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CANADIAN CONTRACT RECORD

A WEEKLY JOURNAL OF THE CONTRACTING INDUSTRY

PUBLIC WORKS • TENDERS • ADVANCE INFORMATION • AND MUNICIPAL PROGRESS

EVERY THURSDAY

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. 7.

OCTOBER 15, 1896

No. 37.

THE CANADIAN CONTRACT RECORD, PUBLISHED EVERY THURSDAY

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, Publisher,

CONFEDERATION LIFE BUILDING, TORONTO.
Telephone 2362.

New York Life Insurance Building, Montreal.
Bell Telephone 2199.

Information solicited from any part of the Dominion regarding contracts open to tender.

Advertising Rates on application.

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TENDERS FOR LOAN

Sealed Tenders, marked "Tenders for Loan," addressed to the undersigned, Town Clerk of the town of Chatham, New Brunswick, will be received up to and including the

First Day of November next

for the purchase of bonds of the said town. The whole issue authorized is \$20,000.00, and tenders will be received as follows:

1. For the whole or any part of \$10,000.00, with accrued interest from the 15th day of July, 1896; money payable on delivery of bonds.

2. For the whole or any part of the entire loan of \$20,000.00, payable as follows:—\$10,000 with accrued interest from the 15th day of July, 1896, on delivery of bonds; the remaining \$10,000 on the 15th day of July, 1897, from which date interest is to run.

This is the first issue of bonds of the Town of Chatham, incorporated 1896, and is authorized by Chapter 46, 59 Victoria, Acts of General Assembly of New Brunswick. The proceeds of the loan are to be expended in the opening, widening and improving of streets and sidewalks; purchasing fire engine and the erection of town buildings, etc. The bonds are redeemable in 40 years from the date of issue and will be issued in denominations of \$500.00 each, interest payable semi-annually on the 15th day of January and 15th day of July in each and every year, at the rate of four per cent. per annum. Interest coupons and bonds at maturity payable at office of Town Treasurer. The highest or any tender not necessarily accepted. For further information address the Town Clerk.

JOSEPH B. BENSON,
Mayor.

W. T. CONNORS,
Town Clerk.

Chatham, N. B., Oct. 6th, 1896.

BUSINESS NOTES.

The Mackey Stained Glass Co., of Toronto, is applying for a charter.

Brown & O'Brien have commenced business as plumbers at St. John, N. B.

The liabilities of Grothe Bros., contractors, Montreal, are said to be about \$120,000, which includes \$40,000 in mortgages.

Town of Goderich

TENDERS FOR SEWERS

Tenders will be received by registered post only, addressed to Robert Thompson, Chairman Public Works Committee, up to 4 o'clock, p.m., on THURSDAY, OCT. 15, 1896, for the supply of material for and the construction of, approximately, four and a quarter miles of

SEWERS

with their appurtenances. Tenders will be received in the three manners following.

- 1st. Supplying Sewer Pipes and Junctions.
- 2nd. Excavating and Back Filling Trenches, Laying and Joining Pipe, etc.
- 3rd. The whole work, including Supply of Pipes, Excavation, Laying, etc.

Specifications, plans and profiles may be seen and forms of tender obtained at the office of the Town Clerk, Goderich, on and after Monday, October 14th, 1896.

A deposit in the form of a marked cheque, payable to the Town Treasurer of the Town of Goderich, for the sum mentioned in the special form of tender shall accompany each tender, except in the case of one contractor or firm of contractors putting a lump sum bid as well as separate bids, in which case the \$300.00 mentioned will cover the three tenders.

The lowest or any tender not necessarily accepted

ROBT. THOMPSON,
Chairman Public Works,
Goderich, Ont.

WALTER BROUGH, Engineer.

CONTRACTS OPEN.

EXETER, ONT.—D. Spicer intends building a new residence in Davis Survey.

RENFREW, ONT.—B. Dillon, architect, is taking tenders for the erection of a brick house.

NANAIMO, B. C.—The by-law to raise \$3,000 for fire department purposes has been defeated.

ST. JOHN, N. B.—G. E. Fairweather, architect, has in hands the new warehouse for W. H. Thorne.

VANCOUVER, B. C.—As soon as a site is decided upon the construction of the automatic car factory will be commenced.

RIDGETOWN, ONT.—The Board of Trade has offered a bonus of \$1,500 to Mr. Cawthorpe to rebuild his tolling mills.

OTTAWA EAST, ONT.—At a recent meeting of the ratepayers it was decided that a system of waterworks should be inaugurated for the village.

RAT PORTAGE, ONT.—Mr. Humbe will erect a new block on Fort street.—The Council has been petitioned to proceed with the sewer construction.

KESWICK RIDGE, N. B.—Tenders for building a Baptist church are invited by W. G. Dykeman until the 20th inst. Plans may be seen at the Baptist parsonage.

