

# Making Pump Concrete By Using Artificial Sand

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**Abstract-** Nowadays it is important to make the concrete economical. In India, the conventional concrete is produce by using natural sand from riverbed as fine aggregate. Now a day's erosion of river and considering environmental issue, there is scarcity of river sand. The non-availability or Shortage of river sand will affect the construction industry hence, there is need to find the new alternative to replace the natural sand. .Replacement of natural sand with artificial sand by 20%, 40% and 60% and finding the compressive strength of concrete cube, this paper aims to deal with the current and future trends of research on the use of artificial sand. Pumped concrete may defined as a concrete flow under the pressure through pipe or flexible hose and directly poured into the formwork. A pump concrete is most beneficial where space and access of the construction equipments is limited. And now a days the construction of high rise building become so vast therefore pump concrete is beneficial for the huge concreting purpose.

**Index Terms-** Natural Sand, Artificial Sand, Pumping Concrete, workability, Pressure Pump, Flow ability

## 1. INTRODUCTION

Cement, Sand and Aggregate are essential need for any construction industry. Sand is major material used for preparation of mortar and concrete and play most important role in mixed design. There is shortages of natural sand due to huge demand in growing construction activities. In general the consumption of natural sand is high, due to the large use of concrete and mortar hence, the demand of natural sand is very high in developing countries to satisfy the rapid infrastructure growth. The developing country like India is before the big problem of getting natural sand and natural sand deposits are being used up and causing serious threat to environment as well as the society. The cheapest and the easiest way of getting substitute for natural sand is by crushing natural stone to get artificial sand of desired size and grade which would be free from all impurities. For the purpose of Concrete pumping has become one of them of widely used approaches to place concrete .Pumping enables the transport of concrete to forms and molds while increasing the speed of delivery and allowing access to hard-to-reach areas.. Consequently, the optimization and development of prediction methods for concrete pumping are becoming a crucial issue for the concrete industry. We can see concrete pumping requires mixing trucks, pumps, and pipes, combined with a large amount of material and Instrumentation, it is not surprising that only a few theses and research papers exist on the topic.

## 2. LITERATURE REVIEW

1. M. Shahul Hameed and A. S. S. Sekar, 2008, Properties of Green Concrete Containing Quarry Rock Dust and Marble Sludge Powder as Fine Aggregate, ARPJ Journal of Engineering and Applied Sciences, Vol. 3, no. 5 Natural sand in many parts of the country is not graded properly and has excessive silt on other hand quarry rock dust does not contain silt.
2. M.S.Shetty, Concrete Technology- Theory and Practice, (Fifth revised edition, 2002, S.Chand &

Company limited, New Delhi). [12] Code of Practice for Plain & Reinforced Concrete IS 456: 2000, Bureau of Indian Standards, New Delhi

3. Sahu Kumar and Sachan :- investigated the suitability of crushed stone dust waste as fine aggregate for concrete. Test results indicated that crushed stone dust waste can be used effectively to replace natural sand in concrete. Concrete made with this replacement can attain the same

## 3. MATERIALS AND METHODOLOGY

### 3.1. Study Object

1. To provide background information on use of artificial sand in concrete.
2. To access existing concrete produce using artificial sand.
3. To study the influence of artificial sand on the compression strength of concrete.
4. To determine the strength of concrete for various grades optimum use of artificial sand that can be use in construction and pump concrete.
5. To determine various strength of concrete, various property of concrete.
6. To make our structure in an economical cost without compromising the strength.
7. To determine how to make pump able concrete

### 3.2. Advantages of pump Concrete

1. Concrete pump is faster and easier method to complete a project.
2. Concrete pumping can reduce the labor cost.
3. You can get concrete to high rising and far reaching places.
4. Pumping of concrete is done before the concrete start to set, improving concrete strength.
5. Concrete pumping has a large application, including residential and commercial.

### 3.3. Requirement of Pump Concrete

- Concrete mixture should neither be too harsh nor too sticky; also, neither too dry nor too wet

- A slump between 80 and 100 mm is beneficial for the pumpable concrete.
- If the water content in the mixture is low, the Friction is increases and minimized at the correct water contents. The presence of a lubricating film of cement paste or admixture at the walls of the pipe also greatly reduces the friction.
- If we increases the cement content it is useful
- No other pumpable content present in concrete than water and it also push other content through the pipe.

