

# A Review on Investigating the Difficulties in Adoption of Precast Concrete Members in Construction Practices

Maniyar P. T.<sup>1</sup>, Patil S. B.<sup>2</sup>

<sup>1</sup>M. Tech. final Year Student of construction Management, Department of Civil Engineering, Ashokrao Mane Group of Institutions, Vathar tarf Vadgaon, Dist: Kolhapur, Maharashtra, India

<sup>2</sup>Asst. Professor, Department of Civil Engineering, Ashokrao Mane Group of Institutions, Vathar tarf Vadgaon, Dist: Kolhapur, Maharashtra, India

\*\*\*

**Abstract** - Though the construction of building could be faster using precast components yet these are not so popular for general practice among the small scale contractors and engineers. To find the practicality of precast components over traditional concreting method or vice versa few research papers were studied.

**Key Words:** Precast concrete, Precast Vs Conventional, Precast beam, Precast column, Precast slabs etc

## 1. INTRODUCTION

Many developing nations are battling with the housing emergency, many developed nations have subdued this issue with precast concrete innovation. Precast concrete development innovation is one of the promising answers for take care of the gigantic housing demand. The utilization of precast concrete frameworks offers a few favourable circumstances, for example, quick and quality development and upgraded well-being and security. Regardless of these favorable circumstances, the industry has not picked up prominence in India. With ever increasing demand for housing, a need to automate and modernize the construction industry was deemed. In the present scenario, engineering and architectural innovation & improvisation has enabled the construction world to explore the neo-arena of precast technology. Innovation & development is not creating something new, but redefining the existing thing in a modern way. Here are some advantages of precast concrete very rapid speed of erection, good quality, entire building can be precast-walls, floors, beams etc., high quality under controlled conditions in factory.

## 2. LITERATURE REVIEW

**1. Sugeng Wijanto et. al (Oct 2008)** in their paper entitled "State of the art: Research and application of precast / prestressed concrete systems in Indonesia" has studied that, as of late increasingly broad utilization of precast/prestressed solid parts, which are created off-site and after that associated nearby, has been occurring in Indonesia. This innovation turns out to be progressively prevalent in Indonesia since it indicates critical advantages contrasted with the customary poured nearby solid innovation. Among others, the advantages are in

quicken the development time, upgrading the nature of solid works, improving its strength and by and large producing focused basic expense.

**2. Bindurani. P, et. al (Dec 2013)** in their paper entitled "Analysis of precast multi-storeyed building – A case study" has studied that, Precast solid frameworks speak to a productive option for structure development. The conduct of a precast framework relies upon associations and it ought to be demonstrated appropriately in the computational models for examination and plan. This investigation speaks to the displaying of associations in a divider type precast structure system. In this paper a contextual investigation of a 23-storeyed structure, made up of precast divider boards and chunks, to think about the demonstrating of vertical joints as far as shear move, is introduced. Two computational models were studied to discover the impact of demonstrating the vertical joints between the divider boards, on the floats and the created powers in the dividers. It was seen that the model, which was not considering any shear move through the vertical joints, will in general give preservationist results regarding measure of steel necessity. The emulative solid divider framework is by all accounts sufficient in moderate seismic zones. The arrangements of tie fortifications, strengthened shear keys and dowel bars give the required basic respectability to the precast framework to keep away from dynamic breakdown.

**3. Sudheer Bommi, et. al (Oct 2014)** in their paper entitled "Precast high-rise residential projects in India- Design implementation" has studied that, this is a continuous contextual analysis with an attention on plan usage for Pragati Towers – Stilt+23 floors total pre-assembled skyscraper private task, structured and worked by Larsen and Toubro development without precedent for India for a seismic zone III area is introduced in this paper. Two computational models were explored to discover the impact of displaying the vertical joints between the divider boards are additionally exhibited in this paper. Difficulties confronted while executing the embraced precast methods, for example, innovation acknowledgment, structure of associations, guaranteeing water snugness reasonable to Indian structure prerequisites are likewise talked about. Plan ideas to forestall dynamic breakdown are likewise featured. A standard seat mark setup for

precast lodging arrangements as a most optimized plan of attack innovation accomplished.

