

## Affordable and Sustainable Housing Construction: Case Studies

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**Abstract :** Recent material advances and cost efficiencies are transforming the housing industry away from traditional lumber and gypsum material to alternate fiberboard material that is workable and resistant to fire, mold, and pest infestation. The use of these materials may add to the initial cost of construction. However, the life cycle (cradle to grave) cost of houses using these construction materials and methods are lower than the life cycle costs using traditional housing construction materials and methods. This paper will present four (4) case studies of sustainable house projects. Each project was designed and constructed using earthen-based, sustainable fiberboard material that is resistant to fire, mold, and infestation and fabricated at a very low material calorific value. These house projects have a living space ranging from 625 sq. ft. for an accessory dwelling unit and up to 3,200 sq. ft. 1-story and 2-story homes. For each case study, we will present the house engineering design and construction method, the initial construction costs, a summary of the life cycle costs, and a comparison to the life cycle cost of traditional housing available in the literature.

**Keywords :** residential housing, sustainable housing, life cycle cost, fire resistance, mold, infestation resistance

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