

CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF THE CONTRACTORS' ASSOCIATION OF CANADA

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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OCTOBER 16, 1901

No. 3.

THE CANADIAN CONTRACT RECORD,

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TENDERS

will be received until noon on SATURDAY, OCTOBER 19TH, for Masonry, Carpentry and Sheet Metal Work of a House on Crescent Road. No tender necessarily accepted.

GORDON & HELLIVELL, Architects,
Confederation Life Building, Toronto.

PUMPS AND WATER WHEELS FOR SALE

1 right and 1 left hand 48 inch Lefell Water Wheels.

2 No. 6 Rotary Pumps with large air chamber shafting, gearing and boxes complete

1 large Escape Valve and connecting pipes, &c.

The above are in good condition and will be sold cheap. For further particulars apply to

J. W. SANDERS,
own Clerk.

Port Hope, 25th Sept., 1901.

Corporation OF THE City of Three Rivers

Scaled tenders will be received at the office of the undersigned, until 4 o'clock p.m., MONDAY, THE TWENTY-FIRST (21ST) DAY OF OCTOBER NEXT, for the purchase of Debentures of the following denominations: "St. Maurice Bridge Bonds" (to the amount of one hundred and twenty-five thousand dollars (\$25,000)); "Drainage Bonds" (to the amount of twenty-five thousand dollars (\$25,000)); "Towing Bonds" (to the amount of ten thousand dollars (\$10,000)); and "School Debentures" (to the amount of eight thousand dollars (\$8,000), all of which will be redeemable in 50 years from the first May, 1901, and bearing interest at the rate of three and a half per cent (3½%) per annum, payable semi-annually.

L. T. DESAULNIERS,
Sec.-Treas. Three Rivers Corporation.

City Hall, Three Rivers, 25th Sept., 1901.



NOTICE TO CONTRACTORS.

Tenders for Concrete Sidewalk,
Asphalt Pavement, and
Tile Pipe Sewer.

Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on WEDNESDAY, OCT. 23rd, 1901, for the following works:

CONCRETE SIDEWALKS—
Cavethra square, both sides, Jarvis to west end.

Dowling ave., west side, King to Queen.

TILE PIPE SEWER—
Phipps street, from St. Vincent to a point 351 feet east.

ASPHALT PAVEMENT—
Garden avenue, McDonnell to Soranren
Contents of envelopes containing tenders must be plainly marked on the outside.

Plans and specifications may now be seen and forms of tenders obtained at the office of the City Engineer.

The usual conditions relating to tendering as prescribed by by-law must be strictly complied with or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

O. A. HOWLAND, (Mayor),

Chairman of Board of Control.

City Hall, October 12th, 1901.

CONTRACTS OPEN.

AMHERST, N.S.—A public meeting has been called to consider the erection of a hospital.

CORNWALL, ONT.—D. McDonald is preparing to erect a new building on Second street.

MOOREFIELD, ONT.—It is said that J. L. Florence intends building another residence.

GRANTON, ONT.—Steps are being taken towards the erection of a new Presbyterian church.

SMITH'S FALLS, ONT.—T. McManus has purchased the opera house and will enlarge it.

BROCKVILLE, ONT.—Negotiations are on foot for the erection of first-class skating rink this fall.

SUNDRIDGE, ONT.—The by-law to assist the Veneer & Box Co. was carried here last week.

ATHENS, ONT.—An Almonte architect is preparing plans for a Methodist church to be built here.

KINGSVILLE, ONT.—The township of Gosfield South proposes to borrow \$899 for drainage works.

DIGBY, N.S.—Messrs. Binton and Trowbridge have each purchased lots on which to build summer residences.

SOUTHAMPTON, ONT.—The by-

law to provide funds for waterworks purposes was carried on Monday last.

VICTORIA, B.C.—The by law to raise \$100,000 for sewerage purposes was carried by the ratepayers on October 10th.

CHATHAM, ONT.—The T. H. Taylor Co. are asking for tenders up to 21st inst. for building a flour mill and elevator.

TARA, ONT.—J. D. Tobey, village clerk, is prepared to receive tenders up to 29th inst. for purchase of \$2,452.20 debentures.

PEMBROKX, ONT.—A special committee of the county council has recommended the rebuilding of Eganville bridge.

BRIDGEBURG, ONT.—Mr. Crockett, C.E., has been instructed by the village council to prepare plans for a waterworks system.

WATERVILLE, QUE.—The council has given a franchise to a company to construct fire protection, water and sewage systems.

GALT, ONT.—A by law to raise \$5,000 for the purpose of building a factory for the Royal Carpet Co. was carried here last week.

ALMONTE, ONT.—Tenders asked by L. Cockburn, town clerk, up to 23rd inst., for purchase of \$30,000 electric light debentures.

SANDWICH, ONT.—The promoters of the South Essex Electric Railway Co. announce that their power house will be erected at this place.

