribute one hundredth of the necessary sum for the erection of a me-

monial hall at Varsity as a tribute to the students who fell at Ridgeway and South Africa

MONTREAL, QUE.— The Level Crossings Committee of the city council have decided to recommend that the city give $500,000 towards the elevation of the Grand Trunk tracks between the Bonaventure station and St. Henri.—The fire committee has decided to ask the finance committee for an appropriation of $87,000 for the following purposes : A new hook and ladder truck for No. 3 station, $2,500 ; new station in place of No. 9 station Point St. Charles, $16,000 ; new station on site of St. Ann's Market, on Craig street, $30,000 ; new station to replace No 5 station on St. Catharine street, $16,000.—The water committee is at present considering the question of adopting filtration in order to improve the quality of the water.—The Laing Packing Co. has asked permission from council to establish a packing house within the city limits.—Building permits have been issued as follows : C. H. Hosurer, three storey house, 299 Drummond st., cost $10,000, Ed. Maxwell, architect ; D. Lalonde, two storey building, 1000 St. Lawrence steet, cost $1,500 ; Thos. Fry, two storey house, 94-96 Ryde street, cost $1,200 ; A. C. Decary, alterations to four storey house, 408 St. Antoine st., cost $1,000.—S. A. Findley, architect, is preparing plans for a new hospital at Verdun asylum.—M. Perrault, architect, has prepared plans for a large convent at Halifax.—T. Pringle & Sons are preparing plans for a new power house at Cornwall.

FIRES.

Factory of J. R. Ball at Waterville, Que., totally destroyed ; loss $20,000.—Block at Granby, Que., occupied by Boisvin's shoe store and Kennedy's tea store ; loss $15,000.—Three storey brick building on Dundas street, London, Ont., occupied by Wood's Seven Cent Bazaar, damaged by fire January 7th ; loss on building $5,000.—Store and dwelling of John Bowes at Elora, Ont.—Block of brick stores at Montreal West, Que., owned by Armstrong & Cook ; loss $15,000.—Premises of the Canadian Baling Co. at St. Johns, Que., damaged to extent of $20,000.—House at Tilbury, Ont., owned by J. McGee.—Brick shop and outbuildings of Jas. Barrett, furniture dealer, Vankleek Hill, Ont.; loss $4,000.—Large block at Bridgen, Ont., including buildings owned by Harkness & Sons and J. D. Wynne.

CONTRACTS AWARDED.

SHERBROOKE, QUE. — Residence for Dr. Bachand : Joseph Simoneau, contractor.

OWEN SOUND, ONT.—$15,000 4 per cent. debentures have been sold to A. E. Ames & Co., of Toronto, at par.

ST. THOMAS, ONT.—Three cottages on Catharine street for F. M. Griffin : H. Lindop, contractor ; G. Jewell, painter.

WINGHAM, ONT.—The contract for new Methodist church has been let to S. Bennett at $11,400, exclusive of seats and furnaces.

KOOTENAY, B. C.—The contract has been let by the C.P.R. for 90,000 ties to be used in building a road from Kootenay lake to Duncan city.

HAMILTON, ONT. — The Hamilton Bridge Works Co. have secured a contract to construct a large steel barge for the Montreal Transportation Co.

COOKSHIRE, QUE. Paquet & Godbout, of St. Hyacinthe, have been awarded the contract for building an addition to the Convent of the Congregation.

QUEBEC, QUE.—The contract for building the new church in the parish of St. Ludger has been let to Mr. Metiver, of St Damien ; estimated cost $20,000.

MONTREAL, QUE.—Mr. Godin, architect, has just let contracts for a Presbytery at St. Remi, Que. — R. A. Waite, architect, has let the contract for the conduit wiring and electric lighting of the new Grand Trunk offices to the Western Electric Company, of New York, and that for heating, ventilating and plumbing to the Bennet & Wright Company, Toronto.

TORONTO, ONT.—John E. Webb, contractor, has been awarded the contract for building five large ice houses at Frenchman's Bay, for which a large quantity of lumber will be required.—The Mackey Stained Glass Co., of this city, have secured the contract for seventeen painted windows, 30 inches x 80 feet, for a Catholic church in Elgin county.

