

AN INVESTIGATION ON THE BEHAVIOUR  
OF MINANGKABAU TIMBER ROOF TRUSS

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**Abstract.**

An important application of the modulus of elasticity of timber is in structural timber design calculations. It is used as a means of estimating the deflection of flexural members and as a parameter in calculating the buckling strength of timber members. A study is made on the realistic value of the modulus of elasticity of timber members of a Minangkabau Roof Truss configuration. The ANSYS Programme is used to iterate the values of the Modulus of Elasticity of the timber members. This was done in order to obtain the closest deflection of the Minangkabau roof truss at selected points on the truss. The full scale testing was carried out at the Heavy Structures Laboratory of the MARA Institute of Technology. Discrepancies in the value of Modulus of Elasticity of the timber members obtained from the iteration with that obtained using BS 373:1957 (Methods of Testing of Small Clear Specimens of Timber) are described herein.

## 1. Introduction

Timber is a traditional building material that remains until today a primary and respectable structural engineering material. Even though timber is known to have many advantages compared to the other structural materials, its use in Malaysia is restricted to areas where it is cheaper in terms of cost of construction and temporary in nature<sup>(1)</sup>. This is probably due to the prejudices of timber which are normally due to poor workmanships and detailings. This means that timber is normally used in the less prestigious structures such as timber trusses where it is concealed and falsework and formwork for concrete and houses for squatter communities or rural folks as temporary structures<sup>(2)</sup>.

Timber provides the means to meet the most indispensable of social needs, especially demanding in developing countries, such as for schools, hospitals and rural centres in addition to low-cost housing. In spite of its importance to society, timber has received considerably less attention in engineering and science than other non-renewable raw materials, and the present trend indicates no immediate improvement.