

EFFECT OF HEIGHT ON PUMPED CONCRETE PLACING AT HIGHRISE STRUCTURES

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Abstract- This paper addresses the importance of finding out the efficiency and productivity of the pumped concrete and utilization of pumping equipment resources in the in situ concreting of buildings in Pune. The study involves close observation of more than 60 pours using pumped concreting on residential building construction sites to generate the problem statement for the study. The information regarding productivity of concrete is also derived and factors affecting the same are analysed. The aim of this study is to analyse the factors affecting the placing rates of concrete. And efforts are taken to minimize the lacunas in it by providing necessary enhancements for the same.

Keywords- Productivity of concrete, in-situ concreting, pumping equipment, placing of concrete, ready mix concrete(RMC).

1. INTRODUCTION

Bond cement is just beside water regarding the measure of material utilized on our planet. Over many years, concrete has turned into the material of decision for developing private and business structures, infrastructural offices, for example, interstates, dams and connects, trenches, ports and other critical offices. The fame of cement owes to its economy, capacity to be thrown into any shape, capacity to be manufactured for all intents and purposes anyplace and last however not the slightest, its intrinsic solidness. Multitudinous authentic historic points in cement say a lot about its sturdiness and adaptability.

Pumping of cement: Position of cement in distant zones has required the utilization of pumps in today's development. Particularly with the development of prepared blended cement crosswise over India, the requirement for pumping has expanded complex. While the simplicity of pumping relies on upon the kind of pump accessible, the separation over which cement is to be pumped, and the properties of the solid, various better

viewpoints can influence the operation. Pumping is an exceptionally productive and solid method for putting solid, which makes it an extremely sparing strategy too. At times, a pump is the main method for putting concrete in a specific area. For example, an elevated structure, or expansive sections where the chutes of the solid truck can't achieve where the solid is required. Different times, the simplicity and pace of pumping solid make it the most conservative strategy for solid arrangement.

Concrete Pump: A solid pump is a machine utilized for pumping so as to exchange fluid cement. There are two sorts of solid pumps. The main sort of solid pump is appended to a truck. It is known as a trailer-mounted blast solid pump since it utilizes a remote-controlled articulating mechanical arm (called a blast) to place concrete with pinpoint exactness. Blast pumps are utilized on the vast majority of the bigger development ventures as they are fit for pumping at high volumes and due to the work sparing nature of the setting blast. They are a progressive distinct option for truck-mounted solid pumps. The second principle kind of solid pump is either mounted on a truck and known as a truck-mounted solid pump or put on a trailer, and it is ordinarily alluded to as a line pump or trailer-mounted solid pump. This pump requires steel or adaptable cement putting hoses to be physically joined to the outlet of the machine. Those hoses are connected together and lead to wherever the solid should be set. Line pumps regularly pump concrete at lower volumes than blast pumps and are utilized for littler volume concrete putting applications, for example, swimming pools, walkways, and single family home solid sections and most ground pieces.

There are likewise slip mounted and rail mounted solid pumps, yet these are extraordinary and just utilized on particular jobsites, for example, mines and burrows. Solid pump architects face numerous difficulties since cement is overwhelming, thick, grating, contains bits of hard shake, and cements if not continued moving. For the most part, cylinder pumps are utilized, in light of the fact

that they can deliver many climates of weight. Such cylinder style pumps can push barrels of heterogenous cement blends (total in addition to bond). The pump on the left uses an exchange tube valve, and the one on the right uses seat valves.

2. OBJECTIVES

To take review of the factors hampering the productivity of concrete and suggest the necessary steps to mitigate the same.

3. SCOPE OF STUDY

In this study we will be concentrating on different issues identified with pumped concrete setting in elevated structures and causes behind it, and propose the likely measures to minimize it. This study should give better time evaluations and improvement in the profitability with most extreme effectiveness at the season of setting the solid. The principle point of this study is to control the deferral and efficiency which are the greatest danger at the season of cement setting.

4. LITERATURE REVIEW

Mohan M. Kumaraswamy 1997

This paper summarises a series of investigations into the productivity of concreting related operations on high rise buildings in Hong Kong. Work Study and related techniques are applied in deriving and comparing concrete placing rates using different methods (such as pumps, and crane + skip combinations). The production rates and activity levels of formwork carpenters and steelworkers are also investigated.

Ming Lu and Michael Anson 2004

The study discussed in this paper involves close observation of 154 pours on building construction sites and 38 days spent at 38 ready-mixed concrete (RMC) batching plants, one day at each. Much detailed productivity information has been derived and the different concrete placing methods have been compared. Other factors affecting the placing rates, pour size, type of pour, and supply of concrete have also been studied.

Tariq S. Abdelhamid and John G. Everett 1999

This paper suggests the attainability of measuring in situ physical requests of solid piece setting and completing work and how this physical interest might be utilized to describe both work power and whether the requests are

physically exhausting to the specialists. Physiological measures of vitality use, including oxygen utilization and heart rate information, were gathered for an eight-part solid section setting and completing group performing genuine development work

Bhupinder Singh, S.P. Singh and Bikramjit Singh 2004

In this paper attention has been drawn to the various parameters having a bearing on the pumping of concrete with particular relevance to the appurtenances involved thereof. The influence of these parameters on determining the capacity of concrete pumps has been discussed and an example has been presented on calculations for selection of a concrete pump for conditions obtained on a typical construction site.

5. RESEARCH METHODOLOGY

The methodology adopted for the present study is as follows,

1. Collection of data information from various sites.
2. Based on the literature survey's and case studies adopted ; suggesting the necessary steps to increase the efficiency of concrete placing

6. CONCLUSION

The steps to mitigate the factors hampering productivity of concrete,

1. Admixture should be added to delay the settling time of concrete.
2. More slump has to be provided while pumping to neglect the effect of temperature while concreting at heights.
3. Continuity of concrete pumping has to be maintained with utmost care to minimize the chances of choking of pipeline.
4. Straight concrete pipes with smaller lengths i.e. distance and minimum bends has to be adopted.
5. Proper co-ordination between the concreting team has to be maintained.

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