

**THE EFFECT OF BUTT JOINTED DRY BOARD
IN PSSDB WALL PANEL WITH WINDOW OPENING**

By

MOHD GHAZALI BIN HJ HAMZAH

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

UNIVERSITI TEKNOLOGI MARA

26 April 2004

DECLARATION OF THE CANDIDATE

I Mohd Ghazali Bin Hj. Hamzah, 2001304214 confirm that the work is my own and that appropriate credit has been given where reference have been made to the work of others.

A handwritten signature in black ink, appearing to be 'Mohd Ghazali Bin Hj. Hamzah', is written above a horizontal dashed line.

(15th April 2004)

ABSTRACT

The rapid development of science and technology has led to the introduction of using new construction techniques and materials in construction industry. One of the innovative composite constructions is profiled steel sheet dry board system.

This report presents an experimental investigation on the effect of butt joint in Profiled Steel Sheet Dry Board (PSSDB) system wall panel with window opening. This is a continuation on the studies that have been carried out before using local materials, to get more information on the behavior of the composite materials used.

Three samples were prepared with butt joint in the vertical direction on samples of 1320mm x 1000mm x 78mm. The entire sample was tested in one way in-plane action supported at top and bottom edges against lateral displacement and subjected to axial load. Openings in the panels represent typical window openings of sizes 400mm x 400mm x 78mm and positioned in the mid section of the panel. Ultimate loads, cracking patterns and lateral displacement of the sample were studied. The parameters measured were ultimate load capacity, displacement and cracking patterns. The ultimate load capacities of the samples were found to be 281kN, 188kN and 296kN, maximum lateral displacements of sample at the ultimate load were -107.1mm, 39.73mm and -38.52mm.

It was found that PSSDB with vertical butt joint had no crack from upper part of the sample. It had higher ultimate load capacity compared to that without butt joint.

TABLE OF CONTENT

	Page
DECLARATION	i
ACKNOWLEDGEMENT	ii
ABSTRACT	iii
LIST OF TABLES	iv
LIST OF FIGURES	v-vi

CHAPTER 1: INTRODUCTION

1.1	Introduction	1
1.2	Problem Statement	3
1.3	Objectives	3
1.4	Scope of the Study	5

CHAPTER 2: LITERATURE REVIEW

2.1	Background Profile Steel Sheet Dry Board System	6
2.2	Load Bearing Wall	8
2.3	PSSDB As Walling Unit	10
2.4	Opening In Thin Wall	12
2.5	Buckling In Thin Wall	14
2.6	Component Of PSSDB	16
	2.6.1 Profiled Steel Sheet	16
	2.6.2 Dry Board	18
	2.6.3 Connectors	23
	2.6.4 Spacing Of Connectors	27
2.7	Advantages Of Profiled Steel Sheet Dry Board System	30
2.8	Advantages Using PSSDB System And Its Potential In The Construction Industry	31

CHAPTER 3: METHODOLOGY

3.1	PSSDB Wall Samples	33
3.2	Experimental Set-up	35
3.2.1	Locations Of Strain Gauge	38
3.2.2	Locations Of Transducers	40
3.3	Observations Of Crack Pattern	42

CHAPTER 4: DATA ANALYSIS AND INTERPRETATION

4.1	Height against lateral displacement.	
4.1.1	Sample 1 – WS1	43
4.1.2	Sample 2 – WS2	45
4.1.3	Sample 3 – WS3	47
4.1.4	General Discussion	50
4.2	Load against Lateral Displacement	
4.2.1	Wall Specimen (WS1)	51
4.2.2	Wall Specimen (WS2)	53
4.2.3	Wall Specimen (WS3)	55
4.3	Bending Stress – Principal Strain Relationship	56
4.3.1	Wall Specimen (WS1)	57
4.3.2	Wall Specimen (WS2)	60
4.3.3	Wall Specimen (WS3)	61
4.4	Direct Stress –Longitudinal Strain Relationship	
4.4.1	Wall Specimen (WS1)	63
4.4.2	Wall Specimen (WS2)	64
4.4.3	Wall Specimen (WS3)	65
4.5	Crack Pattern	67