International Journal of Advance Research in Science and Engineering
Volume No. 10, Issue No. 07, July 2021
www.ijarse.com
IJARSE
ISSN 2319 - 8354

Precast Cement Concrete Block Construction

Rishikesh Kumar[1], Md. Mumtaj[2], Indrajeet[3], Saif Ali Siddiqui[4], Mr. Baijnath Nishad[5]

1,2,3,4 B.Tech. Student, 5Assistant Professor in Civil Engineering

Buddha Institute of Technology GIDA Gorakhpur

Abstract:

Precast concrete *is a construction product produced by casting concrete in a reusable mold or "form" which is then cured in a controlled environment, transported to the construction site and lifted into place .In contrast, cast-in-place concrete is poured into site-specific forms and cured on site.* ***Precast stone*** *is distinguished from precast concrete using a fine aggregate in the mixture, so the final product approaches the appearance of naturally occurring rock or stone. More recently expanded polystyrene is being used as the cores to precast wall panels. This is lightweight and has better thermal insulation.*

Precast is used within exterior and interior walls. By producing precast concrete in a controlled environment (typically referred to as a precast plant), the precast concrete is afforded the opportunity to properly cure and be closely monitored by plant employees. Using a precast concrete system offers many potential advantages over onsite casting. Precast concrete production can be performed on ground level, which helps with safety throughout a project. There is greater control over material quality and workmanship in a precast plant compared to a construction site. The forms used in a precast plant can be reused hundreds to thousands of times before they have to be replaced, often making it cheaper than onsite casting when looking at the cost per unit of formwork. To complete the look of the four precast wall panel types – sandwich, plastered sandwich, inner layer and cladding panels – many surface finishes are available. Standard cement is white or grey, though different colors can be added with pigments or paints. The color and size of aggregate can also affect the appearance and texture of concrete surfaces. The shape and surface of the precast concrete molds have an effect on the look: The mold can be made of timber, steel, plastic, rubber or fiberglass, each material giving a unique finish.

Keyword: *Precast, Casting, CorroSion, Sandwich, Surface.*

Introduction:

The concept of precast (also known as “prefabricated”) construction includes those buildings where the majority of structural components are standardized and produced in plants in a location away from the building, and then transported to the site for assembly. These components are manufactured by industrial methods based on mass production in order to build a large number of buildings in a short time at low cost.

The main features of this construction process are as follows:

- The division and specialization of the human workforce
- The use of tools, machinery, and other equipment, usually automated, in the production of standard, interchangeable parts and products
- This type of construction requires a restructuring of the entire conventional construction process to enable interaction between the design phase and production planning in order to improve and speed up the construction. One of the key premises for achieving that objective is to design buildings with a regular configuration in plan and elevation. Urban residential buildings of this type are usually five to ten stories high (see Figures 1 and 2). Many countries used various precast building systems during the second half of the 20th century to provide low-income housing for the growing urban population.

Material And Method

1. Precast concrete wall (Panels),
2. Precast Slabs,
3. Precast Beam and Girders,
4. Precast Columns,
5. Precast Stairs,

Safety during the handling and erection of precast concrete elements is substantially important. Therefore, all machines and equipment employed precast concrete element handling and erection need to be maintained to a high standard, load tested, and be suited to the intended utilization. Generally, the precast unit should be erected in accordance with the tolerances provided by applicable codes, unless other tolerances are used in the design and specifications. A rigging system for handling

and erecting precast elements requires careful and thorough preplanning. It may be necessary to equalize loads between lifting points on certain precast elements, such as beams or flat slabs.

Future Scope

Today, we can see that the Indian construction majors are adopting precast concrete technology in constructing their latest projects. Precast concrete technology is a durable and versatile technology for construction. In this technology the different elements or panels of concrete are produced under strict quality control measures in state of the art factories by highly trained personnel, with virtually no wastage. There are dedicated precast factories which serve produce for multiple construction projects as well as on-site precast factories which serve a particular construction project.

Precast concrete technology consists of custom-designed precast concrete elements such as: roof slabs,

- beams
- columns
- wall panels
- partition walls
- load bearing walls
- facades
- preinstalled windows
- staircases
- central core

Conclusion

In this study two steel bridge concepts are developed using innovative technologies and techniques that will accelerate the construction of bridges. Both concepts are based on modular units made of steel girders and concrete deck and are presented in discussed in this report.. The first concept is made of all-prefabricated system including the deck slab, whereas the second is made of prefabricated steel girder system including a cold-formed steel form that will receive cast in place concrete deck. Parameters such as normal weight concrete (NWC) versus light weight (LWC), normal strength concrete (NSC) versus high strength concrete (HSC), and 8 inch versus 6 inch slab are studied and compared for performance and cost. Advanced optimization techniques are utilized to optimize the two concepts and to compare between the resulting different systems and assess the influence of the studied parameters on cost.

Reference

1. Allen, EA. (2009). Fundamentals of building construction materials and methods. Hoboken, NJ: John Wiley & Sons, Inc..
2. "Precast concrete facades bring buildings to life". Concrete Issues.
3. "Port Cities". Mersey-gateway.org. Archived from the original on 13 October 2007.
4. **Precast Concrete Station Buildings in New South Wales**Longworth, Jim Australian Railway History, May, 2005 pp163-185
5. "reinforced concrete | building material". Encyclopædia Britannica. Retrieved 24 May 2016.