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EXPERIMENTAL STUDY ON EFFECT OF CRUMB RUBBER AND WASTE GLASS ON PROPERTIES OF CONCRETE

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Abstract
Concrete is premier construction material across the world and the most widely used in all types of civil engineering works, including infrastructures, low and high-rise buildings, defence installations, environment protection and local domestic developments. As India is growing towards developing country, uncontrolled and rapid industrialization and urbanization is the major cause of rapid environmental degradation. Use of nature's freely environmental resources in an uncontrolled manner and throwing of waste to the environment has caused more stress to the assimilative capacity to dilute and disperse the waste. For this project we have made the survey of MIDC (Maharashtra Industrial Development Corporation) Amravati. Various industries are situated in MIDC, from these industries wastes such as plastic, paper, aluminium, rice husk, wheat husk, bitumen, rubber, glass waste etc. The waste from all other industries is reused and recycled for the specific purpose except the waste from rubber and glass industry. The rubber has properties like elasticity, light weight, vibration absorption capacity, adhesive and impermeable; we can use this waste material in concrete to replace natural aggregates. Also, waste glass have property of toughness, strength and durability, we have chosen it to use in concrete mix with some environmental benefits and for the purpose of management of this solid waste too.
Keywords: *Crumb rubber, Waste glass, Concrete*

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1. INTRODUCTION

Concrete is premier construction material across the world and the most widely used in all types of civil engineering works, including infrastructures, low and high-rise buildings, defence installations, environment protection and local/domestic developments. Modern times require introduction of new construction materials and procedures. One of the ways to create a new material is to reinforce the existing one. For instance, the cost effectiveness and strength properties of reinforced concrete are better than those of plain concrete. These requirements cannot be fulfilled by conventional concrete, as it possesses very low tensile strength, limiting ductility and little resistance to cracking. Internal micro cracks are inherently present in concrete and its poor tensile strength is due to propagation of such micro cracks, eventually leading to brittle micro cracks of concrete. One of the most advanced types of concrete reinforcement is by using crumb rubber particles and glass waste as fine aggregates in concrete.

As India is growing towards developing country, uncontrolled and rapid industrialization and urbanization is the major cause of rapid environmental degradation. The depletion of waste has threatened the life of future generations. Increasing number of industries and production of various categories of wastes causes major environmental pollution. For this project we have made the survey of MIDC (Maharashtra Industrial Development Corporation) Amravati. Various industries are situated in MIDC, from these industries wastes such as plastic, paper, aluminium, rice husk, wheat husk, bitumen, rubber, glass waste etc. The waste from all other industries is reused and recycled for the specific purpose except the waste from rubber and glass industry. The rubber has properties like elasticity, light weight, vibration absorption capacity, adhesive and impermeable; we can use this waste material in concrete to replace natural aggregates. Also, waste glass have property of toughness, strength and durability, we have chosen it to use in concrete mix with some environmental benefits and for the purpose of management of this solid waste too.

1.1OBJECTIVES AND SCOPE

The purpose of this research is to study the behaviour and performance of the concrete beam, cylinders and cubes reinforced with glass, crumb rubber and compare its properties with the properties of conventional concrete.

Objectives of this study are as follows

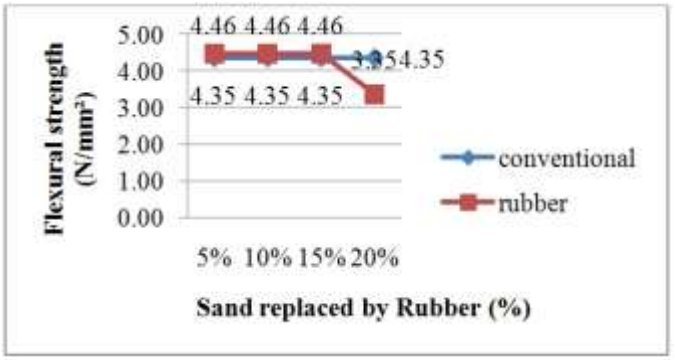
1) To study the flexural performance of concrete beams with waste glass and crumbed rubber.

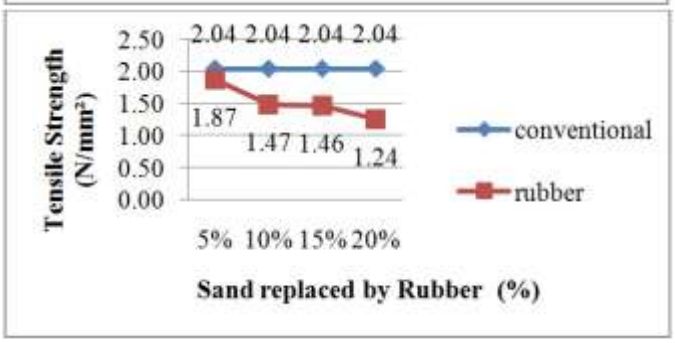
2) To study the compressive strength of concrete cubes with waste glass and crumbed rubber.
3) To study the tensile strength of concrete cylinders with waste glass and crumbed rubber.
4) To study the effect on workability of fresh concrete with waste glass and crumbed rubber.

