two-storey and basement warehouse to cost $25,000, for Brackman-Kerr Company: Luney Bros., this city, contractors.

WINNIPEG, MAN.—V. W. Horwood, architect, has let the following contracts for construction of the James Ryan apartment block on Carlton street: mason work, Brown & Baker; heating, F. H. Scholey Co.—Erection of two additional stories to W. Peck's warehouse: Carter-Halls-Aldinger Co., contractors.

TORONTO, ONT. — Furnishing of steam shovel for Temiskaming & Northern Ontario Railway; Canadian General Electric Co., contractors at $8,500.—Furnishing of cast iron pipe for the city: Canada Foundry Co., this city, successful tenderers at following prices: 3-inch, $3.90; 4-inch, $5.40; 6-inch, $7.20; 8-inch, $10.75; 10-inch, $14.95; 12-inch, $19.65.

VANCOUVER, B. C.—Construction of roadway to city's dam on Seymour creek, a distance of seven miles: Boyd, Clandening & Co., successful tenderers. Estimated cost $40,000. The detailed tender of the contractors specifies the following figures: Clearing road, 96 cents per lineal foot; bridges, $4 per foot; culverts, $2 per foot; cribbing, 10 cents per foot; corduroy, 75 cents per foot. Other bidder, Ironsides, Rannie & Campbell.

LONDON, ONT.—Erection of rectory for St. Mary's church congregation: Moore & Henry, contractors.—Construction of sewer on Bruce street: C. Leathorne, contractor, at $8,250 and 40 cents per foot for side drains.—Construction of sewer on Ottaway avenue: C. W. Dill, Toronto, contractor at $10,454 and 65 cents per foot for side drains.—Construction of three septic tanks for city: A. E. Oakley, Berlin, Ont., successful tenderer at $12,854.10.

A METHOD OF MAKING QUICK REPAIRS TO A STEAM MAIN.

Quick repairs to a steam main 6 in. in diameter were recently described by Mr. Henry Jostes, of Willoughby, Ohio. A crack developed in the pipe, running halfway around one of the flanges at its junction with the pipe. A piece of flanged cast-iron pipe about 6 ft. long had to be removed and a new length of pipe ordered. Meanwhile the plant had to be kept running and temporary repairs quickly made. The pipe was cut off by a 12-inch hack-saw as close to the crack as possible, and the end filed up smooth and square. It was then found to be just 2 in. short. Two blank flanges were then drilled to fit the flanges in the pipe line and three jackets were procured, two of them being placed between the extra flanges and the flange of the old pipe in the line, and the other was placed on the top of the two extra jackets and the cut-off end of the broken pipe was placed against the new jacket mentioned. A set of bolts long enough to pass through the remaining flange on the broken pipe and its companion flange in the line, also through the two new flanges and their jackets and through the fixed flange at the other end of the break in the steam line, was procured. The cut-off end of the broken pipe was carefully adjusted so as to be central with the extra flanges and jackets, and while held fast in that position the nuts were screwed up on the long bolts, and the broken piece of pipe together with the extra flanges and jackets, clamped firmly together. —Engineering Record.

GRAVEL SCREENING DEVICE.

A gravel screening device with which gravel can be taken from a pit with a drag or scoop scraper and delivered into a wagon without the use of a shovel, being screened at the same time, is described in the report of the State Highway Commissioner of Michigan. The device consists of an inclined slideway about 8 ft. high, made of four smooth wooden rails, two being placed so as to support the scraper and two acting as guide rails, one on each side. On each side of the scraper a small wheel is attached which runs on the outside rail of the slide-way Near the top of the slide, the two inside rails turn sharply downward, thus allowing the scraper to pitch forward, pivoting on the supporting wheels, and allowing the gravel to slide off upon a slanting screen consisting of bars of ½x1-in. steel placed on edge and spaced as desired. The wagon is placed under the lower edge of the screen so that the gravel sliding from the latter will fall into the wagon box. The scraper is filled in the pit and drawn up the slide by horse power, the tawing rope being long enough to pass from the scraper through a pulley at the top of the slide and thence to the horse. The operations of filling and drawing the scraper up the slide do not mutually interfere.

QUANTITIES OF MATERIAL IN CONCRETE.

Inexperienced contractors frequently lose money by assuming that the quantity of gravel plus the quantity of sand required, will be equivalent to the volume of the finished concrete—that is, that 7½ cubic yards of concrete in the proportions of 1:2½:5 will require 2½ cubic yards of sand and 5 cubic yards of gravel. This is absolutely wrong, says the American Conduit Company of New York, since the grains of sand fill, to a certain extent, the spaces between the larger pebbles.

The following table is made up from Fuller's rule and represents fair averages for all classes of material. The first figure in each proportion represents the unit, or one barrel (four bags), of packed Portland cement; the second figure the number of barrels loose sand (3.8 cubic feet each) per barrel of cement, and the third figure the number of barrels of loose gravel or stone (of 3.8 cubic feet each) per barrel of cement.

Materials for one cubic yard of concrete:

Proportions.	Cement, Barrels.	Sand, Cubic Yards.	Gravel or Stone, Cubic Yards.
1:2:4	1.57	0.44	0.88
1:2½:5	1.29	0.45	0.91
1:3:6	1.10	0.46	0.93
1:4:8	0.85	0.48	0.96

If the coarse material is broken stone screened to uniform size it will contain less solid matter in a given volume than an average stone, and about five per cent. must be added to the quantities of all the materials. If the coarse material contains a large variety of sizes so as to be quite dense, about five per cent. may be deducted from all the quantities.

Example.—What materials will required for six foundations, each containing 163 cubic feet?

$$\frac{6 \times 163}{27} = 36.2 \text{ cubic yards.}$$

If the proportions 1:2½:5 are selected, it is found, multiplying the total volume by the quantities given in the table, that 47 barrels of cement, 16½ cubic yards of sand and 33 yards of gravel, will be required.

A definition of reinforced concrete was given by the English Court of Appeals recently in the case of Mouchel versus Coignet. This definition reads as follows: "Strengthened concrete may be shortly described as concrete strengthened by the incorporation in it of rods, so arranged as to supply the power of resisting tension strains, a power possessed in a marked degree by iron, but hardly at all by concrete, which, on the other hand, possesses great power to resist compression strain."