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ABSTRACT

Self-Compacting Concrete is an innovative concrete that does not require vibration for placing and compaction. It is able to flow under its own weight, completely filling formwork and achieving full compaction, even in the presence of congested reinforcement. The hardened concrete is dense, homogeneous and has the same engineering properties and durability as traditional vibrated concrete. Plantain leaf ash are waste and are causing threat to environment in terms of odour and to reduce this problem of this material the project has been undertaken so that it can be used for construction fashion following points attempted

i. To study the properties of Plantain leaf ash

ii. To blend to mix or replacement by different % of Plantain leaf ash

iii. To prepare the concrete by replacing the cement by Plantain leaf ash

iv. To study the comparativeness

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CHAPTER ONE

1.0 INTRODUCTION TO SCC

Self-Compacting Concrete(SCC), a relativelynew category ofhigh performance concrete, is proportioned in such that theconcrete freely passesaround and through reinforcement, completelyfills the formworkand consolidates underits own weight without segregation. The high flowability of SCC makes it possibleto fill the formwork without vibration

[Khayat, 1999; Khayat et al., 2004].

Developed inJapan in thelate 1980's **[Ozawa, etal., 1989]**, SCC hasbeen a topicof research and development inmany locations, especially in Japan and Europe **[Ouchi,et al., 2003]**. SCC has been successfully used in numerousapplications where normal concrete is difficult to place and consolidate due toreinforcement congestion and difficult access.Precast, prestressed bridge elements, such as AASHTO Type III girders,have congested reinforcement and tight dimensional geometry, and therefore canbenefit from the use of SCC.

Threebasic characteristics arerequired to obtainSCC: high deformability, restrained flowability anda high resistanceto segregation **[Khayat, etal., 2004]**. High deformability isrelated to the capacity of theconcrete to deformand spread freelyin order to fill all thespace inthe formwork. It isusually a function of theform, size and quantity of theaggregate, and thefriction between thesolid particles, whichcan be reduced byadding a highrange water-reducing admixture (HRWR) to themixture. Restrained flowabilityrepresents how easily the concrete can flow around obstacles, such asreinforcement, and is related to the member geometry and the shape of theformwork.

Segregation isusually related to the cohesivenessof the freshconcrete, which can be enhancedby adding a viscosity-modifyingadmixture (VMA) along witha HRWR, by reducing the free water content,by increasing thevolume of paste,or by some Combination of these factors.

Two general types of SCC can beobtained:

- (1) Concrete with a small reduction inthe coarse aggregate, containing a VMA.
- (2) Concrete with a significant reductionin the coarse aggregate content without any VMA.

SCC has been claimed to offer many advantages for the precast, prestressed industry including elimination of noise and problems related to concrete vibration, lower labor cost per member, and faster casting, thereby increasing productivity. Due to the low water-cement ratio, SCC should have improved durability and strength.

Generally, SCC contains a higher cementitious materials and lower water-cement ratio than conventional concrete, and so can provide relatively high strength. The paste usually includes fly ash, slag, silica fume, or other supplementary cementitious materials, or an inert filler such as limestone powder. The paste content of SCC is also relatively high, with a reduction in the size and quantity of coarse aggregate. These factors are typically associated with increased creep and shrinkage, and may be related to a reduction in elastic modulus.

WHAT IS SELF-COMPACTING CONCRETE (SCC)?

It is a concrete that can be compacted by its own weight and fills every corner in the formwork and the placing can be done without vibrating compaction. In the plastic state it is very homogenous, cohesive and very flowable.

1.1 WHY IT IS NEEDED?

Concrete is a versatile material extensively used in construction applications throughout the world. Properly placed and cured concrete exhibits excellent compressive-force-resisting characteristics and engineers rely on it to perform in a myriad of situations. However, if proper consolidation is not provided, its strength and durability could be questionable. To help alleviate these concerns, Japanese researchers in the late 1980's developed a concrete mixture that deformed under its own weight, thus filling around and encapsulating reinforcing steel without any mechanical consolidation.

§ Self-Compacting Concrete offers new possibilities and prospects in the context of durability and strength of concrete.

§ As a result of the mix design, some properties of the hardened concrete can be different for SCC in comparison to normal vibrated concrete.

§ Mix design criteria are mostly focused on the type and mixture proportions of the constituents.

§ Adjustment of the water/cement ratio and super plasticizer dosage is one of the main key properties in proportioning of SCC mixtures.

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