EVALUATION OF PRECAST TECHNOLOGY ON PROJECT PROFITABILITY

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ABSTRACT

Objectives: The objective of this paper is to compare the precast technology with conventional construction and evaluate the precast technology on project profitability.

Methods: The methodology is to collect the data from precast and conventional construction companies. And analyze the collected data to compare the cost details and duration of the project of precast technology with conventional construction and evaluate the precast technology on project profitability.

Findings: The cost of the project is more in precast technology than the conventional construction, the duration of the project is less in precast technology than conventional construction. The precast technology is faster than the conventional construction so it is very useful in our country to grow the construction projects.

Key words: Precast Technology, Conventional Construction, Profitability.


1. INTRODUCTION

The molds used to manufacture precast components by filling of concrete and then curing can be conducted, and shifted to the site where the components are assembled into place. Now a day the construction boom in India is very fast. It gives more opportunities in our country for an upcoming people in the precast industry. In these days the precast construction is one of the advanced techniques in the whole world, and its wide applicability, the total precast construction system is becoming a popular choice in construction industry. Precast construction components available in many sizes, shapes, including electrical lines and plumbing lines.

2. NECESSITY OF PRE-CAST CONSTRUCTION

The precast components usage is the new technique in the construction industry for constructing the buildings in short time and also getting the good strengths. The main advantage of using pre-cast components is its faster erection with more versatility and good flexibility. The good Quality achieved by
these components. The longer spans easily constructed with precast components in a single stretch. In all aspects, the precast construction is in lead to the ease of construction. The building/structure which is constructed by the precast components is having good finishing. In precast construction, we don’t use large form works than conventional type construction. These components are durable and structurally efficient. The maintenance cost and also the labor cost of the project will be reduced by precast construction. The main advantage of these components is environmental friendly.

3. METHODOLOGY

3.1. General
This presents the comparison of conventional and precast construction of a double-storey residential building.

3.2. Plan Preparation
The double storey building plan prepared for estimating of quantities of precast and conventional construction and it showed in Figure 1.

3.3. Estimation of Quantities
The require materials in both conventional and precast construction by the estimation. The details were collected from the related companies.

3.4. Project Duration
The construction duration details were collected from the similar companies. And the duration of the project finds out by Primavera P6 with CPM (critical path method). And shown in Table.1

3.5. Cost Analysis
In cost analysis, we consider labor, material, machinery to compare the precast with conventional construction of double-storey residential building.

4. RESULTS & DISCUSSIONS
The Floor plans are shown in Figure 1-2. The precast construction and also the conventional construction duration find out by the collected data from related companies. And it is shown in three different stages. The substructure completion time was same in both precast and conventional construction because the same methodology for both constructions. But in the super-structures, the precast construction should complete in short time than conventional construction, shown in Figure 3. and Table 1.
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Figure 1 Ground floor plan

Figure 2 First floor plan
The variation is more in duration between precast and conventional. It is the main advantage of precast construction. Because the elements of staircase, wall panels, and slab panels were manufacturing in the factory and they had smooth surfaces and installed with electric and plumbing lines. The total duration of precast construction is 65 Days. The total duration of conventional construction is 128 days. The duration variation is 63 days of both methods. This graph represents the precast construction completed within a short time than the conventional method. The time duration represents in three different stages they are blue indicates substructure, red indicates superstructure, and green indicates finishing works, shown Figure 4. The precast construction and also the conventional construction duration find out by the collected data from related companies. And it is shown in three different stages. The substructure completion time was same in both precast and conventional construction because the same methodology for both constructions. But in the super-structures, the precast construction should complete in short time than conventional construction, shown in Figure 5. The variation is more in duration between precast and conventional. It is the main advantage of precast construction. Because the elements of staircase, wall panels, and slab panels were manufacturing in the factory and they had smooth surfaces and installed with electric and plumbing lines. The total cost for precast construction is 73,00,000/-. The total duration of conventional construction is 60,19,000/-. The cost variation is 12,91,000/- both construction methods. This graph represents in the precast construction spent more money than the conventional method, shown in Table 2. and Figure 6. The cost detail represents in three different stages they are blue indicates substructure, red indicates superstructure, and green indicates finishing works.
Figure 4 comparison of total duration for precast & conventional

Figure 5 comparison of cost for precast & conventional in 3 different stages

Figure 6 comparison of total project cost for precast & conventional

Table 2 Total cost of construction

<table>
<thead>
<tr>
<th>S.NO</th>
<th>Description</th>
<th>Precast construction</th>
<th>Conventional construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Super structure</td>
<td>526000/-</td>
<td>526000/-</td>
</tr>
<tr>
<td>2</td>
<td>Sub structure</td>
<td>2423000/-</td>
<td>1024000/-</td>
</tr>
<tr>
<td>3</td>
<td>Finishing works</td>
<td>4351000/-</td>
<td>4469000/-</td>
</tr>
</tbody>
</table>
5. CONCLUSION
This paper represents to find out double-storey residential building project duration and project cost in both construction methods, and compare the both precast construction and conventional construction method. The building was completed within a short time by precast construction, easy to work and helpful in labor shortage than the conventional construction. And the time of duration is reduced to 63 days by precast construction. It is the main advantage of precast construction. But in the cost analysis, the conventional construction was better than the precast construction in individual houses.

REFERENCES