BEETON, ONT.—A by-law was carried here last week to raise \$7,000 for extension of electric light plant and street improvements.

SARNIA, ONT.—W. C. Dillon is taking tenders up to 19th inst. for erection of building on West Front street. Plans by R. Fawcett, architect.

HUNTSVILLE, ONT.—The Board of Trade will petition the Minister of Public Works to build a public wharf on the northwest side of lot 7.

FREDERICTON, N.B.—Tenders for building McKnight's bridge, in parish Sussex, are invited by the Department of Public Works up to 21st inst.

WESTMOUNT, QUE.—Building let were last week purchased by Mrs. J. O. Torrance, William Walkeley, George Buchanan and A. C. Mathews.

CHANNAY, QUE.—L. V. Villeneuve has been given a franchise by the council of Woburn township to install system of waterworks in this village.

HAMILTON, ONT.—James Phillips has taken out a permit for rebuilding Chadwick Bros. factory, 193 King street east, at a cost of \$4,000.—R. T. Dodge has been granted a permit for six brick dwellings, corner Cannon and Wellington avenue, cost \$6,000.

QUEBEC, QUE.—H. Staveley, architect, has been commissioned to prepare plans for proposed fire station in Montcalm ward, the cost not to exceed \$10,000.

GODERICH, ONT.—William and James Smith, of Clinton, are the promoters of a proposed summer hotel to be built here, which is estimated to cost \$20,000.

GUELPH, ONT.—Tenders have just been taken for iron roofing the court house building; W. & W. Stewart, of Hamilton, architects.—Plans have been prepared for proposed sewerage system.

TRURO, N.S.—The T. Eaton Co., of Toronto, are reported to be negotiating for the purchase of the opera house site on which to build a departmental store for the Eastern Provinces.

BARRIE, ONT.—At next council meeting Ald. Tyrer will introduce a motion that a by-law be submitted to the ratepayers to raise \$3,000 for enlarging the fire hall and council chamber.

HULL, QUE.—Fortier & Gravelle have purchased a lot, corner Main and Bridge streets, on which they will erect a fine building.—Ground has been purchased as a site for proposed Catholic church.

PORT ARTHUR, ONT.—J. L. Johnstone has purchased property on which to build a residence and bakery.—Mr. Wheeler, architect, is preparing plans for a 60 room hotel to be built by Arthur Bros.

GIBSON, N.B.—James Barnes, M.P.P., is sub-letting in short sections the contract for the railway from Chipman to Gibson. There will be a bridge over the Nashwaak river, probably not far from this place.

RICHMOND, QUE.—Lieut.-Col. H. A. H. H. H., manager of the Richmond County Electric Co., has submitted to the Mayor a proposition for the construction of the St. Francis bridge which was carried away last spring by ice.

GILBERT PLAINS, MAN.—James C. Turner, municipal clerk, invites tenders up to 28th inst., for building a bridge over the Valley river. Information from the municipal clerk or at the office of the Department of Public Works, Winnipeg.

GANANOQUE, ONT.—A company has applied to the council for a bonus of \$5,000, to assist in establishing a factory for the manufacture of tables and other furniture.—It is announced that the steamer Althea will be improved and an electric light plant installed therein.

FARRY SOUND, ONT.—A committee has been appointed by the town council to report on the construction of a sewer from McMurray street to the Seguin river.—At next council meeting a by-law will be introduced to raise \$3,500 by way of debentures for permanent improvements.

WINCHESTER, ONT.—Winchester township council has instructed the reeve to procure estimates of the cost of building an iron bridge across the Nation river at lot 10. It is expected that a by-law to provide the necessary funds will be submitted to the ratepayers at the next municipal election.

BRANTFORD, ONT.—A resolution has been introduced in the city council that steps be taken to construct a railway system connecting the towns of Paris, Galt, St. George and Brantford.—Tenders are being taken this week for erection of brick church at Salt Springs. Plans by L. H. Taylor, architect.

VANCOUVER, B.C.—Tenders close this week for erection of Carnegie library; estimated cost \$40,000. W. G. Grant,

architect.—It is understood that a large tract of land in the east end has been purchased by the Great Northern Railway Co., and that in a few weeks work will be commenced on the extension of that road into this city.

COLLINGWOOD, ONT.—James and Thomas Long have donated a site on which to build the proposed Carnegie library.—A meeting of the projectors of the Machine & Boiler Co. is being held here at time of writing. It is expected that the capital will be about \$3,000,000.—A number of new residences are likely to be built in this town.—John Charlton, M.P., is projecting a railway to run from Port Rowan to Collingwood.—Charles Cameron has had plans prepared for two store and office buildings to be built on Hurontario street.