BURIT'S CORNERS, N. B.—Mr. W. F. Morris has commenced the erection of a

new building to be used as an hotel. The main building will be 30 x 40 ft., and two and a half stories high.

REVELSTOKE, B. C.—W. Cowan and others give notice of incorporation as the Revelstoke Waterworks, Electric Light and Power Company, for the purposes indicated by the name.

CHATHAM, ONT.—Mr. T. S. Cole, provincial secretary of the Y. M. C. A., was here a few days ago negotiating for the purchase of a site for the proposed Y. M. C. A. building.

SHERBROOKE, QUE.—M. C. Gelinas, of Montreal, and Dr. N. A. Dussault will each erect summer cottages at Little Lake, Magog Park.—Plans for a new block of stores are being submitted to builders by McKechnie Bros.

HALIFAX, N. S.—The City Council has decided to grant assistance to the Cold Storage Company.—It is reported that a new pier is to be built at the deep water terminus, north of the present terminal wharf, its dimensions to be 660 x 150 feet.

PARRSBORO, N. S.—Dr. J. R. Smith has secured from the town certain privileges to put in an electric light plant.—The foundations for the new Methodist church are nearly completed.—Mr. M. L. Tucker is building a dwelling house opposite the Baptist church.

KASLO, B. C.—It is announced that the erection of a large commercial hotel, with all modern improvements, has been decided upon. The cost is placed at \$50,000.—The electric lighting proposition of Messrs. Alexander and Retallick will probably be brought before the council again.

BERLIN, ONT.—The new G. T. R. passenger station here will have a 70 foot front, a general waiting room 20x25, the agent's and staff's offices in the centre, and on the west end a ladies waiting room, 20x18. The building will have modern sanitary conveniences, and will likely be of red pressed brick.

WINNIPEG, MAN.—C. H. Millican, C. E., left last week for Minnedosa to locate a site for a bridge on the Indian reserve over the Little Saskatchewan.—The Independent Order of Oddfellows is taking steps to erect in this city at an early date a home for aged and infirm members.—Mr. W. J. Gage, of Toronto, is interested in the establishment of a home for consumptives at some point in the Northwest.

OTTAWA, ONT.—E. L. Horwood, architect, Bank Street Chambers, has now in hand the following works: Row of five houses, corner Elgin and Cooper streets, for Dr. Rogers, cost \$15,000; brick block of stores on Banks street for D. O'Connor, cost \$6,000; house and stables at Hintonburg for Andrew Holland.—Tenders are open for scenery for the Prescott town hall.—The government will next year grant bonuses for the establishment of creameries throughout the country.—An influential local committee has been an-

pointed for the purpose of working up a scheme to erect a science and art building in this city, to cost \$60,000.

ROSSLAND, B. C.—Gilmour & McCandless have purchased a lot and will erect a building for a branch store.—Engineers have selected the Pend d'Oreille river as the location of a power house, the site being near the mouth of the river, and about 12 miles from Rossland. A dam will be constructed, and it is thought that 10,000 horse power will be developed. The water will be conducted from the dam in steel flumes. The total investment will be in the neighborhood of \$250,000. Mr. Norman is one of the promoters.—A lot has been donated on Le Roi avenue for an Episcopal church. The building will be 70 x 28 feet.

VICTORIA, B. C.—E. A. Wilmot, City Engineer, has reported to Council relative to connecting St. Charles street with the existing system of sewerage. The estimated cost would be \$8,000, and 800 feet of 1000 tunnelling would be required.—Improvements to the waterworks reservoir are to be carried out at once, at a cost of about \$10,000.—The question of constructing the Point Ellice bridge is under consideration by the City Council. The City Engineer has been instructed to prepare plans and submit them to the Department of Public Works at Ottawa for approval. There will be three spans of 217 feet each in length and 41 feet in width. The cost will be in the neighborhood of \$150,000.

QUEBEC, QUE.—The pavements on John street, Grand Allee, Fabrique, Buade and St. Joseph streets are badly in need of repairs. Alderman Roy has proposed that the city should borrow \$200,000 to asphalt St. Joseph and John streets, the work to be done at the same time as the electric railway is being constructed.—The Harbor Commissioners are considering the enlargement of the Levis graving dock.—D. Ouellet, architect, is preparing plans for the interior of St. Epiphane church at Temiscouata. Tenders will be invited at an early date.—A contract will be given this fall to finish the interior of St. Leon church, Standon. D. Ouellet, of Quebec, is preparing the plans.—Building permits have been granted as follows:—Reparations of a house, corner of St. Leon and Palais streets, for M. Duke; reparations of a house on Artillery street for J. Mulrooney.—It is probable that the contract for the interior of St. Sebastian church, Aylmer, will be awarded early this winter. D. Ouellet is the architect.

