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Study on Evaluate the Benefits of Prefabrication in Modern Construction Projects

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Abstract - Our nation's construction problem has grown to enormous proportions because to the population growth that is happening so quickly. The goal of this study is to "STUDY ON EVALUATE THE BENEFITS OF PREFABRICATION IN MODERN CONSTRUCTION PROJECTS." Prefabricated systems can be used to achieve this. By attaining quick construction and cost-effective utilization of building materials, it should significantly address these issues. In addition, less waste would be produced on the building site as a result. Significant prefabrication construction companies provided case studies for this study. With regard to the case studies of cumulative energy demand, global warming potential, water consumption, fossil resource scarcity, and mineral resource scarcity, this study looked into the impact of prefabricated rate on the environment. Since precast concrete cores or stabilizing systems are often built to withstand vertical loads, horizontal loads are transferred to the concrete core due to the nature of tall buildings, which arranges the modules in a cluster around them. A variety of techniques were employed, including the Mean Score Method for Ranking (SD), the Snowball Sampling Technique, the Likert Scale Method and Statistical Tools. Prefabrication Rate Calculation is used as a method of prefabrication.

Key words: Prefabrication; Prefabricated Construction Systems; Case Studies on Prefabricated Constructions

I. INTRODUCTION

Infrastructure building and assembly are related activities or processes that are referred to as construction. A multitasking achievement is large-scale construction. The construction manager oversees the project manager, who is in charge of managing the design, project architect, and construction engineer on the project. Any construction project aimed at promoting sustainable development must take into account a number of factors, including planning and management, human resources, health and safety, construction delays, engineering and architectural design, the availability of high-quality materials, client needs, and financial or economic constraints. When a cheap building could be completed in two days, that would be extremely important. Presently, construction technology has advanced to this point.

For the sake of environmental preservation, prefabrication has long been considered a robust construction technique. The impact of prefabrication on the decrease of construction waste and the ensuing waste management operations, such as trash disposal, recycling, reuse, and categorization, is a significant component of this viewpoint. In terms of timeliness, quality, cost, productivity, safety, and functionality, prefabrication is a productive building method.

India's building boom is expanding more quickly than it was previously. It offers a lot of room for a new player in the prefabricated industry in India. Prefabricated concrete structures are currently the most cutting-edge building methods accessible globally. Prefabricated building systems are increasingly being used for several construction projects because of their broad range of applications. Prefabricated concrete is offered in a wide range of sizes and shapes, including structural and non-reinforced components.

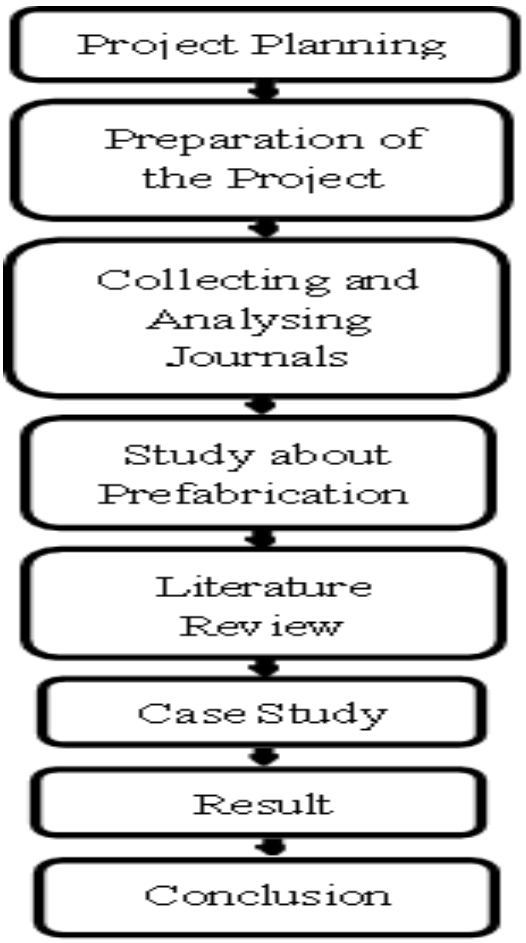
Prefabricated construction refers to those buildings in which the majority of the structural elements are manufactured in factories located distant from the building, to be standardized, and then delivered to the assembly site. Building a house traditionally involves transporting supplies like bricks, lumber, cement, sand, steel, and construction aggregate to the location and using these materials to build the house on site. This kind of construction is only used for the foundations of prefabricated buildings. On the other hand, prefabricated portions of the walls, floors, and roof—along with the windows and door frame—are

delivered to the site, raised into position by a crane, and then boiled together.

