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CANADIAN CONTRACT RECORD

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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.

DECEMBER 31, 1896

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THE CANADIAN CONTRACT RECORD,

PUBLISHED EVERY THURSDAY

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Notice to Contractors

COUNTY OF YORK

Scaled Tenders, endorsed "Tenders for Abutments of York Mills Bridge," will be received by the undersigned up to 12 O'CLOCK, NOON, OF TUESDAY, JANUARY 5TH, 1897, for the construction of

TWO STONE ABUTMENTS

for a Steel Bridge at York Mills on Yonge Street. Plans and specifications may be seen and all necessary information obtained at the office of the undersigned on and after Monday, Dec. 28th, 1896. The lowest of any tender will not necessarily be accepted.

By order,
JAS. McDUGALL, C.E.,
County Engineer.

Court House, Toronto, Dec. 21st, 1896.

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A Thoroughly Competent Master Coach Painter, with railway experience. Apply,
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CONTRACTS OPEN.

COLDWATER, ONT.—It is proposed to expend \$5,000 on improving the village streets.

ST. BONIFACE, MAN.—Messrs. Dyson & Co. intend erecting a \$15,000 factory next spring.

CHELMSFORD, ONT.—The Algoma Coal Mining Co. propose erecting a smelter here.

STANSTEAD JUNCTION, QUE.—The erection of a new Methodist church at this place is contemplated.

OTTERVILLE, ONT.—A. B. Moore is about to erect a residence to cost \$2,000, for which a site has been purchased.

VANCOUVER, B. C.—The Great Northern Railway Company are preparing for building branch lines into the mining districts.

WOORVILLE, ONT.—Dan. McLaughlin, grocer, is preparing to erect a new dwelling house at the corner of John and Ridout streets.

FREDERICTON, N. B.—Mr. Ross, of St. Stephen, is said to be negotiating for the purchase of the Ketchum property, with a view to erecting a mill thereon.

LONDON, ONT.—Y. F. Mossop, of Dundas street east, will erect a brick veneer dwelling on the north side of Queen's avenue, at a cost of \$1,200.

CALGARY, N. W. T.—A proposal is on foot to build a bridge here, at a cost of several thousand dollars. The town will be asked to make a grant of \$500 towards the work.

WOODLANDS, MAN.—C. E. Slade, Secretary Building Committee, will receive tenders until Friday, the 15th of January, for the erection of a concrete church at this place.

HONORA, ONT.—Charles Stewart intends building a planing mill and machine shop, and if satisfactory arrangements can be made with the village council he will also erect a woollen mill.

BROCKVILLE, ONT.—The report of A. Davis, consulting engineer, of Montreal, who recently examined the pumping plant at the water works here, has recommended the purchase of new pumps.

GUELPH, ONT.—The ratepayers will vote on a by-law on the 4th of January to provide the sum of \$20,000 for purchasing a civic electric light plant. Tenders were recently invited for lighting the streets, but no bids were received.

ROSSLAND, B. C.—A. L. Belyea, solicitor, gives notice that application will be made to the provincial legislature for incorporation of the Fraser Valley & Kootenay Railway Company, to construct a railway from Burrard's Inlet to New

Westminster and Rossland, with several branches; also to construct telegraph and telephone lines.

NELSON, B. C.—The Kootenay Iron Works is looking for a location on the shore of the lake in the neighborhood of the C. and K. road, and as soon as one is secured the construction of a large iron foundry will be commenced.

DIGBY, N. S.—A company, of which Dr. Hutchings, of Boston, is at the head, is considering the erection of a large summer hotel at this place, containing about one hundred rooms. The company also talk of building a sanatorium at Kingston, N. S. Should the erection of these buildings be proceeded with the plans will be prepared by F. Mason White, architect, of Boston.

PORTAGE LA PRAIRIE, MAN.—A by-law has been carried by the ratepayers authorizing the town to construct works on the river for water works purposes. —The congregation of Knox Church have decided on the erection of a new structure on Campbell street, to cost in the neighborhood of \$20,000. Plans will be prepared during the present winter, and the work of construction will commence early in the spring.

ST. JOHN, N. B.—Excavating is now in progress for a residence to be erected at the north-east corner of Wellington Row and Carlton street. The proprietor is Dr. Magee.—The committee appointed to report on the harbor improvements at Sand Point have recommended that two berths be built of solid crib work, from the plans submitted by Mr. Peters, city engineer, and that tenders be called for the birch, hemlock, pine, etc., required for the purpose.

