

TESTING FOT WATER PERMEABILITY OF CONCRETE

- A DRAF STANDARD

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ABSTRACT

This paper describes a water permeability test system and a draft standard aimed at promoting concrete durability research.it features a dual-test method for the measurement of water permeability with the standard 150 mm test cube prior to the determination of compressive strength.The calibration o f the test system plays complementary role to the existing methods of assessing durability such as carbonation test and rapid chloride pein rmeability.the test method is non-destructive ,conveint and realible for assessing concrete durability in the laboratory at the mix design stage .It can be used subsequently for test on concrete product and structures for rain water harvesting system.informations technology has been experiment to provide online skill training and electronic publications of research fiding to promote good concrete practice via a research portal <http://www.it-lodge.com>.

Keywords: water permeability. durability, concrete cover, dual-test, draft standard, information technology

WATER PERMEABILITY OF BLENDED CEMENT FOAMED CONCRETE

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ABSTRACT

A study is conducted to determine the effect of rice husk ash (RHA) as a partial cement replacement material. Timber industrial ash (TIA), fly ash (FLY) and proprietary pore blocker (POR) are also used to study their effect on the water permeability and compressive strength of foamed concrete. The study involves the preparation of test specimens tested in accordance with established standards such as ISO/DIS 7031. The blended cement composite of density ranging from 1600 kg/m^3 to 1800 kg/m^3 are experimented. There are four types of foamed concrete mixes in this study which consist of 5% rice husk ash, 5% timber industrial ash, 5% fly ash, and 5% proprietary pore blocker. A comparison of water permeability and compressive specimens for proprietary pore blocker as cement replacement have indicated that the density is more than 2000 kg/m^3 . Therefore the result of the POR is not presented. The water permeability test and compressive strength test will be done on all these cubes for 7, 14, 21 and 28 days. The cubes are air-cured and moist-cured. The average water permeability for air-cured is 10^{-10} m/s and moist-cured is around 10^{-11} m/s . The result of this study is expected to be useful toward achieving technical, environmental and economical advantages for concrete construction.

Keywords: Rice Husk Ash, Timber Industrial Ash, Fly Ash, Foamed Concrete, Water Permeability, Compressive Strength.

WATER PERMEABILITY OF LIGHTWEIGHT AGGREGATE CONCRETE

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ABSTRACT. This paper reports the study of water permeability of self-compacting lightweight aggregate concrete. In this study, palm clinker (POC) is used to replace normal weight aggregates to produce lightweight concrete. There are two types of mix design in this project. The POC mix as the control mix and POC mix with 10% Micronized Silica (TIA 60) as the cement replacement material and superplasticizers (Rheobuild 1100) to produce the self-compacting lightweight concrete. The test tube are 100mm x 100mm x 100mm size and wet-cured. Slump test and compacting factor test are carried out to measure the workability of the concrete. Durability of the concrete is determined by water permeability test based on ISO/DIS 7031, while the compressive strength of the hardened concrete is measured based on BS 1881: Part 2. Water permeability test and compressive strength test and conducted on the cube of these two types of concrete mix at the age of 3, 7 and 28 days. This self-compacting lightweight concrete is exhibiting unique properties as low water / cement ratio below 0.5 exhibits high workability up to 150 mm of slump. The self-compacting concrete requires minimal vibration to achieve high strength. The average coefficient of water permeability is in the order of 10^{-11} m/s which can be classified as an average quality concrete. The reduction of density is approximately 11.2% compared with the OPC normal weight concrete. This concrete mix is expected to be useful for the development of friction piles toward achieving technical, environment and economical advantages for the construction of soft soil foundation.