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CANADIAN CONTRACT RECORD
A WEEKLY JOURNAL OF 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.

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CONTRACTS OPEN.

APPIN, ONT.—The corner stone of the new Anglican church has been laid.

PORT HOPE, ONT.—A grant of $2,500 has been secured for the harbor here.

PETROLEA, ONT.—The corner stone of the Baptist church was laid last week.

PORT COLBORNE, ONT.—A Toronto architect is preparing plans for a club house here.

CUMBERLAND, ONT.—C. P. R. officials visited this village last week to locate a site for a station.

MONCTON, N B.—The Intercoionial Railway will erect a station here. Probable cost, $40,000.

VERNON, B. C.—The council is considering the question of constructing a water works system.

HALIFAX, N. S.—The city electrician is preparing an estimate of the cost of remodelling the fire alarm system.

GODERICH, ONT.—Mr. Brough, C. E., has been instructed to draw up plans and specifications for the town sewers.

DUNCHURCH, ONT. — Tenders for building a Presbyterian church are invited by John McQuhae until the 5th inst.

PORTAGE LA PRAIRIE, MAN.—The sum of $20,000 has been placed in the Dominion estimates for the post-office here.

UNION, B. C.—The secretary of the Provincial Board of Health has recommended the construction of a system of waterworks.

TREHERNE, MAN.—Mr. Millican, engineer for the government, is making surveys of various public works to be executed here.

BELLEVILLE, ONT. — Pinkerton & Cook, of Toronto, are said to be negotiating for the purchase of the street railway franchise here.

ST. BONIFACE, MAN.—The town council will submit a by-law to the ratepayers for the establishment of a lithographic factory.

NAPANEE, ONT.—Thos. Hanley, Belleville, is preparing plans for the rebuilding of the West Ward Academy lately burned. It will cost $4,000.

ARKWRIGHT, ONT.—Tenders will be received by E. W. Holden until the 10th inst. for the erection of a Methodist parsonage in the village. Plans may be seen at the parsonage.

MINNEDOSA, MAN.—The council of the municipality of Odanah is open to receive proposals for the purchase of $10,000 of debentures. Address, W. Hamilton Ditch, Sec-Treas.

VICTORIA, B. C.—Drake, Jackson & Helmenken, on behalf of local capitalists, have given formal notice that application will be made to the Dominion parliament for the incorporation of a company to build and operate a railway from a point

on the south boundary line of British Columbia, thence northerly and westerly to the north boundary line of the province.

CAMPBELLTON, N. B.—Tenders for erecting a brick and stone school building in this town will be received by D. Murray, M. D., until the 15th inst. J. C. Dumaresq, architect, Halifax.

RAT PORTAGE, ONT.—Estimates of the cost of constructing a sewer on Main street have been prepared by Mr. Peterson, and are under consideration by the Council. The cost will be about $10,000.

GRISWOLD, MAN.—A bridge will shortly be built over the Assiniboine river here, plans for which have been prepared by the Department of Public Works. Tenders for construction will be called for shortly.

WINNIPEG, MAN.—The Ogilvie Milling Co. will erect at once a large building at their mill, which will cover about one-third of an acre of ground. The company also propose erecting a barrel factory at an early date.

NEW WESTMINSTER, B C At a public meeting held last week, it was resolved to petition the Dominion government to take steps to protect the city from floods by the construction of dyking and navigation improvements.

PRESCOTT, ONT.—Tenders are asked until the 12th inst. for the purchase of $11,000 of debentures, bearing interest at 5 per cent., and running from one to twenty years. Address, Albert Whitney, Chairman Finance Committee.

QUEBEC, QUE.—Building permits have been granted as follows: one house on Lackevioliere st., for M. Brophy; contractor, M. L'Henreux; one house on Colombe st., for F. Beruké.—Work has been commenced on the construction of the electric railway.

TILSONBURG, ONT.—Alfred E. Raynes, Town Clerk, will receive proposals until Wednesday, the 9th inst., for the erection of a town and fire hall, as follows. carpenter and joiner work; excavating, concrete, stone and brick work; lathing and plastering, painting and glazing, galvanized work, and slating.

FRENCH RIVER, ONT.—The erection of a large hotel here is under contemplation by Mr. H. H. Cook. The plans are already drawn, and show a massive building, sub-divided so that one-half can be devoted to summer visitors, and can be closed in winter when traffic is light. The other half, which will contain a bar room, billiard room, sitting room, closets, etc., will be kept open all season.

ST. JOHN, N. B.—Plans are now being prepared for a new warehouse for W. H. Thorne & Co., to be built on their property on the Johnston wharf. It will be a substantial brick structure, five stories high, fronting 38 feet on Water street and extending down Johnston's wharf 290 feet.—The St. John Railway Company have purchased a vacant lot adjoining the Carville building and will likely erect thereon a new building.—The City Council have made arrangements for a loan of $100,000 with which to proceed with the improvements at Sand Point.

LONDON, ONT.—The new G. T. R. car shops will be shaped like three sides of a square. There will be two large wings, each 616 feet long and 80 feet wide. They will be about 360 feet apart and will be joined at one end by another stretch also 80 feet in depth. The structure will be of white brick, one story in height.—The Bennett Furnishing Company will erect a two story brick addition to their factory on Rectory street, at a cost of $2,000.—Mrs. Strongman will build a double brick dwelling on Colborne street.—George Robinson will erect two brick residences on Richmond street.—Wm. Ward, King street, is making alterations to the large brick house on the north west corner of York and Maitland streets.—Robert Hooper will erect a $1,500 residence at the corner of Dufferin avenue and Maitland street.—Tenders for the construction of the G. T. R. shops must be sent in by Saturday next. The work is to be completed by May 5th, 1897.