QUEBEC, QUE.—The Great Northern Railway Company are considering the question of building their cars in this city. —H. Staveley, architect, has received tenders for a manufactory for W. A. Marsh & Co. The building will be in brick, 290 x 44 feet, and five stories high. —The same architect is also preparing plans for an addition to the Montmorency Electric Co., to be erected on the side of their establishment on Prince Edward street. It will be 60 x 30 feet, two stories.

WINNIPEG, MAN.—Mr. W. W. Ogilvie, of Montreal, has contributed the sum of \$1,000 to the Winnipeg General Hospital, for the purpose of providing increased accommodation. An additional building for public ward patients has become a necessity.—The local legislature is calling for tenders for a new bridge to be constructed over the Assiniboine river near De Clare, to be built in the spring. Plans may be seen at the office of Hon. C. J. Mickle, Birtle, or at the Public Works Department, this city.—The city will probably pay 75 per cent. of the cost of paving Portage, Notre Dame and Logan avenues.

MONTREAL, QUE.—J. Alcide Chausse has been calling for tenders for a presby-

tery at St. Zotique, Soulanges county. Tate's old saw mill, Mill street, is now being converted into a power house for lighting the Lachine canal.—Robt. Findlay, architect, is calling for tenders for a hospital to be erected at Cornwall, Ont. Plans may be seen at the office of the architect, 260 St. James street, Montreal, or at Cornwall, Ont., until January 5th, 1897.—Ground has been broken for a new hotel to be erected by George Carslake at the north-east corner of St. James and Windsor streets. The plans are now being prepared, and it is hoped to have the building completed by the 1st of May.—The Grand Trunk Railway Company will rebuild Victoria bridge, provided Governmental assistance can be secured. It is understood that the Dominion Parliament will be asked for \$150,000, and a like amount from the Quebec Legislature, while the cost of the work is estimated at \$1,500,000.

TORONTO, ONT.—Work has been started on the Massey-Harris summer residence at the company's model farm, Little York. The plans show a handsome brick building, surmounted by an observatory.—Mr. Marcon, of the Toronto Veeneer Company, proposes establishing a factory at Toronto Junction.—The rate-payers of Huntley street have petitioned for the construction of a brick pavement.—The Technical School Board are taking steps to secure the erection of a new building. A consultation with the architects shows that the old buildings cannot be altered to suit the requirements of the school, and the committee will urge the City Council to grant an appropriation for erecting a suitable building.—Messrs. Mercier, Bradford & Titus, solicitors, give notice that application will be made to the Ontario government for incorporation of the Toronto Radial Railway Company, to acquire the franchise of the Toronto Belt Line Railway Company, and to convert the road into an electric railway.—Kingsmill, Saunders & Torrance, solicitors, will make application to parliament for an act to extend the time for the completion of the undertaking of the Niagara Grand Island Bridge Company.

OTTAWA, ONT.—It is said to be the intention of Mr. J. R. Booth to construct, in connection with the Ottawa, Arnprior & Parry Sound railway, several elevators on the lake ports, also vessels to run from Duluth, Port Arthur and Chicago to Parry Sound. It is also thought that the building of the Ontario and Rainy River railway will be carried out within the next two years.—Notices of application to Parliament have been given by the following companies: The Trans-Continental Railway Company, for an extension of time for commencing and finishing the road, and for the building of branches; by the Rocky Mountain Railway and Coal Company, for an extension of time, and by the Alberta Railway and Coal Company, for a revival of powers to extend the railway through the Crow's Nest pass. Notice is also given of application to Parliament for the incorporation of a company to build a railway from a point at or near Glenora, on the Stickeen river, B. C., to the south end of Teslin lake; and also for the incorporation of a company to build a railway from Vancouver to Lethbridge, south of the main line of the C. P. R., with branch lines to Kamloops and to the Gulf of Georgia.—Plans for the proposed Canadian headquarters at Bisley have been received from architects in Montreal, Quebec, Halifax and Hamilton. The award will be made in a few days.—Tenders have been received at the Department of Railways and Canals for new pier work at Port Dalhousie.

FIRES.

