

# Experimental Studies on Bendable Concrete

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**ABSTRACT:** Civil Engineering in the present days undergoes sea changes both in theory and practice. Smart materials, prefabricated structures, and architectural elements use of light weight materials and similar other activities are taking affront seat in the advancement of construction. One such advancement is bendable concrete in the civil engineering industries. Our study is about fabrication and experimental investigation of this bendable concrete which is highly an advanced and sophisticated concrete technology. Only a few works are reported as of now as it is now a new technology. In view of this even a small amount of research work will assume much significance. In our project work we have adopted this new found technique. We have used the following materials to make the specimens.

## Metallic fibre mesh reinforced concrete slab

- Plastic fibre reinforced concrete slab
- Glass fibre reinforced concrete slab
- Reinforced concrete slab for comparison purpose

To demonstrate the superiority of bendable concrete, vis-a-vis reinforced concrete, reinforced and plain cement concrete slabs were also cast for comparison purposes. On testing and comparison with each one of Plastic Fibre embedded with concrete, Metallic Fibre embedded with concrete and Glass Fibre based bendable concrete it was found the superiority of strength identification vis-a- vis the conventional concrete strength. In fact the strength is much improved around the same time stupendous ductility is achieved. Further the four specimens tested gave very good performance characteristics of bendable concrete..

## I INTRODUCTION

This paper written to introduce the prime concept of bendable concrete.

In the present day construction environments and in the future this concept is going to be the main criteria in the civil engineering technology both in theory and practice. In the construction technology, fast phased developments are taking place which give advanced and economic material usage and flexibility in the structural constructional elements. One such promising technology is bendable concrete. [13], [15], [17]

The experimental results show encouraging trend for this type of concrete of bendable concrete. The primary objective of the study is exploring a constructional structural element through a bendable concrete technology as a prefabricated structural element and a preferred element over conventional concrete element. The present study aims at experimental investigation of bendable concrete. The primary objective of the study is exploring a constructional structural element through a bendable concrete technology as a prefabricated structural element and a preferred element over conventional concrete element. [7],[9],[11]

## II. TESTED SPECIMEN

S.No	Type of material used in slab	Load at mild cracks (kN)	Load at major cracks(kN)
1.	Reinforced concrete slab	21.25	33.04
2.	Metallic fibre reinforced concrete slab	9.3	12.5
3.	Plastic fibre reinforced concrete slab	12.6	32.3

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Fig 1: Metallic fibre reinforced slab



Fig 2: Reinforced concrete slab



Fig 3: Plastic fibre reinforced concrete slab

### III. TEST RESULTS

The specimens are tested in Universal Testing Machine (UTM) and the loads are noted for mild cracks and also for major cracks as shown in the table. [19],[21],[23]

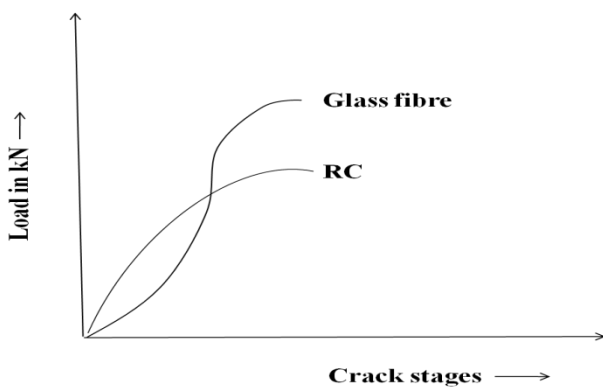


Fig . 4-Glass Fibre Vs Reinforced Concrete

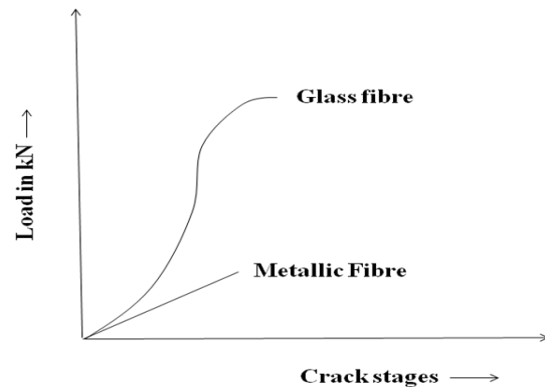


Fig 5 -Glass Fibre Vs Metallic Fibre

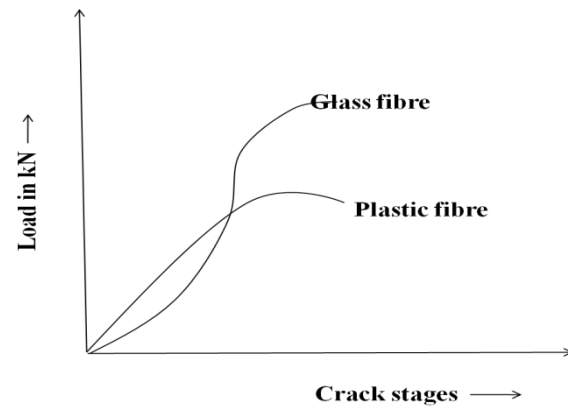


Fig 6 -Glass Fibre Vs Plastic Fibre

### IV CONCLUSIONS

- ❖ Bendable concrete elements are now becoming high worth research. This methodology is the far advanced construction technology practised nowadays.
- ❖ Due to the demands by clients the architectural elements especially in high raise buildings an undergoing sophisticated look in non-conventional geometrical shape. In the present day construction environment, sea changes are taking place to have innovative ideas in the design and construction. [25],[27],[29]
- ❖ For the above bendable concrete offers a new paradigm the design and construction that gives a light weight structural elements will economise the project with proper design.
- ❖ In the bendable concrete, the heavy reinforcements are avoided
- ❖ Light weight reinforcements through fibres of different materials including steel fibres, glass fibres and wire mesh, plastic fibres and similar other fibre based materials will be of much use and purpose.
- ❖ A sustained economy is achieved by this



light weight bendable concrete elements. Especially the bending of structural elements at factory will give a neat finish and architectural elegance.

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