LONDON, ONT.—The Board of Health has reported to the City Council in favor of adopting the following plan for the proposed sewerage system: Trunk sewer, 36 inch brick and 30 inch steel pipe, cost \$54,000; north sewer, King and Ridout to Richmond and Mill, 2 feet 2 inches by 3 feet 3 inches (brick); Richmond to Maitland, 2 feet by 3 feet (brick); Maitland to Adelaide, 1 foot 10 inches by 2 feet 9 inches (brick); Adelaide to Ontario, 18-inch tile pipe; Ontario to Egerton, 15-inch pipe, cost \$72,520; South London trunk sewer to Bruce street, 18-inch pipe Bruce street, east by south, 15-inch, cost \$9,280. The total cost, in accordance with the above route, would be \$165,775. It is probable that Mr. Chipman will be appointed as engineer.

MONTREAL, QUE.—The Gregory Farm incinerator and the fever hospital are said to be in need of repairs.—The ratepayers of St. Denis ward are urging that the city take steps at once to furnish a water supply.—It is probable that the reports of the Road Committee for new sewers, of the Fire Committee for a new station, and of the Water Committee for repairs to the reservoirs and for the laying of new mains, will lay over for another year.—The plans prepared by C. St. Jean, architect, of this

city, for the St. Jerome church, Terrebonne county, have been accepted.—J. H. Macduff, architect, is preparing plans for a three-story house to be erected on Annie st., St. Henry, for J. S. Girouse. Tenders will shortly be invited.—A. Sincennes & Courval, architects, are preparing plans for a building, three stories, to be erected on Laval avenue for Mde. A. E. Clement.—Jos. E. Huot, architect, is preparing plans for a three-story house on St. Andre st., for E. Ropert. Same architect has plans under way for two three-story houses on Willie st., St. Henry, for Jos. Lemoine.—Eric Mann, architect, is preparing plans for a manufactory on St. Paul street.—The Road Committee have recommended the construction of a sewer in Sydenham street, from Marie Anne street northwards.

HAMILTON, ONT.—The Fire and Water Committee have recommended the construction of a main from Main street to Poplin avenue, at a cost of \$1,300.—Stuart McPhie has taken out a permit for alterations to a store at the corner of James and Hunter streets, for A. Rutherford, to cost \$1,000.—The Dominion Cold Storage Company intends, it is said, to have the east portion of the Wanzer building fully equipped for business next spring. Later on the company expects to fit up the Barton street building.—It has been decided to construct a brick sewer on Queen street, from Bold to Hannah streets, at a cost of \$4,125.—It is stated that the old post-office building on James street north has been sold and will be converted into a first-class hotel.—According to an order received from the Railway Committee of the Privy Council at Ottawa, the Toronto, Hamilton and Buffalo Railway Company must build the high level bridge over the Desjardins Canal at its own expense. The bridge is to be not less than 24 feet in width.—The City Council has given notice of its intention to construct pipe sewers on portions of Hess, Wellesley and Maria streets.—The Colony Company, which propose to build a \$55,000 hotel and establish a first-class summer resort at the Beach, have asked the council to assist in securing a patent from the government.—A new building will probably be erected for the Wentworth Historical Society. A site at the east of the court house has been suggested.

TORONTO, ONT.—Ground has been broken for a residence on west side Admiral road.—A meeting of ratepayers on Spadina avenue, between King and Queen streets, was held on Saturday last to consider the question of street paving. The motion which seemed to meet with most favour recommended the paving of two roadways, 21 feet in width, with macadam, thus adding three feet on either side of the boulevard, and to put in stone kerbing. No action was taken pending the report of the City Engineer.—In his fortnightly report the City Engineer again recommends that a 24-inch main be laid from Simcoe to Church streets, at an approximate cost of \$26,000; that the work of laying the pipe be done by day labor, and that permission be given to advertise for tenders for the supply of the necessary pipe. To convert the 8,000-gallon engine at the main pumping station into a high duty engine the estimated cost would be \$28,000. The cost of providing new boilers would be about \$12,000. The construction of pavements is recommended on the following streets: Twenty-one foot brick pavement on concrete on Hazleton avenue, Yorkville ave. to Davenport road, cost \$9,770; 24-foot brick pavement on Leonard avenue, Nassau street to Bellevue place, cost \$4,200; two 16-foot brick pavements on Shaw street, from Queen to Arthur, cost \$18,300; 27-foot macadam pavement on the east side of Queen's Park crescent, from Bloor to College street, cost \$6,300.

