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Energy Consumption of Composite Structure in Various Regions in India: A BIM Approach
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Abstract
Energy-efficient building design has become an important factor to be considered in Architecture, Engineering and Construction (AEC) industry to develop sustainable structures as a result of other environmental issues and the ongoing rise in global warming. The necessity of the hour is to predict the building's energy use and use an appropriate energy-saving solution and construction design. Commercial buildings are a significant energy consumer and a primary factor of CO2 emissions during the course of their existence. As a developing country, the practice on energy efficient building in India is not as much as in developed countries. In the present study, a commercial composite building located in five regions in India with different climatic conditions assist its energy consumption using Building Information Modelling (BIM) tools. Modelling of the structure is developed using Autodesk Revit Architecture. ETABS is used to analyze the structural stability of the proposed composite commercial building. Further for energy analysis, Autodesk Green Building Studio (GBS) and Autodesk Insight are used. From the GBS results, commercial building which is located in Dispur, Assam has less EUI 863.8 MJ/m2/year compared with other four regions of India. The building in the Assam region is further examined using Autodesk Insight to determine the various design strategies with regard to Energy Use Intensity (EUI). The EUI for the Assam region has been shown to vary by a significant amount due to small variations in design strategies. Through energy analysis, the cost of energy could be significantly decreased by using BIM, which helps implement better design alternatives prior to building construction by optimizing yearly energy budget when compared to conventional techniques.

Author Keywords
Building Information Modeling (BIM); Composite Commercial Building; Energy Analysis; Energy Cost; Energy Use Intensity; Greenhouse Gas Emission

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