ABSTRACT

Low income housing is one of most important housing projects that are directed to serve low-income people in Egypt. The greatest challenge that faces the Egyptian government is to decrease the cost of low income housing project taking into consideration the concepts of sustainability aspects. This paper presents a framework that integrates Building Information Modeling (BIM) with optimization in Low Income Housing Projects in an effort to assure sustainability. BIM is used to represent the geometrical information and the other properties of Low Income Housing building such as building elements properties, material properties and its quantities, design alternatives and project location. On the other hand, Leadership in Energy and Environmental Design (LEED) rating system is used to evaluate the sustainability of buildings by awarding points for satisfying green building criteria such as regional material, recycled content, rapidly renewable materials. Genetic Algorithms (GA) Optimization is utilized in order to select the optimum building alternative that minimizes construction cost and duration, while achieving maximum LEED credit points. A numerical example is presented to demonstrate the practical feature of the proposed framework.