WALKERVILLE, ONT.—The Lake Erie & Detroit River Railway Company has awarded a contract to the Canada Bridge Company, of Walkerville, Ont., for the superstructure of a steel viaduct across Kettle Creek ravine, west of St. Thomas, Ont. The viaduct will be 1,215 feet in length and 97 feet high. There will be twenty-three spans and eleven towers. The total cost is estimated at $75,000.

WESTMOUNT, QUE. —The following tenders were received by the council for supply of ladder and truck : International Fire Co., $1,785 ; Seagrave & Co., $2,715, and the Waterous Engine Co., of Brantford, Ont., for $1,500, the latter offering to make their figures to $1,250 if they received permission to use part of the council's ladder now in use, such as lanterns, axes, spikes, etc. An award has not yet been made.

SEA WATER AND MORTAR.

Some interesting observations relative to the action of sea water on mortars are contributed by E. Candlot, whose investigations in the harbour of La Rochelle cover a period of something like forty years. Blocks of 60 cm. (2·36 in.) in length were exposed to the open sea for twenty years, and were above the water surface at low tide. The mortars were of hydraulic limes of different origin, of natural cements from Pouilly, Vassy, &c; of artificial pozzuolanas mixed with lime and sand; of trass from Andernach, &c. Nearly all blocks have completely lost their cohesion after different periods. The few blocks of portland cement experimented upon were in good condition; but blocks of neat cement (English and French) were decomposed. From these tests Viennot draws the following conclusions: (1) Neat cements are destroyed more rapidly than mortars of a certain composition; (2) mortars made of one volume of cement to one of sand, and, again, of one volume of cement to two of sand, are those which offer the greatest resistance to sea water. They will last for twenty, thirty-six, and thirty-eight years. Thurninger commenced new tests with blocks of masonry and concrete made of lime and Speil mortar, with a length of edge of 40 cm. (about 1·6 in.). In 1895 the masonry blocks disappeared, their destruction having commenced four years after their exposure, and out of thirty-two concrete blocks only twenty-six remained, but they were in advancing decomposition. In 1880 other tests were commenced on blocks submerged, of various limes. Many of these have perished. "Out of thirty-one masonry blocks laid in Portland cement mortar, and submerged between 1881 and 1892, twenty-three are still intact, while some have commenced to disintegrate." Viennot points to the following conclusions: (1) Mortars of hydraulic lime, mixed in any proportion, in most cases commence to disintegrate after one or two years immersion in sea water—they crumble into pulp after periods varying in length, but apparently not exceeding fifteen years; (2) concrete resists better than masonry, owing to the greater density imparted to it by ramming ; (3) rapid setting cements may commence to disintegate after six or eight years, but may last longer than thirty-eight years without crumbling; (4) the mortars offering the greatest resistance are those consisting of one part cement to one or two parts sand. This mixture corresponds to the weight of cement required to fill the spaces between the grains of sand. These, therefore, are the least porous mortars.

NOTES.

The Grey & Bruce Portland Cement Co. will locate their works at Brooke, Ont.

The capacity of the Lakefield Cement Works will be 600 barrels per day, instead of 200, as at first contemplated.

The Durham Portland Cement Co., of Durham, Ont., obtained its charter last month. The directors are Jas. A. Hunter, H. Parker, G. McKechnie, J. M. Hunter, D. Jamieson and Wm. Calder.

The Canadian Bridge Co., of Walkerville, capitalized at $25,000, has been incorporated by the provincial government, with B. S. Colburn, F. C. McMath and G. F. Porter, of Detroit, provisional directors.

A consolidation of all the granite industries at St. George, Charlotte Co., is being effected. The Bangor News says : The syndicate will control the red granite trade of Canada, and will make a great effort to prohibit the importation of Scotch stone. The syndicate will probably buy up all the quarries and water privileges on the Magaguadavic and may introduce other industries which the enormous and easily available water power there might warrant.