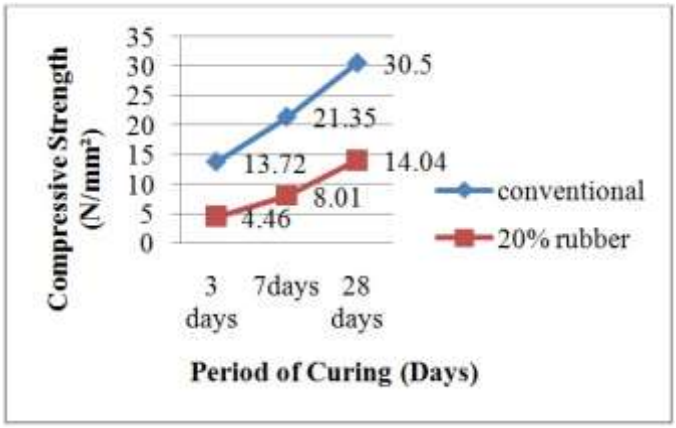
2 METHODOLOGY

1) The density of crumb rubber concrete is decreased by 25.39 kN/sq.m to 23.29 kN/sq.m for 0% replacement of sand by crumbed rubber. If further crumbed rubber is added we may reach to density of light weight concrete for non structural elements
2) The 28 days strength of crumbed concrete is reduced as we increase the percentage of crumbed rubber
3) Flexural strength is increased by 15-17% by increase in crumbed rubber
4) Tensile strength is negligible
5) The 28 days compressive strength of wgc is increased by 46% than the conventional concrete for replacement of 15% of waste glass gives higher strength instead of sand. It is possible to achieve economy
6) Tensile strength is increased by 18%
7)Flexural strength is increased by 33% in M25
8) From the above observation it is also conducted that when we use waste glass concrete of grade M20, it approximately gives strength of M30

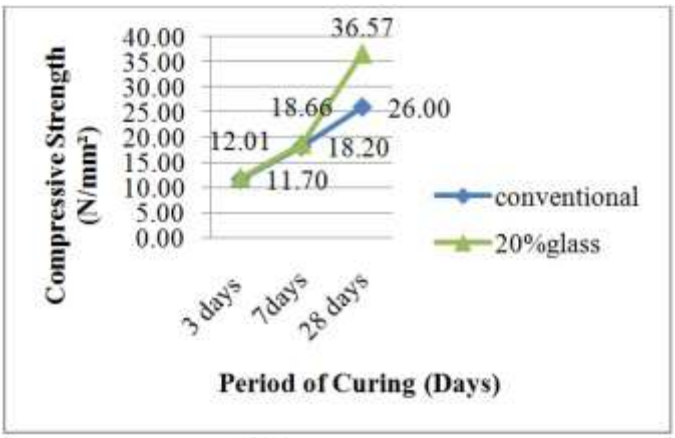
2.1 RESULTS OF CRC ON CC

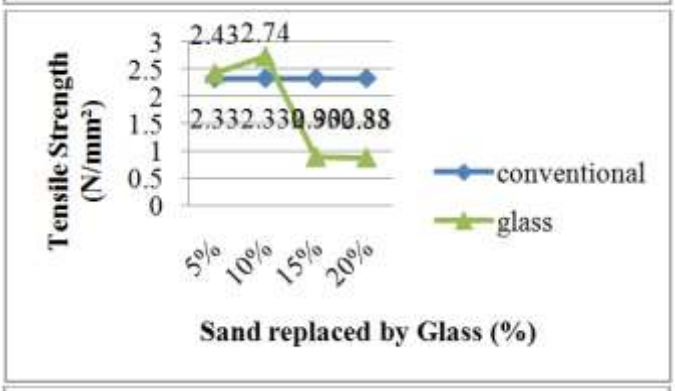


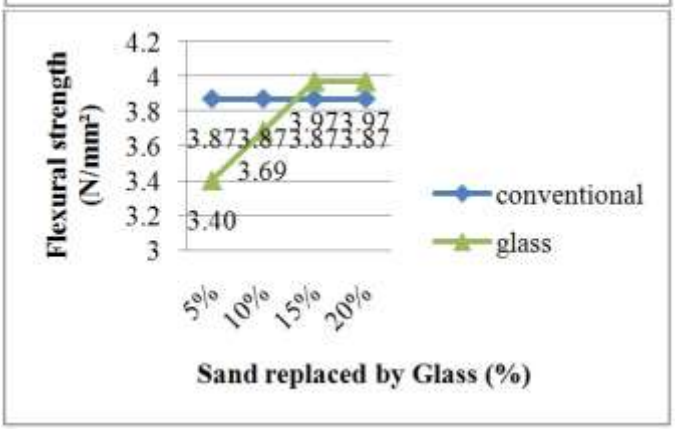




2.2 RESULTS OF WGC ON CC







3. CONCLUSION

Waste Is Minimised
Compressive Strength, Tensile Strength And Flexural Strength is increased Economy Achieved

ACKNOWLEDGEMENT

It gives me great pleasure in bringing out the project entitled "Experimental Study On Effects Of Crumb Rubber & Waste Glass On Properties Of Conventional Concrete" I would like thank all those who directly and indirect help me during work

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