the contract for constructing eight miles of the Ottawa, Arnprior and Parry Sound Railway.

OTTAWA, ONT.—The contracts for two sections of the Trent Canal have been awarded by the Department of Public Works. For section one of the Balsam Lake and Lake Simcoe divisions, there were twelve tenders, the successful tenderer being Andrew Onderdonk, of Chicago, his figure being in the neighborhood of $475,000. Section one of the Peterboro' and Lakefield division was secured by Hogan & Macdonald, of Montreal, at the price of $260,000. For this work fourteen tenders were sent in.

TORONTO, ONT.—D. McIntosh & Sons, of this city, have been awarded the contract by the Dominion Government for the erection of monuments, 38 feet high, at Crysler's Farm, Chateauguay and Lundy's Lane.—Tenders for various supplies required by the Works Department for the ensuing year were opened by a sub committee of the Board of Works on Saturday last. The following were accepted: good coarse sand per cubic yard —W. J. Adare, 75c.; pit gravel, clean, east of Yonge—John Bourne, 72c.; west of Yonge, W. J. Adare, 80c., screened, east of Yonge, John Bourne, 97c.; west of Yonge—R. A. Scarlett, 90c.; five-inch wire nails P. Meredith & Co., $2.14 per 100 pounds; horse feed—P McIntosh; cedar paving posts—D. L. Van Vlack, $5 20 per cord, culls, $4 75; lumber Reid Company, plank per 1000 feet $12.57, scantling $12.27; other tenders (Bryce & Co.), plank $13.39 and scantling $12.40; hardware—Aikenhead Hardware Co., $1,014.06; ironwork, Galloway, Taylor & Co., castings per 100 lbs., $1 40; wrought iron, $3; sewer pipe—Ontario Sewer Pipe Co.

QUEBEC, QUE.—The following tenders have been accepted by the Road Committee for the construction of the new City Hall: excavation and masonry, J. B. Jinchereau, $71,316; carpentry and joinery, J. B. Gingras, $27,966; plumbing and gasfitting, Paul Parent, $1,775; heating apparatus, Ovide Picard, $7,400; roofing, N. K. Connolly, $5,400; painting and glazing, Jos. G thier & Frere, $2,755; total $116,612. The unsuccessful separate tenders were:—Excavation, etc.—Honore Dorion, $79,500; Louis Larose, jr., $81,518; W. Peters, $79,000; N. K. Connolly, $128,300; Francois Parent, $88,147.78; carpentry and joinery—Jos. Bussiere, $29,429; Elzear St. Pierre, $36,720; W. J. Peters, $37,000; N. K. Connolly, $35,000; plumbing, etc.—James Maguire, $2,115; N. K. Connolly, $2,900; Ovide Picard, $3,430; Chas. Vezina, $2,349; heating apparatus N. K. Connolly, $10,800; Chas. Vezina, $10,139; roofing —J. J. Barbeau, fils, $5,472, Alfred Langlais and C. Labrecque, $5,473; N. Barbeau, $5,900, painting and glazing— W. J. Peters, $3,200; N. K. Connolly, $3,200; tenders for the whole work were received as follows. Emery Lafontaine, Montreal, $141,000; Ferdinand Devarenne, $131,000 for city labor and $129,000 for work done by outside laborers; W. J. Peters, $134,800 for city labor; N. K. Connolly, $178,550, outside labor; Alph. Charlebois, $129,801.57, city labor; outside labor, $124,628.15; Francois Parent, $144,591, city labor, and $135,716 outside labor.

NEW COMPANIES.

BROCKVILLE, ONT Cossitt Bros Co, limited, seeking incorporation, capital $400,000, to manufacture harvesting machinery and other implements.

WALLACEBURG, ONT. — Sydenham Glass Co., incorporated; capital $50,000; to manufacture glassware; incorporators, J. Steinhoff, D. A. Gordon, H. Morris and others.

KINGSTON, ONT.—Kingston Vehicle Co., incorporated; capital, $70,000; to manufacture carriages, waggons, etc.; incorporators, George Richardson, R. J. Carson, John Hewton, and others.

