CHAPTER 1

INTRODUCTION

1.1 Background

Nowadays, many technologies used are involving composite elements and it used in as structure in building construction. One of the new technologies in construction structure is precast concrete floor system. A conventional precast concrete floor system consists of 2 main elements that are hollow core (HC) slabs and inverted-tee (IT) beams that supported the slab and supported on column corbels or wall ledges. This floor system allows rapid construction of multi-story buildings that are economical, durable, fire-resistant, and that have excellent deflection and vibration characteristics. The top surface of the HC floor system can either be a thin non-structural cementitious topping or casting- in-place (CIP) concrete composite topping that also provides a continuous level surface. The conventional methods for construction of floor are inefficient, dull, dirty, dangerous, low quality, noisy, disruptive, an environmental unfriendly and is also labour intensive.

Other than precast concrete floor system, there is another floor system named as Profile Steel Sheet Dry Board (PSSDB) slab system. Wright and Evans (1989) had started the research about the composite structure and had been continued by Wan Hamidon and his group researcher (1995) by using local materials to form composite structure and used it in construction of wall structure and roof structure.
This research had been winning the price in the international level by using Bondek II / Cemboard Composite Floor Panel (BCCFP) system and it was successfully developed and marketed. From this result, they continued the research by using PSSDB component as a slab structure. The profiled steel sheeting dry board (PSSDB) system is made up from a thin-walled, lightweight composite structure consisting of profiled steel sheet connected to dry boards by means of mechanical connectors.

Besides that, Profiled Steel Sheeting Dry Board (PSSDB) had tested to apply as slab system in construction. This system had been tested and experimental by using different parameter such as thickness of dry board (DB), thickness of profile steel sheeting (PSS), type of Dry Board, and spacing connector (Wan Hamidon, et.al, 2010)

![Diagram](image)

**Figure 1.1:** Profiled Steel Sheeting Dry Board in Method of Construction
Development of the composite slab structure gives many new ideas to the researcher to improve the method of structural system to be more efficient and significant for the user. In Malaysia, slab structures commonly used in construction project are Composite Ferro-cement Masonry Slab (CFMS), (Yavuz Yardim, 2010) and Precast Composite Slab with Steel Fibre Reinforced Concrete Topping (Nurul Nadia and Izni Syahrizal, 2013). Development of the composite slab structure gives many new ideas to the researcher to improve the method of structural system to be more efficient and significant for the user. The Profile Steel Sheeting Dry Board without infill caused vibration, low strength and decreased the stiffness of the system when used it. Further research is needed to identify the effect of differences screw spacing when foam concrete used as infill in Profile Steel Sheeting Dry Board floor panel in order to increase the stiffness of the system.

1.2 Objectives

The objectives of the Profile Steel Sheeting Dry Board (PSSDB) research are:
1. To identify the stiffness of the PSSDB structure with the foamed concrete infill.
2. To identify the suitability of foamed concrete as infill.

1.3 Scope of Study

The main purpose to conduct this research and experiment is to identify the stiffness for the PSSDB slab system and applied it as a structural element in the construction site. This experiment is using bending moment test based on British standard 8110 code (BS 8110).

For this experiment, the thickness of the Profile Steel Sheeting (PSS) used is 0.8 mm and the size is 1.2 m x 2.0 m. The lightweight concrete made up from combinations of the Styrofoam, cements, sand and water. The concrete will filled in the PSSDB structure before attaching the dry board to it.