The tannery and harness shop of Samuel Wilbur at Buctouche, N. B., were

destroyed by fire on the 24th inst. Loss \$1,000, no insurance. The British Columbia Cooperae works at Vancouver, B. C., were recently damaged by fire to the extent of \$1,000, fully covered by insurance.—Three stone front residences on Stanley street, Montreal, were almost totally destroyed by fire on the 23rd inst. The houses were occupied by Messrs. Frank W. May, William H. Browne and Hon. Justice Doherty. The total loss is placed at \$25,000, partially covered by insurance. The High School building at Richmond Hill, Ont., has been burned. The building was insured for \$2,000. Steps will be taken at once to erect a new school.—A house belonging to Joseph Denis at St. Jerome, Que., has been destroyed by fire. The loss is placed at \$3,000, on which there was no insurance.—The dry goods store of Doupt & Company at Simcoe, Ont., was burned on the 27th inst. The building was owned by Mr. McColl—A two storey residence at London, Ont., owned by Philip Herbert, has been burned.—At Laprairie, Que., on the 23rd inst., the water works buildings owned by Mr. Demers were destroyed by fire. Loss \$4,000, insurance \$1,700.—The residence of R. J. Giguin at Mackay's Station, Ont., was recently consumed by fire.

CONTRACTS AWARDED.

FRASERVILLE, QUE.—A contract has been awarded to Mr. Charlebois for the construction of water works and sewerage systems.

COLBORNE, ONT.—Plewes & Spence have secured the contract for lighting the streets of the town, and an electric light plant will be installed at once.

MONTREAL, QUE.—The general contract for the Saint Jerome church has been awarded to Messrs. P. Boileau Bros. C. St. Jean is the architect.

FREDERICTON, N. B.—The Bank of British North America have purchased \$5,000 of school debentures, running twenty-five years, at 4 per cent., the figure being \$5,123.

LEAMINGTON, ONT.—The tender of the London & Canada Loan & Agency Company, of Toronto, has been accepted for the purchase of \$25,000 of debentures. The premium is \$1,700, with accrued interest.

GUELPH, ONT.—Tenders for a new hook and ladder truck were received as follows: Smith Bros., Toronto, \$425; J. Robertson, Guelph, \$439; J. D. Ronald, Brussels, \$575; Waterloo Engine Co., Brantford, \$600 and \$725.

TORONTO, ONT.—The John Ritchie Plumbing & Heating Company have secured the contract for heating the building at 122 Adelaide street, owned by the Canada Permanent Company.—The contract for 24-inch pipe has been awarded to the St. Lawrence Foundry Co., at \$44 per length.—The Board of Control have accepted tenders for annual city supplies as follows: Curbing stone, Thomas Murray, 18 inches deep, 25c., 45c., 35c., 34c. and 45c. per foot; 24 inches deep, 32c., 55c., 45c., 44c., 55c.; paving brick, Ontario Paving Brick Co., \$14.75 and \$9 per thousand; sewer pipe, Hamilton & Toronto Sewer Pipe Co.; sand, Construction & Paving Co. and E. Ashton & Son; special castings, Galloway & Taylor; hydrants, Ontario Engine & Machine Co., \$32 and \$59.25; lead pipe, Jas. Robinson & Co., \$4.10 all sizes; brass and bronze castings, Wilson & Cousins; cast iron pipe, St. Lawrence Foundry Co.; coal and wood, Standard Fuel Co., hardwood, cut and split, \$3.40 per cord, pine, cut, \$2.50, soft coal, \$3.95; egg coal, \$5.15, stove coal \$5; iron and steel, Meredith & Co \$504.25; brass work for house services, Wilson & Cousins; lumber, The Reid Co.; wire nails, Rice Lewis & Son,

\$2.20 per hundred pounds; cedar posts, D. L. Van Vlack, \$4.70 per cord, culls, \$4.40; stop valves, Doig & Co.; iron valves and stop cock boxes, St. Lawrence Foundry Co.; gravel, east of York street, Edwin Ashton & Son, 57 cents and 85 cents per cubic yard; west of Yonge street, Construction & Paving Co., 58 and 95 cents; horse feed, Moses Hunter.—The Bennett & Wright Co. have secured the plumbing, heating and electric wiring contract for the Forrester's Temple on Bay street. Geo. W. Gounlock, architect.

BUSINESS NOTES.

J. R. Riendeau has started business at St. Henri, Que., as painter.

Joseph Brisebas, painter, St. Henri, Que., is reported to have assigned.

The assignment is announced of the Silica Sand and Gravel Co., of Montreal, with liabilities of about \$25,000.

The Weeks-Eldred Co., of Toronto are seeking incorporation, for the purpose of carrying on business as heating and ventilating engineers and general contractors. Among the applicants are Fred A. Daley, Chicago, Byron E. Eldred and Charles Lord Weeks, of Toronto.

