ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)

Vol. 4, Issue 8, August 2018

Compressive strength of concrete using coconut fibre

K.N.JANARDHANAN[1]

[1]Lecturer in Civil Engineering

Murugappa Polytechnic College, Chennai-62.

Email id: shakthijana2015@gmail.com

Abstract:

The work ability of the concrete with fibers was discovered to be extremely less. Subsequently, it can be improved to have a superior slump esteem. Along these lines, certain admixtures, for example, air entraining agents and super plasticizers can be utilized in order to improve the stream characteristics of concrete. Hand mixing turns out to be tedious and prompts formation of a non-homogenous mix. Certain chemicals can be added in order to supplant hand mixing by machine mixing. Admixtures can likewise be utilized to lessen the quantity of voids which are shaped because of the presence of fibers in the concrete. It might help improve the strength characteristics of concrete. It was tracked down that the outcomes did not improve by addition of fibers past 5% of the weight of cement in the mix. Thus, the optimum increase in the strength of concrete by addition of fibers lies between addition of fibers somewhere in the range of 0% and 3% ofthe weight of cement in the mix.

Keywords: Concrete, coconut, fibers.

1. Introduction:

With the mission for moderate housing system for both the country and metropolitan population in Ghana and other developing countries, various recommendations focussing on cutting down conventional building material expenses have been advanced [1]. One of the suggestions in the front has been the sourcing, improvement and utilization of alternative, non-conventional local construction materials including the possibility of using some

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)

Vol. 4, Issue 8, August 2018

agricultural squanders as construction materials [2]. Natural reinforcing materials can be obtained requiring little to no effort and low degrees of energy using local man power and technology. Utilization of natural fibers as a type of concrete enhancement is of particular interest to less created regions where conventional construction materials are not readily available or are excessively expensive. Coconut and sisal-fiber reinforced concrete have been utilized for making rooftop tiles, corrugated sheets, pipes, silos and tanks [3].Concrete made with portland cement has certain characteristics: it is strong in compression however frail in tension and will in general be brittle. The shortcoming in tension can be overwhelmed by the utilization of conventional steel barreinforcement and somewhat by the inclusion of a sufficient volume of certain fibers [4]. The utilization of fibers likewise changes the behavior of the fiber-matrix composite after it has broken, along these lines improving its toughness. The general goal for this exploration is to investigate the potential of using waste and low energy materials for domestic construction, principally in Ghana [5].

2. Methodology:

The objective ofthis research is to experiment on the utilization of coconut fibers as an enhancement of concrete.Coconut fibers are not normally utilized in the construction industry yet are frequently discarded as squanders. Coconut fibers obtained from coconut husk, belonging to the family of palm fibers, are agricultural side-effects obtained in the processing of coconut oil, and are available in large quantities in the tropical regions of the world, most especially in Africa, Asia and southern America. In Ghana, they are available in large quantities in the southern piece of the country. Coconut fiber has been utilized to upgrade concrete and mortar, and has demonstrated to improve the toughness of the concrete and mortar (Gram, 1983, and Ramakrishna, et al., 2005). In any case, the issue of long term durability has not yet been addressed. It has additionally been noticed that the degree of enhancement of concrete by coconut fibers relied upon the kind of coconut species and the sub-region that the coconut plant was cultivated. The specific objective of experimenting on

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)

Vol. 4, Issue 8, August 2018

coconut fiber as an enhancement of concrete is two overlay. Firstly, to evaluate if the fibers of the species grown in Ghana would improve the mechanical properties of concrete like the species in Latin America and South East Asia. Besides, whenever it was demonstrated that vital mechanical properties of could be upgraded by coconut fiber from species grown in Ghana, at that point further investigation would be carried out on improving the long term durability of concrete and mortar with coconut fibers as an enhancement. The coconut fiber utilized for this experiment is from Ghana and is from the coconut type known as the MYD+PT hybrid(combination of Malayan Yellow Dwarf and Penuate Tall). This is the sort of coconut that is at present being cultivated after the devastating assault on the African tall spices by the Cape SaintPaul disease (since 1990). The figure 1 shows concrete arranged with coconut fiber.

