STRUCTURAL PERFORMANCES OF EXPANDED POLYSTYRENE LIGHTWEIGHT CONCRETE (EPS-LWC) WALL PANEL WITH DIFFERENT OPENING CONFIGURATIONS

ROHANA BINTI MAMAT

MSc in Civil Engineering (Structure)
UNIVERSITI TEKNOLOGI MARA
2014

AUTHOR'S DECLARATION

I declare that the work in this dissertation was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This topic has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

In the event that my dissertation be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and agree be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

Name of Candidate	:	Rohana Binti Mamat
Candidate I.D. No.	:	2011192885
Programme	:	Master of Science Civil Engineering (Structure)
Faculty	:	Civil Engineering
Thesis Tittle	:	Structural Performances of Expanded Polystyrene Lightweight Concrete (EPS-LWC) Wall Panel with Different Opening Configurations
Signature of Candidate:		.....
Date	:	January 2014

ABSTRACT

This study investigates the structural performances of Expanded Polystyrene Lightweight Concrete (EPS-LWC) wall panel with different opening configurations under axial load. Opening in wall panel is importance in the form of windows, doors or as a ventilation purposes. EPS is chosen as the lightweight aggregate because it offers advantages in terms of energy absorbing capacity which suitable for high impact structure like shear wall. Since it is understood that the lightweight concrete will have strength reduction, steel fabric reinforcement is used to strengthen the wall panel structure. Steel fibre has been also added to this structure to improve the lightweight concrete strength. The compressive strength obtained for EPS-LWC wall panel in this study is 20.87 N/mm^2 and the density is 1900 kg/m^3. Two (2) different opening locations have been set and the structural performances are compared. The opening configurations are chosen to investigate the deep beam effect at the top and base end of EPS-LWC wall panel. The loading capacities obtained are 477.70 kN and 463.70 kN for each opening location. EPS-LWC wall panel has set to have pinned-fixed end conditions. Both EPS-LWC wall panel samples deformed in single curvature profile. For a wall with slenderness ratio of 13.33 the EPS-LWC is classified as short wall and had experienced crush failure. Maximum displacement recorded is 1.45 mm and 1.18 mm for each sample. It could be observed that there are several hairline cracks occurred at the top left of opening edge and propagated towards the EPS-LWC wall panel edges.

TABLE OF CONTENTS