BEST PROJECT LIST

BATCH 2012-13

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INVESTIGATION ON THE EFFECT OF NATURAL FIBRES IN CONCRETE

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The indiscriminate infrastructural growth is leading to rapid environmental degradation. Steel, cement, synthetic polymers and metal alloys used for construction activities are energy intensive as well as cause environmental pollution during their entire life cycle. In order to quantify the energy and potential on reduction of CO^2 emissions by applying best available technologies. Steel, fiber reinforced plastics etc.. is in form of rods/fibers/sheets/wires are widely used to improve the performance of concrete. The natural resources may lose in coming days due to it's extensive use for the production and enhancing the properties of concrete. It is the time to investigate and invent on the development of alternative reinforcing system. Presence study attempted to use the natural fibers which are possible alternative for the existing artificial fibers to enhance the concrete properties. The experiment has been conducted with bamboo fibers as a strengthening material in concrete. In general the strength of bamboo is as high as mild steel while, the density is as low as carbon fiber. The present study the use of the bamboo fiber is proposed to avoid the week part of bamboo i.e. nodes into the reinforcing medium. The present study showed excellent improvement in the concrete material properties.

INVESTIGATIN ON SPRIAL STIRRUPS IN REINFORCED CONCRETE BEAM

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In recent times, the high cost and general shortage of reinforcing steel in many parts of world has led to increasing interest in the possible use of alternative locally available material for reinforcement of concrete. Also, heavy loads on concrete beams produce diagonal shear cracks. Cracking in beams is normal and indicates the tension bars are actually working. Excessive cracking needs to be controlled by additional bars called stirrups placed perpendicular to the cracks.

This experimental study aims at exploring ways of making the use of 3mm wires as stirrups in concrete beams, with various spacing so as to make the stirrup efficient and cost effective for cheaper construction. The 3mm wire is made continually spiral, to avoid the unwinding of stirrups.

The plain concrete beam with stirrups are compared with that of the standard beam with 2-legged stirrup and the analysis is done using the ABAQUS software to know the variations in load versus displacement curve, maximum principal stress, minimum principal stress between the normal stirrup and the continuous spiral stirrup.

DEVELOPMENT OF HIGH PERFORMANCE CONCRETE USING POLYPROPYLENE FIBER

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There are various methods adopted and being technologically developed to increase the strength of the concrete. Fibers are also used to increase the compressive strength, tensile strength of the concrete. In this project the utilization of the polypropylene fibers are adopted in concrete and the strength analysis of the concrete were done. Admixtures such as silica fume, polypropylene fiber were used in the concrete to increase the strength.

The split tensile test for cylinder specimen, compression test for cube specimen and flexural test for prism specimen also done and the test for sand, cement and coarse aggregate were separately conducted. The comparative study of conventional concrete with that of the polypropylene fiber in concrete and also silica added concrete where done and represented in charts.

INVESTIGATION ON GEOGRID BASED FERRO CEMENT SLABS

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The development and construction of light weight pre-fabricated sandwich structural elements in building construction is a growing trend in construction industry all over the world. The ferro-cement panel has high strength to weight ratio, reduced weight, and good thermal insulation characteristics. the thickness of panels are in the order of 20 to 40 mm and steel meshes were widely used for construction. The major issues found in these panels are in the form corrosion and deterioration. To overcome this deficiency, the present study attempted to investigate on the non-corrosive geo-grid plastic meshes by replacing the steel wires meshes for the construction of ferro-cement. Geo-grids are widely used as reinforcement in the soil retaining systems and for the finishing works. In the investigation, the geo-grid meshes which are developed from pvc are used for construction of ferro-cement slabs for various applications. The geogrid meshes with different reinforcing combinations are examined to explore the various possibilities of using these panels for different purposes including lindals, water tanks and other storage tanks, wall panels and etc., a companion slab which is reinforced with pvc square meshes alone is casted and tested to compare the results of slabs with other reinforcing combinations. A slabs with pvc square meshes and 3mm GI wire in both the slab directions, a slab with pvc square meshes and 3mm GI wire in shorter direction and 6mm steel rods in longer directions and slabs with Teflon square meshes and 6mm steel rods in both and slab directions are casted and tested. The structural behavior was monitored by reading the deflection and by observing the crack pattern. The companion slab showed adequate strength to bare its self weight and it is found insufficient for the structural applications. This deficiency is due to poor tensile strength of geogrid plastic which needs further more investigation with high strength geogrid plastics for the better performance. The ferro-cement panels with additional reinforcement performed by with adequate structural strengths still the issues with corrosion is unsolved in the present study which needs further investigation for the best structural applications in the prefabricated rcc structural systems in future

NUMERICAL SIMULATING OF PLATE BONDED CRACKED REINFORCED CONCRETE BEAMS

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A three dimensional nonlinear finite element analysis modelling framework was developed for simulating the behaviour of beams retrofitted with Carbon Fiber Reinforced Polymer (CFRP). The strength of composite structure is primarily depending on the interfacial bond strength between the surfaces of different components. The distressed concrete structures are frequently required with CFRP laminates and the behaviour is depends on the interfacial interaction between the concrete to glue and glue to CFRP laminate. The main advantages of using CFRP laminates are their light weight and durability, which results in ease of handling and maintenance.

The present study deals with the comparison of analytical results obtained from a standard finite element software, ABAQUS. Concrete was modelled using a plastic damage model. Steel bars were modelled as as elastic perfectly plastic material, with perfect bond between concrete and steel. A cohesive model was used for modelling the cfrp- concrete interface. The nonlinear material properties for modelling the concrete are obtained from the literatures. With these material properties the model has given satisfactory results.