MONTREAL, QUE.—J. Alcide Chaussé, architect, has prepared plans for a house on St. Denis street, for Henri St. Pierre. Tenders are being received this week. Plans and specifications can be seen at the architect's office.—Building permits have been granted as follows: reparations and additions to three houses on Aylmer street for J. D. Clifford; carpenter and joiner's work, Phaneuf & Dore.—E. Doran, architect, has prepared plans for a house, three tenements, on St. Urbain street, for W. W. Halpin, and is calling for tenders this week.—The selection of a site for No. 7 fire station has been postponed until the funds for the work are obtainable.

TORONTO, ONT.—The bridge over the Etobicoke river at the first concession north of Dundas street has collapsed, and a new structure will likely be constructed.—A petition has been received against the construction of a brick pavement on Wellesley street.—An architect has not yet been engaged to prepare plans for the addition to the Bay street fire hall.—An estimate prepared by the City Commissioner placed the cost of putting a new boiler into the jail building for heating purposes at $1,600. The Property Committee will consider the matter at the next meeting.—Tenders are wanted for alterations and additions to three houses. Plans at 713 Queen street west.—The residents on Prospect street having petitioned against cedar block, a petition for a brick pavement is being circulated.—Building permits have been granted as follows: Arthur Howe, 2-storey and attic bk. dwelling, s. side Starr ave., near Dunn ave., cost $2,000; Bank of Commerce, 3-storey bk. add. and alterations, 146 King st. e., cost $1,500.

HAMILTON, ONT.—The East Flamboro Council will submit a by-law to grant a bonus of $25,000 to the International Radial Railway, the money to be payable as follows: $17,000 on the completion of the line from Hamilton to Guelph; $4,000 on the completion of a branch from Aldershot to Burlington, and $4,000 on the completion of a line from Waterdown to Galt via Millgrove.—The Radial Railway Company intends to extend its line from the power house to Port Nelson, and next spring it will be extended to Oakville.—The sewage interception works will be proceeded with at once. Tenders will be invited for the building and machinery, and the construction of the tanks will be first carried out. — Building permits have been granted as follows: Thomas J. Littlewood, two-storey brick dwelling on Murray street west, cost $1,000, E. B. Patterson, two-storey brick dwelling on King street west for A. J. Taylor, cost $1,200; James Mercer, two two-storey brick dwellings on Duke street, cost $3,600.

OTTAWA, ONT.—Ald. Hastey has been granted a permit for the building of four houses on Waller street, on the west side, at the northern end of his present block. They will cost about $5,000.—Messrs. C. H. Keefer and R. A. Davey, civil engineers, last week presented their report on the main drainage scheme. The Rideau canal is made a dividing line, the area to the west being designated No. 1 and that to the east No. 2. In No. 1 they recommend the construction of a main sewer 7x5 feet, to have straight walls with arch and counter arch, for a distance of 1,400 feet, continuing from that point by means of a tunnel 7½x6½ feet. for a distance of 2,300 feet. From Rochester street the sewer would pass along King street to Preston street and Wellington street, through the Canada Atlantic Railway property to the aqueduct property, and discharging into the tail race, north of the Queen street bridge. The estimated cost is $198,561, and the total length 10,750 feet. For the eastern section, No. 2, it is proposed that the sewer commence at the intersection of Nelson and Somerset streets, passing along Riverside avenue, Osgoode street and the Rideau river line to St. Patrick street bridge, a distance of 7,200 feet, thence across Porter's island, Stanley avenue, etc., to the river. The estimate of cost is $127,891, and the total length 12,650 feet. The estimates are made for brick sewers, but at the same time the engineers advise the Council to consider concrete for brick as far as possible.

FIRES.

A large saw mill at Newcastle, N. B., owned by D. & J. Ritchie, was burned on Saturday last. The loss is between $40,000 and $50,000.—McMulkin's shingle mill at Indiantown, N. B., was burned a few days ago. The loss is several thousand dollars.—The saw and chopping mills of Wilson W. McCreadie, in South Dorchester, near St. Thomas, with a quantity of lumber, were destroyed by fire last week. Loss over $3,000; no insurance.—The large salt works, dairy salt mill, saw mill, stave and heading factory belonging to Peter McEwan, of Saltford, Ont., has been burned. The loss will be about $15,000, partially covered by insurance.—A large portion of the town of Tignish, P. E. I., has been destroyed by fire, including J. H. Myrick's store and warehouse, the post office, the residence of Ed. Hackett, M. P., Brennan's dwelling, warehouse and outbuildings, Chaisson's buildings, Mrs. Week's residence, Dr. Dorion's residence, Dr. Murphy's residence, McKinnon's hotel, Bernard's hotel and hardware stores, the railway round-house and coal shed.—The Hamilton Biscuit Company's factory at Hamilton, Ont., was damaged by fire on the 30th ultimo to the extent of $12,000. The loss on the buildings, owned by the Pattison estate, is placed at $3,000.—The barrel manufactory of J. L. Martin, Gaspereaux, N. S., was burned last week. Loss, $2,000; no insurance.—The residence of John Gilbert, at Battersea, Ont., has been destroyed by fire. Loss covered by insurance.—The Slater Asbestos Company's building on St. Peter street, Montreal, was damaged by fire recently to the extent of $12,000.—On the 27th ultimo fire destroyed the residence of John Lyons, at Wallacetown, Ont. The loss is placed at $1,500.

CONTRACTS AWARDED.

DESERONTO, ONT.—Mr. Dolan, Belleville, has the contract for the R. C. church.

KINGSTON, ONT.—Geo. Wilson has the contract for granolithic sidewalks, to cost $6,000.

