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COMPARATIVE STUDY OF MONOLITHIC STRUCTURE OVER CONVENTIONAL STRUCTURE

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Abstract - *In the cost and time effectiveness of the buildings, Monolithic structure act as a beneficial member of building compare to conventional structure system. The monolithic structure is important to reduce wall thickness, decreasing to foundation width and especially useful to reduce seismic effect. In this paper, we conclude the reviews and previous of some research experts on the benefits of monolithic structure system over Conventional structure system. This study is to determine the suitability, adoptability and economic feasibility of monolithic structural system over the conventional structural system. This topic is very useful to construction industry because we all know that in every project/ product the cost of that is most important factor in project. So in this study we work on cost and time effectiveness of the monolithic structural system over conventional structural system takeoff the quantity of material to estimate the cost of material used in the both kind off structural system and used the MS Project to find out the probable finishing timeline of both type of structure has been taken in study. We have to compare the cost and the tame taken in construction work of the single casted monolithic structure to the conventional structure for find out the best efficient construction system to fulfill in future method of construction whatever will be convenient. We also consider the strength and cost cutting factor which would be affects the most reliable construction system between monolithic construction system and conventional structural system.*

Keywords: *Monolithic structure, Conventional construction, Cost-effectiveness, Time effectiveness*

1. INTRODUCTION

A building is defined as "an enclosed structure intended for human occupancy". A building has two basic part; substructure or foundation and super structure. There's different style of structural system which categorized by method of construction they are; CONVENTIONAL METHOD & MONOLITHIC METHOD. Conventional method could be a traditional method within which the construction method used i.e. simple R.C.C. framed construction. For lateral supports against loading and forces, beam and column will be provided. During this method commonly pre-stressed work in site should be done and the materials used are concrete, masonry steel and wood. Monolithic system; all walls, slabs, stairs, together with door and window opening are cast in place in one operation at site by use of specially designed, easy to handle with less labour and equipment efforts, modular formwork made of aluminium formwork.

Monolithic construction is a method by which walls and slabs are constructed together. In this method, fresh cement concrete is poured in lightweight aluminium formwork system having required reinforcement bars for needed strength. As the walls and slabs are cast in one go, the operation is very fast. This is ideal for multi storied construction, allowing speedy construction on mass scale. This technology offers speedier solutions to rapidly increasing housing shortage in urban areas by optimal use of time, money and building materials like steel and cement. It promises accelerated construction at optimized cost and time when we go for mass housing especially for economically weaker sections and low income groups who are large in number without houses. It is a highly efficient technology which facilitates concreting of all the components like walls, roof etc. simultaneously, resulting in a structurally very sound monolithic construction.

1.1 Need for the Study

The survey indicated the fact that there are about 10-30 present of the people living in temporary shelters either on illegal or own land with little or no access to basic infrastructure services. Affordable housing enabled by appropriate technology would be the only solution to housing need of the urban poor. The rising urban population has also given rise to increase in the number of urban poor and shelter less. Therefore, there was a need to Comparative study the of Monolithic Concrete Housing over conventional structure Housing for its Cost effective, Time saving, safety, durability, affordability and other housing parameters.

1.2 OBJECTIVE-

This research based on the construction method selection and identifies the sustainable performance criteria assisting construction practitioners in selecting an appropriate construction method. And study the factor of economic and social category.

2. METHODOLOGY

In the analysis phase we will find out the quantity of material with the Specifications of Building Material 53 Grade ordinary Portland cement conforming to IS 12269, For most

work, 20 mm aggregate is suitable; Aggregates shall comply with the requirements of IS: 383, Concrete M30 grade specified characteristic 30 N/mm2, Reinforcement Fe500, Type of soil – Medium & used the software Revit Architecture's material take-off function for monolithic structure as well as for conventional structure.

After that we will compare data for cost effectiveness of both structure and also find out the time taken for the construction by MS project software of both structure In the end we conclude the benefits in between monolithic structure and conventional structure. Data were collected from site building having monolithic structure. I got Architectural plan (Hard copy) in data. Plan and location of site of (G+14) Structure of 15th Battalion S.A.F is a Locality in Indore City.

