

Comarison of two different grade retempered concrete (M40) and medium grade retempered concrete(M20)

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ABSTRACT

Concrete is complete composite man-made material, is the most widely used in building material in construction industry. Concrete is a very strong and versatile moldable construction material. It consists of cement, sand and aggregate mixed with water .as the grade of concrete increases . for M20 concrete we can retempered concrete up to 120 min. but for M40 concrete retempering time is only 30 min. the quantity of cement also increase which affects the properties of retempered concrete . usually the retempering process is used with normal retempered concrete with additional retarder . adding water to plastic mix increase the porosity . placement operation can take place from 10 to 60 min. depending upon field condition and load size.

INTRODUCTION

Concrete is complete composite man-made material, is the most widely used in building material in construction industry. Concrete is a very strong and versatile moldable construction material. It consists of cement, sand and aggregate mixed with water. The relative quantities of cement, aggregates and water mixed together, control the properties of concrete in the wet state as well as in the hardened state.

In current era one problem that has been headache to civil engineer is casting delays which spoil the quality, durability and workability of concrete. To overcome such a problem the practice of retempering is frequently performed to keep concrete workable

reducing consolidation efforts. For this addition of admixture, super plasticizers, cement Admixtures are chemicals added to the concrete mix to control its setting properties used primarily when placing concrete during environmental extremes, the main effect of retempering of concrete is that workability goes on. decreasing as retempering goes on increasing. Also the retempering time affect some properties of concrete.

In present thesis an attempt is made to check the compressive strength, compaction factor and slum cone test of normal and retempered concrete with an addition of retarder in two different percentages as 0.2% and 0.4% at retempering time of 0, 30 minutes and 60 minutes.

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check the compressive strength, compaction factor and slump cone test of normal and retempered concrete with an addition of retarder in two different percentages as 0.2% and 0.4% at retempering time of 0, 30 minutes and 60 minutes

LITERATURE REVIEW:

In order to collect the necessary and valuable information the literature survey is done, so that more light can be put on the subject. The literature is available in the form technical paper presented in various journals.

2.1 Kiran M. Mane, Dr. D. K. Kulkarni

“Effect of retempering with retarding admixture on properties of concrete subjected to prolonged mixing”

In situations like delivery of concrete from central mixing plant, in road construction, in constructing lengthy tunnels, in transportation of concrete by manual labor, in hilly terrain long hauling of concrete is required. Loss of workability and undue stiffening of concrete may take place at the time of placing on actual work site¹. In such situations engineers at site, many a time reject the concrete partially set and unduly stiffened due to the time elapsed between mixing and placing. Mixed concrete is a costly material and it cannot be wasted without any regard to cost. It is required to see whether such a stiffened concrete could be used on work without undue harm with use of retarding admixtures. The process of remixing of concrete, if necessary, with addition of just the required quantity of water is known as „retempering“ of concrete¹. Sometimes, a small quantity of extra cement is also added while retempering. In the site sometimes the concrete has to wait for some time to enter in the formwork after it is mixed. In such situation’s addition of small of

retempering methods on the compressive strength

2.2 J. Sobhani, M. Najimi, A.R. Pourkhorshidi

“Effects of retempering methods on the compressive strength and water permeability of concrete”.; Retempering of concrete is a common practice in ready-mixed concrete industries for adjusting the workability that might adversely affect strength and

durability properties in hot climates. In this paper, the effects of retempering with melamine sulphonate naphthalene-based super plasticizer (RS), water (RW) and withhold water (RWW) on the compressive strength and water permeability (WP) of concrete, are experimentally investigated. The results of this study indicated that the compressive strength of concrete retempered with super plasticizer and withhold water, enhanced by increasing the delay in casting, while retempering with water, resulted in a substantial decrease. Moreover, it was found that RS improved the water permeability of retempered concrete much more than RWW, whereas RW diversely increased this parameter. Although RWW imposed a slight slump loss, RWW and RS are generally proposed for the retempering of concrete, due to the suitable strength and permeability results.

2.3 D.K.Kulkarni, K.B.Prakash.

“Experimental Investigation of Addition of Combination of Admixtures on the Properties of Retempered Concrete”

The process of remixing of concrete, if necessary, with addition of just the required quantity of water is known as ‘retempering of concrete’. Sometimes, a small quantity of extra cement is also added while retempering. In such situations the concrete loses its plasticity. In retempered concrete addition of small quantity of cement and water along with

combinations of admixtures can bring back the plasticity to concrete. Thus retempering becomes important in odd situations. In this paper an attempt is made to study the strength characteristics of concrete containing combination of admixtures at retempering time of 15 min up to 90 min. The combinations of admixture studied in this experimentation are Super plasticiser + Air Entraining Agent + Retarder (S+AEA+R). The tests are conducted to evaluate the strength characteristics of concrete like compressive strength, tensile strength, flexural strength and impact strength for different retempering times.