GUELPH, ONT.—The tender of Dunbar & Cape has been accepted for masonry at Gow's bridge. The price is $7.95 per cubic foot.

WINNIPEG, MAN.—The council has decided to purchase 1,004 feet of Maltese Cross rubber hose from the Gutta Percha & Rubber Co., at $1.05 per foot.

TWEED, ONT.—Thomas Hanley, of Belleville, has secured the contract for the erection of a new public school in this village. The new edifice will cost $6,000.

OTTAWA, ONT.—The new concrete foundation for Rideau rink will be built by John Foley. The Canadian Bridge Co. will supply the steel pillars and A. Sproule the steel work.

QUEBEC, QUE.—The contract for the church of St. Charles, of Limoilou, have been awarded as follows: Masonry and woodwork, Jos. Gosselin; galvanized iron

roofing, M. Langlois, of Limoilou; painting and glazing, J. M. Tardevet. Amount of contracts, $25,000.

ORILLIA, ONT.—W. H. Croker, architect, has let the contract to the Toronto Furnace Co., for heating by high pressure steam the whole of the Tudhope Carriage Co.'s building.—The contract for heating and plumbing for the Central public school has been let to Purdy, Mansell & Mashinter, of Toronto.

CHATHAM, ONT.—The Council has accepted the following tenders for sewers. Adelaide street, John Illingsworth, $945; Park street, Jas. Etches, $105; William street, Hayden & Findlay, $257. The last named firm was also given the contract for drains on Selkirk and Victoria streets, at $325 and $180 respectively.

GODERICH, ONT.—Tenders in connection with the electric light plant have been accepted as follows: Goldie & McCulloch, Galt, engine, 10×14, $1,400; Packard Electric Co., St. Catharines, transformers, $576; Rogers & Co., London, inside wiring of stores and houses, cleat work, $1.50, and concealed work, $2 per outlet. The standpipe and dynamo tenders have not yet been awarded.

LONDON, ONT.—The London and Port Stanley Railway Board have awarded contracts as follows for building the new freight house, round house and other terminals for the use of the Lake Erie & Detroit River Railway here: E. F. Howie, building coal docks, $160; Everett King, brickwork on round house, $1,600; John Purdom, carpenter work on round house, $1,350; J. Garratt, brickwork on freight house, $1,800; E. F. Howie, carpenter work on freight house, $1,985; Moses Cox, drains, 6-inch tile, 21c; 8 inch tile, 25c per foot, $175; Pace & Fitzgerald, painting, $116; Smith Bros., plumbing, $106; J. Brockhurst, iron work, $70. Total, $7,362. — Contracts have been awarded for the erection of a warehouse on Bathurst street for Thomas Robinson & Co., Hartlepool, Eng. The cost will be $3,700.

MONTREAL, QUE.—A. C. Hutchison, architect, has awarded contracts as follows for one residence on Peel street for Doctor Yates: Masonry and brick work, J. B. St. Louis; carpenter and joiner's work, John Allan; plumbing, J. W. Hughes; painting, W. B. Scott; plastering, Knott & Gardiner; roofing, Montreal Roofing Co.; steel work, Dominion Bridge Co.; electric wiring, C. W. Henderson.—W. E. Doran, architect, has awarded the following contracts for one store and three dwellings, corner of Centre and Montmorency street, for John Killlea: all trades, Etienne Robert. Also for two stores and dwellings, corner Lagauchetiere and Hermine streets, for F. B. McNamee: Carpenter and joiner's work, R. Neville; masonry, J. B. Quinlan; brick, Gauthier Bros.; plastering, M. McCarthy; painting and glazing, H. O'Brien; iron work, Dominion Bridge Company.

BUSINESS NOTES.

J. Sullivan & Co., carpenters, Montreal, have dissolved partnership.

William Hart, painter, Essex, Ont., is said to have assigned to G. A. Church.

The dissolution is announced of Reid & Daly, railway contractors, Montreal.

Nicholson & Stewart, contractors, Montreal, have dissolved partnership.

CLEANING PAINT.—Cleaning varnished paint is often a troublesome business, and so much rubbing has to be done that the surface gets worn off, and the whole looks shabby. To avoid this use a concentrated solution of spent tea leaves, say, ¼lb. of the latter to one pint of boiling water. Steep for half an hour, then strain, and use the clear liquor for cleaning the paint.

SUGAR IN MORTAR.

Common mortar, we are told, "is made with fat lime and clean sharp sands, in the proportions usually of one to five by volume." Mortar so prepared hardens promptly in the air, and becomes, finally, very hard, if of good quality, and if frost or too great dryness or excessive dampness does not injure it while setting. Sand used for mixing mortars should be free from clay and perfectly clean; it should be sharp and rather coarse. River sand is much better than sea sand, as it is free from salt, and is less liable to be found "water worn," or, in other words, "sharper," having the angles more definite, thereby increasing its "bounding qualities."

In India the method of making mortar is much better understood than in this country. In mixing his mortar the Indian adds to his slacked lime a certain proportion of "jaggery," a sort of unrefined sugar, which has the quality of making the mortar stronger and more compact than if prepared the ordinary way. "Jaggery" is not only used in the manufacture of mortar for plastering purposes, but it is also employed in mixing mortar for laying brick and stone work. It is related that when Hyder Ali's troops threatened the city of Madras with destruction over a hundred years ago a wall was hastily built up by the citizens to keep the intruders at bay, and "jaggery" mortar was used in the construction, and when it became necessary a few years ago to tear down the wall it was found almost impossible to separate the bricks at the joints, the mortar was so adhesive and so strong, and in many places dynamite had to be employed to rend the work asunder. The polished "chunam" walls, for which Madras is famous, are prepared with neat cement tempered with water in which unrefined sugar has been dissolved. About one and a half pounds of course sugar dissolved in one gallon of clean water, and used in mixing the cement, will form a mass that, when properly set, will make a block harder than the hardest marble, and as tough as our best limestone, and if applied to walls or columns or to any similar work it may be polished as highly as Quincy granite, and which will be just about as durable.

