

SULIT



First Semester Examination
2021/2022 Academic Session

February/March 2022

EAS451 – Timber and Masonry Engineering

Duration : 1 hour

Please ensure that this examination paper contains **THREE (3)** printed pages before you begin the examination.

Instructions : This paper contains **TWO (2)** questions. Answer **ALL** questions.

All questions **MUST BE** answered on a new page.

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1. **Figure 1** shows bolted connection (three-member steel-to-timber bolted moment connection) is subjected to a long-term eccentric load of 15 kN. The joint comprises two 4 mm thick steel side-plates and an inner timber in SG6, grade standard/green joined together using eight M12 bolts under wet conditions. Verify the adequacy of the connection.

[50 Marks]

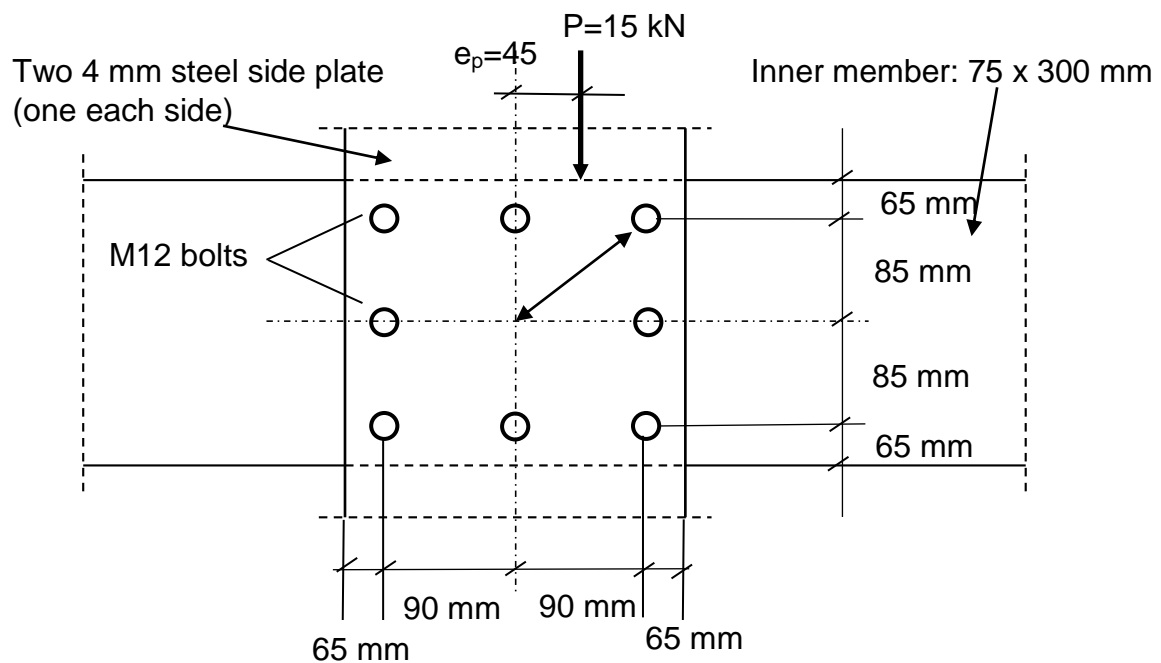


Figure 1: Eccentrically loaded connection

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2. (a). Explain the differences between confined masonry system and reinforced concrete infilled frames system. Answer your question in a tabular form.

[20 marks]

- (b). Determine the maximum height of a building wall and the vertical load resistance for hollow concrete blocks unit and solid fired clay brick. Assume height (h) is equal to effective height (h_{ef}) and thickness (t) is equal to effective thickness (t_{ef}).

[28 marks]

Table 1

	a) Hollow concrete blocks	b) Solid fired clay brick
Size (length x width x height)	390 mm x 190 mm x 190 mm	215 mm x 102.5 mm x 70 mm
Mortar designation (class)	iii	ii
Eccentricity	0.05t	0.05t
Characteristic compressive strength masonry (f_k)	4.5	3.7
Compressive strength of unit (N/mm^2)	45	30
Safety factor for materials (γ_m)	Category normal	Category normal

- (c). Give **ONE (1)** factor that significantly affects on the vertical load resistance in (b).

[2 marks]

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