FIREPROOF PAINTS.

More than ever before, there seems to be a demand on the part of the public for some paint, or other easily applied coating, which will render woodwork fireproof, or at least not readily inflammable. It is, of course, impossible to make woodwork actually fireproof by any external coating that can be applied with a brush, for once the outer skin is destroyed the inner portion of the woodwork will burn as readily as ever. But the greatest desire on the part of the insurance companies seems to be for something that will make our ordinary buildings slow burning, so that a stray spark will not immediately cause them to blaze, or that if a fire once catches it will spread so slowly that the fire department may be on hand before the flames gain great headway. The portions of the building which need the most protection are most often not painted at all; the underside of the floors and the rough structural timber, such as the joists and studding, for it is here that stray sparks are apt to lodge from defective flues, or the woodwork is apt to char from too close contact with an overheated hot air pipe from the furnace. The general introduction of electric lighting adds another danger, for a crossed wire or a burnt-out fuse plug may cause a fire to start back of the plastering that will cause much serious damage.

The outside of the building does not need the same attention, for it is usually of smooth lumber, which affords little hold for flying sparks, and which requires a longer continued heat to set it on fire than such a spark usually gives. Indeed, if we examine carefully into the matter, we find that in the majority of cases a fire originates inside the building, and in those occasional cases where the origin is outside, the heat to which it is exposed is too intense to be resisted successfully by any mere paint coating.

There have been a goodly number of

so-called fireproof paints put upon the market recently, but most of them are intended rather for the outside work and as a substitute for ordinary paints than for the rough woodwork, thus showing that their manufacturers have, as a rule, studied the problem from the wrong point of view. A fireproof paint that would be of real value must be so cheap and so easily applied that its use would add but very little to the cost of the house. Fortunately we have just such a coating in ordinary lime whitewash. Two heavy coats of whitewash will render rough woodwork almost non-inflammable. The experiment is easily tried by putting a piece of whitewashed wood in the fire, or attempting to kindle the kitchen stove with wood that has a couple of good heavy whitewash coats. Moreover, it will cling much better to rough than to smooth lumber, and this is a great advantage. It should be used on an ordinary frame building just after the frame is up, the building enclosed and the floors are laid, and before any plastering is done, coating every part of the rough woodwork very thoroughly with two heavy coats. It would be an extra precaution if the rough sheathing, both on sides and roof, were given a couple of coats of whitewash on the outside before the weatherboarding or siding was put on, or before the roof was shingled or slated.

For the first floor joists, and under side of first floor, or where the coating would be exposed to dampness, a wash recommended for boiler rooms might be substituted. It consists of six quarts of freshly slaked lime, well sifted, to which is added one quart of rock salt and a gallon of water, the mixture being then well boiled and skimmed clean. To five gallons of this mixture are added a pound of alum, half a pound of copperas (stirred in slowly), three-quarters of a pound of potash and four quarts of fine sand or hardwood ashes, well sifted. To this may be added any coloring matter desired. It is said to be exceedingly durable, and may be used as a substitute for paint on brickwork.

Silicate of soda or water glass has also been highly recommended as a fireproof coating for woodwork. In a London paper, published in the early part of 1894, F. H. Gossage narrates several experiments he made with this material. He says: "I find that painting woodwork of any kind with several coats of silicate of soda, and finishing off with a mixture of this solution and sufficient common whiting to make it about as thick as ordinary paint, is a most excellent protection against fire. Wood treated in this way will not take fire from mere contact with flame; it requires to be heated till destructive distillation begins." The same thing was also recommended by A. H. Lorton, of New York city, in a paper read before the New Jersey State Association of Master Painters and Decorators, at Passaic, January 16, 1895. He said that whiting might be mixed with the silicate of soda when it is intended to paint over it, and stated that this gave a good hard surface, making an excellent

priming that wears well. It also gives a good surface when varnished over. He illustrated his paper with a number of experiments which showed conclusively the truth of his statements.

A French authority gives the following formula for a fireproof paint: 20 pounds of finely pulverized glass; 20 pounds of finely pulverized porcelain; 20 pounds of any sort of powdered stone, 10 pounds calcined lime and 30 pounds of water glass. The solid elements having been powdered as finely as possible and sifted, are moistened and then intimately mixed with the water glass. This gives a syrupy mass that may be employed for painting, either alone or mixed with color. The addition of the lime gives a certain unctuousity to it, and its combination with the silicic acid of the water glass tends to bind the other materials together. The proportions of the materials may be changed, except the water glass, which remains constant. The first coat hardens almost immediately, and a second coat may be applied six hours later.