The practice of mixing sugar in mortar is a very old one, and the utility of the practice was well known to the Greeks and Romans long before our era. Both Vitruvius and Pliny make mention of the manner in which the Romans made their wonderful mortars, and Pliny, who calls the mixture Maltha, says it was made of quicklime slaked in wine and then ground up in figs and laid. This made the surface upon which the mixture was spread, after an application of oil, harder than stone. In this case the wine contained a large percentage of sugar, and as figs contain about 62 per cent. of uncrystallizable sugar, 5 per cent. of gum and phosphate, 15 per cent. of fibrine and grease, the rest being water and chloride of lime, it is quite evident that it was the sugar that gave to the mortar its density and polishable qualities.—National Builder.

FELLING A DANGEROUS CHIMNEY.

There is only one way of saving a chimney out of plumb from collapse if the bend increases—that is, to cut a slice out of the masonry on the other side, so that it may sink on the side and bring itself straight. But that method, though efficacious at times, often weakens the structure. The only other alternative is to pull down and build afresh, and there are two ways of doing that. One is to pull the chimney down stone by stone, beginning at the top—a tedious method, and a terribly risky one, if the structure be tottering to its fall. The other method the writer has often seen practised in Lancashire and Yorkshire. At a mill a few miles outside of Manchester, for instance, a dangerous chimney had to be "felled" not long ago, and the contractor started to cut away the brickwork at the base on five out of its eight sides. Once, thinking it was about to settle on him, he and his men hurried away; but the fall did not take place, and they returned to work. The gaps were propped up with timber, and the structure supported in this way until the proper time. Then the wood was soaked with paraffin and daubed with resin and ignited. The flames and smoke poured up the chimney with a great roar, and the daring man lingered at the foot for a quarter of an hour, feeding the flame at one point, so that the wood might collapse there first, and the chimney take that direction in its fall. At length the baulks gave way, the chimney tottered, then leaned over in a circular fashion, and finally collapsed in the middle and fell in a heap. The climber told the writer that he distinctly preferred to bring a chimney down in that way, for once, while taking down a shaft in North Lancashire district, he heard it groan and creak, and had only time to slip down the rope and rush away when it fell.—Illustrated Carpenter and Builder.

TOOLS FOR STONE WORKING.

The pneumatic tool used in stone cutting is one of great importance, and is likely to take precedence of every other device in shaping natural stone into whatever form the architect or designer may specify The skilled operator of this tool will do more work in a given time than ten ordinary cutters could in the old way. Its general use will bring about a larger demand for ornamental stone work in building and more monuments of better grade will be erected. The increased consumption will conpensate for the reduction of the force of stone cutters, inasmuch as the output will need to be greater and the manufacture of the tools will employ large numbers of men. Such labor saving devices are not always the means of robbing the mechanic or artisan of employment, but rather broadens the field and increases their usefulness. The natural result is, then, that a less number of men are not employed, but simply the transportation of talents from one activity to another, and mankind in general is the beneficiary.

Compressed air is the power utilized to operate this tool, and in skilled hands it marks out lines of beauty and symmetrical figure equal in finish to the clear cut work of the master in the art of chiselry. With it the noblest conceptions of the sculptor are quickly wrought into enduring form. Where power is available the cost of plants may easily be borne by even smaller yard owners.—Compressed Air.

The chemical changes which take place resulting in what is commonly known as rust on iron are described in a contemporary. In the presence of carbonic acid and water, the formation of a ferrous carbonate takes place, which is dissolved in carbonic acid water to form ferrous bicarbonate ; this in turn decomposing in the presence of air into magnetic oxide, and this again in turn, in connection with the water, forming a hydrated ferric oxide, this last form being what is known as common rust. Iron will not rust in pure water, nor in dry air, though the air contains free oxygen. Carbonic acid is held to be a necessary adjunct to the oxidation, though there will not be any carbon in the resulting oxide. Further, it appears that there must be a layer of water on the iron formed by condensation or otherwise. In addition to the complexity of the chemical changes occuring in oxidaton, there are electrical elements affecting the process which are as yet but little understood, although varying relations of their galvanic elements may greatly retard or assist oxidation ; as, where two metals are connected together, one being electro positive to the other, oxidation will be retarded in the one and hastened in the other.

MUNICIPAL ENGINEERS, CONTRACTORS AND MATERIALS

MUNICIPAL DEPARTMENT

STREET CONSTRUCTION FOR MEDIUM TRAFFIC.*

By Arthur E. Collins, A. M. I. C. E., City Engineer, Norwich, Eng.

(Concluded.)

From the point of view of first cost and maintenance, wood paving is more costly than granite From the sanitary point of view it is also inferior to granite, if nervous diseases are not taken into account. It is, however, the quietest pavement, suitable for medium to heavy traffic, of which there is much experience. It gives fairly good foothold to horses, especially in the case of uncreosoted deal. The extension of wood paving is almost invariably asked for by the public wherever it is laid. Excepting in Norwich, the author is unaware of wood pavements having been extensively laid excepting on concrete foundations; in Norwich about 16 miles of streets have been paved with wood during the past 20 years, the greater part of which has no such foundations. When the author first entered upon his duties in that city he was convinced that the construction of wood paving without concrete foundations must end in failure; his experience during the past two years has proved to him that, at any rate in Norwich, the presence or absence of such foundation appears to have little, if any, effect on the wear and life of the pavement, provided that where concrete is not used the pre-existing road is thoroughly sound.