#### 4. COMPRESSIVE STRENGTH

Compressive Strength

$$= \text{Load/Cross Sectional Area}$$

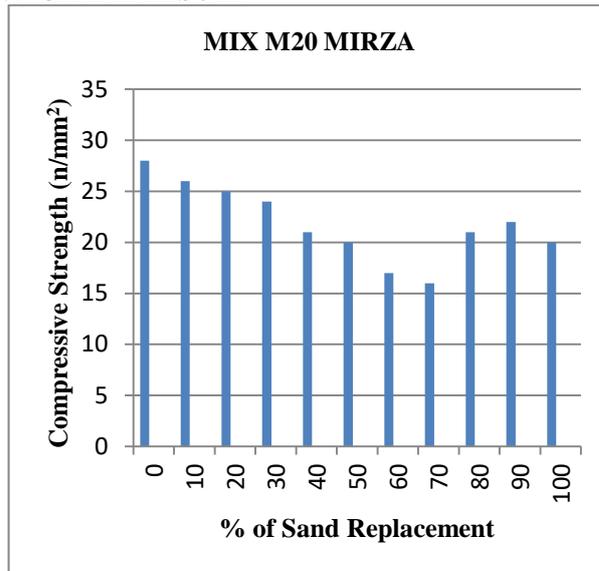
#### 5. HOW TO MAKE PUMP CONCRETE?

- First thing that we have to understand is what is pumping “ A concrete conveyed under pressure through the rigid pipe or flexible has and directly pored to the desired location is known as pumping.
- To make pump concrete our primary aim is to reduce friction in the pipe. For that we have to make homogenous mixture.
- For that the purpose we increases the cement content also we add admixture for smooth flowing of the concrete through pipe.
- While making concrete we have to maintain w/c ratio because of strength if we increase w/c ratio strength will reduces so we add admixture for the greater workability.
- Also we used 12 mm aggregate.
- Strictly this can be easily flow through the pipe.

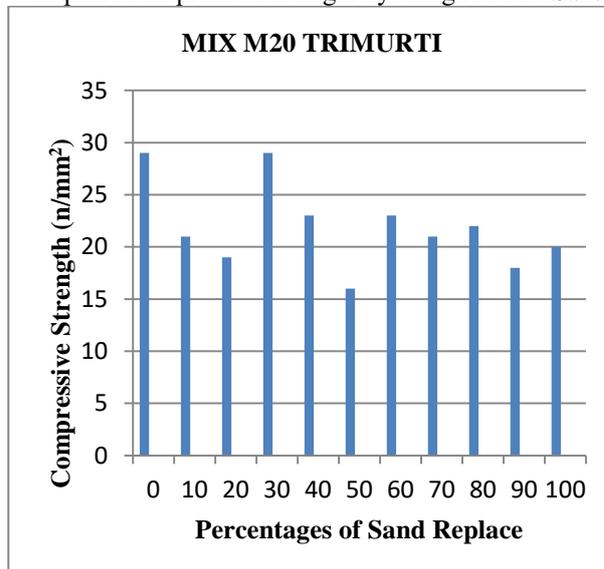


Fig. 1. Pumpable Concrete using the artificial Sand.

#### 6. GRAPH RESULT



Graph 1. Compressive strength by using Mirza's Sand



Graph 2. Compressive strength by using Trimurti's Sand

#### 7. FUTURE SCOPE

- We replace natural sand by different percentages in concrete and tested compressive strength.
- We can also used artificial sand for making high strength concrete.
- Suitability of manufactured sand must be ascertained for plastering.

#### 8. CONCLUSION

- Though the artificial sand is not beneficial for pump concrete but we changes some of the properties of artificial sand and make pump concrete
- a review of different experimental studies performed by various researchers have been carried out to examine various operational parameters like workability, compressive

strength, of concrete with crushed sand as a replacement to the natural sand in that total investigation. We use MIRZ'S crushed sand I think that following conclusion are made.

- The properties of the fine normal weight aggregate (sand) play a more prominent role in the proportioning of pump able mixes than do those of the coarse aggregates. Sand having a fineness modulus between 2.4 and 3.0 are generally satisfactory provided that the percentage passing the 300 and 150 micron sieves meet the previously stated requirements.

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