

Performance Evaluation of Off-Site Construction Method for Mass Housing Projects using Building Information Modelling (BIM) Approach

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Abstract

Mass housing is always in bulk and is referred to as mass housing and built by conventional method. However Modern methods of construction like Off-Site Construction (OSC) in mass housing has been researched very limited. In this context, this study attempted to use building information modelling (BIM) to evaluate the performance of OSC in mass housing projects. In this study BIM models of base and OSC developed and evaluated cost and time. Besides, COVID-19 impact on project also reported. The investigation results shown the cost effective of OSC in mass housing projects proven to be significant in terms of project time and cost savings by 67% and 23%, respectively. Nevertheless, this study contributes to the body of knowledge and may set guidelines for housing policy makers and construction practitioners with an option of adopting OSC and use of BIM to minimize overall project timeline and optimize the workforce.

Keywords: Mass Housing; Off-site construction (OSC); Structural Behaviour; Schedule; Cost; Material Management and Building Information Modelling (BIM).

1 Introduction

Mass housing is of utmost importance in India and other developing nations. In response to this pressing need, ministry of housing and urban affairs has launched numerous mass housing schemes and initiatives. Unfortunately, these targets often go unmet due to a significant gap in the adoption of a systematic development approach. To address the issue of unorganized developments and expedite project execution, it is crucial to replace the slower conventional cast-in-

situ method of planning and construction with a more rational implementation of alternative techniques, such as Off-Site Construction (OSC). OSC represents an innovative construction method that is well-suited to address the housing shortage (Liu et al., 2020).

OSC can be defined as an approach to construction and project delivery where structural components are manufactured at factories or casting yards located away from the construction site. These components are subsequently transported to the construction site and installed in their permanent