SHERBROOKE, QUE.—It is understood that new tenders are to be invited for proposed bridge over the Magog river at Wolfe street.—The Poland Machinery Co., of Boston, are considering the establishment of a plant here and desire to know what assistance may be expected from the council.—The Canadian Dressed Poultry Co., now being formed to conduct a cold storage warehouse business, propose to erect 12 factories in different parts of Canada, and have made a proposition to the council to establish one in this town.

SYDNEY, N.S.—The town is purchasing property on which to erect a school building.—It is the intention of A. Vassalo to convert the Thompson block into a first-class hotel, plans for which are being prepared.—The Dominion Iron & Steel Co. have extended the time for receiving tenders for quarrying limestone to November 1st. Particulars from David Baker, superintendent.—An announcement that the Nova Scotia Steel & Coal Co. will establish a large plant here, including pig iron furnaces, is expected within a few days.

TORONTO, ONT.—Tenders are invited by the city up to 23rd inst. for construction of an asphalt pavement on Garden avenue, from McDonnell to Sorauren avenue, tile pipe sewer on Phipps street, and concrete sidewalks on portions of Cathara square and Dowling avenue. It is proposed to construct a macadam roadway on Crescent road, at a cost of \$9,290.—Edward Terry is promoting the establishment of works at Ashbridge's Bay for the manufacture of Portland cement. He has secured the control of a deposit of marl in King township.—Building permits have been granted as follows: A. T. Reid, two storey and attic brick residence on Park Road, Rosedale, cost \$7,000; William Hales, residence on Harvard avenue, near Tilley avenue, cost \$2,500; T. W. Sleam, store and dwelling on Bloor street, near Major, cost \$2,000; J. M. West, residence on Homewood avenue, near Wellesley street, cost \$4,500 (Gounlock & Baker, architects); Mrs. J. Riddell, brick dwelling at 146 Margueretta street, cost \$1,400.—J. F. Brown, Architect, is this week taking tenders for Baptist church, corner College and Margueretta streets.

MONTREAL, QUE.—The council has given notice of its intention to construct a sewer on Aylwin street, between Ontario and Stadacona streets and on Christopher Colombo street and Massue street.—An electric light plant is to be installed in Christ church cathedral, as the result of a special gift.—In the annual report of Notre Dame hospital it is announced that Rudolphe Forget has promised to obtain the necessary money with which to build a new hospital. Steps will now be taken to select a site and obtain plans for a modern building.—The Dominion Subway Co. is applying for incorporation, to construct underground wires, cables, and pneumatic tubes. C. F. Sise and Senator Robert Mackay are among the promoters.—Building permits have been granted as follows: J. P. Perron, two three and a half storey houses, 230 Champlain st., cost \$6,300 (R. Montbriand, architect, Derocher & Frere, contractors); David Morley, two storey house, St. Charles st., cost \$1,000; N. Leclaire, one two storey house, Guilford street, cost \$1,500 (N. Leclaire, contractor); Holmes & Harpin, alterations to one storey house and factory, 241 Chatham street, cost \$1,000; Langtin Migloire, two storey house, 207 Lafontaine st., cost \$1,200; A. Paquette, two storey house and factory, Notre Dame street, cost \$3,000 (A. Paquette, contractor); David Houassa, two storey house, Davidson street, cost \$1,500; Royal Electric Co., one storey house and factory, 57 Wellington street, cost \$93,000 (Maurice Perrault, architect, P. Lyall & Sons, contractors); Mrs. J. Sumpson, three storey house, Centre street, cost \$2,800 (MacDuff & Lemieux, architects); S. Jean de Baptiste school, four storey house and school, Drolet street, cost \$6,500 (Arthur St. Louis, architect); Antoine Brunet, three storey house, 1019 Berri street, cost \$2,900; Mrs. H. P. Labelle, three storey house, Sherbrooke street, cost \$7,000 (A. Raza, architect); J. B. Gratton, three storey house, Visitation street, cost \$1,600 (W. E. Doran, architect); Dawes & Co., alterations to two storey house and factory, Cathedral street, cost \$1,200; A. Marsolais, two storey house, St. Dominique street, cost \$1,500; Jos. Archambault, three storey house Aylwin street, cost \$2,800; Maggie, Fannie and Eva Riddle, two storey house, 122 Sebastapol street, cost \$1,200.