The Oil and Colorman's Journal says that a good fireproof paint may be made of 70 pounds of zinc white, 39 pounds of air-slaked lime, 50 pounds of white lead, and 10 pounds of sulphate of zinc. Mix the zinc white and lime together and grind in elastic oil, then add 1 gallon 35° water glass, then the white lead and sulphate of zinc; stir well. This will make a white paint; any color may be added to give the shade desired.

Another recipe for non-inflammable paint is as follows: To a gallon of a mixture of equal parts of lime water and vinegar, one-half pound of salts, one-quarter pound of alum and one-quarter pound of white vitriol are added, each in the form of a powder. The mixture is then boiled. One gallon of linseed oil, or any other drying oil, is then added and the boiling repeated. After the addition of one gallon of crude petroleum the mixture is once more heated to the boiling point, and is then ready for use.—Painting and Decorating.

Send for a copy of the CANADIAN CONTRACTOR'S HAND-BOOK. Price \$1.50; to subscribers \$1.

TESTING THE QUALITY OF BRICK.

When two bricks are struck together they should give a more or less metallic ring, which will be very pronounced in the case of hard-burnt brick of good quality, and dull in the case of soft brick. Generally the ring of the trowel while the brick-layer is at work will tell the quality of the brick. According to the "Building World," if they are to be exposed to the weather, they should not absorb more than one-sixth to one-eighth of their weight when dipped in water after previous drying, or one-fifth if left in water twenty-four hours. The hardest brick will sometimes absorb as little as one-fifteenth. A good facing brick should resist the knife, and a good rubber should resist the finger nail until the outer skin of the brick is removed. If required for important work where a great load has to be carried, or a new quality or make of brick is proposed to be used, specimens should be submitted for testing the crushing strength of a small cube or a whole brick, and also the crushing strength of a pier built in mortar or cement. A good brick cannot be broken by throwing it on the ground, but it can be broken by holding one end and striking the brick about two-thirds along against the edge of another one. The appearance and squareness of the fracture and force of blow required will indicate some of the qualities of the brick. The structure should in all cases be uniform and compact.

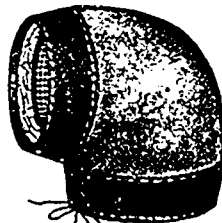
CRUSHED STONE.

One of the noticeable things of recent years is the greatly increased use of crushed stone for building purposes. Ten or fifteen years ago very little demand existed for broken stone outside the requirements for railroad ballast and road making. Now and then came a demand for broken stone for concreting a foundation for a bridge or for bedding engines and heavy machinery in mills and factories.

For building purposes there was practically no demand whatever. The custom was to lay down broad footing courses or large dimension stone, and on these to erect the wall, and this is still the custom with all ordinary sized buildings.

With the advent of the twelve and fifteen inch concrete blocks, the demand has increased.

(Conclude on Page 4.)



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teen storey "sky-scraper," however, a totally different plan prevails. After the excavations have been made, heavy steel beams or old rails are laid down and the spaces filled in with a concrete mixture of broken stone, cement and sand. This in a short time solidifies into a rigid mass of enormous strength, and the result is a footing course of practically a single stone to bear the weight of the great steel structure to be erected upon it. The builders and architects of Chicago are entitled to the credit of introducing this system, the soft nature of the ground and the vast size of the buildings necessitating a construction of the kind. The results were so superior to the old-fashioned way that the plan was speedily taken up in other cities and to-day there is scarcely a great building in any of the large cities which does not rest on a concrete mass.

Thousands of tons of crushed stone are used in a single building. Crushed stone and cement go hand in hand as concrete and assume various forms. Solid arch bridge work is just coming into use in the United States, but is old in Europe. Time and the elements have little effect upon these structures where honest material and honest work are the rule. England and Germany have worked out this form of construction with the most complete details. The crushed stone industry has a promising future in the United States.—Cement and Engineering News.

WATERWORKS DISPUTE.