One of the author's predecessors, Mr. Marshall, a former member of our association, in a report to the Norwich Council, dated February, 1888, says: ". . . I have satisfied myself as to the manner of laying down the wood pavement—that is, in regard to the foundation—whether a greater wear of the pavement is occasioned, more or less, by the absence of concrete. Upon a careful examination of the streets, and taking up a course of blocks without disturbing the sand beneath them, I find that the wearing away of the blocks into holes is not occasioned by any settlement in the foundation. In every case I have found the formation undisturbed." The author has made many similar investigations, with in almost all cases similar results to those recorded by Mr. Marshall. The traffic in Norwich, whilst not including many heavy individual loads, is close and continuous, the streets generally being narrow and winding; the traffic is more concentrated and trying to the street surface than the same volume and weight would cause in most towns. Unfortunately, the author has had no opportunity to cause records of the traffic to be made. Uncreosoted deal blocks were generally used for the first 12 years after wood paving was introduced here; they were bedded on sand. After about the seventh year from laying such pavements they became rough; they had to be renewed during the eighth or ninth year. About 10 years since pitch-pine and creosoted deal blocks began to be used; the pitch-pine was not successful, the heartwood wearing better than the surrounding rings, notwithstanding great cost incurred at the time of laying in removing all sap-wood. Creosoted deal paving, laid in 1888 without concrete foundations, but bedded on sand grouted with cement, is still in use, and in good order, excepting as regards slight roughness where it is on a gradient of 1 in 30 and is subject to the climbing and backing actions of horses' feet. No difficulty has arisen in the use of cement grouting for the joints of creosoted deal blocks. Where such paving is opened for sewer, etc., trenches, it is usually found necessary to chip the cement from the blocks. Pitch grouting has been used with creosoted deal with great success as regards imperviousness, but the creosote from the blocks has so altered the temper of pitch as to cause trouble during very hot weather. All wood paving is now laid with close joints, the courses being forced together with the aid of sledge hammers, at about each twelfth course. As far as can be ascertained, no pavements in Norwich are laid on roads passing over clay; in every case the soil is either gravel or chalk. This is a most important feature in the case.

In January last the author made an endeavor to elicit the opinions of borough engineers and others on the subject of tarred macadam, but the replies received to the questions sent out vary so much that it is difficult to make any general statement founded upon them. From his own experience, however, he is of opinion that where the gradients are suitable, and the traffic such as that usually found in suburban streets, tarred macadam forms an economical pavement which is much appreciated by residents. Wherever tar is used, skilled and attentive workmen must be employed to obtain satisfactory results. When such works fail it is usually found to arise from either (1) the use of an excessive quantity of tar; (2) the use of watery or insufficiently boiled tar; (3) the use of pitch to thicken unsuitable tar; (4) the use of flinty or non-absorbent gravel or stone; (5) insufficient consolidation. It is probable that the constant, careful supervision necessary to commence with to obtain good results with tarred work has prevented its general adoption. The author has had very varied experience with his work in this connection, some unsatisfactory, some satisfactory.

A properly constructed tarred macadam is easily cleansed, quiet, easily repaired where opened for connections, etc., economical in maintenance, and, being impervious and offering no lodgement for dirt, it is a good pavement from the sanitary point of view. The material used for tarred macadam, or tarred pavements generally, should be hard, close-grained iron slag, or hard blue mountain limestone, or hard Kentish rag. The tar should be boiled until thick; when allowed to cool, it should be capable of being drawn out into threadlike filaments. Good results are not likely to be obtained by thickening tar with pitch. The stone should be heated to such an extent only as to drive off all moisture, and, whilst warm, the boiling tar applied. Each particle of stone should be completely covered as thinly as possible with tar. Where the bottom is thoroughly good, a coating of tarred macadam 3in. thick is sufficient for the class of traffic for which such pavement has been described as suited. The material for the first coat to consolidate to 3in. thick should be broken to 1½in. gauge, and after thorough consolidation with a steam roller it should be faced with tarred ½in. material, to fill up and seal the surface and be re-rolled. The top should be dusted with dust of the stone used and ground lime in equal quantities, and a hand roller passed over to press the dust in and prevent it from blowing about.

Cost per Superficial Yard for Constructing and Maintaining Street Carriageways in Norwich.

Description of road	A. s. d.	B. s. d.	C. s. d.	D. s. d.
*Syenite Granite Macadam, including gravel foundation	4 6 0	9 0	10 1	7
*Uncreosoted deal paving, 5in deep, on sand bedding and jointed with sand	5 6	1 0	5 1	6
*Pitch pine, 5 in. deep, laid as last.	7 0	1 3	0 5	1 8
*Creosoted deal, 5in. deep, on sand bed grouted with cement	8 0	0 10	0 4	1 2
†3in. by 5in. syenite granite paving on sand bed, joints grouted with pitch. This supposed pavement will have a life of 25 years; it allows for taking up and repaving twice during that period, and for small repairs	8 0	0 3¼	0 3	0 6¼
‡Tarred macadam, including gravel foundation (Foundation 2s., tarred macadam 4s)	6 0	0 6	0 3	0 9

A. First cost. B. Maintenance. C. Cleansing. D. Total annual cost excluding capital charges. *Note.—None of this pavement has required renewal up to the present It is assumed that with slight repairs it will last four years longer, making 12 years in all. †Note.—Very little of this material has required repairs during the time it has been in the author's charge. He has assumed that once in five years it will require re-facing, that with this attention it will have a life of 20 years in the class of streets where it is suitable. Note.—In the last three cases the costs of maintenance are partly estimates.