WINNIPEG, MAN.—It has been decided to call for tenders for the following works: Sewers—Alexander avenue, cost \$1,680; Sherman street, from Logan avenue to Alexander avenue, and on portions of Alexander avenue and Xante street, cost \$10,994. Asphalt pavements—Princess street, from William avenue to Bannatyne avenue, cost \$4,650; Princess street, from Rupert avenue to Civic avenue, cost \$1,860; Civic avenue, from Main street to Princess street, cost \$6,845; Sargaut avenue, from Edmonton street to Balmoral street, cost \$6,915; Qu'Appelle avenue, from Hargraves street to Balmoral street, cost \$13,730; Assiniboine avenue, from Donald street to Main street, cost \$11,670; Notre Dame avenue, from Portage avenue to Charlotte street, cost

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TORONTO MONTREAL ST. JOHN HALIFAX

\$17,418. Macadam pavement—Euclid avenue, from Point Douglas avenue to Main street, cost \$7,400; Sargent avenue, from Balmoral to Young street, \$1,795. The city engineer estimates the cost of a sewer to the crematory at \$10,954.—The C.P.R. is taking tenders for moving about 60,000 yards of earth on the Pipestone branch.—S. Hooper, architect, is preparing plans for a new Catholic convent to replace St. Mary's convent on Notre Dame street east.—The council has decided to advertise for tenders for 3,000 feet of sewer pipe and 500 junctions.—In December next a by-law will be submitted to the citizens to provide funds with which to build a fire hall in Fort Rouge.

OTTAWA, ONT.—The congregation of Christ church cathedral will likely erect a parish hall as a memorial to the late Dean Lauder.—Tenders are invited by the Department of Public Works as follows: Up to the 18th inst. for heating apparatus for the military store building, this city; up to 23rd inst. for fittings for the military store building, this city; up to 25th inst. for construction of a pier at Father Point, Rimouski county, Que. A cheque for \$7,000 is to accompany each tender for the latter work. Plans at above department, at office of P. Beland, clerk of works, Quebec, and at room 411, Merchants Bank Building, Montreal.—McLeod Steward is about to leave for England, where he expects to complete arrangements for the building of the proposed palace hotel on the Clemow property.—The Chaudiere Hotel Co. is seeking incorporation, to erect hotels throughout Canada, an iron bridge over the Rideau canal between Major's Hill Park and Lover's Walk, and a subway to the Central station under Sapper's bridge, in this city.—Building permits have been granted as follows: S. L. Kyle, brick house, 5 Wellington street, cost \$1,000; George Lester, brick dwelling, 28 Second avenue, cost \$1,000; Hugh S. Conn, brick dwelling, 7 Alice street, cost \$3,000; F. A. Collins, brick veneer dwelling, 21 Wellington street, cost \$2,000; James Wilson, two brick dwellings, 13 Lisgar street, cost \$4,000; E. Tasse, 4 brick veneer dwellings, 4 Stewart street, cost \$5,000; Henry S. Hardy, brick veneer dwelling, 17 Cartier street, cost \$2,200; Ottawa Car Co., foundation under sheds, cost \$3,000.

FIRES.

Apple evaporating factory at Port Elgin, Ont., owned by S. P. Freeman; loss \$5,000.—Building at 275 St. Martins street, Montreal, occupied by the Imperial Waterproof Co. and the Rankin Wire Fence Co.; damaged to extent of \$3,000.—Public school building at Carman, Man., totally destroyed; loss \$12,000.—I. C. R. station at Eel River, N. B., adjoining highway bridge.—Fire at Killarney, Man., on 8th inst., destroyed the Pritchard block, Guide Printing Co.'s office, shoe store of W. Morgan and other buildings.—Shingle mill of Roberts Bros. at Marble Cove, N. B.; loss \$2,000, no insurance.—Saw mill at Mississippi, Ont., owned by Isaac Allan, partially destroyed.—Shingle mill at Hazelmere, B.C., owned by J. T. Kinney.

CONTRACTS AWARDED.

PALMERSTON, ONT.—The contract for new rink to cost \$3,000 has been awarded to Mayor Woodbridge.

ST. JOHN, N.B.—The contract for the new C.P.R. engine house has been awarded to Clark & Son, this city.

BERLIN, ONT.—The contract for John Peet's hotel has been let to J. Hancock; approximate cost, \$9,000.

NIAGARA FALLS, ONT.—The Niagara Falls Power Co. is said to have let the contract for the dam at the intake to James Barry.

MONTREAL, QUE.—A. Dubreuil, architect, has awarded the contract for house for Dr. Lesage, Montreal Annex, to A. Carriere.

WIARTON, ONT.—P. L. Marden & Co., of London, have been given the contract for granolithic sidewalks on West Burford street.

BROCKVILLE, ONT.—The James Smart Mfg. Co., of this town, have secured the contract for heating and ventilating the Methodist church at Midland. Two No. 24 and one No. 20 Kelsey generators will be used.

OTTAWA, ONT.—The Dominion Public Works Department has let contracts as follows: Heating apparatus for drill hall at Windsor and post office at Paris, Martel & Langelier; heating apparatus for drill hall at Brockville, W. Mashinter, Toronto.

AMHERSTBURG, ONT.—For purchase of \$10,000 county debentures tenders have been received as follows: R. A. Baby, Detroit, \$10,250 (accepted); Geo. A. Stinson, Toronto, \$10,117; F. Marx, Chatham, \$10,105; Chas. Bell, Oxley, \$10,050; O'Hara & Sons, Toronto, \$10,050.50.

