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WORKABILITY OF FRESH CONCRETE BY COMPACTION FACTOR

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Abstract - *Workability is a one of the properties of fresh concrete material composition. In another words, workability means the convenience of placement and workable concrete means the concrete which may be placed and can be compacted easily with none segregation. Workability is a important property of concrete and related with compaction additionally as strength. The specified workability isn't same for all sorts of concrete. More workability is required for a thin inaccessible/unreachable section or heavily reinforced section instead of a mass concrete body. Consistency is a general term to indicate the degree of fluidity or the degree of mobility. Degree of fluidity or the degree of mobility. Hence, we can't set a typical workability for all casting works. A composition could have a very fluid consistency and be very placeable, but if it segregated it would not be considered to have good workability due to lack of homogeneity. This paper present review on the fresh workability of the concrete by conducting experimental research to find out the workability of concrete.*

Key Words: Fresh Concrete, Workability, Strength, Compaction Factor Test, Consistency.

1. INTRODUCTION

Concrete is the largest product/material which is used for the construction. Concrete is the by product of the aggregate, cement, sand and required amount of water. The characteristics of fresh concrete which defines workability are consistency, mobility, and compatibility. Consistency could be a measure of fluidity while mobility is that the ability of fresh concrete to flow into a formwork. Compatibility is that the ease with which entrapped air, voids and segregation is eliminated from a mixture. For a fresh concrete to be stable, it must maintain its uniformity which also depends on its property of consistency and cohesiveness. Workability in fresh concrete practice offers an insight on plastic behavior of fresh concrete. This explains why plenty of research has been done on the consequences of things like water-cement ratio, aggregate size, shape and grading, admixture, ambient condition etc.

2. COMPACTION FACTOR TEST

The principle of compacting factor is determining the degree of compaction achieved by concrete for a standard amount of work done by allowing the concrete to fall through a standard height. The compacting factor gives the behavior of fresh concrete under the action of external forces. It measures the comparability of fresh concrete which is an important aspect of workability, by measuring the amount of compaction achieved for given amount of work. The compacting factor test has been held to be more accurate results than slump test.

very low workability	0.7 to 0.8
Low workability	0.8 to 0.85
Medium workability	0.85 to 0.95
High workability	>0.95

Fig 1:- Range Index of Workability

3. METHODOLOGY

Clean and moist the internal sides of the upper and lower hoppers using dampen clothes. Place the sample of prepared fresh concrete within the upper hopper; and let the sliding door closed to stop fall down. Open the top slide door, so that the fresh concrete falls into the lower hopper. Open the slide door of the lower hopper, so that the fresh concrete is allowed to fall down into the cylinder. Remove the excess fresh concrete above the top level of the cylinder, the outside is wiped clean Weigh the concrete in the cylinder that is partially compacted let be W1 Empty the cylinder and fill it with the fresh concrete from the same sample in 3 layers compacted approximately of equal volumes. Each layer heavily rammed or vibrated so as to obtain full compaction. Struck off level the top surface of the fully compacted fresh concrete with the top of the cylinder, and weigh it, let to be W2.After this all the apparatus is cleaned.

Fig 2:- Filled Upper Hooper

Fig 3:- Filled Lower Hopper

Fig 4:- Cylinder Filled Table with Concrete

Fig 5:- Compaction with vibrator

4. RESULT AND DISCUSSION

The Workability of the concrete is found to be 0.77. Hence the degree of workability is very low**.** The reason behind using low workable concrete is to minimize/reduce the thermal stresses development which is caused due to the large volume of the heat of hydration which in turn develops thermal cracks on harden concrete surface.

5. OBSERVATION AND RECORDING: -

Sr. no	Description	Reading
1.	Weight of cylinder (W1) Kg	12.4
2.	Weight of cylinder + Concrete falling through standard height (W2) Kg	22.18
3.	Weight of partially compacted concrete (W2-W1)=W3 Kg	9.78
4.	Weight of cylinder + Fully compacted concrete (W4) Kg	25.15
5.	Weight of fully compacted concrete (W4-W1)=W5 Kg	12.75
6.	Compacting factor = W3/W5	0.77

6. CONCLUSION: -

By above research we can conclude that the compaction factor of the fresh concrete mix is 0.77, hence the degree of workability is very low, that means roads are vibrated by power operated machines. The relationship between workability and compacting factor is higher the compaction factor higher is the work-ability. Theoretically maximum value of the compaction factor can be 0.96 to 1.0.

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