The author has seen tarred macadam which after 12 years' use required very little repairs. He has constructed crossings in macadamized and gravel streets which have outlived two renewals of the surrounding surfaces. In preparing existing macadam for repairs, or for taking it up to make way for paving, a suitable macadam scarifier is of the greatest assistance where power is available to drive it. If the works of a town are of sufficient magnitude to make it worth while having a scarifier, it enables several of the men usually employed in lifting macadam to be employed in other work, leaving the scarifier to lift the macadam more expeditiously and effectually than is possible at reasonable cost by manual labour. The paper on the subject of macadam scarifiers which I had the honour of reading before you in 1894 states my views on the subject. I will not amplify them now, excepting to say that my further experience increases my conviction of the utility of these machines. The city of Norwich possesses a most efficient scarifier made by Messrs. Manlove & Alliot, of Nottingham; it is pulled and pushed by a 15-ton compound engine steam roller, of Messrs. Aveling & Porter's construction. Ordinary macadam forms one of the most expensive street surfaces known to the author, as regards maintenance and cleansing. Accounts which have been kept in Norwich show that syenitic granite macadam in the city streets costs 6d. to 1s. per superficial yard per annum for maintenance, and from 8d. to 1s. a yard for cleansing; taking the average at 9d. and 10d. respectively, the total average amounts to 1s. 7d. per yard.

* Paper read before the Association of Municipal and County Engineers, London, Eng.

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CONDITION OF THE MARKET.

TORONTO: The market has been characterized by a sorting-up demand, and the volume of trade is small. A slight improvement is announced in plumbers' supplies and building paper. A reduction in the price of iron pipe of about five per cent. is announced by manufacturers. The discounts are now as follows: ¼ inch, 60 and 2½ per cent.; ⅜ to ½ inch, 67½ and 2½ per cent.; ¾ inch, 70 and 7½ per cent.: 1 inch, 70 and 10 per cent.; 1¼ to to 1½ inch, 70, 10 and 5 per cent.; 2 inch, 70, 10 and 10 per cent. A steady trade is doing in lead pipe, and a slight revival is reported in paints and oils.

MONTREAL: The volume of trade in builders' supplies for the season of the year is small. As new buildings are nearing completion a fair demand is reported for plumbers' supplies, glass and paints and oils. For galvanized iron there is a moderate but steady request, while lead and iron pipe is also moving quite freely. The cement trade is confined to small lots, and no large sales are reported. The arrivals so far this season have been 45,768 barrels English and 43,415 Belgian. At a meeting of the Canadian Cut Nail Association held last week, it was decided to reduce the price of cut nails five cents per keg.

LUMBER.

CAR OR CARGO LOTS.

	Toronto.		Montreal.	
	$	$	$	$
¼ to 2 clear picks, Am ins.	33 00@36 00		40 00@45 00	
¼ to 2 three uppers, Am ins.	37 00	40 00	45 00	
1¼ to 2, pickings, Am ins.	26 00	27 00	30 00	
1 inch clear		40 00	45 00	
1 x 10 and 12 dressing and 1 better	20 00	22 00	18 00	20
1 x 10 and 12 mill run	16 00	17 00		19
1 x 10 and 12 dressing	20 00	22 00		18 00
1 x 10 and 12 common	13 00	14 00	8 00	10 00
Spruce culls	10 00	11 00	8 00	10 00
1 x 10 and 12 culls	9 00	10 00		9 00
1 inch clear and picks	28 00	3200	35 00	40 00
1 inch dressing and better	20 00	22 00	18 00	20 00
1 inch siding, mill run	14 00	15 00	12 00	16 00
1 inch siding, common	12 00	13 00	10 00	13 00
1 inch siding, ship culls	11 00	12 00	10 00	11 00
1 inch siding, mill culls	9 00	10 00	8 00	9 00
Cull scantling	8 00	9 00	8 00	9 00
1¼ and thicker cutting up plank	24 00	26 00	22 00	25 00
1 inch strips, 4 in to 8 in. mill run	14 00	15 00	14 00	15 00
inch strips, common	11 00	12 00	10 00	12 00
1¼ inch flooring	16 00	17 00	12 00	15 00
1½ inch flooring	16 00	17 00	12 00	15 00
XXX shingles, sawn, per M 16 in.	2 25	2 30	2 60	2 60
XX shingles, sawn	1 40	1 50	1 60	1 70
Lath	1 60			1 50

VALUATIONS.

Mill cull boards and scantling	10 00	10 00		12 00
Shipping cull boards, promiscuous widths	13 00			13 00
Shipping cull boards, stocks	16 00			16 00
Hemlock scantling and joist up to 16 ft	21 00	12 00		10 00
Hemlock scantling and joist up to 18 ft	12 00	13 00	12 00	3 00
Hemlock scantling and joist up to 20 ft	13 00	14 00	13 00	14 00
Cedar for block paving, per cord		5 00		5 00
Cedar for kerbing, 4 x 14, per M		14 00		14 00
Scantling and joist, up to 16 ft		14 00		14 00
" " 18 ft		15 00		16 00
" " 20 ft		16 00		16 00
Scantling and joist, up to 22 ft		17 00		17 00
" " 24 ft		19 00		19 00
" " 26 ft		20 00		21 00
" " 28 ft		22 00		23 00
" " 30 ft		24 00		25 00
" " 32 ft		27 00		27 00
" " 34		29 50		29 50
" " 36 ft		31 00		31 00
" " 38 ft		33 00		33 00
" " 44 ft		34 00		36 00
Cutting up planks, 1¼ and thicker, dry	25 00	28 00	25 00	30 00