—The City Engineer has reported that the cost of a 4-foot wooden sidewalk and wooden bridge across the lagoon from Centre Island to Hanlan's Point would be \$2,200.—The House of Industry Board have appointed a committee to urge the City Council to bear a portion of the cost of erecting a more commodious building for aged people.—The pavements recommended by the City Engineer were approved by the Board of Works on Monday last.—The extension of the sewers on Dufferin street and Spencer avenue into deep water has been referred to the City Engineer for a report.—Building permits have been granted as follows: Strickland & Symons, architects, 2 story bk. add. to Bay st. fire hall, cost \$4,000; John Beatty, 1497 Queen st. w., pr. s. d. 2 story and attic bk. dwellings, 1636-38 King st. w., cost \$4,500.

FIRES.

Marsh & Brown's tannery at Newmarket, Ont., was consumed by fire on the 7th inst. Loss, \$5,000; insurance, \$3,000.—A three-story building on Esplanade street west, Toronto, owned by James Lumbers, and occupied by Harvie & Co. and Strachan & Hay, was completely destroyed by fire on Sunday last. The loss is upwards of \$15,000, partially covered by insurance.—A rough-cast house at Belleville, Ont., owned by Mrs. Dermott, and situated on Baldwin street, was destroyed by fire last week.—The school building at Newcastle, Ont., has been burned. Insurance, \$5,500. It will be rebuilt at once.—The Northern Elevator Company's elevator at Douglas, Man., was burned last week. The building was insured for \$5,000.—The T. H. Taylor Company's flour mills at Chatham, Ont., were recently damaged by fire to the extent of \$10,000.—The residence of John Brackenbridge, of North Embro, Ont., was consumed by fire on Monday last.—The Methodist church in Simcoe, Ont., was completely destroyed by fire on Tuesday last. The church was valued at \$12,000, and was insured for \$8,000. It will likely be rebuilt at once.—The residence of Mrs. Henry Harvey, at Melbourne, Ont., has been burned. Loss, \$1,200.

CONTRACTS AWARDED.

KINGSTON, ONT.—The old tramway rails have been sold to B. W. Folger, at \$12.50 per ton.

DUNCHURCH, ONT.—J. Burns has been awarded the contract to build the Presbyterian church.

PARRY SOUND, ONT.—F. Strain has been given the contract for a residence on William street for E. C. McKinley.

BRANDON, MAN.—The contract for the plumbing and heating apparatus for the hospital has been awarded to J. H. Midgeley.

WOODSTOCK, ONT.—A. Vincent has the contract for the brick and mason work of the new factory on Norwich ave. for Hay & Co.

NIAGARA FALLS, ONT.—Fifty thousand dollars' worth of 5 per cent. sewer debentures have been sold to the Imperial Bank of Canada, at 113.65.

VANKLEEK HILL, ONT.—The Vankleek Hill Mfg. Co. have secured the contract for the lumber and finishings required in building stations on the M. and O. Railway at St. Eugene, Vankleek Hill, Caledonia Springs and Alfred.

QUEBEC, QUE.—The following tenders have been recommended for acceptance for the construction of the bridge over the St. Charles river: for the construction of the pillars only, Lortie & Co., \$7,600; for the iron superstructure only, Carrier, Laine & Co., \$6,500, making a total of \$14,000.

RIVERFIELD, QUE.—The contract for-

an iron bridge of one hundred and twenty-five feet span, across the English river here, has been let to the Rousseau Bridge Company, of Montreal, for \$2,500. This includes the supports at each end, which will be metal pillars filled with concrete.

WINNIPEG, MAN.—The contract for the excavating of the Westbourne ditch has been let by the local government to McKelvie & Watson. The number of yards of earth to be excavated is 32,000, and the contract price is about \$10,000.—The Department of Public Works has let the contract for the construction of the Springfield road to P. Holden & Co.

LONDON, ONT.—Three tenders for the building of the turntable pit were received by the London and Port Stanley Railway Board, and that of Martyn & Hammett, at \$749, was accepted. Ald. Garratt tendered at \$1,025, and Everett & King at \$1,031. Three tenders were also received for building a turntable, two from American companies and the other from the Dominion Bridge Company, of Montreal. The latter has been accepted.

ST. JOHN, N. B.—On Friday last the tenders for roofing the new warehouse at Sand Point with roofing felt and pitch were opened. The following were received: A. M. Rowan, per square foot, \$3 (accepted); G. S. Fisher & Co., \$3.50; Robert Magee, \$3.15; M. J. Thomas, \$3.20; George Young, \$3.95. Three tenders for supplying doors and windows for the warehouse were received, and that of Scott, Lawton & Love, at \$3.40 for doors and \$2.75 for windows, were accepted. The other tenderers were Haley Bros. & Co., at \$3.50 for doors, and A. Christie Wood Working Co., at \$4.

