

The following Table gives a summary of the results obtained for Red Pine:—

BEAM.	Dimensions in inches.			Weight in lbs. per cubic foot at date of test.	Maximum skin stress in lbs. per sq. inch.	Coefficient of elasticity in lbs.
NEW TIMBER.						
	<i>l</i>	<i>d</i>	<i>b</i>			
XXXV.	156	× 11.15	× 3.325	37.69	4,339	1,616,075
XXXVIII.	210	× 11.25	× 6.34375	37.55	6,752	1,802,633
XXXIV.	156	× 9.125	× 3.125	36.59	5,079	1,784,800
XXXVII.	210	× 13.125	× 6.1875	36.50	5,219	1,418,500
XXXVI.	210	× 13.25	× 6.375	36.39	3,937	1,241,950
XXXI.	174	× 7.125	× 6.21875	34.97	5,442	1,618,900
XXXIX.	210	× 11.25	× 3.1	32.03	4,818	1,198,550
XXXIII.	180	× 11.125	× 3.1	31.87	6,554	1,618,000
XXXII.	180	× 8.125	× 3.1	31.56	6,928	1,575,200
XXX.	174	× 7.25	× 6.1875	30.96	4,634	1,325,950

Hence,

The average weight in lbs. per cubic foot = 34.61.
 “ co-efficient of elasticity in lbs. per sq. in. = 1,520,056.
 “ maximum skin stress “ “ = 5370.

If, however, the plank results are omitted,

The average weight in lbs. per cubic foot = 34.78.
 “ co-efficient of elasticity in lbs. per sq. in. = 1,431,717.
 “ maximum skin stress “ “ = 5137.

In general, the following data may be adopted in practice:—

The average weight in lbs. per cubic foot = 34.6.
 “ co-efficient of elasticity in lbs. per sq. in. = 1,430,000.
 “ maximum skin stress “ “ = 5,100.
 “ safe working skin stress “ “ = 1,700.

3 being a factor of safety.

In the accounts of these several beams it will be observed that the failures are almost invariably due to the crippling of the material on the side in compression, indicating that the tensile strength of the timber exceeds its compressive strength, and this was subsequently verified by the direct tension and compression experiments.

WHITE PINE.

Beams XXXVI and XXXVII are two pieces cut out of one large piece of square pine, made and taken out in the Gatineau Valley, Ottawa County. The timber was brought down via the Gatineau and Ottawa Rivers to Montreal, and remained in the water until late in the fall of 1892, when it was piled on the land for winter sawing.

This timber was purchased from Messrs. J. & B. Grier.

Beam XXXVI was tested February 16th, 1893, with the annular rings as in Fig. 81.

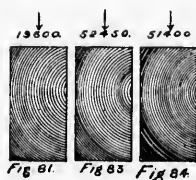


Fig. 81 Fig. 83 Fig. 84

The load upon the beam was gradually increased until it amounted to 19,600 lbs., when it failed by the tearing apart of the fibres on the tension side.

The maximum skin stress corresponding to this load is 2993 lbs. per square inch.