Some time ago the Water Commissioners of Windsor, Ont., three in number, decided by a vote of two to one that a water filtration system was needed to furnish the city with a pure supply of drinking water, and accordingly a contract was made with McDougall and Sons, of Montreal, to furnish a polarite filter for \$40,000. Many people were against the

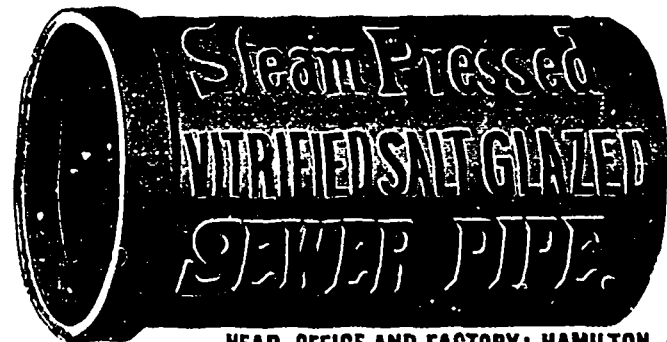
expenditure of the money, claiming it to be unnecessary, and considerable dissatisfaction was created all round. Recently the matter was brought to a climax by the issuance of a writ through Clarke, Bartlet & Bartlet, attorneys, against the commissioners, restraining them from appropriating the money of the Water Board for a filtering system. It is now proposed to test in court the legality of the commissioners' action, and if possible have a permanent quietus put to the proposition. Physicians differ as to the purity of the present water supply, and it is claimed by some that although the water is good enough for use in cold weather, when heat comes matter is generated in Lake St. Clair which has a tendency to germ-breeding, and consequent possible outbreaks of typhoid and other fevers.

PURIFICATION OF WATER.

The purification of drinking water by means of ozone has now been carried out on a large scale at Oudshoorn, Belgium, for over a year. The water source at this place was polluted, being, when untreated, absolutely unfit for use. At the first con-

tact of the water and the ozonized air the greater part of the microbes are killed, few however offering resistance, to kill which seven or nine minutes of constant application are required. A remarkable example of the power of ozone for this purpose is mentioned, namely, that of seventeen sample tubes thus treated, sixteen remained sterile. It has also been found that the ozonized water is very much less liable to reinfection than water which has been merely filtered, and that the beneficial salts in water are scarcely affected by ozone, while both the color and taste of the water are modified favorably. The only difficulty in the application of this process hitherto has been the want of perfectly constructed apparatus to produce the ozone economically and in large quantities—a difficulty lately overcome by Dr. Repin's process. The method of treatment in question depends, in respect of cost, upon the amount of organic material in the water and the price of coal, so that in the treatment of Seine water, for example, the expense is given as less than one horse power per hour for the sterilization of five cubic meters.

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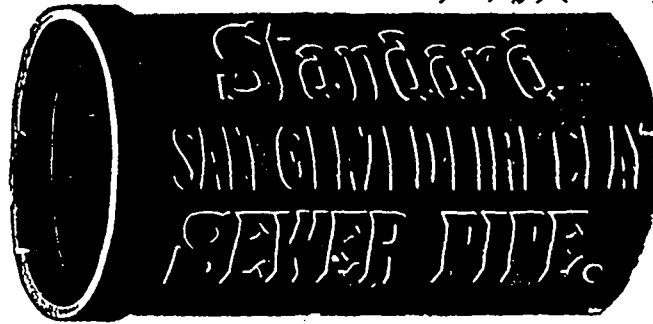
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VALUABLE REPORT ON ROAD CONSTRUCTION.

(Concluded.)

ROLLING.

For economical, durable and serviceable road-making a heavy roller is indispensable. A road should be sufficiently smooth and compact to shed the water readily to the side gutter. If the gravel or other road metal is dropped from the wagon loosely on a soft foundation as is your practice, water passes into the sub-soil as through a sieve. Wheels passing over the road when in such a condition at once sink into and rut not only the gravel but the earth beneath.

Water is held in the ruts and each succeeding vehicle renders their condition worse. The road is less durable, since the gravel being mixed with the dirt beneath, obtains when finally consolidated, a dusty, easy worn surface.

The weight of roller used must depend upon various circumstances—the amount of work it will be required to do, the quantity and quality of road metal used, the strength of the bridges and culverts over which it must pass.

A steam roller costs much more than a horse roller, but does so much better and faster work that it is more economical. Municipalities surrounding your town would find it to their advantage to rent such machine, thus keeping it employed, as it is too costly to remain idle. A weight of twelve tons does satisfactory work, and it is not too heavy for the majority of bridges.

Rolling should commence at the side of the road, approaching the centre gradually. If the roller is first passed over the centre, the loose metal is crowded out and the shape of the road destroyed. It is best to roll the earth foundation in dry weather, and each succeeding layer up to the top dressing. When the latter is put on the rolling should be continued in wet weather, or the metal thoroughly compact and solid, able to resist without displacement the heaviest load passing over it.