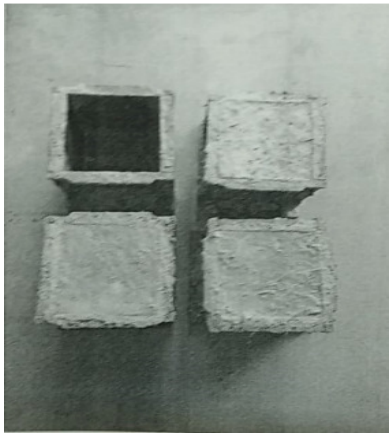

Figure 1: Concrete prepared with coconut fiber.

Concrete is a composition of coarse aggregate, fine aggregate, binding materialand water in such proportions, that sets into a monolithic mass when concrete is utilized without anyone else it is called mass concrete and when it is reinforced with steel it is called reinforced concrete.

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)

Vol. 4, Issue 8, August 2018

BINDING MATERIALS

Cement or limes are utilized as the binding material. They bind the individual units of fine aggregate and coarse aggregate by virtue of its properties of setting or hardening in combination with water. The binding material assists with filling voids and imparts density to concrete.

Fine Aggregate serves to fill voids in coarse aggregate and decreases the quantity of cement. The fine aggregate is sand. Crushed stone sand may likewise be utilized. It should go through a sieve having 3/16 square meshes. Fine aggregate ought to be clean, hard, strong, durable and chemically inert.It's grains ought to be sharp and angular. It ought to be highly siliceous and liberated from impurities like clay, loam, dust, coal particles and organic matter.

Coarse Aggregate is the main filler and structures the bulk of concrete, broken stones, broken bricks and gravels are generally utilized as coarse aggregates. Granite, basalt are likewise magnificent coarseaggregate. Crushing strength and water tightness of concrete and resistance to mileage rely on the aggregate. The aggregate ought to be clean thick, hard, strong durable and sound.

Water facilitates the spreading of cement over the aggregates and regulates the consistency. Water utilized ought to be clean. Ocean water ought not be utilized as it hinders setting.

CASTING OF CUBES PROCEDURE:

The material required for casting the cubes are gathered by weight and make to prepared for use.Take the sand and cement in plate, mix it thoroughly, at that point mix with 20mm coarseaggregate.After mixXing of the ingredients, measure the required quantity of water and againmix the mixture with estimated quantity of water.. Keep the shape on a G.I sheet horizontally and apply oil for inner side of themould.. Check bolts and nuts of the form in

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)

Vol. 4, Issue 8, August 2018

legitimate position.Fill concrete into the shape in layer approximately 50mm deep.compaction is finished by hand, pack the concrete with the standard bar, strokes being uniformly distributed over the cross-section of the mould.For 1 50mm,number of strokes ought not be under 35% per layer.. If compaction is finished by vibration, at that point each layer by methods for suitable vibrating hammer or vibrator or vibrating table.Level the top surface of shape and finish the If identification checks on cubes.Repeat a similar technique for casting the other cubes.And the cubes are relieved for 7 and 28 days.And the test outcomes is contrasted and the provisions.

3. Conclusion:

Coconut fiber being low in density lessens the general weight of the fiber reinforced concretethus it can be utilized as a primary light weight concrete.By reinforcing the concrete with coconut fibers which are unreservedly available, we can diminish theenvironmental waste.Flexural strength increases if there should arise an occurrence of 1% fiber mix. Consequently, economy can be achieved inconstruction.Since, 0.5% and 0.75 % fibers show ideal outcomes, it can be inferred that fiber contentshould not be utilized past 1%.

References:

1.M.S Shetty, Concrete Technology Theory and Practice, Published By S. Chand AndCompany, Ram Nagar, New Delhi.

2. IS 456-2000 Plain and reinforced concrete - code of practice. IS 516:1959 Method oftest for strength of concrete.

3. IS 383:1970 - Specification for coarse and fine aggregates from natural resources forConcrete.

ISSN (ONLINE): 2454-9762
ISSN (PRINT): 2454-9762
Available online at www.ijarmate.com

International Journal of Advanced Research in Management, Architecture, Technology and Engineering (IJARMATE)

Vol. 4, Issue 8, August 2018

4. IS 269:1989 Specification for ordinary Portland cement, 33 grade.

5.IS 456:2000 Code of practice for plain and reinforced concrete.