

“To study the properties of concrete by using polypropylene fibers and different admixture”

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ABSTRACT:

We all be aware of that mortar is nothing however the mixture of cement, sand and water. When concrete is used in presence of reinforcement then it is referred to as RCC (Reinforcement Cement Concrete). If we do away with coarse aggregates then it is called as no aggregate concrete. In this study no aggregate (course) concrete has been made by means of thinking about polypropylene fiber 20% of weight of cement and including extraordinary admixture (aluminium sulphate, sodium hydroxide, sodium metasilicate), having high tensile strength and compressive electricity respectively. Additionally improve some houses of concrete using 25%, 30%, 35% aggregate by adding polypropylene fibers and exclusive admixtures (aluminium sulphate, sodium hydroxide, sodium metasilicate) in concrete enhance compressive strength, durability and additionally improve some properties of concrete.

1) INTRODUCTION:

This type of concrete is an advanced type of concrete in which the use of coarse aggregates is totally eliminated. This leads to preservation of natural resources of rocks, hills and mountains. This concrete which has low density as compared to conventional concrete and gives high order of strength. It proves economical as it does not contain coarse aggregate. Compaction is not required for this particular type of concrete for casting in situ situation. It is also easy to pump this concrete at high levels without taking additional efforts. The workability of this concrete is more than conventional concrete without using extra amount of water.

Necessity:

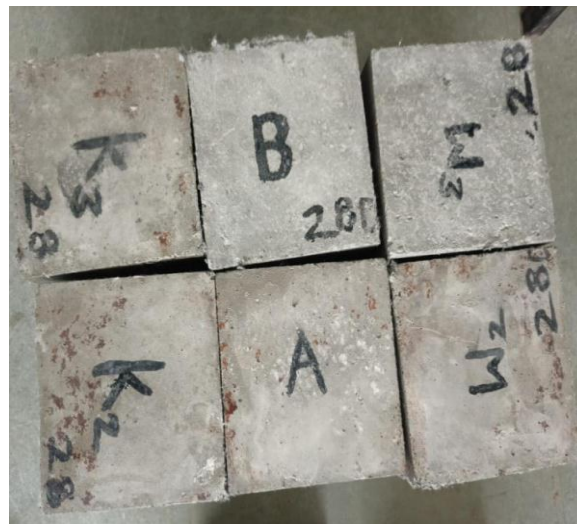
Coarse combination now not solely increases water demand however also will increase the tendency of segregation. This kind of concrete helps us to enhance segregation property as nicely as required less quantity of water. Stone quarrying leads to depletion of natural resources as well as it reasons quite a number kinds of pollution such as air pollution, noise pollution. Using this type of concrete.

Objectives:

- To find out about the residences of admixture.
- To compare compressive power of conventional concrete block and admixture concrete block.
- To supply compressive energy check on blocks for 7 days and 28 days.
- To make concrete economical.

METHODOLOGY:

- To learn about the properties of fabric for chemical admixture.
- Making 24 wide variety of concrete blocks of a number of percentage such as 25%, 30%, 35% the use of different admixtures with substitute of high-quality aggregate.
- Take a compressive power test on concrete block after 7 days and 28 days.
- To evaluate end result by the use of 25%, 30%, 35% concrete blocks and traditional blocks.



EXPERIMENTATION: Experimental applications for acquiring suitable material which includes a number tests, which are in this chapter Cement mortar reinforced with Polypropylene fibers with an addition of exceptional admixtures are used as a material.(For over all experimental work 1:1.5:3 percentage is used)

Material:

Cement : The cement used in this experimental work is “ACC” fifty three grade Ordinary Portland Cement conforming to IS 12269:1987.

Fine Aggregate : For experimental work we used synthetic beaten sand of V.S.I. of dimension much less than 4.75mm.

Polypropylene Fibers : We used 1.5% that is 20 gm for single block of polypropylene fiber with the aid of the mass of total cementitious material.

Fly Ash : The fly ash is used in experimentation satisfies of IS :3812 (30) and cement is replaced through 20% by fly ash for all mix proportion.

Aluminium sulphate : Add powdered shape of aluminium sulphate 36.4 Gm/100 ml of water and saved it for 1 day (24 hr).

Sodium Silicate : Add powdered structure of sodium silicate 170.52 Gm/100 ml of water and saved it for 2 days (48 hr).

Sodium hydroxide : Add pallets of sodium hydroxide 48 Gm/100 ml of water and stored it for 2 days (48 hr).

(These all solutions mixed with magnetic stirrer for appropriate mixing)

MIX PROPORTION:

For this we taken comparative study to get better and nice effects by using specific cloth for variable mixture like sand, admixtures, PP fibre, etc.

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MIX PROPORTION:

For this we taken comparative study to get better and satisfactory results by using different material for variable mixture like sand, admixtures, PP fibre, etc.

