

**A PROJECT REPORT SUBMITTED TO THE
SCHOOL OF ENGINEERING IN PARTIAL
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EFFICIENCY OF GLUED FINGER JOINT

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ABSTRACT

The project covers the Finite Element analysis of the glued wood joint under tensile loads with different tip thickness and lap length. The analysis of the wood joints covers the mini finger joint.

The results' from the experimental (Selbo) analysis i.e tensile strength and efficiency were used as a comparison with the data from the computer analysis

The objectives were to obtain the stresses and displacement of the joint using the ANSYS program package. Isoparametric solid 2D element i.e PLANE 42 are used in analysis. Linear finite element model and the aspect ratio limited to 1:10, were used in order to reduce the errors.

It was found that the value of efficiency of the finger joint increased with the decreasing tip thickness (t), slope (s) and increasing of the glue line length.

CHAPTER 1

INTRODUCTION

1.0 INTRODUCTION

1.1 General

Glued finger joints are considered as the best glued end joint in timber construction. The strength of the joint among other is influenced by the ratio of t/p , L/p and the stress concentration at the tip. Finger joint strength also depends on the type and configuration of joint and the manufacturing process. High-strength finger joint can be made when the design is such that the fingers have relatively sharp tips (t).

The joint strength theoretically should approach the tensile strength of the wood, discounting the strength losses caused by effect of stress concentrations that probably occur at the finger tips. Mini finger joint will be needed as the computer modelling and the efficiency of the joint will be examined and compared with the experimental results.

The work cover in this thesis is on the finite element analysis of the glue finger joint based on the species of Sitka Spruce, Douglas-Fir and White Oak (United state wood). The works try to investigate the efficiency of glue finger joint under the effect of joint geometry and width of clearance influent of the tip.