Injections of cement have long been employed for stopping cracks in masonry ; but the operation has been performed from the surface to the inside. The "Annales des Ponts et Chaussees" mentions the following method devised by M. Camere, who works the reverse way. He makes verticle channels in the new masonry, 12 centimeters in diameter, into which cement is injected by the aid of air under a pressure of 1 kilogramme per cubic centimeter. The system can, it is stated, be applied for the consolidation of masonry in bad condition.

Messrs. L. Benjamin Copeland, of Three Rivers, John T. Peddie, Howard Murray and Harry H. Bullock, of Montreal, and Richard W. Douglas, of Westmount, have given notice that they will apply for incorporation under the name of "The Shawinigan Falls Brick Manufacturing Company." The objects for which the company are seeking incorporation are to manufacture bricks of all kinds, artificial stone, drain pipes, cement, timber, lumber and cord wood, and to sell the same .The proposed amount of capital stock of the company will be $25,000, divided into two hundred and fifty shares of $100 each. The principle place of business of the company wil be Shawinigan Falls.

HEAT DEVELOPED IN THE SETTING OF CONCRETE.

Although the fact has long been recognised that during the setting of Portland cement a considerable rise of temperature takes place throughout the mass, with an accompanying disengagement of heat, but little attention has been bestowed hitherto upon this peculiar property of one of our most important constructive materials. One reason for this apparent neglect of so interesting and instructive a subject is no doubt due to the fact that the testing of all samples of cement, concrete, and of nearly every other substance in testing works, laboratories, and similar establishments for the same purpose is carried out upon so very limited a scale, and upon specimens comparatively so exceedingly small. Under these restricted conditions the particular phenomenon referred to very rarely becomes sufficiently developed to attract any appreciable notice and even if it did, the absolute rise or difference in temperature would be so small that it would be a matter of great difficulty to measure it with any degree of accuracy.

A very recent experiment has been carried out with the view of obtaining some reliable information upon the whole question, with a mass of solid concrete amounting to nearly 300 cubic yards. The concrete was composed of 1 part by weight of pure cement, 1 of sand and 2 of rather coarse gravel. So that it had considerable strength and tenacity. In the mass of concrete there was a large number of welding down bolt holes, which served as ready receptacles for the thermometers. Some of these which were of the ordinary mercurial description, were inclosed in small zinc sheaths or tubes ½ inch diameter, while others were of larger size, registering maxima and minima, and were placed in tubes 3½ inches in diameter in various parts of the monolith. These thermometers were also differently located with respect to sides or boundaries of the concrete block. Those of the ordinary pattern were inserted at a distance of 3 ft. from the outer surface of the mass; but the maximum and minimum instruments were placed at a distance of 8 ft. from external surfaces. The thermometrical observations were made with great rapidity, in order to avoid the registered temperatures being affected by the temporary contact of the instruments with the outside air. They were drawn up by means of a small wire attached to each, the readings quickly taken, and they were then redeposited in their little cavities, and a small wooden wedge was inserted to hold them securely in place.

At the commencement of the experiment, before the setting of the concrete, the temperature was 43° Fahr. and the maximum reached was 86° Fahr. The observations extended over three weeks, and at the expiration of that time all the instruments recorded practically the same temperature as that of the external atmosphere, although the latter had varied in its diurnal and nocturnal limits as much as 20°. There does not appear to be any law regulating the rate of the setting of the concrete subsequent to its commencement, for in the experiment described the maximum temperature was attained at the end of six days after the process of setting had begun. There is a point in connection with the subject of our article which deserves attention. It is that the decrease in temperature after the maximum had been arrived at was slow and gradual, and not of a sudden or spasmodic character. On a future occasion we shall refer to some very interesting experiments undertaken to ascertain the effect upon masses of concrete of sudden and violent cooling as in the case of frost. It is perfectly well known that the origin of fissures and cracks in concrete structures have been attributed to this and collateral causes, and bearing in mind how largely that material is at present employed in engineering and architectural works of very considerable magnitude, there is no necessity for mentioning that a good deal of additional information respecting those causes and their validity, or otherwise, would be very acceptable.—T. C., in the Building News.