Material quantity:

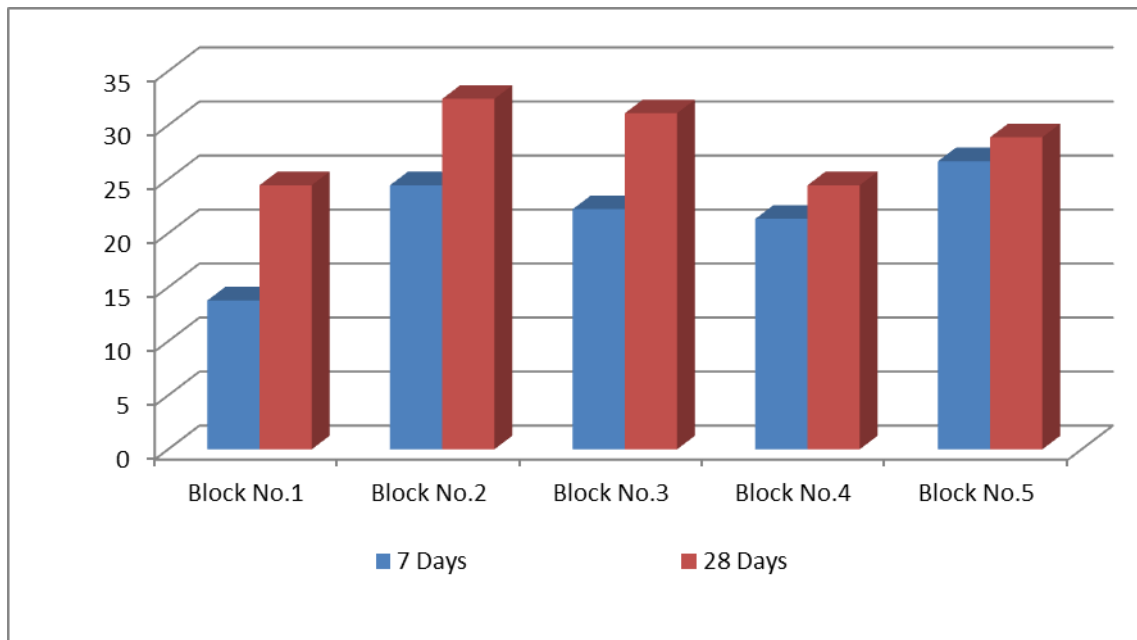
| Case | Cement | Fly Ash | Crush Sand | Water | Aggregate (%) | PP Fiber | NaOH | Al2SO4 | Na2SiO3 |
|----------------------------------|--------|-------------|-------------|-------|---------------|----------|---------|--------|-----------|
| Block No.1 (conventional) | 1.5kg | - | 250kg | 675ml | 100% (4.11kg) | - | - | - | - |
| Block No.2 (2% Agg.) | 1.5kg | 0.5kg (35%) | 3kg | 550ml | 25% (0.8kg) | 20gm | 67.05ml | 40.5ml | 25.31ml |
| Block No.3 (30%Agg) | 1.5kg | 0.5kg (35%) | 2.8kg | 550ml | 30% (1.06kg) | 20gm | 67.05ml | 40.5ml | 25.31ml |
| Block No.4 (35%Agg) | 1.5kg | 0.5kg (35%) | 2.5kg | 550ml | 35% (1.24kg) | 20gm | 67.05ml | 40.5ml | 25.31ml |
| Block No.5 (No Agg) | 1.5kg | 0.5kg (35%) | 0.5kg (35%) | 550ml | - | 20gm | 67.05ml | 40.5ml | 25.31mlss |

Table NO.1

RESULT AND DISCUSSION:

After applying trial and error technique for finalizing material. Having suitable working properties for experimentation project. We received exceptional effects for exceptional % of aggregate. comparing fabric for putting time property, we found that by adding aluminium sulphate answer in cementitious material preliminary putting time of material get decreased by means of 12 min. By adding sodium silicate make bigger compressive energy of concrete as well as reduce porosity. Effect of adding sodium hydroxide prevents segregation and decrease - amount of water required. Polypropylene fiber increases tensile strength of concrete and reduces weight of concrete.

Table 4. Compressive Strength For 7-days And 28-days



After observing the test results for compressive strength of material, we observed that compressive strength of material increases with the addition of sodium silicate. Whereas using 25% aggregate having more compressive strength than concrete using 30% and than concrete using 35% aggregate respectively.

CONCLUSION:

- Initial placing time of cement minimize with the use of acceleration such as aluminum sulphate.
- To reduce time of the repression of metallic of with the aid of increasing water manipulate for achieving workability sodium hydroxide and sodium metasilicate are used.
- For growing compressive electricity of cement mortar, components like polypropylene fiber (pp fiber).

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