

Design and Construction of Low Cost Building Using Pre-cast Concrete

Name of Supervisor: Omer A Alawad

Name of Students: Khalid Ali Almutairi, Mohammed Kaljamal, ZahidM Meshal, Abdullmajeed Asweed, Ahmed Mhamma,

Abstract

Low Cost Housing is a new concept which deals with effective budgeting and following of techniques which help in reducing the cost. Reduction of total cost of building can be achieved by selection of more efficient material,, or by using prefabricated structural building elements "pre-cast concrete elements).

Precast concrete components are standardized and produced in plants in a location away from the building, and then transported to the site for assembly.

These components are manufactured by industrial methods based on mass production in order to build a large number of buildings in a short time at low cost.



Figure 1: Type of Pre-cast Concrete

Objective

The main objective is to improving the performance of precast concrete structural components and building systems.

The specific objectives are:

1. to assess the technical feasibility and implications of incorporating alternative aggregate and sand replacements in solid precast structural flooring elements, with respect to the structural design, manufacture or installation of the elements.
2. To evaluate current typologies and quantify any potential benefits or risks that may exist when adopting such precast concrete building technologies

Methodology



Figure 2: Assembly of Pre-cast Concrete (Erection)

Significance to the Kingdom

1. Saving in shuttering cost - Scaffolding is eliminated
2. The mould for the precast components can be used for large number of repetitions thereby reducing the cost of the mould per unit.
3. Time is saved by the use of precast elements which are casted off-site during the course of foundations being laid.
4. In prefabricated construction, the work at site is reduced to minimum, thereby, enhancing the quality of work, reliability and cleanliness
5. Since there is repeated production of similar types of components in precast construction, therefore, it results in faster execution, more productivity and economy.

References

1. Rook, John G. "Low cost prefabricated housing construction system." U.S. Patent No. 6,006,480. 28 Dec. 1999.
2. Glass, Jacqueline. The future for precast concrete in low-rise housing. Leicester: British Precast Concrete Federation, 2000.