MONTREAL, QUE.—Contracts have been awarded as follows by W. E. Doran for three stores and three tenements on St. Uubaine street, for W. W. Halpin: masonry and brick work, Paquette Bros.; carpenter and joiner's work, E. Robert.—M. S. Trappier has taken tenders for a residence to be erected at Montreal Annex for Soucisse & Brouillette. The successful contractors are not yet known.—Building permits have been granted as follows: Two buildings, 47 x 65 feet, three stories, stone and brick, corner Sherbrooke and City Councillors street, for Fch. Dumont. Two houses, two stories, brick front, on Murray street, for Richard Kelly—contractors, masonry, Mike Furlong; carpenter and joiner's work, M. Dwyer; brickwork, M. Connors.]

LITTLE CURRENT, ONT.—The contract for the construction of the Manitoulin and North Shore railway has been let to W. B. Strang, jr., & Co., of New York and Philadelphia. The contract covers the entire work of the construction and equipment of 42 miles of standard gauge railway from Little Current, Ont., to a junction with the Canadian Pacific Railway. Some difficult engineering work will have to be done through the Whitefish gorge of the La Celeche mountains, and besides several large bridge structures on the line, a swing bridge is to be built over the navigation channel in the passage between the Manitoulin Island and the main shore. J. A. Macintyre, 56 Gluck Building, Niagara Falls, N. Y., is managing director for the company, in which several Toronto gentlemen are interested.

HAMILTON, ONT.—The Sewers Committee received tenders as follows for the sewage interception works: mason work, George F. Webb, \$4,889, (accepted); W. Hancock, \$5,165; George E. Mills, \$5,780. Carpenter work, Coleman Lumber Company, \$1,475, (accepted); Downie & Sons, \$1,790; James Gage, \$1,650; J. S. Hossack, \$1,949. Painting and glazing, John Goodfellow, \$223; P. Thompson, \$225; David Kemp, \$196; J. T. Corner, \$244; Metcalf & Zimmer-

man, \$212; A. M. McKenzie, \$187.50, (accepted); Boothman & Hutchison, \$249. Iron girders, Hamilton Bridge Company, \$220. Plumbing, Fairley & Stewart, \$164, (accepted). Slating and galvanized iron work, James Findlay, \$1093; J. Wallace & Son, \$1,069, (accepted). Thomas Irwin & Son, \$1,097; John E. Riddell, \$1,085. The contract for boilers was awarded to Beckett Engine Company at \$835, and that for machinery to A. J. Nic at \$2,760.

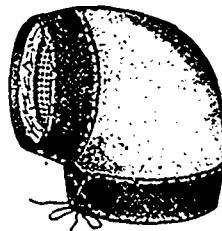
ERRATUM.

In the issue of the CONTRACT RECORD of October 1st, it was stated that the Silica Sand and Gravel Co.'s premises had been damaged by fire. This was an error, as the premises damaged were those of the Sicily Asphaltum Paving Company. We desire to express our regret that the error should have occurred.

ASPHALT LININGS FOR WATER WORKS RESERVOIRS.

In a paper on asphalt linings for water works reservoirs, which was presented at the recent convention of the American Water Works Association by J. L. Le Conte, of Oakland, there is a description of the method followed in repairing a small reservoir at Mill Valley, Cal., which is of particular interest at the present time, on account of the wide-spread belief that asphalt is destined to play an important part in water works construction before long. The Mill Valley reservoir is located on the flank of a rugged ravine, one-half of its base being on solid rock, and the remainder on made ground. The old lining of this basin consisted of twelve inches of concrete, faced with a one-inch coat of high grade asphalt sidewalk finish. The portion of this lining which rested on made ground settled and cracked badly. The cracks were repeatedly cleaned out and filled with new material of the same character, but without improving the basin, which was finally abandoned on account of the leakage from it. A new reservoir was built and put in service, allowing the old basin to be drawn down and examined thoroughly. The side slopes were nearly vertical, the larger cracks being in the corners, and at the foot of the walls. It was finally decided to make an attempt to put the basin in a serviceable condition by giving it a flexible lining of asphalt. Extra precautions had to be