B. M.

1⅜ in. flooring, dressed, F M.	26 00	30 00	28 00	31 00
1½ inch flooring, rough, B M.	18 00	22 00	18 00	22 00
1¼ " dressed, F M.	25 00	28 00	27 00	30 00
1¼ " undressed, B M.	18 00	19 00	18 00	19 00
1⅜ " dressed	18 00	20 00	18 00	22 00
1¼ " undressed	12 00	15 00	12 00	15 00
Beaded sheeting, dressed	20 00	35 00	22 00	35 00
Clapboarding, dressed		12 00	8 00	12 00
XXX sawn shingles, per M 18 in.	2 60	2 70		3 00
Sawn lath	2 50	2 60	2 50	2 60
Cedar		2 90		2 90
Red oak	30 00	40 00	30 00	40 00
White	37 00	45 00	35 00	55 00
Basswood, No. 1 and 2	28 00	30 00	18 00	20 00
Cherry, No. 1 and 2	70 00	90 00	70 00	80 00
White ash, No. 1 and 2	24 00	35 00	30 00	35 00
Black Ash, No. 1 and 2	20 00	30 00	18 00	30 00
Dressing stocks	16 00	22 00	16 00	22 00
Picks, American inspection		30 00		40 00
Three uppers, Am. inspection		50 00		50 00

	Toronto.		Montreal.	
BRICK—₱ M				
Common Walling		6 50		6 00
Good Facing		8 00		8 50
Sewer	8 50	8 00	8 50	9 00
Pressed Brick, Per M:				
Red, No. 1, f.o.b. Beamsville		16 00		
" " 2		14 00		
" " 3		9 00		
Buff		21 00		
Brown		24 00		
Roman Red		30 00		
" Buff		35 00		
" Brown		40 00		
Sewer		7 50		
Hard Building		6 0		
Roof Tiles		22 00		
Hip Tile (each)		20		
Ridge Tile "		60		
1st quality, f.o.b. at Port Credit		12 00		18 00
2nd " " " "		10 00		15 00
3rd " " " "		8 00		12 00
Hard building brick		6 50		
Ornamental, per 100	3 00	10 00		
SAND.				
Per Load of 1¼ Cubic Yards		1 25		1 25
STONE.				
Common Rubble, per toise, delivered		14 00		14 00
Large flat Rubble, per toise, delivered		18 00		18 00
Foundation Blocks, per c. ft.		50		50
Kent Freestone Quarries Moncton, N. B., per cu ft., f.o.b.		1 00		
River John, N. S., brown Freestone, per cu. ft., f.o.b.		95		
Ballochmyle	80	90	65	75
New York Blue Stone				1 05
Granite (Stanstead) Ashlar, 6 in. to 12 in., rise 9 in., per ft.				25
Moat Freestone			60	70
Thomson's Gatelawbridge, cu. ft.			75	80
Credit Valley Rubble, per car of 15 tons, at quarry		8 00		
Credit Valley Brown Coursing, up to 10 inch, per sup. yard, at quarry		1 75		3 25
Credit Valley Brown Dimension, per cu. ft. at quarry		60		75
Credit Valley Grey Coursing, per superficial yard	1 50	2 00		2 15
Credit Valley Grey Dimension, per cubic foot		60		75
Clark's N. B. Brown Stone, per cubic foot, f.o.b.		1 15		1 00
Brown Free Stone, Woodpoint, Sackville, N.B., per cub. ft.		1 15		1 00
Madoc Rubble, delivered, per toise	14 00	14 50	14 00	14 50
Madoc dimension floating, f. o. b. Toronto, per cubic ft.	30	32		
Cape Bauld, N. B., Brown Freestone		90		70
Cocaigne, N. B., Gray Freestone (ol.ve-green)		90		70
OHIO FREESTONE, FROM THE GRAFTON STONE CO.'S QUARRIES.				
No. 1 Buff Promiscuous		90		1 00
No. 1 Buff Dimension		95		1 05
No. 1 Blue Promiscuous		60		70
No. 1 Blue Dimension		65		75
Sawed Ashlar, No. 1 Buff, any thickness, per cub. ft.		1 10		1 20
Sawed Ashlar, No. 1 Blue, any thickness, per cub. ft.		85		90
Sawed Flagging, per sq. ft., for each inch in thickness		06½		07½
Above prices cover cost freight and duty paid. For small lots add 5 to 10 cents per cubic foot.				
Quebec and Vermont rough granite for building purposes, per c.ft. f.o.b. quarry	33	1 50		
For ornamental work, cu. ft.	35	2 0		
Granite paving blocks, 8 in. to 12 in. x 6 in. x 4½ in., per M		50 00		
Granite curbing stone, 6 in. x 20 in., per lineal foot		70		
SLATE.				
Roofing (₱ *square*).				
" red		18 00		20 00
" purple		00		10 00
" unfading green		9 00		6 00
" black		8 00		5 50
Terra Cotta Tile, per sq.		25 00		
Ornamental Black Slate Roofing		8 50		
PAINTS. (In oil, ₱ lb.				
White lead, Can., per 100 lbs.	6 25	5 50	5 50	6 00
" zinc, Can., " "	6 50	7 50	6 50	7 50
Red lead, Eng	4 00	5 00	4 50	5 00
" venetian, per 100 lbs.	1 60	1 75	1 60	1 75
" vermillion	90	1 00	90	1 00
" Indian, Eng	10	12	10	12
Yellow ochre	5	10	3	5
Yellow chrome	15	20	15	20
Green, chrome	7	12	7	12
" Paris	20	25	14	20
Black lamp	15	25	12	25
Blue, ultramarine	15	20	12	18
Oil, linseed, raw, *Imp. gal.*	50	59	58	59
" boiled "	53	63	62	63
" reboiled, "	78	85	75	75
Putty	2¾	2¾	2¾	2¾
Whiting, dry, per 100 lbs.	60	80	60	75
Paris white, Eng., dry	90	1 25	90	1 00
Litharge Eng	4	5	4 50	5 00
Sienna, burnt	10	15	12	15
Umber, "	8¾	12	12	15
Turpentine	40			
CEMENT, LIME, etc.				
Portland Cements.—				
German, per bbl		3 25	2 55	2 65
London "	2 50	2 75	1 92	05

