ULTIMATE STRENGTH OF DOUBLE LAYER STEEL FABRIC REINFORCED CONCRETE SHORT WALL PANEL

By

NOOR RAIMEE BINTI MOHAMAD RADZI

Report is submitted as partial requirement for the degree of
Bachelor Engineering (Hons.) Civil

UNIVERSITI TEKNOLOGI MARA
NOVEMBER 2008

ABSTRACT

Reinforced concrete construction which is the backbone to any infrastructural project depends for its performance on its prime elements namely concrete and reinforcement. The construction industry in Malaysia in high rise building currently practices use of the reinforced concrete wall due to improved construction technology. Reinforced Concrete Wall Panel is the new method currently used to replace the conventional method. It is an established fact that by mechanization or industrialization any and every productive activity invariably benefits in all respects of quality, efficiency of time and energy and elegance of human effort.

This research is conducted to determine the structural behavior of double layer steel fabric short wall panel. The short wall panel is subjected to direct axial load through experimental work. Two wall panels reinforced with double layers steel fabric of type (B7) with a dimension of 75x1000x500 mm (Thickness:Length:Height) were prepared. Grade 30 Normal Portland Cement (OPC) with a water cement ratio 0.55.The wall panel was tested under compressive axial load (without eccentricity). The end conditions of the wall for this study are pinned-fixed.

Experiment results show that both wall panels failed in compression shear at bottom edge of the wall panel. The average ultimate load of both samples was 391.27 kN. A single curvature buckling pattern is dominant in the both samples with average maximum lateral displacement as calculated 5.47 mm, occurred at 375mm from base. This research is hope to replace the conventional method which is took longer time thus increase the total cost. This research gives many benefits to developer where by using this short wall panel it delivers fast and cost effective technique.

Keywords: *reinforced concrete short wall panel, steel fabric*

ACKNOWLEDGEMENT

Alhamdulillah, thanks to Allah S.W.T for His blessing upon completing this research report with entitled "**ULTIMATE STRENGTH OF DOUBLE LAYER REINFORCED CONCRETE SHORT WALL PANEL**".

Firstly, I would like to express my gratitude and appreciation especially to my Final Year Project supervisor, Assoc. Prof. Ir. Dr. Hjh. Siti Hawa Binti Hamzah for all her time and efforts in supervising this project. Her guidance, advice, encouragement and dedication towards the accomplishment of this research proposal have been valuable.

I would also like take this opportunity to thank Nurhamiza who is RA to Assoc. Prof. Ir. Dr. Hjh. Siti Hawa Binti Hamzah for gave me high co-operation in this research. Besides that, I would also like to thank all laboratory technicians and my friends for their support and kind assistance in helping me to complete this research report.

Last but not least, special appreciation to my beloved parents for their moral and financial supports, care and encouragement throughout the course of my study at Universiti Teknologi MARA Malaysia.

Finally, thank you so much.

TABLE OF CONTENT

CHAPTER 1

INTRODUCTION

1.1 Background

Reinforced concrete wall panels are load bearing structural elements similar to slabs, beams, and columns. While a rectangular wall hinged at top and bottom and carrying vertical loads behave as a panel in two-way action under the same loading and develops biaxial curvatures in directions parallel and perpendicular to that of loading. Loads on wall panels are usually in-plane axial loads but, often, they could become accidental eccentric loads due to constructional imperfections. As the thickness is a small, consideration of stability also. Depending on the relative proportions, a loaded panel may behave as anything from a shallow and wide element to a deep and narrow element. Hence, an understanding of the strength and behavior of wall panels as influenced by geometry, support conditions, and materials of construction is necessary to develop procedures for their satisfactory design. (Desayi and Saheb 1990, Saheb and Desayi 1989).

It is an established fact that by mechanization or industrialization any and every productive activity invariably benefits in all respects of quality, efficiency of time and energy and elegance of human effort. The application of technology to any process helps achieve accurate control on all the required parameters. Reinforced Concrete Construction which is the backbone to any infrastructural project depends for its performance on its prime elements namely Concrete and Reinforcement.