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INDUSTRIALISED BUILDING SYSTEM (IBS)

Industrialised Building System (IBS) is a need of the construction industry in today's period due to its time and cost-saving benefit. This chapter covers the description, history, advantages and disadvantages of IBS. Apart from this, IBS score calculation has also been provided as per the CIDB Malaysian edition.

9.1 DEFINITION OF INDUSTRIALISED BUILDING SYSTEM IBS

Industrialised Building System (IBS) is a construction technique where building components are built in a controlled environment [75]. The components can be built in both on and off-site. If built off-site, these components are shifted to the site where they are assembled as a designated structure, saving additional site work. IBS components are formed with a quality control procedure which also minimises the traditional way of construction [76]. Building components include beams, walls, staircases and floors that are used in IBS projects. Besides providing quality results to end-users, IBS implementation also reduces the wastage of resources [77]-[78]. In Malaysia, several programs based on IBS have been implemented, where the development framework for capability building has two components, i.e., Soft Aspects (Knowledge Development) and Hard Aspects (Technology and Physical Projects Development). The IBS activities are executed under IBS Centre, CIDB and have the following five thrusts [79],

1. IBS Industry Planning
   IBS Centre's function is to act as the secretariat of industry coordination and the IBS Roadmap. IBS Steering Committee and Construction Industry Master Plan (CIMP) Strategic Thrust Committee monitor the IBS Roadmap implementation. Industry leaders and government officials make the representation of these communities. Moreover, Bumiputera development programs are emphasised to support National Mission.

2. IBS Promotion and Marketing
   Promotional activities such as seminars, roadshows and knowledge sharing sessions are organised. Besides that, with the involvement of industry players, a proactive role from IBS Centre is required for human capital development and IBS Showcase. With IBS Showcase, an external display of IBS components is made.

3. IBS Technology
   IBS Centre also addressed the hard aspects of IBS besides industry planning and knowledge development. CIDB Malaysia also supports technology transfer along with research and development. In this regard, since 2007, RM 19.13 million have been allocated for IBS researchers. IBS Centre also supports the design systemisation exercised and development of Construction Industry Standards (CIS) and Malaysian Standard (MS). A special incubator program is offered for local IBS technopreneurs.

4. IBS Certification, Verification and Testing
   There is a list of IBS players handled by the IBS Center by offering various IBS Status programs to contractors, consultants, manufacturers, and installers. These programs help to support supply chain databases for both private and government IBS projects execution.

5. IBS Industry Training
   IBS Centre also focus on human capital development by offering various training programs which play a proactive role in development. The purpose of time training is to educate the construction stakeholders in IBS implementation. The training is performed at different times depending on the topic where certification is also issued to qualified individuals.

9.2 HISTORY OF IBS

IBS concept was introduced in 1624 in the construction sector when North America brought wood panel houses from England. An early example of IBS implementation is the pyramids of Egypt, where smaller blocks were transported to build their structure [80]. In 1851, the United Kingdom utilised the IBS concept and construction of a Crystal Palace with the help of steel windows, glass and wood components [81]. In the 1960s, IBS was initiated within Malaysia after several visits to European municipalities by the Ministry of Housing and Local Government, with the intention to assess their housing development plans. In 1964, IBS was launched in Malaysia to enhance the construction projects' efficiency and performance. IBS was introduced to have an alternative to the existing conventional system that was in existence for a long time in Malaysia, along with improving the affordability of substantial-quality houses. In 1966, the Malaysian government launched two IBS projects