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Cost-Effective and Sustainable Affordable Housing Using Lean Construction and Integrated Building Systems

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Abstract: *Affordable housing is a critical requirement for sustainable urban development in rapidly growing cities of India. Escalating construction costs, inefficient project management practices, poor coordination among building systems, and lack of standardized execution methods often hinder the successful delivery of affordable housing projects. This paper presents an integrated approach combining contract documentation, lean construction principles, and system integration strategies for the development of affordable residential apartments at Thudiyalur, Coimbatore. The study examines how structured contract management improves clarity and risk control, while lean construction minimizes waste, enhances productivity, and controls cost and time overruns. System integration of architectural, structural, electrical, plumbing, fire safety, and sustainability systems is also analyzed to achieve functional efficiency and aesthetic harmony. The findings demonstrate that an integrated construction management framework significantly improves project performance, reduces lifecycle costs, and enhances user satisfaction without compromising safety or quality. The study concludes that lean and integrated construction practices provide a replicable and sustainable model for affordable housing development in India.*

Keywords: Affordable Housing, Lean Construction, Contract Documentation, System Integration, Cost Optimization, Sustainable Construction

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