2.4 A.R. Pethkar and V.V. Patil

“Comparison Between High Grade Retempered Concrete[M40] and Medium Grade Retempered Concrete [M20]”

As the grade of concrete is increases the quantity of cement is increases which effects on the properties of retempered concrete. For M20 concrete we can retempered the concrete up to 120 min. but forM40 concrete retempering time is only 30 min. Adding water to a plastic mix to increase slump is an extremely common practice, even though it is not recommended because it increases the porosity of concrete. Concrete often arrives on site more than half an hour after initial mixing. Placement operations can take anywhere from 10 to 60 minutes, depending on the field conditions and the size of the load. When the slump decreases to an unacceptable level during the operations, water is added to the mix. Objective of this paper to study the strength characteristics of retempered concrete M20 & M40 concrete. Usually the retempering process is used with normal concrete or with ready mixed concrete; an attempt is made to check the compressive and flexural strength of normal retempered concrete with an addition of retarder in three different percentages

as 0.2%, 0.4% and 0.6% at retempering time of 15 minutes to 90 minutes.

2.5 A.R. Pethkar and G.K. Deshmukh

“Comparison of Strength between Retempered Concrete of Two Different Grades”

As the grade of concrete increases, the quantity of cement also increases which affects the properties of retempered concrete. For M20 concrete we can retemper the concrete up to 120 min. but for M40 concrete retempering time is only 30 min. Adding water to a plastic mix to increase slump is an extremely common practice, even though it is not recommended because it increases the porosity of concrete. Concrete often arrives on site more than half an hour after initial mixing. Placement operations can take anywhere from 10 to 60 minutes, depending on the field conditions and the size of the load. When the slump decreases to an unacceptable level during the operations, water is added to the mix. The objective of this paper is to study the strength characteristics of retempered concrete M20 and M40 concrete. Usually the retempering process is used with normal concrete or with ready mixed concrete; an attempt is made to check the compressive strength of normal retempered concrete with an addition of retarder in three different percentages as 0.2%, 0.4% and 0.6% at strength retempering time of 15 minutes to 90 minutes.

2.6 “Effects of retempering on consistency and compressive strength of concrete subjected to prolonged mixing”

In this study, effects of prolonged mixing and four different retempering processes on some properties of fresh and hardened concrete, such as temperature, slump loss and strength were investigated. Two types of concrete mixtures with different compression strength having 15 cm initial slump were produced in a laboratory mixer. After

mixing for 5 min at 20 rpm speed to ensure homogeneity, the mixing was continued at 4 rpm for a period of up to 4 h to simulate the prolonged agitation of ready-mixed concrete in truck mixers. Concrete samples were taken out of the mixer at the end of first, second, third, and fourth hour for estimating the effects of prolonged mixing on properties of fresh concrete. For restoring the initial workability, four different retempering methods were used and their effects on properties of concrete was investigated. Results show that compared to the untemper concrete mixtures, those tempered with solutions prepared by 3% or 4.5% solid super plasticizer by mass of retempering water had significantly less loss of 28-day compressive strength

2.7Abdulrahman M. Alhozaimy and Abdulaziz I. Al-Negheimish

“Retempering of ready-mixed concrete in Riyadh, Saudi Arabi Retempering is typically done to restore concrete slump back to specified limits. The practice is known to result in some loss of strength which is proportional to the amount of water added. When retempering of concrete is done only to restore slump as per ACI 116 definition, it causes a loss in compressive strength of 7 to 10 percent, but it can be much higher depending on the amount of retempering water added. The practice of worst as the addition of water at the jobsite is frequently done to increase slump beyond the specification’s limits. The effect of retempering on the strength of ready-mixed concrete (RMC) in Riyadh was investigated. This investigation covers 12 construction sites and represents 11 ready-mixed concrete (RMC) plants operating in Riyadh. The addition of water was found to correlate well with the increase in slump. Also, the reduction in strength was found to be proportional to the increase in slump. In cases where

controlled amount of water is added to restore the slump within the specifications limits (100 ± 25 mm), the reduction of strength was below 10%. However, when the amount of water added is not controlled, reduction of strength may be as high as 35%. Based on these findings, it is strongly recommended that the practice of adding water to RMC at the job site to restore or increase slump should be prohibited. Super plasticizer can be used instead of water to adjust slump. This recommendation has been adopted by the Municipality of Riyadh and communicated to all RMC factories operating in Riyadh to abide by it.

CONCLUDING REMARK

we observe the study which gives a new methodology and results determining by time and different stage or place of work ,network to give the preferred overcome result.

1. M20 grade of concrete without adding retarder, the observed slump value is less as compared to the slump value obtained after adding 0.2% of retarder.
2. At 0% of retarder, the compaction factor of M20 grade concrete is more than that of the compaction factor when 0.2% of retarder is being added.
3. M20 grade concrete shows less compressive strength than that of the 0.2% retarder when get added.
4. In M40 grade concrete, while adding 0.2% of retarder small amount of slump is observed which indicates that even after retempering, we may get certain slump value unlike adding 0% retarder.
5. M40 grade with 0.2% retarder shows higher compaction factor than without adding retarder.
6. In M40 grade concrete, as the time elapsed there is increase in compressive strength when 0.2% of

- retarder is added while the compressive strength of sample without adding retarder is less.
7. The concrete M20 and M40 without any retarder shows target compressive strength , flexural strength up to retempering time 45 min. and 15 min. respectively.
 8. With the addition of 0.6% retarder the demoulding period is increase up to 48 hours.
 9. With addition of 0.2% retarder the demoulding period is increase up to 24 hours.
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