

## Industrial Building System; Does it good for sustainable building?

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### Abstract

Housing and building construction is an important principle in sustainable development. The industrialization of building systems has been found to be necessary due to several factors: the fast and continuing progress of today's world, the industrialization of many aspects of modern living, significant population growth, and the inadequacy and incompetence of conventional construction methods particularly in dense housing situations. This paper investigates the relevance of these factors as the drivers for changing people's habits and perspectives toward building construction and to justify the introduction of industrialized construction approaches to replace the outdated conventional methods as well as the necessity to provide training in order to achieve product quality.

*Keyword:* Industrialization building system, sustainable eco town, eco-friendly housing

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### 1.0 Introduction

In this current century, urbanization is an important concern for societies and governments. They have to design and direct the development of cities bearing in mind the need for sustainable development and moving people from rural to urban environments (Alusi, 2011). As mentioned by Stevenson (2007), there must be consideration to various aspects of sustainable development such as economic security, social and economic achievements, social coverage, as well as a conducive and healthy environment. All these are necessary for people to work and live, along with high safety living features that come with best planning and fair opportunities and facilities for all classes of society. Another type of sustainability is in houses that are eco-friendly, and using sustainable energy; homes that are resistant over time and protected from noise pollution (DHSC, 2007). Also mentioned is a community that is sustainable, able to support all social groups with different incomes and making available affordable homes that meet the needs of all social groups (DHSC, 2007). It is stressed that housing is one of the important fundamental and key ingredients in human needs (Dumraicher, 2008). Nowadays there is growing awareness and better knowledge of sustainable development. In line with this, the construction industry is already moving toward sustainability. Sustainable development has been faster through better control of the building industry and the use of environmentally friendly materials (Riduan, 2011). Affordable housing and industrialized building technology are two of the main criteria in the infrastructure of sustainable development of an Eco town. Also, one of the most important components of a sustainable Eco town construction is the appropriate material of green housing (Roshanfekr,Twil, Goh,&CheAni, 2013). Olia (1999), after World War II discussed the need for high construction building because of rising due demand. The main reason was neither economic nor timing but quality which was important to people at that time. (Zabihi, 2012). Richard believes overall industrialization is activities which complete product's quantity(Richard ,2006) .Due to the fact that industrialized building production in industrial countries is as much as 20 to -60%, the significance of industrialization is obvious (CIDB, 2003).

### 2. Industrial Building System

The industrialization of building systems has progressed around the world in the advanced industrial countries such as Japan, Korea, UK, US, Switzerland and many others. Figure 1 is a sample of an industrial building system for a sustainable city.



Figure1: Ulsan, Korea's second-largest city, is leading the charge towards ecologically sustainable industrialization. Image Copyright: John Mathews (2012). <http://theconversation.com/cities-will-drive-the-green-industrial-revolution-5827>

This paper discusses the industrialized building system (IBS) and lists some of its advantages and disadvantages and also its components. Figure 2 shows the position of an industrialized building system (IBS) for a sustainable Eco town.

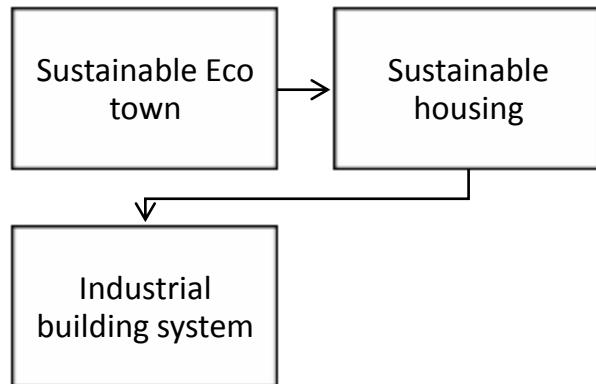


Figure 2: sustainable eco town chart

An industrialized building system is known as a system of construction produced in a factory, then transferred to the building site to be assembled (CIDB, 2003). Maryam Qays (2010) defines an industrialized building constructions systems as a development method the elements of which are usually produced at the manufacturer's premises or off the construction site and later transported to and assembled directly at the construction site minimal work on site.

In an industrialized building system, 93% of the operation is mechanical. The industrialization method is easier to control, because most of the work is done in a controlled environment such as the factory site/ In the industrialized method, the proportion of building is 33 to 73% less than in the conventional method (Warszawski, 1999). In the industrialized building system the estimated time and speed of construction is more precise compared to the conventional system. Generally with the new technologies, the possibility of deficiency is in the first stage of the products, because they have not passed all the quality tests(Saleh Jaffar, 2009). This is due to the lack of adequate academic education in universities and educational centers (CIDB, 2003).

The industrialized building system has some limitations such as: the attachment of people to conventional methods. Usually in different communities, there is opposition to modernization and change especially when they are not fully knowledgeable about the benefits of IBS and so prefer to stick to methods they are used to (CIDB, 2003). Another reason for continuing to use the conventional method is its simplicity which allows them to use unskilled labor, whereas in using the IBS, a trained workforce is required (Miller, 1987). Also the IBS

incurs high initial cost primarily, because of the low demand, but over time with the IBS being more widely accepted, costs will be significantly reduced.

### 3.0 Conclusion

The industrialized building system encompasses all activities related to design, technology, methods of construction and manufacturing and production of building components which comply with the scientific and academic standards of quantity based on a standard modular and compliant with cultural and social requirements, leading to economically sustainable development. It can be noted that the purpose of the industrialized building system is to speed up production and increase manufacturing output and result in: lightweight building, retrofit, savings in materials, reduced energy consumption during construction and operation, thus minimizing manufacturing period, cost savings, and maximizing the exploitation of modern building technology and its application.

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