**4. Akash Lanke, et. al (Jun 2016)** in their paper entitled "Design, Cost & Time analysis of Precast & RCC building" has studied that, Precast concrete is outstanding innovation in which some institutionalized units which are made in processing plants are utilized for quick development. Despite the fact that the technology is created numerous years prior, however the usage isn't up the imprint in our nation. In this investigation they have done itemized investigation of different ideas of precast, experience number of writing and found the actualities related with it. We have accepted one structure as a case and Design a similar structure as a precast structure and Traditional Cast in-situ constructing. Here we have made cost examination just as possibility keep an eye on premise of costing and Duration. For progressively down to earth consider we have visited the two continuous building locales of Precast and cast in-situ and assembled required data, from this examination It is surprisingly observed that the expense of precast structure is fundamentally diminishes and length of development is likewise a lot lesser than conventional technique. From this examination we can be infer that the precast solid framework is practical than ordinary cast set up strategy yet at the same time there are a few conditions which we need to deal with while utilizing precast, those are amount of development, Distance of site from assembling unit, Type of structure and so forth.

**5. Mausmi P Gulhane et. al (Apr 2017)** in their paper entitled "Review On Analysis of Precast Concrete Structure" has studied that, despite the fact that the precast cement auxiliary frameworks are in effect generally utilized around the world, in India a large portion of the developments are thrown in-situ solid developments. The gigantic development of populace in India and restricted space accessible has prompted the interest for multi-story private structures. This interest can be fulfilled by the usage of manufacturing plant made quality controlled precast units that accommodates quicker development prompting economy. Precast cement auxiliary frameworks showing non-direct reaction attributes can be extensively arranged into two fundamental classifications as identical solid frameworks and jointed frameworks. Presence of a fixing piece brought about enhancements in the splitting minute and introductory solidness of empty centre units. In the present investigation, seven kinds of basic mechanical precast shaft section associations and a reference solid example were considered. The solid examples cast in two numbers with the fortification itemizing according to IS 13920:1993. The seven precast shaft segment associations were gathered into three classifications. The examples were ordered into three gatherings with two numbers in each gathering. They are Type-I associations jolt and pole associations, Type-II Connection: fitting point and

solidified projection associations and Type-III associations: dowel associations.

**6. Anisha Mire, et. al (Nov 2017)** in their paper entitled "study of precast construction" has studied that, those days' regular kind of development was blurring up when contrasted with precast development. precast cement is a savvy approach to fabricate any kind of structure, securely, moderately. it guarantees quick development time, high benefit and astounding quality. precast cement is an industrialized method to manufacture. it means move of work from locales to production lines. this improves efficiency and quality and abbreviates development time of a structure. to put it plainly, precast solid brings down all out development costs significantly. this paper manages the investigation of precast innovation and its favourable circumstances over traditional development.

**7. Wadkar Kapil Viajkumar et. al (Sept 2018)** in their paper entitled "Analytical Study of Prefabricated Construction Technique Practicability in Solapur City" has studied that, in Western nations the precast framework has been generally utilized in developing extensions, places of business and private structures. In India, cast set up is the customary development framework that has been for the most part utilized and precast framework is utilized simply for floor chunks in India. Just a couple of gatherings in the Indian development market have received completely precast solid frameworks. Notwithstanding, numerous elements affect the selection of precast solid framework. The examination assesses an investigation of the noteworthy factors in the selection of precast solid components and framework, for example, work cost, hardware and apparatus cost, quality work and time required for execution. The investigation closes the flexibility of Prefabricated Construction Technique for multi-storeyed structure in Solapur City.