2.1 ESTIMATION OF QUANTITIES

Estimation is used to find out the requirement of the materials for both the constructions. The details of the materials which are used in the construction from the companies were collected. By getting these details we can estimate the quantities of the materials

Table -1: Calculation for Blocks

S No	Description	Area	Unit	Per.
1	Total Land Area	80549.16	Sqm.	
		867023.94	Sqft.	
		19.904	Acres	
		8.054	hectors	
2	Total block area	29319.89	Sqm.	36.40
2	blocks for Future	0	Sqm.	0.00
3	Area of Roads	20805.848	Sqm.	25.83
4	Green, Park, Open Spaces, Amenities	30431.47	Sqm.	37.78
	TOTAL			100.00

2.2 Cost Analysis

This is the main factor which is considered in the project is to find out the comparison of cost analysis of building for the

Monolithic construction and conventional construction. In this analysis we want to consider the resources of labour,

Material and machineries.

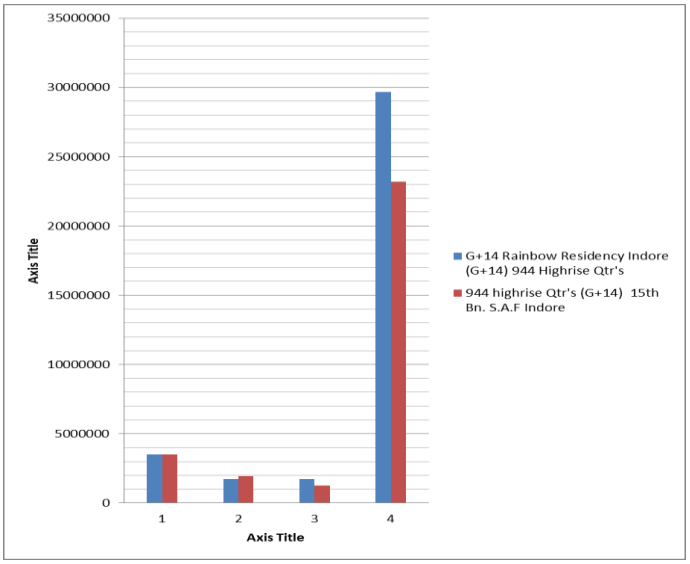

Fig -1: Cost Relationships between Monolithic Construction and Convention

2.3 PROJECT DURATION

Project duration of each construction was collected from the site offices and compares the time of completion of gives the project duration of Monolithic and conventional construction of the building.

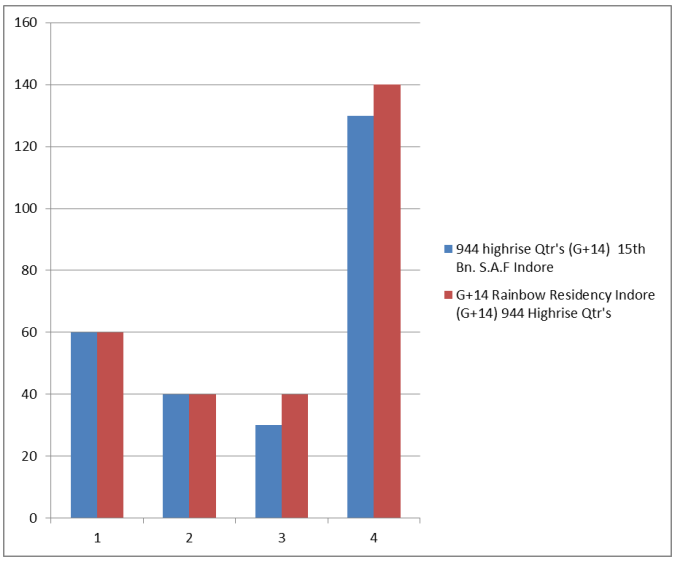

Fig -2: Time Relationships between Monolithic Construction and Convention

3. CONCLUSIONS

We have study and analyzed the both methods conventional structural construction and monolithic structural construction. The initial cost of Monolithic construction is more than conventional construction because its initial setup cost is more. But after the 1000-1500 units constructed it become economical.

The cost of maintenance (repair cost) is more in conventional construction as compare to monolithic construction. And Time saving in Monolithic construction is 33-45% of the conventional construction. At the end value of cast in-situ construction is 2% but at the end value of precast construction is 10%. More significant advantages, such as improved quality control, reduction of construction time, construction waste, dust and noise on-site and less labour requirement on-site.

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BIOGRAPHIES

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