N = number of wires in outer ring of wires of a strand

K = 1.0 for hoisting and guy rope; 0.8 for extra flexible 8 x 19 hoisting rope; 0.33 for tiller rope.

The aggregate cross-sectional areas of the wires was expressed approximately by the equation:—

$$A = CD^2$$

where C = 0.41 for 6 x 19 plow steel hoisting rope
= 0.38 for 6 x 19 crucible steel hoisting rope
= 0.38 for 6 x 7 guy rope
= 0.35 for 6 x 17 plow-steel rope
= 0.26 for 6 x42 iron tiller rope.

It was found when the maximum loads determined from tensile tests were platted as functions of the diameters of the ropes that the curves bounding the lower frontiers of each zone comprising the observed values were in close agreement with similar curves platted from the minimum strength stipulated in the specifications of the Isthmian Canal Commission of 1912. These strengths were also in approximate agreement with the standard strengths recommended in 1910 by the manufacturers from the results of their tests of cables similarly classified. The minimum strengths found from the present investigation are given by the following empirical equation:—

$$\text{Load} = C \times 75{,}000 D^2$$

where D = diameter of wire rope in inches

C = 0.9 to 1.1 (mean about 1.0) for 6 x 19 plow-steel cables; 0.8 to 0.95 (mean, about 0.9) for 8 x 10 plow-steel and 6 x 19 crucible cast-steel cables. 0.3 to 0.4 (mean, about 0.35) for iron tiller and steel guy rope

The modulus of the rope calculated from stress-strain measurement was found to vary from 3,000,000 to 9,000,000 lbs. per sq. in., depending upon the diameter and class of cable.

Plow-steel ropes were selected for comparative analyses of the constituent materials. In the chemical analyses the carbon content ranged from 64 to 96 per cent., with a mean of about 75 per cent. The manganese ranged from 25 to 68 per cent., the silicon from 11 to 24 per cent. The percentage of phosphorus and sulphur was relatively low. In certain cases the steel of the filler wires was softer than the main wires.

The fibers used in making the core of the rope were estimated as manila, jute, istle, mauritius, manila fiber alone being employed by certain manufacturers. The preservative and lubricants on the cores were composed of wood and vegetable tars, petroleum products, and fish oil, the practice varying somewhat.

There was a reasonable uniformity in the strengths and elongations of the wires from a particular cable, but a larger variation in the strengths of the wires from cables of different manufacturers. This was probably due to the fact that different grades of plow steel were used by the several manufacturers in meeting the provisions of the specifications.

The cables developed from 72 to 90 per cent. of the aggregate strengths of the wires. The upper limit of the ratio of the strength of a rope to the strengths of its wires was found from theoretical considerations to be 89.2 per cent. for 6 x 19 plow-steel cables. The differences between the results of the theoretical analysis and the practical tests were largely attributed to different strengths and degrees of ductility of the wires, this causing an unequal distribution of the load among the strands, with over-stressing of certain strands near the point of failure.

The Civil Service Commission of Canada will receive applications not later than September 6th for the following positions at the Royal Military College, Kingston, Ont.: Professor of engineering, salary $3,480; instructor in physics, $1,800; instructor in civil engineering, $1,800. W. Foran, Ottawa, is the secretary of the commission.

TOWN PLANNING IN EASTERN CANADA*

THE Nova Scotia Town Planning Act has been amended in accordance with suggestions made by the Town Planning Branch of the Commission of Conservation. The Act formerly required that town planning schemes or by-laws had to be prepared before 1918, but the war prevented this being done. Under the amendments made the period for compulsory preparation is extended to 1921. The Act has also been widened in scope to deal with rural as with urban development. The model town planning by-laws of the province have been prepared for recommendation to the municipalities.

Nova Scotia has also passed a Housing Act to enable the province to take advantage of the federal loan. A draft housing scheme is under consideration. In the investigations made into the housing shortage in Canada and the costs of building, it has been found that conditions are worse in Halifax than in any other part of the Dominion, owing to the combined effects of exceptional prosperity and the destruction caused by the disaster of 1917.

The Halifax city and county schemes, covering large areas, are well advanced in preparation.

New Brunswick

The St. John Town Planning Scheme, dealing with over 20,000 acres, has been approved by the councils of the city and the county municipalities. This is an important achievement having regard to the novelty of many of the provisions of the scheme and the somewhat drastic changes which they introduced in local procedure. The scheme has been prepared by the City Planning Commission in consultation with the Town Planning Branch of the Commission of Conservation. The Housing Act of New Brunswick is now on the statute books and a housing scheme has been prepared by the province and approved by the federal government.

Quebec

In Quebec a Housing Act has been passed, a provincial housing scheme has been prepared and a director of housing has been appointed. The Quebec scheme conforms more strictly to the federal scheme than the schemes in any other provinces. Practically all the recommendations of the federal government have been introduced into the Quebec scheme in a mandatory form. The appointment of Dr. Nadeau as director of housing is significant of the importance which the province attaches to the promotion of housing schemes in the form of garden suburbs and with proper town planning provisions. For many years Dr. Nadeau has been an active worker for town planning and housing reform in Quebec.

Although Quebec is the only eastern province without a Town Planning Act, it has introduced town planning provisions in its housing scheme and the intention is to pass a Town Planning Act at the next session of the legislature.

Ontario

The fact that Ontario was responsible for initiating the movement for government housing in Canada and that the province has appropriated $2,000,000 of its own money to be spent in housing, has given it a start in advance of the other provinces in the matter of carrying out housing schemes. The Housing Act and scheme of the province was approved by the Federal government on February 20th last.

J. A. Ellis, an ex-mayor of Ottawa and a member of the Ontario Railway and Municipal Board, has been appointed director of housing, and is giving able leadership to the movement in the province. The director reports that 47 municipalities have already appointed housing commissions and applied for loans, and that the whole of the $10,000,000 available is already spoken for. Actual building operations have begun in Toronto. Two sites of about 40 acres in area have been acquired in the city of Ottawa and are being planned with a view to building operations being started in the immediate future.

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*From "Conservation of Life," published by the Commission of Conservation, Ottawa.