WINDSOR, N. S.—Dominion Atlantic Railway Co., applying for incorporation; to purchase the assets of the Windsor and Annapolis Railway Co. and to construct and operate telephone and telegraph lines, railways, etc.

THE UNITS OF MEASUREMENT OF MASON'S WORK ARE.

For excavation, the cubic yard.

For concrete, foundations, the cubic foot.

For concrete, floors, the superficial foot.

For dimension-stone, footings, the superficial yard.

For dimension-stone, bridge masonry, the cubic foot.

For dimension-stone, surface dressing, the superficial foot extra.

For rubble-work, the cubic foot.

For rubble-work, surface dressing, the superficial foot extra.

For brick-work, common, the thousand brick.

For brick-work, pressed, the superficial foot

For tuckpointing, cleaning fronts, the superficial foot.

For plastering, plain surfaces, the superficial yard.

For plastering, cornices, the running and superficial foot.

ROMAN CONSTRUCTION IN BRICK AND STONE.

The Romans, at a very early period, adopted two distinct methods of construction, which they were accustomed to combine in their buildings—the construction with squared and figured stones, and that with rubble or brick. The former was employed by them only as a thick facing composed of large blocks laid together without mortar, united by gudgeons and cramps of metal, or even of wood, behind which they threw masses of small stones or gravel imbedded in an excellent mortar. The vaults were made of principal arches or ribs of cut stones or bricks, with a filling of concrete. This construction imposed on Roman architects plans peculiarly their own, composed of massive piers as points of support for the springing of their vaults. In these constructions there were no walls properly speaking, but isolated points of resistance, connected together by certain walls or screens, comparatively light, as they had no weight to support. The arrangements of plans, necessarily resulting from this principle, were admirably adapted to vast edifices containing numerous apartments for various uses.

WHAT MILL CONSTRUCTION IS.

1. Mill construction consists in so disposing the timber and plank in heavy solid masses as to expose the smallest number of corners or ignitable projections to fire, to the end also that when fire occurs it may be most readily reached by water from sprinklers or hose.

2. It consists in separating every floor from every other floor by incombustible stops—by automatic hatchways, by encasing stairways either in brick or other incombustible partitions—to the end that a fire shall be retarded in passing from floor to floor to the utmost that is consistent with the use of wood or any material in construction that is not absolutely fireproof.

3. It consists in guarding the ceilings over all specially hazardous stock or processes with plastering laid on wire lath or upon dovetailed lath or by plaster board of a suitable kind, following the lines of the ceiling and of the timbers without any interspace between the plastering and the wood, or else in protecting the ceiling over hazardoes places with tin or other suitable metal, but not with zinc.

4. It consists not only in so constructing the mill, workshop, or warehouse that fire shall pass as slowly as possible from one part of the building to another, but also in providing all suitable safeguards against fire.

5. It consists in laying the top floor and the outer boarding of the roof over mortar, plaster board, or some other fire retardent between it and the plank, where the maximum of safety is to be attained.

CORK AS A BUILDING MATERIAL.

Mr. S. Campolo calls the attention of architects and engineers to the value of the cork waste for building purposes. With a cement of plaster of Paris, dextrine and sequioxide of iron which may be made waterproof by oxychloride of zinc, the pulverized cork may be formed into bricks, which, while resisting compression, retain the peculiar properties of the cork. Such bricks, which have already been made and tested in France, only begin to crack under a pressure of 190 pounds per square inch. The material is an efficient non-conductor of heat, and may be employed to confine the heat of boilers and pipes, or it could be used to line roofs and walls to make houses cooler in summer and warmer in winter. As a non-conductor of sound, cork concrete has been tested in Paris for a hall ceiling to protect tenants overhead from troublesome noise at night. The cork composition is so elastic as to have an important effect in reducing vibrations due to the running of machinery; and as a lining for walls and partitions in a gunpowder factory it has so resisted the force of an explosion that only a harmless shower of cork fragments fell upon the workmen. Cork bricks are very light, only about half as heavy as ordinary porous bricks. While not strictly fireproof, they do not spread fire but carbonize very slowly, giving out smoke but no flame.

