

Engineer has presented a report to Council of the cost of extending Queen street into High Park. He recommends the widening and extension of the street, commencing at Roncesvalles avenue, and continuing west to High Park, the width to be 80 feet. The cost is placed at \$50,700.—The Street Railway Company are asking permission to lay a car track to their new stables on Yorkville avenue. The paving for this will cost the city \$2,200.—The Separate School Board has decided to expend the sum of \$20,000 on the erection of a ten-roomed high school on Bond street. The Archbishop has donated a site for the purpose on the east side of the street, between the Cathedral and the convent. Building permits have been granted as follows: Josiah Blackwell, 105 Walker avenue, two story and attic, d. bk. dwellings, s. side Roxborough st., near Yonge, cost \$14,000; Wm. Jones, jr. s. d. 2 story and attic bk. dwellings, n. side Langley ave., near Broadview ave., cost \$6,000; Wm. Tedford, two det. 2 story and attic bk. dwellings, 380-82 Adelaide st. w., cost \$7,800; T. Whittard, 2 story b. f., add. to 407 Dupont st., cost \$1,000; Wm. Dineen, 1 story bk. add. to 124-26 King st. w., cost \$1,000; Jno. R. Wood, alterations 653 Ossington ave., cost \$1,000; John Kamridge six att. 2 story and attic b. f. dwellings, 21 to 31 Euclid ave., cost \$7,200; W. H. Lacey, 93 Macdonnell ave., eight att. 2 story and attic bk. dwellings, 2 to 14 Drummond Place, \$8,000

FIRES.

The saw and shingle mill at Bernedale, Ont., recently purchased by Kennedy Bros., was completely destroyed by fire on Saturday last. Loss, \$6,000; insurance, \$2,000.—The Salvation Army Barracks at Orillia, Ont., was burned last week.—Morningstar's grist mill, situated a couple of miles from St. Catharines, Ont., was destroyed by fire on Friday of last week. Loss, \$7,000; insurance, \$3,500; \$2,000 on mill and \$1,500 on machinery.—The Commercial hotel at Iona, Ont., owned by Mr. J. S. Waddell, was destroyed by fire on Sunday morning last. Loss, \$2,000. Saylor's block at Trenton, Ont., was badly damaged by fire on Tuesday last. The insurance on the block is \$3,000.—Mr. Hugh Jack's cheese factory at Carleton Place, Ont., was destroyed by fire on Thursday last. The total loss is \$7,500, \$2,200 of which is on the building, which was insured for \$1,000.

CONTRACTS AWARDED.

AVLMEY, QUE.—The Roman Catholics have awarded the contract for a new church, to cost \$30,000.

BELLEVILLE, ONT.—The County Council have awarded the contract for a new iron bridge at Tweed, to the Peterboro Bridge Company, whose tender was \$2,325.

MARKDALE, ONT.—Messrs. Post & Holmes, architects, Toronto, have let the contract for a new R. C. church to cost \$4,000 to Mr. J. C. Whitten, of Shelburne.

NEW WESTMINSTER, B.C.—The contract for the new Industrial school at Chilliwack, plans for which were prepared some time ago by Mr. Thos. Hooker, has been awarded to A. Ackerman, of this city, at the price of \$17,000.

OTTAWA, ONT.—The tender of Mr. James Summers has been accepted for the construction of the public swing bridge at Oliver's Ferry, the Government to supply all the material. The bridge will have oak piers and iron superstructure.

TORONTO, ONT.—The Works Committee of the City Council have accepted the following tenders for general supplies: Loan, Taber Bros., 10 cents per cubic yd., delivered east of Yonge st. and 65 cents west of Yonge street; Macadam stone, P. Wilson, \$10.50 per ton delivered at Portland street yard, J. Goulding, \$8.40, delivered at Frederick street yard, crossing stone, A. J. Brown, 24 cents per lin. ft.; ironwork, Ontario Foundry, \$1.60 per 100 lbs. for castings and \$2.50 for wrought; sand, A. W. Godson, 95 cents per cub. yard; wire nails, Ontario Lead and Barb Wire Co., \$27.50 per 100 lbs.; lumber, Wm. Bryce & Co., \$12.78 per M. ft.; B. M. for gang 1 inch plank and the same price for scantling, pressed spikes, F. W. Unit, \$3.20 per 100 lbs. for 7x½ and 8x½; gravel, Taber Bros., 95 cents.

both east and west of Yonge street: sewer pipe, Standard Drain Pipe Co., 6 in. 8½ cents, 9 in. 14 cents, 12 in. 22 cents, 15 in. 22 cents, 18 in. 48 cents. Inverts, 18 and 27 cents. Stoppers, 6 and 9 in. 4 and 5 cents. Curves 6 and 9 in. 20 and 35 cents. Bends and elbows, 12, 15 and 18 in., 80 cents, \$1.20 and \$1.50. Junctions, 2 ft. lengths, from 80 cents to \$1.70. The contract for the Bathurst street sewer, from the C. P. R. to Convalescent Home, was awarded to Messrs. Smith & Wilson, at \$860.