WIDTH OF PAVEMENT.

The usual width of our street allowance is 66 feet. This generous width is always advisable for sanitary reasons, besides adding greatly to the appearance of the street. It is, however, an unnecessary expense, both in first cost and in maintenance, to have a wider drive-way on residential streets than is necessary to accommodate the traffic. A broad carriage-way is very beautiful, but so also are wide stretches of nicely sodded boulevard ornamented with handsome shade trees which are a notable feature of your town. Carriage-ways of from 20 to 26 feet are now being adopted on the residential streets of cities and are now meeting with general approval.

GRAVEL.

My attention was directed to the gravel in three pits—Rapson's, one on Joint street, and another on the north side of the town. The material in the two former is of a very inferior quality in its natural state, being very largely mixed with sand, earth matter, and large boulders. In order to be of service in road construction material of this kind should be screened to remove large stones, sand and earth. A means sometimes adopted is to place in the pit a steam crusher with screen attachment, whereby the refuse is removed, and at the same time the large stones are broken and form a very valuable part of the road metal resulting.

The gravel in the pit on the north side of the town is excellent. Much of it is fit for application to the road without any treatment other than to remove occasional large stones.

Cleanness of material is absolutely necessary. Sand and earth are very injurious to the roadway when mixed with gravel, as they attract and maintain moisture and permit it to pass through to the sub-soil. A covering like this is not only less serviceable while it lasts, but is less durable than one composed of clean metal. Gravel should be placed on the road in layers of not more than four inches in depth and each layer consolidated with a roller. The depth of gravel required on a street varies in proportion to the nature and extent of the traffic. On residential streets, little travelled, eight inches at the center and five inches at the sides will be sufficient. Residential streets considerably travelled with occasionally heavy loads will require nine inches in the center and six inches at the sides. On other streets largely travelled ten inches in the center and seven inches at the sides will be needed.

BROKEN STONE.

Broken stone is a much more durable material than gravel, providing, of course, that a suitable quality of stone is used. The best stone is that which is hard, tough, and which will not readily decay on exposure to the atmosphere. The only stone to be had in the vicinity of Woodstock is field stone and river boulders. If these are crushed care should be taken to exclude rocks of a poor quality, the most common of which are "weathered" sandstones and granite. Some limestones also weather very rapidly. Slaty rocks are too brittle to be used on the road. There are heavily travelled streets in your town approaching the business centre which it would be well to pave with broken stone instead of gravel, and for preparing gravel and for breaking field stone a stone crusher would be a very valuable machine for your town to possess.

The stone should be crushed and screened into sizes varying from one inch in diameter to two and one half inches. The largest stone should be placed in the bottom of the roadbed and the smallest at the top. A road surface of a mixture of large and small stones in time becomes very rough, owing to the smaller wearing more rapidly than the larger, while large stones at the surface have a tendency to become loose.

The stone should be placed on the roadbed in layers and each layer thoroughly consolidated with a roller before the next is applied. The depth of the stone may vary according to the traffic, from nine inches at the center and nine inches at the side to twelve inches at the center with six inches at the side. As with gravel, it is very important that the material should be clean. No "binder" is needed with limestones. If an excessively hard metal, such as trap, is used the fine "screenings" of the stone will be the best aid to consolidation. In rolling, the lower courses of stone should be perfectly dry, but in finishing the road, water

may be used to flush a dressing of stone screenings into the interstices.

FIRST-CLASS PAVEMENTS.

The qualities essential to a first-class pavement are:

(1) A secure and pleasant footing for horses.

(2) Smooth so as to render travelling and traction agreeable, easy and noiseless.

(3) It should be sanitary. The form and material such that it will be impervious and liquids have no permanent lodgement. Dust will not be easily produced.

(4) The durability and service rendered will be commensurate with the cost of construction and maintenance, that is, it must be economical.

(5) It must be easy of removal, replacement, and repair and at reasonable cost, and with the appliances and materials within the control of the corporation.

In view of the above it will be apparent, I believe, that brick and asphalt are the two competing materials for use on Dundas street. With regard to the first quality, the foothold afforded to horses, brick must have the preference. It is one of the objectionable features of asphalt that it is exceedingly slippery when wet, and even when dry it is not always safe.

As to the second quality, asphalt must take first place, since it is in a slight degree smoother and less noisy than brick. It is doubtful, however, if traction is any easier, owing to the insecure footing afforded to horses.