**8. P. Karthigai Priya, et. al (Jan 2018)** in their paper entitled "A review on precast concrete" has studied that, a large portion of the development exercises in India occur by customary cast in situ technique for development. Yet at the same time there is an enormous interest for lodging in India. So the development action needs to happen in a lot quicker way. This can't be accomplished by regular technique for development. It very well may be done conceivable with precast cement of development. In addition, there are more points of interest of precast solid when contrasted and traditional one. So different literary works are considered and an audit of those all has been given in this paper. Likewise, the preferences and drawbacks of precast development are additionally talked about here.

### 3. CONCLUDING REMARK

Above papers deal with what are precast concrete components, erection methodology of precast concrete

components, use of precast concrete construction in multi-storeyed buildings, joints and connections, labour productivity analysis using precast components with respect to time, traditional method of concreting versus installation and erection of precast components and seismic response of connections in precast structures with reference to beam and column joints, analysis and behaviour of precast concrete. None of them give any idea about use of precast in general construction practices construction industry or why precast concrete is not being used in construction industry.

It can be suggested that, use of precast can result in cost saving with respect to tremendous time saving during precast erection with zero compromise in quality with optimum number of labours.

#### 4. PROBLEM STATEMENT

As per the papers available, it has been seen that precast construction components give fast and better results as compared to the construction as fast as possible. Yet precast components are not so entertained for general small scale construction practices. So it becomes essential to find out the difficulties arrive during adoption of the precast concrete components for general small scale construction projects.

#### 5. METHODOLOGY

**Phase 1:** To study the literature

**Phase 2:** Study of data available

**Phase 3:** Analysis of data available

**Phase 4:** Results

#### 6. REFERANCES

1. Sugeng WIJANTO<sup>1</sup> and Takim ANDRIONO<sup>2</sup>, "State of the art: research and application of precast / prestressed concrete systems in Indonesia", The 14<sup>th</sup> World Conference on Earthquake Engineering October 12-17, 2008, Beijing, China
2. Bindurani. P, A. Meher Prasad, Amlan K. Sengupta, "Analysis of precast multistoreyed building – a case study", International Journal of Innovative Research in Science, Engineering and Technology, Volume 2, Special Issue 1, December 2013
3. Sudheer Bommi, Krishna Somaraju, Krishnamurthy Senou, Amit D. Barde. "Precast High-Rise Residential Projects in India: Design Implementation", The Masterbuilder | October 2014

4. Akash Lanke, 2Dr. D. Venkateswarlu, "Design, Cost & Time analysis of Precast & RCC building", International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056 p-ISSN: 2395-0072 Volume: 03 Issue: 06 June-2016

5. Mausmi P Gulhane<sup>1</sup> and Shrikant R Bhuskade<sup>2</sup>, "Review on analysis of precast concrete structure", International Journal of Advance Engineering and Research Development, e-ISSN (O): 2348-4470, p-ISSN (P): 2348-6406 Volume 4, Issue 4, April -2017

6. Anisha Mire<sup>1</sup>, R.C. Singh<sup>2</sup>, "Study of precast construction", International Journal of Mechanical and Production Engineering, ISSN: 2320-2092, Volume- 5, Issue-11, Nov.-2017

7. Ar. Wadkar Kapil Viajkumar<sup>1</sup>, Prof. Joshi Sanjay Dhondo<sup>2</sup> "Analytical Study of Prefabricated Construction Technique Practicability in Solapur City", International Journal of Recent Innovation in Engineering and Research Scientific Journal Impact Factor - 3.605 by SJIF e- ISSN: 2456 – 2084

8. P karthigai priya<sup>1</sup>, M. Neamitha<sup>2</sup>, "A review on precast concrete", "International Research Journal of Engineering and Technology (IRJET)" e-ISSN: 2395-0056 p-ISSN: 2395-0072 Volume: 05 Issue: 01 (Jan-2018)