Systems of mechanical ventilation are very often faulty, says Heating and Ventilation, in that, while the supply of a sufficient volume of pure, fresh air has been provided for, the ducts through which it is conveyed are of too contracted area, so that the air enters the room at too high a velocity, causing disagreeable currents and too much of an admixture of the pure and impure air within them. Naturally this lessens the useful effect of the air admitted, which should act as nearly as possible to push the impure air out bodily before it, thus replacing the foul air instead of merely diluting it. The best results can be obtained in hot blast heating and ventilation only by introducing volumes of air at a slow velocity.

BRICK DUST AS A SUBSTITUTE FOR HYDRAULIC CEMENT.

The use of brick-dust mortar as a substitute for hydraulic cement, where the latter cannot be obtained, is now recommended on the best engineering authority, experiments made with mixtures of brick-dust and quicklime showing that blocks one-half inch in thickness, after immersion in water for four months, bore without crushing, crumbling or splitting, a pressure of 1,500 pounds per square inch. It is considered, too, that the addition of even as small a portion as one-tenth as much brick-dust as sand to ordinary mortars, is preventive of the disintegration so often characterizing mortars used in the masonry of public works. The use of brick-dust mixed with lime and sand is said to be very generally and successfully practised in the Spanish domains, and it is said to be in all respects superior to the best Rosendale hydraulic cement in the construction of culverts, drains, tanks or cisterns, and even of roofs, whether for setting flat tiles or for making the usual tropical flat roof. The proportions used there in the manufacture are approximately one of brick-dust, one of lime and two of sand, mixed together dry and tempered with water in the usual way.

BUSINESS NOTES.

Prenoveau, Turcot & Martineau, masons, Montreal, have dissolved partnership.

Napoleon Turcot, plumber, Montreal, has compromised with his creditors at 50 cents on the dollar.

MUNICIPAL DEPARTMENT.

Granite metalling was used in the construction of a road in Toronto in 1893, which was built in a manner described essentially as follows by Mr. H. D. Ellis, the roadway engineer of the city. The surface of the ground was excavated to a depth of 11 or 12 inches, and thoroughly rolled with a 10-ton roller until a compact subgrade was obtained, upon which a layer of large stones was placed on end by hand and the interstices filled with small pieces of granite. The whole was then rolled until the stone formed a true surface. Upon this a layer of broken granite was laid and rolled, the surface and binder being composed of fine granite screenings. The roadway was rolled longitudinally, beginning at the curb, with a final rolling on the crown. This rolling was kept up, with thorough sprinkling, until no impression could be made with a horse roller 3½ feet in diameter and 4½ feet in width, loaded to weigh ten tons, and giving a pressure of 433 pounds per lineal inch of roller. No loam or sand was allowed to be mixed with the stone, which was clean and broken to pass through a 1½-inch ring.

The sewage disposal works at Teddington, England, are described by their engineer, Mr. Henry York, in a paper recently read before the Incorporated Association of Municipal and County Engineers. The sewage is charged with milk of lime and then pumped up about 36 feet into a channel leading to the precipitating tanks, alumino-ferric being injected into the rising main before the tanks are reached. The latter have a capacity of about 67,200 gallons each and are adapted for either continuous or intermittent use. The effluent from the tanks is discharged over a filtration area of 6¾ acres, the underdrains of which terminate in a 15-inch stoneware pipe emtying into the Thames River. The buildings at the disposal works contain the air compressing machinery for working the Shone ejectors on the sewerage system, a small electric lighting plant driven by an arrangement of pulleys from the pumping engine, and a duplicate sewage pumping and sludge compressing plant. The works are designed to treat the sewage of 30,000 people, but at present only 5,200 persons are connected with the sewerage system. The machinery was started up about a year ago and has been run 12 hours a day only until recently; continuous pumping is now maintained and is found to be more satisfactory.

Mr. Charles F. Chapman, an eminent civil engineer, and a native of Prescott, Ont., died in Minneapolis last week. He had been employed on many important works in Canada and the United States.