There is little if any difference between the sanitary status of the two pavements. Both are, of course, impermeable and offer little resistance to the flow of liquids; the joints of the brick are just sufficient to retain moisture and subdue dust. With the smooth asphalt surface no amount of sprinkling will keep the surface moist in hot weather.

As to cost, asphalt is from one-half to one-third more than brick, and experience has not proven its life to be any greater. As to durability, there must always be the proviso that good material and proper plans and methods of construction are used in any case.

The laying or repairing of brick does not require skilled labor, as does asphalt, and this difficulty in connection with the latter is felt more particularly in places where only a short section of asphalt is used. In large cities the inconvenience is not so great.

While asphalt is extensively used in the United States and Canada, and is unquestionably a good paving material for certain kinds of traffic in large cities, I believe brick more suited to the requirements of your town.

The quality of a brick pavement is not to be gauged by the best brick used in its construction, but by the poorest. For this reason it is necessary before deciding on the kind to use, to see that it comes up to the standard of scientific tests. More than this, while the building of the pavement is in progress there should be careful inspection to see that no brick of an inferior quality is used.

There is a tendency also to endeavor to reduce the cost of pavement by having a cheap foundation. Foundations of gravel, sand, and macadam have proven successful in a number of cases, but only where the natural sub-soil is of a loose and porous nature. In this climate where we are subjected to alternative of frost and slush, the experiment is a dangerous one. A foundation of at least four inches of concrete should be used. On this place a one-inch cushion of sand and fill the joints of the brick with a matrix of tar or pitch and sand. The earth sub-soil should of course have been previously graded and consolidated with a heavy roller.

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Prices of Building Materials.

CONDITION OF THE MARKET.

TORONTO: The feature of the market this week has been a drop in the price of cut nails. Following the collapse of the nail combine in the United States, American manufacturers made a strong effort to capture Canadian trade, and at a meeting of Ontario manufacturers a reduction of 45 cents per keg was decided upon in order to meet the competition. The price is now \$2.30, with a rebate in car lots of 7 1/2 cents per keg. The lowering in price has not stimulated trade, there being little demand. Wire nails are more active. Cement jobbers are getting in their winter supplies, but few sales are effected. Iron pipe and galvanized iron are selling freely at firm quotations.

MONTREAL: No material change has taken place in the market. The general tone of business is perhaps slightly improved, and some lines are moving freely. Among these are iron pipe, galvanized iron and building paper. A fair business is also doing in fire-bricks and cement, at the advanced quotations. The stock of cement is larger than was at first anticipated, and will be ample for the winter's trade; consequently, values are likely to rule steady. Glass and paints and oils are dull and featureless.

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Toronto. Montreal.

Table with columns for Toronto and Montreal prices for various lumber types including clear picks, Am. ins., spruce culls, and various shingles.

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Table listing prices for mill cut boards, shipping cull boards, hemlock scantling, and various sizes of canting and joist.

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Table listing prices for various types of flooring, including dressed, rough, and undressed lumber.

Toronto. Montreal.

BRICK-M

Table listing prices for various types of bricks including Common Walling, Good Facing, Sewer, and various colored bricks.

SAND.

Table listing price for Per Load of 1 1/2 Cubic Yards.

STONE.

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Table listing prices for various types of Ohio freestone including Buff Promiscuous, Blue Promiscuous, and various sizes of ashlar.

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

PAINTS. (In oil, lb.)

Table listing prices for various types of paint including White lead, Red lead, Yellow ochre, and various oil-based paints.

Toronto. Montreal.

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Table listing prices for various types of cement including Portland Cement, German, London, Newcastle, and various hydraulic cements.

Table listing prices for various types of plaster including Portland, Roman, and various grades of plaster.

HARDWARE.

Table listing prices for various types of hardware including cut nails, steel, and various sizes of nails.

Table listing prices for various types of casing and box, flooring, shook, and tobacco box.

Table listing prices for various types of finishing nails in different sizes.

Table listing prices for various types of slating nails.

Table listing prices for various types of common barrel nails.

Table listing prices for various types of clinch nails.

Table listing prices for various types of sharp and flat pressed nails.

Table listing prices for various types of steel wire nails.

Table listing prices for various types of iron pipe in different diameters and lengths.

Table listing prices for various types of galvanized iron including lead pipe and waste pipe.

Table listing prices for various types of structural iron including steel beams, channels, and plates.