

SURVEY ON PRECAST CONCRETE INDUSTRY IN SRI LANKA

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This thesis was submitted to the Department of Civil Engineering of the University of Moratuwa, Sri Lanka, in partial fulfillment of the requirements for the Degree of Master of Engineering in Structural Engineering Design.



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Abstract

Concrete is the widely used construction material and there are two methods for casting of concrete, viz., insitu cast and precast concrete. The main objectives of this research were investigation of the present situation of the precast concrete industry in Sri Lanka, suggestions for improvement of the industry and study on cost effectiveness of precast concrete for single and multi-story residential buildings.

A literature survey was carried out in order to obtain the history of precast concrete industry in Sri Lanka and many field visits and questionnaire survey were conducted to collect data to investigate current situation regarding precast industry in Sri Lanka. In order to compare the cost of precast and insitu construction, single story and four storied residential buildings were considered.

The first application of precast concrete in Sri Lanka was in port related structures in 1949. As a solution to deterioration of RCC maritime structures pre-stressed precast concrete was introduced and Dr A.N.S. Kulasinghe has played a major role in this regard. This technology was introduced to building construction in mid 1950's and precast pre-stressed concrete technology became the most important construction method in the building construction industry by 1960. After 1970 there was a drop in construction activities with precast technology.

Results obtained from analysis of current data shows an increase in application of precast components during 1999-2001. Private sector involvement in the industry has been increased and it has created a competitive environment in the industry. Further, problems related with the present precast industry were also discussed.

According to the collected information and analysis of data indicates more application of precast concrete can be expected in the future and it can be considered as an environmental friendly less energy consumed material compared with other construction materials.

According to the cost analysis it was found that four-storied residential building construction using pre-cast concrete makes 17% cost saving when compared with insitu construction of the same building. Furthermore, it is not economical to use precast concrete items in single storied construction and it increases construction cost by 33% when compared with insitu construction of same building. If it is a repetitive

construction with a difficult time target or having larger spans like industrial buildings precast concrete construction would be effective in single story constructions.

There is 33% of construction time saving for both single and four-storied buildings with precast components. When the construction period reduces the running cost of a project also reduces and it leads to further reduction of project cost.



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