BIM-BASED STRUCTURAL PERFORMANCE ASSESSMENT OF INDIVIDUAL MODULES IN MODULAR BUILDING DESIGN

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Modular building construction is a factory-based construction technique that the building's units, called modules, are fabricated in a manufacturing plant, then shipped to the construction site and are installed there to form a building. Modular building design is more complex than conventional one due to the additional processes needed such as manufacturing, transportation, installation etc. Therefore, modules need to be designed to resist various types of loads such as fabrication, transportation, installation and operational loads. The modular building technology is relatively new with limited understanding of structural performance under different loading conditions. The issues associated with modular construction can be the lack of proper design and management tool, the need for considering fabrication at the design phase, ability to understand and anticipate the impact of design change, etc. Hence, using an effective tool to solve these issues is vital in modular building design. Building Information Modeling (BIM), which is an objected-oriented technology, has emerged as an effective parametric design tool in modular construction industry. The main objective of this study is to demonstrate how BIM software technology can be utilized to increase the opportunities for assessing the structural performance of modules *under different* maximum expected *loading* scenarios in modular building design. For this purpose, individual modules with different configurations are modeled using Autodesk Revit structure 2016 with all their structural components and their structural performance under different types of loadings are assessed in Autodesk Robot Structural Analysis to design robust cost-effective modules in modular buildings design.

Keywords- Modular building construction; BIM; Individual Modules; Structural performance assessment.