taken to prevent the slipping of the lining on the steep slopes. The fissures and cracks were cleaned out and filled with a paste of nothing but Portland cement and water. V-shaped grooves were then cut in this cement and filled with a mastic composed of 20 per cent. of asphalt and 80 per cent. of sand, the top of the mastic being level with the surface of the old lining. The entire inner surface of the reservoir was then painted with liquid asphalt, which was intended to act as a binder or adherent, to make the succeeding materials adhere to the concrete. The four side walls were next covered with heavy burlap, such as is used in grain sacks, anchored to the top of the slopes and hauled down taut and pressed into the fresh asphalt. The lower end of the burlap was made to run out on the bottom of the basin about three feet. The bottom was then covered with two layers of asphalt mastic, each one inch thick, which were well rolled with hot iron rollers. The final step in the repairs was to coat the entire inner surface of the reservoir with a first-class hard finish of rock asphalt, heated to a temperature of 300 degrees and put on hot. When completed, this lining was entirely waterproof and did not creep under the hottest summer sun. The basin has been in uninterrupted use since September, 1894, and has shown no indications of leakage anywhere. The contract price for the entire work of repairing was 16 cents per square foot of inside facing. [Another work of somewhat similar nature was carried out at the Linda Vista reservoir, at Oakland, Cal., which is entirely an excavation in a sandy clay soil, interspersed with seams of gravel. This reservoir has a capacity of 5,000,000 gallons, and has side slopes of 1½ to 1. Here an asphalt lining was employed when the basin was first built. It was laid directly on the earth and consisted of a coating of asphalt mastic from 1.3 to 2 inches thick and an outside finish of hard rock asphalt as a sunproof coating. About two years after it was completed, during a period of hot weather when the water was low, the mastic lining showed some signs of creeping down the slopes. An outside layer of liquid asphalt and burlap, covered with a hard finish of rock asphalt, completed the repairs and stopped the creeping entirely. This work is now four years old.]



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BRIDGE BUILDERS

BELLEVILLE, ONT.

AN ELECTRIC DREDGE.

The Revista de Obras Publicas, a Spanish journal published in Madrid, gives a description of a dredge on the system Bunau-Vailla, for the purpose of dredging railway ballast from the river Esla, and delivering it in a washed state into barges. It is claimed for the electrical dredge: That the numerous interruptions of work usual with a steam-driven dredger are done away with, and many chains and anchors are abolished. Production is continuous without any interruption. The work of the dredge can be so arranged as to give almost the theoretical output. Ability to attack ground above the water level. That the management and direction of the dredge can be soon learned by any person, reducing to one man the numerous crew needed in an ordinary machine. That the motive power employed is only that produced under the best conditions in an independent installation quite apart from the dredge, and not subject more over to the perturbations and limitations usual when intimately connected with the dredge. The force and power of the dredge can be augmented considerably without increase of size of dredge—a result impossible in the ordinary machine. The generating station installed on the bank consists of a boiler, a motor, and an electrical generator, established on a hulk or platform on concrete, and guarded by a wooden house.

The boiler is tubular, 4.70 metres long and 1.20 metres diameter, with tubes of 56 millimetres diameter, and 56 square metres of heating surface. The engine is a compound of 150 h. p., able to run with or without condenser, and with cylinders of 0.38 and 0.67 metres diameter. The engine is rope geared to a triphase alternator with fixed armature and revolving fields on the system of C. E. L. Brown, producing a high tension current of 2,000 volts, which after passing the switchboard on which are mounted the interruptor, lightning conductor, and meters, passes out by a 6 millimetre copper wire carried overhead to the dredge, which it enters by a perfectly insulated cable. The hull of the dredge is 25 metres long, 6 metres wide, and 2.30 metres deep. The ladder opening in the front of the vessel is 14 metre long and 2.4 metres wide. In the rear of the vessel is placed the transformer gear for reducing the current to 200 volts, with switchboard and suitable switches for working the various motors. In the same hold is a motor of 45 h.p. at 600 revolutions, also on the system Brown.

This actuates the upper arbor of the bucket chain and another motor of 10 h. p., working a centrifugal pump for washing the dredged stuff. There are also two 25 h. p. motors to work twin screws of 1 metre diameter. They are placed in the front part of the hull on either side of the ladder well, and serve to work the ship. The bucket ladder is 19 metres long, and is able to dredge 7 metres deep. The ladder windlass is fitted with a 15 h. p. motor at 800 revolutions. There are 32 buckets each of 200 litres capacity, and they travel at 14 buckets per minute, giving a theoretical output of 168 cubic metres per hour. The elevators to take the dredged ballast from the barges to

the land are also electrically worked, and it is considered that the dredge is a great success.

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MUNICIPAL DEPARTMENT

BRICK FOR RESERVOIRS.

The use of bricks for reservoir purposes is largely on the increase, says the British Clayworker, but we do not think that the engineer takes the fullest advantage from the material. Generally speaking, he relies too much on the value of puddle, which does very well, for a time, for small reservoirs, but is often notoriously bad for large ones. The quantity of bricks used even in brick reservoirs, however, is nothing like what it ought to be. In dealing with stone the engineer uses that material so lavishly as to surpass all possible requirements; but with bricks he is always sparing, and never employs them except in a half-hearted way. Nothing beats a good sound brick for keeping in, or keeping out water; no stone either natural or artificial is so impervious, or has such a long life. Engineers should never forget this fact.

DIVIDING THE COST OF A SEWER.