Geo. A. Wooten & Company have commenced business in Halifax, N. S., as plumbers.

MUNICIPAL DEPARTMENT

INSTRUCTIONS FOR MIXING CEMENT CONCRETE.*

ESSENTIAL REQUIREMENTS.

1. All broken stone, gravel, and sand must be carefully selected; no soft friable sandstone, soft slate or gypsum shall be used..

2. Any stone, gravel, or sand that enters into the composition must be free from loam and all earthy ingredients. If at all unclean, it shall be washed and the dirty water allowed to run off.

3. Concrete should be a mixture that will make nearly a solid mass when properly mixed, and may be solidified by uniting with it such a quantity of cement as will coat each and every particle of sand, gravel, and stone and fill the voids remaining.

4. When gravel is used it is best to have it screened to regular grades, so that the proportions of sand required to fill the voids may be better provided.

ABUTMENTS OR PIERS FOR HIGHWAY BRIDGES.

The concrete will be mixed by hand in the following manner; the stone and sand will be measured from an empty cement barrel:

Firstly—As many barrels of broken stone or gravel as are specified to one of cement will be emptied into the trough and spread over it to a uniform thickness.

Secondly—The parts of sand to be used are to be emptied on top of the stone and leveled over it in like manner.

Thirdly—One barrel of cement is to be emptied over the top of both and spread to a uniform thickness over the sand.

Next, two men with long-handled shovels standing opposite each other, one on each side of the trough, are to commence a one end and turn the three constituents over, keeping a space of the full width of the shovel as they proceed and taking care not to throw each shovelful in a heap, but spreadingly, same as if covering seeds.

The turning over in this manner to be repeated, proceeding alternately from each end of the trough.

Upon the proper intermixture of the materials for concrete in this dry condition will largely depend a reliable concrete for piers or supports of bridge superstructure.

All component parts of this concrete batch must be accurately gauged as to relative volume and incorporated in this dry state before any water is applied.

The next, and no less important condition to be observed, is to not allow too much water to be poured over the mass.

In fact, water should not be poured at all on a concrete intermixture; it should be merely sprinkled, and this sprinkling should be continued with great care, the operation to be repeated only as often as may be necessary to convert the sand, stone, and cement into a mortar which will stand in a pile and not be fluid enough to move. During the application of the water the mass must be constantly turned over with shovels in the trough, proceeding in the same way as described for turning over the dry intermixture.

The abutments and piers are erected within a skeleton framework, closely boarded against the face as the work proceeds upwards. They are built of Portland cement rubble concrete faced with Portland cement fine concrete.

The facing of fine concrete is generally six inches in thickness, but may be varied, as will be specified. It is the concrete that we have been describing the manufacture of, and is to be applied as follows:

The rubble concrete work generally adopted for the highway bridge supports in Nova Scotia consists of fine concrete placed as a rim of concrete within which large stones weighing 20 lbs. and upwards are placed by hand.

These stones are placed "rack and tooth" end upwards two inches apart, and the space between them grouted up solid with the rim to form a compact mass. The fine concrete facing is kept at least six inches higher than the rubble concrete and united with it so to form one solid body. In every instance the top of the pier or abutment is finished with fine concrete for a depth of 1 foot, 6 inches. The outer rim or border of fine concrete is first placed all round the pier for a height of about 9 inches and kneaded or rammed so that no holes or cavities will appear when the boards are removed, within which the large stones are to be set, end upwards.

The courses should follow each other as rapidly as possible in order that they may become effectually joined and form finally one monolithic mass. When the work is interrupted at the end of the day, and another course of concrete is to be laid the following day, the top of the concrete should be covered and kept wet. Each course should be washed and all earthy matter removed before the course to follow is commenced.—M. Murphy, Provincial Engineer.

*Extracts from the Nova Scotia Bridge Act of 1883, and amendments thereto up to 1899.