PARRY SOUND, ONT.—For con

struction of bridge over the Segun river two tenders were received by the town council, as follows: Young & Bropey, \$1,625; Johnson, Beveridge & Poulin, \$1,700. The latter tender has been accepted. The contract for construction of drain on James street, at an approximate cost of \$3,500, has been given to Johnson, Beveridge & Poulin.

WINNIPEG, MAN.—Contracts for waterworks supplies have been let as follows: Pig lead, J. H. Ashdown, \$78 per ton; cast iron water pipe, Canada Foundry Co., Toronto, \$36.07 per ton; specials, Canada Foundry Co., \$54 per ton; valves, E. H. Bissett, 4 inch at \$6, and 6 inch at \$10.—J. Greenfield, architect, has let the contract for a frame residence on stone foundation for T. T. Graham, cost \$2,700.—W. F. Lee has been awarded the contract for sewers on Nasseau street and Henry and Corydon avenues, at total cost of \$7,070.

IMPROVED METHODS OF SLATE QUARRYING.

Dr. Le Neve Foster's report on the North Wales district, among much other interesting matter, contains the conclusions of Mr. G. J. Williams, H.M. Assistant Inspector of Mines, on the applicability of the wire saw for quarrying slate. Mr. Williams was sent to the Continent especially to study this matter, and his investigations included the Belgium marble quarries and the slate workings of the Pyrenees. After describing at length the method adopted—which consists of an endless cord of twisted wire traversing the rock face which is being cut, and which is continuously fed with siliceous sand and water—he proceeds to consider the advant-

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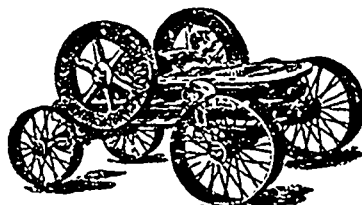
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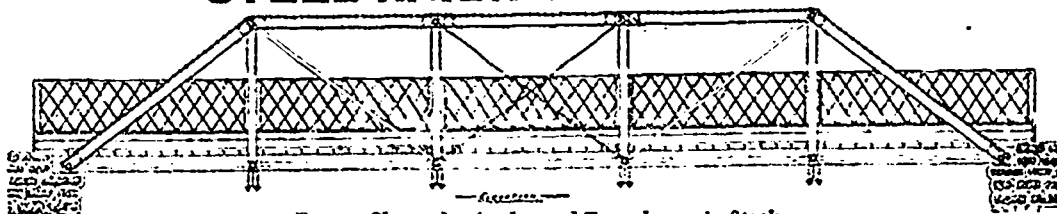


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Estimates Furnished on application.

ages which the system possesses over the crude methods employed in Wales. These advantages are of three kinds. The wire saw method is cheaper, less wasteful, and less dangerous. It is estimated that the cost of explosives is but an eighth of what is required when the "freeside" and "freebottom" have to be cut by blasting. There is also much more less unproductive work. There is a great saving effected in the cost of removing waste, as where an ascending method of working is employed the waste can be almost all used to pack the spaces between the pillars. Something like 1-5th of the total stone mined is said to be wasted at Festiniog, while in the Maillon quarry, in the Pyrenees, the loss falls as low as 1-27th in underground chambers, and even less in the open workings. Much less damage is also done to the structure of the rock than by blasting, and less good stone has to be left to form pillars. As the majority of accidents in quarries arise from the firing of shots, the great reduction in the quantity of explosives used adds largely to the safety of the miner, whilst the necessity of frequently examining the roof, which has been calculated to amount to 4s. 6d. per cubic yard of stone mined, is entirely saved where the wire saw ascending method is adopted.

A MONSTER BLAST.

Big blasts are coming to be recognized as the cheapest and best way of removing rock, when they can be advantageously applied. The effect is always found to be

ALWAYS IN STOCK

PIG LEAD, PIG TIN AND SOLDER

Syracuse Smelting Works, Montreal, P.Q.

better than a succession of smaller blasts. One of the largest blasts ever fired outside of this country was recently set off in a railway cutting at Tarana, New South Wales. A drive was made in the face of the hill 60 feet in direct line, and 20 feet at right angles. At the extreme end of the drive a chamber was excavated in the solid rock sufficient to hold 3½ tons of powder, half a ton of gelignite and 16½ cwt. dynamite. The charging of the hole was carried out by Mr. G. A. Colquhoun, of the Rand Drill and Rackerock Company. The last was an unqualified success and it is estimated that fully 60,000 to 70,000 tons of stone were shifted.

A NOTABLE STONE BRIDGE.

The longest stone arch bridge in the world is under construction at Luxem-

bourg, over the valley of Petruffe. This arch will have a span of 277 feet and a rise of 102 feet. The total width of the available roadway is 52 feet and this width is divided into two parts by a space 19 feet wide, covered by slabs of armored concrete carrying the footways. This bridge will have a span 41 feet wider than the famous arch over the Adda, near Trezzo, built in 1370 by Barnato Visconti, of Milan, but now no longer in existence.