A correspondent writes to the Engineering Record as follows:

SIR: The city of B contemplates a sewerage system for a section comprising 75 acres, the outlet of which is to be temporarily the present sewerage system of A, but eventually the new intercepting sewer already commenced by A. The problem is to determine what amount B ought to pay A for the privilege of entering their sewer. This section of 75 acres will require immediate disposal into the A system. We also have about 7.6 miles of sewers which will eventually be obliged to enter the intercepting sewer at a different point, but only the 75 acres demand immediate attention. A is much more thickly settled than B, the 75 acre tract being very thinly settled. The population being no criterion, we have thought of making the sewerage areas a basis of settlement for the present, taking in the remaining areas as fast as sewerage. Can you give us any suggestions on the subject outside of the work of the Boston, Mass., Metropolitan Sewer Commission?

In replying to the above questions it is stated that the subject has been studied more carefully by Engineer F. H. Snow, of Brocton, Mass., than, perhaps, by anyone else. His recommendations are that one-half of the total cost, including maintenance, be raised by rental assessed on the user, one-fourth by assessment on the abutting land, vacant or otherwise, and the remaining one-fourth by general tax levy. To equalize the disputed justice of assessments by areas and assessments by frontage he advised that six-tenths of the second item, that is, the assessment on the abutting land, be assessed on the area and four-tenths on the frontage. So that to find the amount which was charged per square foot of area, six-tenths of one-fourth of the whole cost of the sewers, was divided by

the total number of square feet within a certain distance of the street beyond which it was thought the additional depth of the lot did not insure any additional benefit from the sewer. In Brocton this distance was fixed at 125 feet. The assessments recommended by Mr. Snow were as follows: For 1st assessment 3 mills per square foot and 15 cents per foot front; for rental 28 cents per 1,000 gallons entering the sewer, or \$8.40 per year for unmetred connections; for general taxes about \$1.32 per \$1,000 in 1895, to about 88 cents in 1900. Their application is of course largely local. The rental rates were determined from the consumption of water, estimating that 95 per cent. of the water in dwellings reaches the sewer and 30 per cent. from shops. As agreements between towns are usually more convenient if made on some approximation, a side light might be had by estimating roughly the cost of any disposal system. B might build independent of A. Then the annual charge paid by B to A ought not to exceed the sum of the interest on first cost, operating cost, and depreciation charge on this possible disposal system. Again, these three items of the annual cost of the sewer actually built by A might be found and divided among the two places by Mr. Snow's plan. If A is to build the sewer larger to accommodate B, B ought to pay the increased cost of the larger sewer, but if A is building the sewer large now to meet future needs so that it costs nothing to handle B's sewage, a very reasonable adjustment of charge would be of advantage to both towns if B cannot now afford to pay its proper share. These could be readjusted as the growth of B allowed.

THE SEPARATE SEWAGE SYSTEM

In view of the consideration which is now being given to the question of obtaining a satisfactory system of sewage, the following particulars regarding the separate system may be of interest to municipal officers:

The separate system of sewers was first introduced into the United States in 1880, in the city of Memphis, where two years before 5,000 of the 30,000 population had died of yellow fever. Eighteen miles of such sewers were constructed, at a cost of \$137,000; and the system is said to have proved so great a success that many other similar works were constructed in southern towns and cities.

Brockville was the first Canadian town to adopt the separate system. This occurred in 1887, when the population was 8,500. The town drained naturally into a mill creek connecting with the river, but the adoption of a water works system rendered necessary the construction of a long intercepting main sewer.

Col. Waring, a Rhode Island engineer, who first brought the separate system idea to the continent, reported for Brockville, and recommended the exclusive separate system. This was adopted, but some details he proposed were not, because he apparently had not considered the weather conditions fully, and some changes were made. All sewers were

laid deeper than seven feet below the surface where possible. This system was begun in 1887, and completed in 1891. Eight miles of sewers were laid, at a cost of \$95,000, about \$15,000 of which represented rock excavation.

In a report upon the Brockville and other separate systems of sewage in Ontario, all of which were constructed under his supervision, Mr. Willis Chipman, civil engineer, says that although Brockville was the first town in the province to have the separate system, the results have been very satisfactory. Stringent rules and regulations governing plumbing add to the efficiency of the service received. All plumbing or house sewers must be laid under the supervision of the engineer. A complete record of house sewers and plumbing is kept by the town engineer.

Before the construction of the sewage system the town had constructed box drains for the removal of storm water and for draining cellars, and these were retained, the sewage being diverted into the sewers proper. New storm sewers had to be constructed on a few streets.

Cornwall has a satisfactory separate sewage system.

Barrie also has this system. It was recommended to them by Mr. Chipman for financial and sanitary reasons. Surface drainage in Barrie caused no inconvenience, the graded street gutters removing what is not absorbed by the porous soil.