The cost of cleaning sewer and catch-basins in Chicago has been steadily decreasing, according to a report by Asst. Supt. W. E. Quinn, of the Bureau of Sewers. The cost per mile is given as $50.92, 35 per cent. of the cost in 1892, but the report indicates that larger appropriations could be used to advantage. Much trouble is caused by the practice of sweeping street refuse into catch-basins, and by the grease entering the sewers at the connections of restaurants.

The universal use of water meters in St. Louis was advocated in a paper read before the Commercial Club of that city by Mr. Edward Flad, water commissioner. He stated his recommendation as follows: "With the universal introduction of meters, the meter rates could be reduced without interfering with the net income of the works. Each consumer should be charged a fixed minimum rate, which could be somewhat less, perhaps three fourths of the present schedule rates. The minimum rate would allow for each residence a fixed quantity of water, which would be ample to allow of liberal use of same. All excess above such fixed quantity would be paid for at meter rates.

MUNICIPAL ENGINEERS, CONTRACTORS AND MATERIALS

Prices of Building Materials.

PRESSED BRICK, Per M.

TORONTO PRESSED BRICK AND TERRA COTTA WORKS.

	F.O.B. Milton, Ont.	F.O.B. Montreal.
Red No. 1	$12 50	$18 00
" 2	10 50	16 00
" 3	8 50	14 00
Buff No. 1	14 50	20 00
" 2	13 00	18 50
Brown	20 00	25 50
Roman Red	25 00	30 50
" Buff	28 00	33 50
" Brown	35 00	40 50
Hard Building	6 50	12 00
" Sewers	6 50	12 00
" Backing	5 00	11 50

Moulded and Ornamental from $2.00 to $5.00 per 100.
Terra Cotta String Courses and Frieze, from 30c. to $2.00 per ft. run.
Roofing Tiles, $20 00 per 1,000, $23.00 Montreal.

BEAMSVILLE BRICK AND TERRA COTTA CO.

	F.O.B. Beamsville.	F.O.B. Montreal.
Red Peerless Facing	$15 00	$10 50
" No. 1	13 00	18 50
" No. 2	11 00	6 50
" No. 3	8 00	14 00
Brown Peerless Facing		25 50
" No. 1		23 50
Buff Peerless	20 00	25 50
" No. 1	18 00	23 50
" No. 2	15 00	20 50
Moulded and Ornamental Brick from $3 to		$10 per C
Roman Red (Size 12 x 4 x 1½ in.)	28 00	33 50
" Buff " "	23 00	33 50
" Brown " "	34 00	39 50
Vitrified Paving Brick No. 1	18 00	23 50
" " " No. 2	15 00	20 50
Sewer	6 50	12 00
Roofing Tile	22 00	26 00

COMMON BRICK, Per M.

	F.O.B. Toronto.		F.O.B. Montreal.	
Common Walling	7 00	8 00	7.50	8 00
Good Facing	8 00	9 00		8 50
Sewer	8 00	9 00	8 50	9 00

STONE.

Common Rubble, per toise, delivered	10 0	11 00
Large flat Rubble, per toise, delivered	14 00	16 00
Foundation Blocks, per c. ft.	30	30
Granite (Stanstead) Ashlar, 6 in. to 12 in., rise 9 in., per ft.		25
Amherst Red Sandstone. Amherst, N.S., per cub. 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	90
Port Philip, N. S. Brown Sandstone		
"Scoriæ" Paving Blocks, 8"×3½"×5"	55	
"Scoriæ" Paving Blocks, 8"×3½"×4"	45 00	
Masillon	30 00	
Quebec and Vermont rough granite for building purposes, per c. ft. f.o.b. quarry	40	1 00
For ornamental work, cu. ft.	40	
Granite paving blocks, 8 in. to 12 in. x 6 in. x 4½ in. per M.		50 00
Granite curbing stone, 6 in. x 20 in. per lineal foot		
Buctouche Olive Freestone	85	

CREDIT VALLEY STONE.

	F.O.B. Quarries.	
Rubble, per car or 25 tons		7 00
Brown Coursing, up to 10 in., per sup. yard	1 50 to	1 75
Brown Dimension, per cub. ft		60
Grey Coursing, per sup. yard		1 00
Grey Dimension, per cub. ft.		45

LONGFORD STONE.

