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USE OF GLASS FIBER CONCRETE

Syed Intikhab Zia

M.Tech Student, Civil Engineering, Roorke Institute Of Technology, Uttrakhand ,India

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Abstract ***Glass-Fiber reinforced concrete (G R C) is a material made up of cementatious matrix composed of cement, sand, water and admixtures , in which short length glass fiber are dispersed , due to the high corrosion-resistance ability in Glass Fiber Reinforced Polymers (GFRP), this reinforcement type is developing to be promising alternative reinforcement construction materials for concrete bridge decks currently . It has been widely used in the construction industry for non-structural elements , like façade panels , piping and channels. GRP offers many advantages, such as being lightweight fire resistance , good appearance and strength. In this study trial tests for concrete with glass fiber without glass fiber are conducted to indicate the difference in compressive strength and flexural strength by using cubes of varying sizes***

Keywords- *glass Fiber, Compressive Strength, Cost, Flexural Strength, Paver Block, Water Absorption.*

Introduction

Glass-Fiber reinforced concrete (G R C) is a material made up of cementatious matrix composed of cement, sand, water and admixtures , in which short length glass fiber are dispersed , due to the high corrosion-resistance ability in Glass Fiber Reinforced Polymers (GFRP), this reinforcement type is developing to be promising alternative reinforcement construction materials for concrete bridge decks currently . It has been widely used in the construction industry for non- structural elements , like façade panels , piping and channels. GRP offers many advantages, such as being lightweight fire restitance , good appearance and strength. In this study trial tests for concrete with glass fiber without glass fiber are conducted to indicate the difference in compressive strength and flexural strength by using cubes of varying sizes

OBJECT STUDY

Glass-Fiber reinforced concrete (G R C) is a material made up of cementatious matrix composed of cement, sand, water and admixtures , in which short length glass fiber are dispersed , due to the high corrosion-resistance ability in Glass Fiber Reinforced Polymers (GFRP), this reinforcement type is developing to be promising alternative reinforcement construction materials for concrete bridge decks currently . It has been widely used in the construction industry for non- structural elements , like façade panels , piping and channels. GRP offers many advantages, such as being lightweight fire restitance , good appearance and strength. In this study trial tests for concrete with glass fiber without glass fiber are conducted to indicate the difference in compressive strength and flexural strength by using cubes of varying sizes

Methodology of the study

Glass-Fiber reinforced concrete (G R C) is a material made up of cementatious matrix composed of cement, sand, water and admixtures , in which short length glass fiber are dispersed , due to the high corrosion-resistance ability in Glass Fiber Reinforced Polymers (GFRP), this reinforcement type is developing to be promising alternative reinforcement construction materials for concrete bridge decks currently . It has been widely used in the construction industry for non- structural elements , like façade panels , piping and channels. GRP offers many advantages, such as being lightweight fire restitance , good appearance and strength. In this study trial tests for concrete with glass fiber without glass fiber are conducted to indicate the difference in compressive strength and flexural strength by using cubes of varying sizes

CURING

After moulding , the specimens are stored on the site free from vibration under damp matting , sack or other similar material for 24 hours from the time

of addition of water to the other ingredients .

The temperature of place of storages was within the range of 22 c to 32 c . After a period of 24 hours cubs were marked . After removing from the moulds , cubes were stored in clean potable water at a temperature of 24 c to 30 c until they were transported to the testing laboratory .

$Fb = PL/bd^2$

When (a) is grater than 20 cms or

$Fb = 3Pa/bd^2$

When (a) is less then 20cms but grater than 17cms

GRC RAW MATERIAL COST

S. NO	Material	Unit Price
1	White cement	Rs. 12.50per kg
2	Silica Sand	Rs. 4.00 per kg
3	**AR-Glass Fiber**	**Rs. 250 per kg**
4	**Hardener (a)** **(Cemplast) Black** **Liquid plasticizer**	**Rs. 98 per litre**
5	(SBR-Styrene butadiene rubber)	Rs. 165 per kg

*mix of 100 kg GRC (TYPYCAL)

Result of tests

Sample No.	**% Of Glass Fiber**	**Flexural strength MPa (N/mm²) 7 days**	**Average Flexural Strength MPa**
NO.1	**2.0**	**4.99**	**5.18**
No.2	**2.0**	**5.52**	**5.18**
No.3	**2.0**	**5.05**	**5.18**
NO.1	**2.5**	**5.0**	**5.21**
No.2	**2.5**	**5.58**	**5.21**
No.3	**2.5**	**5.05**	**5.21**
Sample No.	**% Of Glass Fiber**	**Flexural strength MPa (N/mm²) 28 days**	**Average Flexural Strength MPa**
NO.4	**2.0**	**5.50**	**5.85**
No.5	2.0	6.42	5.85
No.6	**2.0**	**5.64**	**5.85**
NO.4	**2.5**	**5.48**	**5.84**
No.5	**2.5**	**6.00**	**5.84**
No.6	**2.5**	**6.05**	**5.84**

➢ Discussion

Following points emerge from the test result :

- As seen from table 5 , the seven days average compressive strength of concrete is maximum when 2% of glass fiber are used .
- According to this result , increasing weight of glass fiber in normal concrete affect the cohesiveness between the practical of concrete of this result in degrading of compressive strength ,flexural and tensile strength .
- For (M60) mix ,a percentage of glass fiber of 2**%** gave a flexural strength of (6.15MPa) , which is 10% more than that obtained at 2%.
- One should take care of glass fiber during mixing with concrete . It should be not allow to mix more than 1 min otherwise it will be break to tiny pieces , and it can not be worked with .

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