II.LITERATURE SUMMARY

The journals mentioned above aid in our analysis of the advantages of prefabrication in contemporary building projects. Every piece of literature cited in this research has gathered data from workplaces through surveys and interviews. These journals offer information on a variety of prefabricated construction systems, including light gauge and pre-engineered steel structural systems, PVC stay-in-place formwork systems, prefabricated sandwich panel systems, monolithic concrete construction using tunnel formwork, precast concrete construction systems with precast components assembled at site, and precast concrete construction systems with three dimensions. It was evident from these journals that prefabrication is critical to attaining competitiveness and growth.

III. METHODOLOGY



IV. CASE STUDIES

Utilizing a case study methodology, this research has recovered parameters assessing the advantages of prefabrication in contemporary construction projects. Case studies were conducted to gather data and arrive at conclusions regarding the advantages of prefabrication in contemporary construction projects.

A ZATPAT House is the product of Satara MIDC engineer Jayant Murudkar, 78 years old. By putting ready-made walls and slabs together and fastening them with nuts and bolts, he eliminated labor-intensive procedures from the construction site. Weld mesh, chicken mesh, cement, and sand are combined and packed with mortar to create ferrocement. In order to achieve the necessary form and shape without the need for formwork, skeletal steel in the shape of 6mm or 8mm bars is utilized. The 3.5 x 2.5 meter precast ferrocement wall panels were uniformly thick, measuring 25 mm. With 4 x 0.6 m roofing panels of the same thickness and ribbed construction, the panels are lighter and more durable. Disassembling the houses is possible.

The GFRG panels approach was used to save materials and construction time in a two-story building in Kochi that was being built by Sheghram Nirman Pvt. Ltd., a company based in Kerala. The technique lowered the overall cost and time estimation by more than 50% when compared to the conventional method. The speed at which GFRG panels may be built on site is by far its greatest benefit.

The greatest dwelling options for people who consider comfort and style to be essentials are Amrapali in the Hemisphere. Greater Noida's serene setting reflects the calm that best accentuates the somberness of these residences. These villas include all the contemporary conveniences and amenities, making living a breeze.

One provider of prefabricated floor and wall elements based on enormous timber slabs for the Swedish building market is of concern to the Swedish construction industry. The supplier has his own sawmill and makes glulam timber beams for various kinds of construction projects in addition to components for use in multi-story housing projects. All 271 Prefabrication, assembly, and open building Prefabrication are used in the company's projects. The initiative's goal is to give the participating

enterprises a higher market share in the multi-story housing industry by producing houses at a lower cost than they could on their own.

V. ADVANTAGES OF PREFABRICATION

a. Because self-supporting prefabricated components are employed, scaffolding and formwork shuttering are not as necessary.
b. Buildings are finished sooner and construction takes less time, providing for a quicker return on investment.
c. There is less development and traffic on the site.
d. In a factory assembly line situation as opposed to a building site, quality monitoring may be simpler.
e. Where trained labor, power materials, space, and overheads are less expensive, prefabrication can be situated.

VI. DISADVANTAGES OF PREFABRICATION

a. In a similar vein, joints in prefabricated components may develop leaks.
b. To be installed, large prefabricated constructions need to be carefully measured, lifted, and handled by heavy-duty cranes.
c. Buildings made out of many prefabricated element types sometimes have a dull, uniform appearences.
d. Local Jobs are lost.

VII. RESULTS & SUMMARY

The five case studies are a component of large-scale, continuing research initiatives, the findings of which are analyzed and published in other scholarly journals. Interviews, site visits, design and production meetings, and design and production documentation have all been used to gather data for the five examples. Consulted the articles mentioned above for additional details on the case study techniques applied. The company, its product offering, the perceived value by clients, and the prefabrication choice and its impact on stakeholder value are all described in the case study results.

VIII. CONCLUSION

The ability to assess the advantages of prefabrication in contemporary building projects within the construction business can greatly simplify our construction procedures. To guarantee the authenticity and dependability of the results, meticulous planning, coordinating, and execution will be required during project implementation. Because prefabrication technology is production- or knowledge-based rather than product- or consumption-based, it has not moved as readily as other technologies, according to the case studies that were conducted. In the Indian building sector, prefabrication has the potential to have an impact on the environment, society, and economy. There are countless options and possibilities; all that's needed is for entrepreneurs to take the brave decision to make a change.

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