

A Comparative Study on Conventional Reinforced Concrete and Prefabricated Concrete Floor Slab Systems for Mass Housing in Ethiopia

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ABSTRACT

The severe housing shortage in Ethiopian cities has led to spontaneous settlements of the impoverished in metropolitan regions and within cities. As a result of this large-scale mass housing development, a new automated building technology that is less expensive must be implemented. Conventional concrete-cast-in-place floor slab construction is widely used in our country and requires a long time and a lot of materials. Additionally, the system takes longer to run and may cause project delays because of it. When constructing buildings, the implementation of a relatively cheaper and modern automated system will not only have economic benefits, but will also reduce the reliance on conventional systems. A precast prestressed concrete floor slab was designed and analyzed, and the cost of concrete and reinforcement steel was compared to that of a cast-in-place concrete floor slab system, in order to determine the advantages of the precast prestressed concrete floor slab system. A review of current practice in precast prestressed concrete floor slab systems are the first step in this study, which is followed by proof concept analysis and design before a comparison of two floor slab systems is made. When compared to cast-in-place solid slabs, the precast prestressed concrete floor slab technique was shown to be more cost-effective.

Keywords: *Precast concrete, Floor slab, Large-scale construction, pre-stressed concrete, Cast-in-situ, Ethiopia*