CEMENT CONCRETE FLOORS.

By SANFORD E. THOMPSON, ASSOC. M. AM. SOC. C. E.

It is generally assumed that any country brick mason or stone mason can lay a good cement floor for a basement or other ground story, and frequently but little attention is paid to the selection of the ma-

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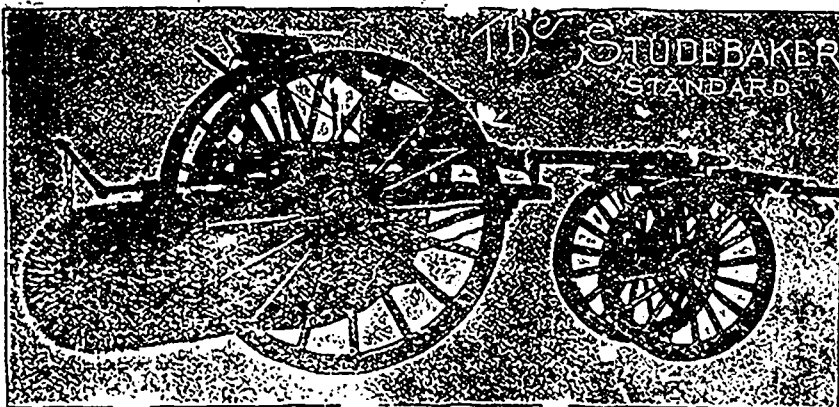
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Geo. Heaman, Mfr., London, Ont

erials or to the method of laying. Of course, some masons can do as good work in this direction as in their regular line of laying up walls, but too often there is a considerable waste of time and of cement, and the resulting floor is not finished so as to properly stand the wear and tear of heavy work.

It is the purpose of this article to describe the process of laying cement walks in sufficient detail to serve as a guide for anyone who wishes to lay a basement or other ground floor having the greatest possible durability. Floors of this kind are occasionally laid. We see them most noticeably in the train sheds and other buildings connected with some of our large city railroad stations, and many railroads use this material exclusively for their platforms.

In brief, the work of laying a floor of this description consists in the preparation of a good foundation, the mixing and placing of a layer of concrete about three inches thick, and the covering of the surface with about one inch of rich mortar troweled on.

A GOOD FOUNDATION THE FIRST REQUISITE.

The work will now be considered in detail. The first requisite is a good foundation. If the ground where the floor is to be laid consists of porous sand or gravel in its natural state, and if this material is dry the concrete can be laid directly upon it without further preparation. If, as is sometimes the case in mill construction, the ground has been filled in at a comparatively recent date, it should be thorough-

ly puddled by means of a fire hose, so as to fill all of the open spaces or voids which will naturally occur in filled ground. If the filling has been sand or gravel, it can be graded up with the same material, rammed with hand rammers, and the concrete laid directly upon. Wherever, either on natural ground or in filled ground, the earth is of character which will not provide perfect drainage for all of the ground water, or water from the mill, which will naturally soak into it, it should be brought to a grade about 4 inches below the grade of the bottom of the concrete, thoroughly rammed, and covered with a layer 4 inches thick, after ramming, of cinders, porous gravel, broken stone or broken brick. Some of the cities require in sidewalk work that this layer should be as thick as 12 inches, but in a building where the action of frost is slight a 4 inch layer is amply sufficient. This foundation material should be thoroughly rammed,

and the surface should conform to the grade of the bottom of the concrete. A convenient rammer for this, and also for the concrete, consists of a square plate of cast-iron with a socket in the top to receive a wooden handle or a piece of gas pipe.

The concrete itself consists of two distinct layers. The first layer, called the base, which is placed directly upon the natural or prepared foundation just described, varies in different specifications from 2½ inches to 4 inches in thickness. A good thickness for mill floor is 3 inches. The top, or wearing surface, varies from

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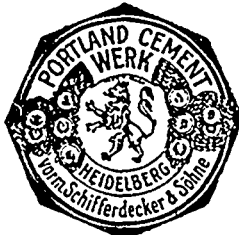
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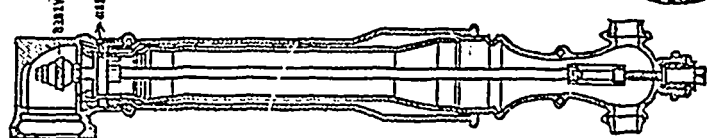
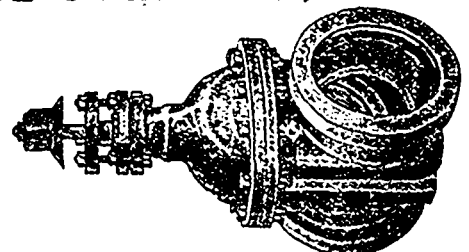
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½ inch to 1 inch. Three-quarters of an inch is sufficient for most requirements. The base is laid in a similar manner to ordinary concrete, and the wearing surface is spread like a coat of plaster before the concrete of the base has had a chance to set, and is floated to a smooth surface. The processes are described at length below. The proportions of the concrete for the base are most customarily one part of cement to two of sand to five of small broken stone or gravel. In the wearing surface the most common proportions are one part of cement to one part of sand.