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

SLATE.

	Toronto.	Montreal.
Roofing (per square).		
" red	17 50	20 00
" purple	8 50	10 00
" ding 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 70	2 90	2 25	2 45
Newcastle "	2 50	2 70	1 95	2 10
"Dyckerhoff "	3 00	3 15	2 60	2 75
North's "Condor	2 95	3 10	2 55	2 65
Alsen's, (German)	3 00	3 15	2 60	2 75
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
Parian "	5 25	5 25	5 75	5 75
Keene Superfine "Whites"	11 00	12 00	9 00	10 00
Keene's Coarse "Whites"	8	8 50	8 50	9 00
Karlstadt " (German)	3 05	3 25	2 75	2 90
Germania " (German)	3 00	3 15	2 60	2 75
" Rooster" (Belgian)			2 15	2 20
" Keystone " (Belgian)			2 25	2 20
"Anvil" (Belgian)			1 95	2 05
White Cross (Belgian)	2 40	2 50	2 00	2 10
"Burham" (English)	2 60	2 70	2 20	2 30
Hydraulic Cements.—				
Thorold, per bbl		1 50		1 60
Queenston, "		1 50	1 50	1 60
Ontario. "		1 50		
Fire Bricks, Newcastle, per M	30 00	35 00	16 00	21 00
" Scotch "	30 00	35 00	19 00	21 00
Lime, 100 lbs., Grey		30		
" " White		35		30
Plaster, Calcined, N. B.		2 00		2 50
" " N. S.		2 00		2 50
Hair, Plasterers', per bag	80	1 00		00

HARDWARE.

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

Cut nails, 50d & 60d, per keg	2 85	2 85
Steel " " " "	2 95	2 95

Toronto. Montreal.

CUT NAILS, FENCE AND CUT SPIKES.

40d, hot cut, per 100 lbs	2 45	2 35
10 to 12d, hot cut	2 55	2 95
8d, 9d, " "	2 60	3 00
6d, 7d, " "	2 75	3 15
4d to 5d, " "	2 85	3 25
3d, " "	3 10	3 50
2d, " "	3 45	3 85

Cut spikes, 20 cents per keg advance.
Steel Nails, 10c. per keg extra
Wire nails, 2.85 base price.

Iron Pipe:

Iron pipe, ⅜ inch, per 100 feet	$3.25
" " ½ " " "	3.35
" " ¾ " " "	3.60
" " 1 " " "	5.00
" " 1¼ " " "	7.00
" " 1½ " " "	7.60
" " 2 " " "	2.00

Lead Pipe:

Lead pipe, per lb	7c. } 15 per
Waste pipe, per lb	7½ } cent. dis.

Galvanized Iron:

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

Note.—Cheaper grades about ½c. per lb. less.

Structural Iron:

Steel Beams, per 100 lbs	2 75	2 90
" channels, "	2 85	2 33
" angles, "	2 50	2 60
" tees, "	2 80	2 60
" plates, "	2	2 00
Sheared steel bridge plate		2 35

ARCHITECTURAL VARNISHES.

THE IMPERIAL VARNISH AND COLOR CO, LIMITED.
(Highest grade)

(Cans free.)	In 5 gal. cans. Per gal.	In 1 gal. cans. Per gal.	In ½ gal. cans Per gal.	In ¼ gal. cans. Per gal.	Pint Cans. Per gal.
Exterior wearing body	$1 50	$1 75	$1 85	$1 80	$1 60
Exterior rubbing	3 50	3 75	3 85	4 20	4 60
Elastonia	3 50	3 75	3 85	4 20	4 60
Ivory Enamaline	5 00	5 25	5 35	5 70	6 10
Crystalite	4 50	4 75	4 85	5 20	5 60
Yachtine	3 00	3 25	3 35	3 70	4 10
Architectural Coach	2 50	2 75	2 85	3 20	3 60
Granitin floor finish	2 50	2 75	2 85	3 10	3 60
Architectura flatting	2 00	2 25	2 35	2 70	3 10

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