THE STRENGTH OF MATERIAL.

In estimating the strength of different parts of buildings, it should be borne in mind that beams decrease in strength much faster than the length is increased, for instance. If a beam of any given size, twenty feet long, will sustain a load of 100 pounds per foot, one of the same size and forty feet long will only sustain 25 pounds per foot, and that with much more deflection, while the same beam cut down to ten feet in length, would carry four hundred pounds to each foot in length.

With posts, the ratio of strengths to their lengths differs somewhat with different proportion; but roughly speaking, posts of sizes in common use diminish in strength as they increase in length, in a ratio of about 1, to 2, that is if a post of a given size and 10 feet long is capable of supporting 12 tons, one of the same material and size but 20 feet long will support but 4 tons. The comparative strength of rods sustaining loads by suspension is not materially affected by their length; a long rod of a given size is nearly as strong as a short one of the same dimensions.

Now, with these general principles in mind, let us remember as a base of calculation a few examples. Take first a mill 50 feet wide, three 10-foot stories in height, of the usual "mill construction," center posts and beams 8 feet between centers, making beams 25 feet long from posts to wall. To safely carry the ordinary load of 200 pounds per square foot the beam should be of Southern pine, 12x16 inches, with round posts, 11 inches in diameter or 10 inches square, posts in the first story to support the second and third story and roof; 10-inch round posts, or 9x9 in the second story for the support of the third floor and roof, and 9 inch round or 8-inch square to carry the roof. A 15-inch I-beam 150 pounds per yard, this length would be of about the same strength as the 12x16-inch beam. A 6-inch round wrought iron column of ½-inch shell, or a 6 inch cast-iron column, free from defects, with a ½-inch shell, would be the same strength as the 10x10 inch posts, cast-iron being stronger in columns than wrought-iron, except where they are very slender. Iron will not resist heat as long as wood, wrought-iron becoming soft and pliable and cast-iron cracking with heat and water. If a brick pier is to carry the load of 10x10 inch posts it should be of good masonry, 2 feet square, or at least 20x24 inches, and it will resist the action of heat longer than any other of the materials mentioned. A 1½-inch iron rod will safely support by suspension the same amount of floor surface of a single floor as is carried by one of these posts.

If it is desired to use this building for a warehouse, to be filled with barrels of flour, it should be estimated at 400 instead of 100 pounds to the square foot, and it would require another row of posts between the center posts and outer wall, thus making the beams about 12 feet between bearings, the beams remaining the same size and the posts increased a little, the wood about 1 inch, or ½ inch for the iron. *National Builder.*

LEGAL DECISIONS.

A case of great importance to the building trade and others who make use of Belgian girders has been determined on appeal in the Edinburgh Courts. A firm of builders in Glasgow entered into a contract with Messrs. P. & W. Maclellan, the well-known iron merchants of that city, to supply beams and girders for new tenement buildings. One of the conditions was that

the girders were to be delivered "at such times as may be required by the mason." There was some difference of opinion as to the meaning of the words, but when the case was first tried it was held that what was intended was that the rate of delivery was to be regulated by the needs of the masons, in order that the works might not be blocked up by the girders, which would be the case if all were supplied at one delivery by Messrs. Maclellan. The girders were obtained from Belgium; some arrived in good time, but owing to strikes and other causes the supply was retarded. Afterwards it became necessary to take an action for the recovery of the balance of 244/ due on the account, whereupon the builders took a counter action for damages on account of the delay. The sheriff who tried the case held that Messrs. Maclellan had proved that it was a custom in the trade that the buyer in such cases took the risk of delay from strikes and other unforeseen causes beyond the seller's control, and in both actions judgment was given in favor of Messrs. Maclellan with costs. The builders appealed. The judgment of the courts below was affirmed on the ground that Messrs. Maclellan had exercised due care in placing the order for the iron with a proper and suitable manufacturer in Belgium; that they were not responsible for the delay which occurred, not having been able to anticipate its causes; that they were therefore not chargeable with breach of contract in unduly delaying delivery. It will be observed that in the judgment of their lordships the custom of the trade is not recognized, and that the issue was made to depend on the facts stated in evidence.