All cities require Portland cement for use in their walks. For a mill floor which is not to be affected by frost, natural cement might perhaps be used for the base, but the Portland cement costs nowadays in most localities so little more than natural cement that it pays to use it on account of its additional strength. There are a number of brands of American Portland cements which are just as good for this, as well as for other purposes, as are the foreign brands.

The sand for the base should fulfill the requirements for ordinary first-class concrete; that is, it should be fairly coarse and clean. The coarse stuff of the concrete base should be smaller in size than is used for concrete generally, on account of the thinness of the layer. Either clean gravel or broken stone may be used for it. In sidewalk work some cities require that the stone or gravel shall pass through a screen having a ¾-inch mesh, while others allow the sizes of the particles to run as high as 1½ inches. For a mill floor stones as large as the latter size

may be used, but a large part should be of smaller dimensions. The sand or the dust need not be screened out of this coarse material, except in gravels where the sand largely predominates over the stones.

For the wearing surface the same sand may be used as is employed in the concrete of the base, provided it is clean and sharp. If crushed stone is easier to obtain than sand of the proper quality, it may be used instead, after being screened through a screen having meshes of either ¼-inch or ½-inch, the former being preferred. If crushed stone is used for this top surface it should be a good hard stone, such as trap or granite.

LAYING THE CONCRETE.

Having prepared the foundation and selected the material we come to the actual work of laying the concrete. The concrete is preferably divided into separate "stones," which are usually from 4 to 6 feet square, the size depending upon the general layout of the floor. The principal object in dividing the surface into squares in this way in sidewalk use is to prevent visible cracks. If expansion or contraction, due to the heat of the sun and to frosts, tends to produce cracks they will merely open or close the joints between the stones, so that the effect is not noticeable. In order to form these stones forms are laid, consisting of strips about two inches wide and as deep as the total thickness of the pavement; that is, for the thickness we have mentioned, 3¾ inches or 4 inches deep. These strips are set on edge so as to form the boundaries of the blocks, and stakes of wood are driven into the ground behind them to hold them temporarily in place. The blocks are laid alternately, being allowed to set before the forms are removed and the intermediate blocks filled in.

The concrete for the base can be made by the same methods described in a previous article for ordinary concrete. The mixing should be very thorough. A good way is to thoroughly mix the sand and cement dry, shovel it on to the broken stone or gravel which has been spread in a layer, and mix the three materials so as to obtain a uniform color throughout. Some contractors employ two men with shovels to do this mixing, while a third rakes the pile with an iron rake. When thus thoroughly mixed water is poured on

to it, and it is again turned with shovels two or three times. If desired the sand and cement may be first wet up in a mortar before being mixed with the gravel or broken stone instead of mixing all of the materials together dry. In this case it should have at least two turnings after the mortar is placed with the coarse stuff. The concrete thus prepared is wheeled and spread between the forms. It is leveled and thoroughly rammed so that the surface is the proper distance below the top of the forms to insure the correct thickness of the top layer. In laying this concrete for the base care should be taken to see that it is neither too wet nor too dry. There should be sufficient water to show upon the surface when rammed, but the mass as left by the rammer should be solid and not too much like "pudding."

LAYING THE TOP SURFACE.

To insure a perfect floor the top or wearing surface must always be laid before the concrete base has had a chance to set. By this I mean that it must be laid immediately, within at the most, say, an hour or two. If the base is laid for an entire floor and then the mortar spread on in one batch a joint will be formed between the two layers and the upper surface will be liable to peel off. A perfect union between these two layers is an absolute essential for durability. The materials for the wearing surface may be mixed like ordinary mortar. But the mixing must be extremely thorough. The sand, or screened stone, should be mixed with the cement dry until the mass is of an absolutely uniform color throughout, and then it may be wet. A regular plasterer should be employed to attend to the laying of this surface. The mortar is spread upon the base already laid, and it is smoothed off by drawing a straight edge over the tops of the forms. As soon as it becomes sufficiently dry it is hand floated with a plasterer's trowel.

(To be continued.)

