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[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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[\[PDF \(2878K\)\]](#) [\[References\]](#)

The Ratio of Working Stress to Allowable Stress of Structural Members of Wooden Houses II. Beams of houses built in an area of average snowfall

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Abstract: The load-bearing ratio of working stress to allowable stress on beams of three wooden houses, which were built in an area of average snowfall, was investigated. Their load-bearing ratio of maximum flexure to flexure limit was also surveyed. Then the condition of stress or maximum flexure at each duration of load at the maximum load-bearing ratio was examined. It was found that : 1) It was supposed that safety margins were sufficient because the load-bearing ratio was less than 20% on average in 70% of all beams. However some exceptional beams exceeding 80% of the maximum load-bearing ratio were found. 2) There is a tendency of determining the maximum load-bearing ratio by “the maximum flexure” of roof beams. This is because a short depth of roof beams does not have an uncomfortable effect on living, and thus was chosen by the designer in order to take into consideration its economical advantage. 3) Some beams possessing less safety margin possibly existed if a shear wall without the support of a 1st-floor column is located at mid-span. The safety margin of those beams is decreased with increasing shear strength of the shear wall.

Keywords: working stress, allowable stress, flexure, load-bearing ratio

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