

UNIVERSITI TEKNOLOGI MARA

**EUROPEAN YIELD MODEL (EYM)
FOR DOUBLE SHEAR SPLICE
CONNECTION MADE OF TST AND
STS BOLTED MENGKULANG
GLULAM**

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ABSTRACT

This research presents the development of a European Yield Models (EYM) for Malaysian Mengkulang timber and its application to splice timber joints, including the potential design benefit of relevant glulam design made of the same strength group timber species. The structural glulam was fabricated based on BS EN 14080: 2013, and its laminations were using Phenol Resorcinol Formaldehyde (PRF). There were factors influencing the load-carrying capacity for double shear connection: dowel-bearing strength, bolt yield moment, and withdrawal capacity. The double shear connections are in the form of timber-steel-timber (TST) and which (steel as the central plate) and steel-timber-steel (STS) (steel as an outer plate). The EYM for glulam was verified by comparing it to the actual size bolted splice joints under tensile loading. The glulam specimens have been certified for quality performances, despite determining the actual size capacity for the EYM parameters. The local glulam beam manufactured as the basis of all samples was investigated. The main parameters in EYM, such as dowel-bearing strength, withdrawal capacity, and bolt yield moment, were tested for 12 mm, 16 mm, and 20 mm bolt diameter, respectively. The average value of dowel-bearing strength, bolt yield moment and withdrawal capacity of the corresponding 12 mm, 16 mm and 20 mm bolt diameters were determined, respectively. Three parameters test shown 20 mm bolt diameter was performed higher than 12 mm and 16 mm with some factor affects. The average values were considered in finding load-carrying capacity for double shear bolted splice connection in EYM. Results of the EYM (glulam) model based on the factor of safety (FOS) showed the potential of EYM (glulam) to be used as a tool to predict the load-carrying capacity of bolted splice joint for both TST (central plate) and STS (outer plate). This study has successfully modified the EYM for double shear splice connection made of TST and STS bolted Mengkulang glulam.

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