

A Critical Review on Bamboo Reinforced Concrete Beam

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Abstract: *In the world concrete is a man-made material. Concrete may be a common artifact within the world, reinforcement utilized in concrete is kind of costly. There's a less expensive reinforcing material which will be utilized in reinforced concrete. For temporary structure and scaffolding, bamboo used as reinforced material. In structural engineering, bamboo is used as reinforced material in concrete. Bamboo contains good water absorption property it's going to cause reduce the mechanical properties and structural failure.*

Key Words: Bamboo Reinforcement, Tensile Strength, Water Absorption, Shape of Bamboo, Durability.

1. INTRODUCTION:

Commonly concrete used as a building material, it's very important to create the event of construction, cost-effective material. Because of expensive prices and for low-cost housing and temporary structure steel is very difficult to obtain for developing countries.

Around the world, many researchers are starting to explore the utilization of low-cost reinforced material as building construction material. Bamboo is one of the important substitutes among all possibilities. Bamboo is the fastest growing plant which we are using as a building material. It is an easily available and naturally growing plant in many parts. Transportation and harvesting cost is very less for bamboo. Manufacturing cost is very less compared to steel. Bamboo encompasses a good lastingness and light-weight weight. Bamboo features a good water absorption capacity it should reduce the mechanical properties and causes structural failure. there's have to control the water abortion of bamboo. there's have to use proper seasoning method to scale back the water absorption.

Bamboo is in a position to resist more tension than compression. the fireplace resistance is extremely good thanks to the high content of silicate acid.

2. PROPERTIES OF BAMBOO:

2.1 Tensile strength: Bamboo fibers are run axially. The outer zone of the bamboo has very elastic vascular bundles that have high tensile strength. The durability of those fibers is higher than that of steel

2.2 Shrinking: Bamboo shrinks quite wood when it loses water. The canes can belittle the nodes.

2.3 Fire resistance: the hearth resistance is extremely good due to the high content of silicate acid. It can stand a temperature of 400° C if it filled up with water, while the water cooks inside

2.4 Strength Compressive: Compressive strength is affected by the portion of lignin. Whereas the buckling and the tension strength are influenced by the high portion of the cellulose because it represents the building substance of the bamboo fiber.

3. LITERATURE SURVEY:

Sanjeev Gill, Dr. Rajiv Kumar, bamboo can be utilized as reinforcement in concrete. Bamboo may be a cheap substitute for steel because it grows much faster and could be a renewable source after 4-5 years. The strength of bamboo is directly affected by water absorption. The lastingness of bamboo is sweet so it will be used as reinforcement. The behavior of bamboo as a reinforcement is that the same as a plain steel bar.[1]

Pratish Kumar Singh, Aashish Jodhani, Abhay Pratap Singh, vertical position is more durable

than in horizontal it has been proved. If heat, either dry or applied the pressure bamboo can be permanently bent. the sort of coating will rely upon the seasoning material is employed. A brush coat or dip coat of emulsion is beneficial for the treatment of bamboo. Bamboo ferroconcrete beam design is comparable to steel reinforcing design[2]

Anurag Nayak, Arehant S Bajaj, Abhishek Jain, Apoorv Khandelwal, Hirdesh Tiwari, In construction work bamboo can replace by timber and other material. As reinforcing material when seasoned bamboo is used it should receive a waterproofing coating to cut back swelling when to bear with concrete. Bamboo will swell before the concrete has developed sufficient strength if we do not use a proper coating. As compared to the steel bamboo reinforcement technique is cheap.[3]

Dr. Ashok Kumar Gupta, Dr. Rajiv Ganguly, Ankit Singh Mehra, Bamboo is a very lightweight material because of its incredibly low density. By increasing nodes, water absorption capacity is also increased. But tensile stress increase by increasing the number of nodes.[4]

Atul Agarwal, Bhardwaj Nanda, Damodar Maity, Adhesive material has good resistance to water, oil and many other solvent. It observes that adhesive bonding strength at the interface of the bamboo concrete composite is higher.[5]

4. CONCLUSIONS:

As a reinforcement in R.C.C. structure bamboo can use as an occasional housing or temporary structure. Bamboo can bear enduringness up to 370

N/mm². It is in between 120 N/mm² to 370 N/mm². Mechanical properties of bamboo are reduced due to its water absorption capacity. By weight water content capacity of bamboo is between 50%-60%. Proper seasoning treatment should be required to scale back the water absorption capacity. If we use bituminous paint, epoxy, and coal tar then the seasoning of bamboo is excellent. Bamboo needs to apply epoxy to bond with concrete because bamboo has low bond stress with concrete.

Epoxy should apply by brush in a thin coat, the thickness of the epoxy can fluctuate the bonding with concrete. It can be used as reinforcement because the behavior of bamboo is quite the same as steel. Bamboo reinforcement concrete design is nearly the same as R.C.C. steel beam. Bamboo is light in weight due to its low density.

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