

Chapter I

INTRODUCTION

1.1 Literature review

Solid timber members are usually used for timber construction. Built-up members are sometimes used when larger sizes of timber are not available. Built-up timber members may be fabricated by the use of glue or fasteners, such as nails or connectors such as split rings depending on the type of loading i.e. flexural members and those subjected to axial loads. Built-up members which are subjected to axial force, such as timber rafters and timber columns with light loading, may use spaced columns.

Spaced columns are composed of two or more timber shafts fastened together by split rings and spacer blocks at the ends and at the middle of the members. Spaced columns are widely used as the method of assembly is simple and convenient for practical work in the field.

There is no research work of spaced column in Thailand. Experimental works were made in Europe and the United States of America, but only empirical formulas for design practice could be found.

1.2 Scope of the research

The research is intended to determine the strength of the spaced columns of different slenderness ratios and to determine the strength of solid columns of the same cross-sectional areas and lengths. These spaced columns are composed of two vertical shafts and the end spacer blocks located at 1/20 for type 'a' and 1/10 for type 'b' with split rings

of 70 mm. diameter. The tested strength of these two types of spaced columns and the tested strength of solid columns are compared.

Tests were made on 15 columns under axial load for the pin-ended condition. The amount of lateral buckling and the corresponding column load of all columns were recorded. Connections between the spacer blocks and the column shafts of the spaced columns were observed for suitability of split rings fabricated from steel tube.

1.3 Advantage of the research

The results of the research can be applied to timber structures constructed of Thai timber. Such designs would include trussed structures and building columns where solid columns of larger sizes are not available. This research also showed the possibility of empirical formulas in design computations.

1.4 General plan

Because of the limited budget for this research, Takian-Tong timber is the only species of Thai timber to be tested. Takian-Tong timber may be found in all parts of the country as commercial timber. The size of the shaft of the spaced columns was 4 x 9 cm. dressed size and the size of solid square section was 8.5 x 8.5 cm. The lengths of columns were 1.50, 2.00, 2.50, 3.00 and 3.50 meters. All columns were tested in dry condition.