	Toronto.		Montreal.	
Portland Cements.—				
Newcastle "		2 50	1 85	1 95
Belgian, Josson, artificial	3 40	2 50	2 65	2 75
English, artifical, per bbl	2 60	2 90	2 55	2 65
Belgian, natural, per bbl	2 30	2 40	1 70	1 85
Canadian "	2 30	2 50	1 80	1 85
Roman "			2 00	2 25
Parian "	4 50	4 75	5 50	5 75
Superfine "	6 50	7 00	8 00	9 00
Hydraulic Cements.—				
Thorold, per bbl.		1 50	1 25	1 50
Queenston, "		1 50	1 50	1 60
Napanee, "		1 50		1 50
Hull, "		1 50		1 50
Ontario, "		1 25		
Keene's Coarse "Whites"	4 50	4 75	4 50	4 75
Fire Bricks, Newcastle, per M	27 00	35 00	15 00	21 00
" Scotch "	27 00	35 00	19 00	21 00
Lime, Per Barrel, Grey		40		
" " White		50		
Plaster, Calcined, N. B.		2 00		
" " N. S.		2 00		2 50
Hair, Plasterers', per bag	80	1 00		
HARDWARE.				
Cut nails, 50d & 60d, per keg		2 75		2 75
Steel " " " "		2 85		2 85
CUT NAILS, FENCE AND CUT SPIKES.				
40d, hot cut, per 100 lbs		2 80		2 80
30d, " " "		2 85		2 85
20d, 16d and 12d, hot cut, per 100 lbs		2 90		2 90
10d, hot cut, per 100 lbs		2 95		2 95
8d, 9d, " " "		3 00		3 00
6d, 7d, " " "		3 15		3 15
4d to 5d, " " "		3 35		3 35
3d, " " "		3 75		3 75
2d, " " "		4 25		4 25
4d to 5d cold cut, not polished or blued, per 100 lbs		3 25		3 25
3d to 5d cold cut, not polished or blued, per 100 lbs		3 65		3 65
FINE BLUED NAILS.				
3d, per 100 lbs		4 25		4 25
2d, " "		4 75		4 75
CASING AND BOX, FLOORING, SHOOK AND TOBACCO BOX NAILS.				
12d to 30d, per 100 lbs		3 25		3 25
10d, " "		3 35		3 35
8d and 9d, " "		3 50		3 50
6d and 7d, " "		3 65		3 65
4d to 5d, " "		3 85		3 85
3d, " "		4 25		4 25
FINISHING NAILS.				
3 inch, per 100 lbs.		3 60		3 60
2½ to 2¾ " " "		3 75		3 75
2 to 2¼ " " "		3 90		3 90
1½ to 1¾ " " "		4 10		4 10
1¼ " " "		4 50		4 50
1 " " "		5 00		5 00
SLATING NAILS.				
5d, per 100 lbs		3 60		3 60
4d, " "		3 60		3 60
3d, " "		4 00		4 00
2d, " "		4 50		4 50
COMMON BARREL NAILS.				
1 inch, per 100 lbs		4 25		4 25
⅞ " " "		4 50		4 50
¾ " " "		5 00		5 00
CLINCH NAILS.				
3 inch, per 100 lbs.		3 60		3 60
2½ and 2¾ " " "		3 75		3 75
2 and 2¼ " " "		3 90		3 90
1½ and 1¾ " " "		4 10		4 10
1¼ " " "		4 75		4 75
1 " " "		5 25		5 25
SHARP AND FLAT PRESSED NAILS.				
3 inch, per 100 lbs.		4 10		4 10
2½ and 2¾ " " "		4 25		4 25
2 and 2¼ " " "		4 40		4 40
1½ and 1¾ " " "		4 60		4 60
1¼ " " "		5 25		5 25
1 " " "		5 75		5 75
STEEL WIRE NAILS.				

Steel Wire Nails, 70c. and 5% discount from print d list.

Iron Pipe:

Iron pipe, ¼ inch, per foot		6c.	6c.
" " ⅜ " "		7	7
" " ½ " "		8½	8½
" " ¾ " "		12	12
" " 1 " "		17	17
" " 1¼ " "		24	24
" " 1½ " "		30	30
" " 2 " "		43	43

Toronto, 65 per cent. discount.
Montreal, 60 to 65 per cent. discount.

Lead Pipe:

Lead pipe, per lb	7c.
Waste pipe, per lb	7½

Discount, 30 % off in small lots.

Galvanized Iron:

Adam's—Mar's Best and Queen's Head:		
16 to 24 guage, per lb	4½c.	4¾c.
26 guage, "	4¾	5
28 " "	5	5¼
Gordon Crown—		
16 to 24 guage, per lb	4¼	4½
26 guage, "	4½	4¾
28 " "	4¾	5

Note.—Cheaper grades about ¼ c. per lb. les.

Structural Iron:

Steel Beams, per 100 lbs	2 75	2 10
" channels, "	2 85	2 6[illegible]
" angles, "	2 50	2 3
" tees, "	2 80	2 6
" plates, "	2 55	2 [illegible]5
Sheared steel bridge plate		2 3[illegible]

(Corrected up to September 2nd)