Brantford has 12½ miles of separate sewers. Here the sewage is discharged into the river about two miles below the city. The sewers are strictly upon the separate system, not even roof water being permitted to enter them. The surface grades, the location of natural watercourses and the very porous character of the soil allow storm water to cause very little inconvenience. In Brantford it is necessary to remove fungus growth in two or three sewers about once in three months.

Berlin has a sewage farm, which it is said can be made a success only by careful management.

In 1891 Toronto Junction entered into an agreement with the city by which the town was permitted to discharge its sewage into the sewers of the city, all storm water to be excluded. The sewers were laid consequently on the separate system, and gave the greatest satisfaction.

TEARING UP PAVEMENTS.

The breaking up of pavements for necessary repairs, or for making new connections for water and gas pipes, sewers, etc., is an unavoidable evil which is especially a disadvantage to asphalt pavements. All pavements suffer more or less from this kind of work, for it is very seldom that a contractor is inclined to, or is able to make the pavement as good as it was at first. The filling put in invariably settles after a time, causing the surface of the pavement to sink. To prevent this a regulation has just been made in Brooklyn, N. Y., requiring, in addition to a proper refilling and ramming of the trench, the laying of 8 inches of Portland cement concrete under the asphalt. The object of this is to form a bridge in the event of the filling settling, and so prevent the surface falling in. This increases the expense of the work considerably, and tends also to discourage the tearing up of the pavements for anything but really necessary work.

In other cities a check is put upon the breaking up of pavements by means of a fixed charge; New York city charges \$4 per square yard for opening an asphalt pavement, with a minimum charge of \$16. The city of Philadelphia charges \$13 for a permit to open an asphalt pavement, and increases this fee to \$18 between December 1 and March 1, in any year.

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Prices of Building Materials.

CONDITION OF THE MARKET.

TORONTO: Taken as a whole building material is moving satisfactorily. A reduction in the price of wire nails has caused a revival in the demand. In the heavy metal trade there is a fair proportion of orders received. Galvanized iron is moving freely, and higher prices are being asked for pig iron in some of the United States markets. Several lots of plate glass have been disposed of

MONTREAL: There is a well distributed demand for such lines of builders' supplies as are required at this season of the year for completing buildings, and although the volume is not large, the market shows considerable life. A fair trade is doing in cut nails, plumbers' supplies, and pig iron. Window glass has advanced five cents on first break, and 10 to 20 cents on second break. Cement is in short supply, and dealers are having difficulty in filling orders. An advance in freight rates may result in a rise in quotations. Local and western buying is brisk.

LUMBER.

CAR OR CARGO LOTS.

Table with columns for Toronto and Montreal prices for various lumber types including clear picks, three uppers, pickings, inch clear, and various shingles.

VAID QUOTATIONS.

Table listing various building materials and their prices, including mill cull boards, Hemlock scantling, Cedar for block paving, and various types of shingles.

Toronto. Montreal.

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Table listing prices for various types of bricks including Common Walling, Good Facing, Sewer, Pressed Brick, and Roof Tiles.

SAND.

Table listing prices for sand per load of 1 1/2 cubic yards.

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Table listing prices for various types of stone including Common Rubble, Large flat Rubble, Foundation Blocks, Kent Freestone Quarries, and Granite.

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Table listing prices for roofing slate in various colors and finishes.

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Table listing prices for various types of paint including White lead, Red lead, Venetian, Vermillion, and others.

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Table listing prices for Portland Cements and other building materials.

Toronto. Montreal.

Table listing prices for Portland Cements from various manufacturers like Newcastle, English, Belgian, Roman, and Superfine.

Table listing prices for Hydraulic Cements including Thorold, Queenston, Napanee, Hull, and Ontario.

Table listing prices for Keene's Coarse Whites and Fire Bricks.

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Table listing prices for hair used by plasterers.

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Table listing prices for cut nails, steel, and various types of cut nails and spikes.

FINE BLUED NAILS.

Table listing prices for fine blued nails in various sizes.

CASING AND BOX, FLOORING, SHOOK AND TOBACCO BOX NAILS.

Table listing prices for casing and box nails.

FINISHING NAILS.

Table listing prices for finishing nails in various sizes.

SLATING NAILS.

Table listing prices for slating nails in various sizes.

COMMON BARREL NAILS.

Table listing prices for common barrel nails in various sizes.

CLINCH NAILS.

Table listing prices for clinch nails in various sizes.

SHARP AND FLAT PRESSED NAILS.

Table listing prices for sharp and flat pressed nails in various sizes.

STEEL WIRE NAILS.

Table listing prices for steel wire nails.

Iron Pipe:

Table listing prices for iron pipe in various diameters.

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Table listing prices for lead pipe in various diameters.

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Table listing prices for galvanized iron in various gauges.

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Table listing prices for structural iron in various types.