Thin brass tubing used for gas fixtures is fashioned into the various complicated ornamental shades required for such purposes by placing the tube between two steel moulds which are heavily clamped, and then the tube is expanded by hydraulic pressure reaching as high as 10,000 pounds to the square inch. The shell of this tubing is about 1-16th of an inch in thickness, and made of highly annealed brass. In order to complete the process for some of the more complicated forms, it is necessary to apply the water pressure four or five times, annealing the tube between each operation. The use of pressure for expanding a pipe is not fundamentally novel, as that is the method used in lining cotton hose with rubber. The lining is carried through the hose and expanded by steam-pressure, which completes the vulcanization of the rubber and presses it into the fabric so firmly that it adheres closely.

Stones of uniform texture commonly decay by disintegration at the surface, losing grain by grain in proportion to time and exposure. But they sometimes suffer a singular change, as if baked at the surface. An external enveloping crust is thus formed, as at Stonehenge, where the interior is soft, but the exterior hard. This process appears to render such a stone durable, but if carried further, so as to produce a new texture of the surface, the external shell separates from the interior mass, desquamates and falls off, leaving a rough, soft inner core. This happens even to molded surfaces, like those of balusters. Stones composed of parts unequally mixed suffer unequal waste in different parts. Shell, corals, concretions and crystallized masses thus appear prominent from limestones, and indicate the general fact that in proportion to the force of molecular aggregation in the stone is the resistance which it offers to decay. Again, the circumstances under which a stone is exposed in a building influence its conservation. It is not the amount, but the kind of exposure which governs the decay. The southern and western parts of our cathedrals yield, while the northern and eastern resist. Prominent cornices often are perfect, while below them the moldings are reduced to shreds. The drip-moldings remain and are even hardened, while parts which it was destined to protect have mouldered away.—*The Architect.*

MUNICIPAL DEPARTMENT.

LEGAL DECISIONS AFFECTING MUNICIPALITIES.

The County Council of Elgin, has decided to defend the validity of the by-laws granting aid to high schools, action to set aside which has been taken; to petition the Ontario Legislature to amend the High School Act making only those portions of a country not in a high school district liable for the maintenance of county pupils, and to petition the Dominion Parliament to require ditches to be opened up through Indian reserves; also to require railways to open culverts under the roads where there are natural water-courses.

SUSKEY V. TOWNSHIP OF ROMNEY.—Judgment on motion by Suskey to quash a by-law of the township of Romney assessing upon the lands of certain rate-payers a sum of \$3,000 paid by the township out of its general funds for extra work upon a drain after it had been constructed and completed. The Chancellor holds that the by-law falls fairly within the scope of sec. 573 of the Municipal Act of 1892, which gives power to amend a drainage by-law when sufficient means have not been thereby provided for the completion of the work, so as to make it an efficient work, though there may be some deviations and variations or addition to the work as originally planned by the engineer. Application dismissed with costs.

REG. V. ABELL, REG. V. HUGIL, REG. V. MCKENZIE.—A motion by the defendants to make absolute the rules nisi granted in these cases in respect to the conviction of the defendants for illegal collection of tolls on the Vaughan road. The defendant Abell is the president, and the other defendants are toll-keepers of the Vaughan Road Company, between whom and the township of Vaughan a dispute had arisen with regard to the company's right to collect tolls. It was contended by the residents of Vaughan that the road company could not collect toll until the township engineer certified that the road was in a proper state of repair. A Justice of the Peace endorsed this view and fined all the defendants for collecting toll while their road was in a state of unrepaired and condemned by the township engineer. The judges held that the fine was correctly imposed and that the defendants were barred from collecting any toll until their road is put in a proper state of repair and certified by the township engineer. Motions dismissed with costs.

BRIDGE BUILDING IN AMERICA.

Mr. T. Kennard Thomson, C. E., writing on the above subject in the *Engineering Magazine*, among other things says: "In this country to day the best practice in bridge building is to use eye-beams for spans up to 18 ft., plate girders for spans 18 ft. to 80 ft., or even 100 ft., lattice or open riveted girders from the last limit to 120 ft.; pin-connected trusses to 350 ft.; cantilevers from this limit to a span somewhere between 1,000 ft. and 1,500 ft.; after which economy requires suspension bridges. Continuous girders, or bridges connected or made continuous over two or more spans, have gone out of favour, owing to the ambiguity of strains, least settlement of a pier rendering the strains uncertain. Of course, where these bridges are built they are provided with adjustable shoes, so that if the piers settle the bridge can be raised, but this requires great watchfulness. The above limits are necessarily subject to change, owing to local circumstances, such as the difficulties of erection, etc. For instance, in the Lachine Bridge, where the St. Lawrence River made false work out of the question, the two channel spans of 408 ft. each were built as cantilevers, but turned into continuous girders when coupled up or completed.

The inspection of a bridge from the first drawing to the last coat of paint cannot be too thorough. Many think it un-