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The Potential Application of IBS Modular System in the Construction of Housing Scheme in Malaysia

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Abstract

Industrialised Building System (IBS) Modular System (MS) is a construction delivery method where buildings are manufactured 60% to 90% off-site in a factory-controlled environment and transported, assembled and fixed at the final building site. Findings from the questionnaire survey indicated that the MS may be able to reduce the total construction time and minimise the construction wastage considerably. However, the high initial cost and lack of technical expertise are among the hindrances in the implementation of Modular System in Malaysia. This paper will also look into options in achieving the quality of life aimed for its tenants and community.

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Keywords: Industrialised building system (IBS); modular system (MS); IBS modular system; housing schemes

1. Introduction

Innovative Industrialised Building System (IBS) can be defined as the modern method of construction through innovation and “green” characteristic as a main element; which is advanced than the previous version of Industrialised Building System (IBS). It is the total manufacturing of IBS product in control environment (by means of high technology IBS plant, generated by the sophisticated program and

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machine). Modular System (MS) is a co-ordinated unified system for dimensioning spaces, components, fitting etc so that all elements fit together without cutting or extending even when the components and fittings are manufactured by different suppliers (W.A Thanoon et al., 2003 & Trikha, 1999). Due to the poor architectural design, the old pre-fabricated buildings have given the public bad impression about precast concrete (Ahmad Baharuddin Abd. Rahman et.al.,2006). The so called “old version” of IBS is irrelevant; technically speaking. Design is the main factor to be considered by the customer’s / home owner’s eyes.

The most common problems encountered in IBS systems are improper assembly of the components that normally involved the beam-to-column and column-to-base connections (Ahmad Baharuddin Abd. Rahman et.al., 2006). This is due to factor that highlighted by W.A Thanoon et al., 2003 which states fully prefabricated construction system requires high construction precision. Typically, most of the IBS design process deals with offsite production through the concept of design for preassembly and pre-fabrication process. A number of previous studies indicated that a weakness of IBS lies in its cumbersome connections and jointing methods that open to errors and sloppy work (Thanoon et. al., 2003a and Nawi et. al., 2007b).

After the lessons learnt from previous public projects involving the IBS system, the government through the Construction Industry Development Board (CIDB) initiated the IBS roadmap whilst enforcing the IBS system application to all public works in the country; which emphasises the promotion of green, recycled, recyclable materials towards sustainability in the Malaysian construction industry.

On the other hand, the Modular System offered the potential and realistic characteristics in its system and it is believed that Modular System is able to resolve some of the conventional IBS issues. Other than speed of construction, reduced wastage, cost effective and green environment; Modular System is the system that promotes reused and recyclable materials, flexibility in many areas as well as possible relocatability.

2. Literature review

2.1. Introduction

As a developing country, Malaysia is moving towards a sustained growth rate that has been proposed in the Brundtland commission report. According to the report, a sustained growth rate in the developing countries should be about 5 to 6 %. This is required to provide an economic basis for an increased level of distributional equity without placing any restrictions. To support this vision, the Construction Industry Development Board Malaysia (CIDB) has identified the importance of increasing the level of knowledge within the construction community in the Malaysian Construction Industry Master Plan 2005-2015. This approach is mandatory to drive changes in the local construction market to pursue long term sustainability and to ensure sustainable capabilities to the stakeholders. In addition, the improvement will enhance the ability of local construction players to compete in the global market by emerging sustainable development principles. However, it is important to note that the progress of adopting sustainability in the Malaysian construction industry is still at the early stage and awareness on this issue should be improved immediately.

However, the concept of constructability started in the late 1960s to integrate the optimum use of construction knowledge and experience in the conceptual planning, detail engineering, procurement, and conduct field operations in phases to achieve the overall project objectives; and ease of construction (CII, 1986). The constructability concept has been extensively developed and applied in UK, Australia and Malaysia where numerous studies have proved that constructability concept manage to save cost and time in the process of completion of the projects (Nima et al., 2001, Trigunaryah, 2004, Wong et al.,2007).

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