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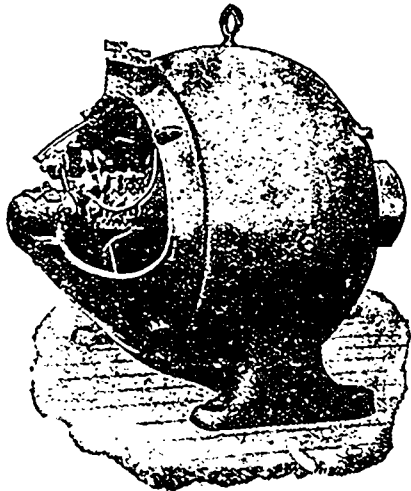
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FRENCH PRACTICE IN THE MANUFACTURE OF CAST-IRON PIPES.

(Continued from last week.)

The idea of shrinking steel bands on to cast-iron cylinders is very ancient, and at the present day English pipefounders shrink wrought-iron bands on the sockets of large diameter pipes intended for export, to prevent breakage in transshipment; but there is no doubt that steel or wrought-iron bands, shrunk on in this manner cannot bear with perfect uniformity on every particle of the surface, as owing to inequality in shrinking, some parts must be more strongly compressed than others.

The problem was, therefore, to find some method which would cause the bands to follow exactly the shape of the parts to be enveloped, and exert an even pressure throughout. This is satisfactorily accomplished by the method of winding above referred to. It is clear that in the manufacture of pipes all idea of using complicated machinery must be rejected, and it was therefore essential to provide a method of winding which, while being perfectly simple in its application, would secure perfect uniformity of tension in each wire wound round. To solve this problem M. Jacquemart started from the fact that a steel wire of uniform diameter must have a constant resistance throughout its length. He therefore devised a method by which the wire is passed through a draw-plate, which reduces it to a certain fixed diameter. A means of winding at an equal and constant pressure is also a very important feature of the process. The winding is effected by revolving the pipes, the wire first passing through the drawplate above described under the desired amount of tension. Another important point in the application of steel wire is the bedding of the ends. This is effected by shaping the edges of the grooves, so that the extremities of the wire can be bedded into them, and thus be securely fixed, and for greater security liquid tin is poured over every wire, which perfects the arrangement. It is also essential that the steel bindings should be of the same durability as that of the cast-iron; and to secure this a phosphate is put on at high temperatures, which penetrates the spaces between the coils and

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A cast-iron main of this type, 2 metres (78 inches) in diameter, has been laid by the water company of Paris.

C. H. Rust, city engineer of Toronto, has prepared a very exhaustive report on the disposal of the sewage of Toronto, in which he gives much information on the various sewage disposal works he examined on his recent trip to England. Mr. Rust refers to the Exeter and other experiments and to various systems visited in Europe, including the sewage works for the south of London, situated at Abbey Mills, Kent, and the works at Sutton, Hampton, Manchester, Croydon, Leicester, Birmingham and Leeds. Mr. Rust states that chemical precipitation is not only unsatisfactory, but is expensive

both in operation and construction, and that it only prepares the sewage for purification, a work now done much more efficiently by the septic tank. Mr. Rust presents four separate schemes for consideration: 1st. An intercepting sewer to discharge the whole of the city sewage into Lake Ontario, 9 miles east of the waterworks intake pipe. 2nd. Septic tanks at Ashbridge's Bay and filter beds near the Woodbine. 3rd. Septic tanks and bacteria beds. 4th. Septic tanks and single bacteria beds, one series at the outlet of Garrison creek sewer for the west end, and the other at Eastern avenue in the east end.

The third annual convention of Ontario Municipal Associations, which was held at St. Catharines, added the following clause to the municipal act: "That the act relating to the cutting and trimming of shade trees be amended so as to allow municipalities of under 100,000 inhabitants the privilege of cutting down and trimming the trees on the streets without it being necessary to pass a by-law, and to recompense individuals for the loss of the trees."

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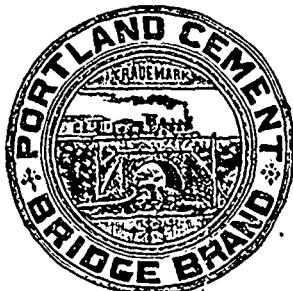
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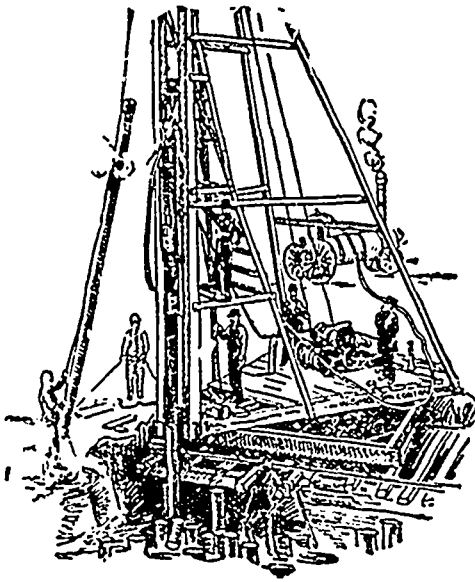


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