Properties of Mortar Incorporating Polyvinyl Alcohol Fibers with Cement Mortar of Clay Brick Masonry

Shivani Dholpuriya[1] Amarta Jain[2]
[1]Research Scholar [2]Assistant Professor
[1,2]Department of Civil Engineering
[1,2]SIRT-E, Bhopal, India

Abstract— Due to the increase in growth of industrial sectors the power of requirement of the country is rapidly increasing. India depends on Thermal power as its main source, thus increasing power requirements every year. The present scenario of our country shows that 75% of the country's total installed power generation is thermal of which coal-based generation is 90%.

Keywords: Polyvinyl Alcohol Fibers, Cement Mortar, Clay Brick Masonry

I. INTRODUCTION

PVA (polyvinyl alcohol) fibers are superior reinforcement fibers for concrete and mortar. PVA fibers are well-suited for a large form of applications owing to their superior crack-fighting properties. PVA fibbers' are distinctive in their ability to form a molecular bond with mortar and concrete. A PVA fiber is a high-performance reinforcement fiber for mortar. Due to using PVA fiber in mortar, we can arrest the hair cracks. Improve the frost and resistance of concrete. PVA fiber increases the toughness, impact resistance, and bending strength of concrete

A. Crack Reduction

A PVA fiber is also used to reduce many types of concrete cracks. To restrain shrinkage cracking, the fiber should be stiffer than the concrete. PVA fiber is reducing the formation of plastic shrinkage cracking and shrinkage. PVA fiber is enhancing the durability and toughness of concrete and mortar.

II. RESULT

The strength characteristics of waste material in concrete mixtures have been computed in the present work as follows:-

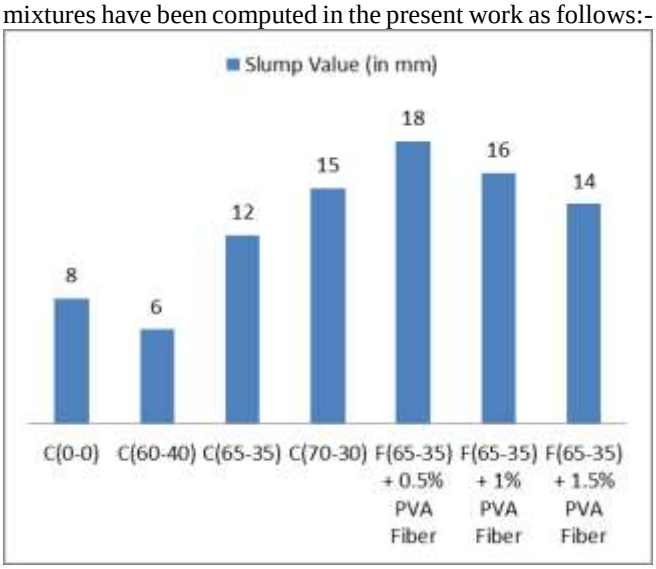

Fig. 1: Slump Height for Different mixes of ECC w/c 0.5

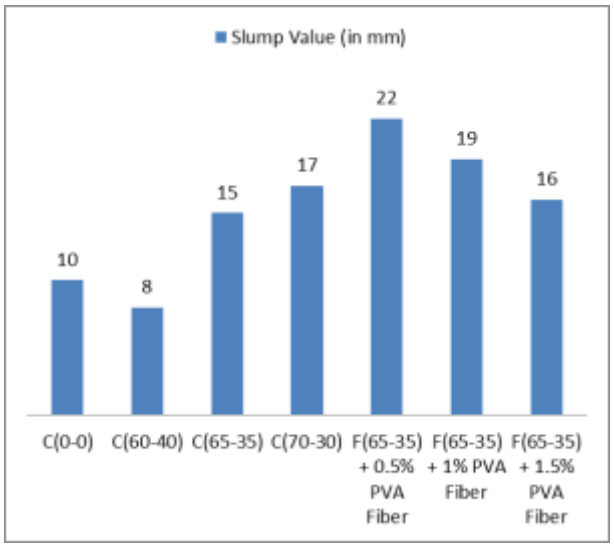

Fig. 2. Slump Height for Different mixes of ECC w/c 0.55

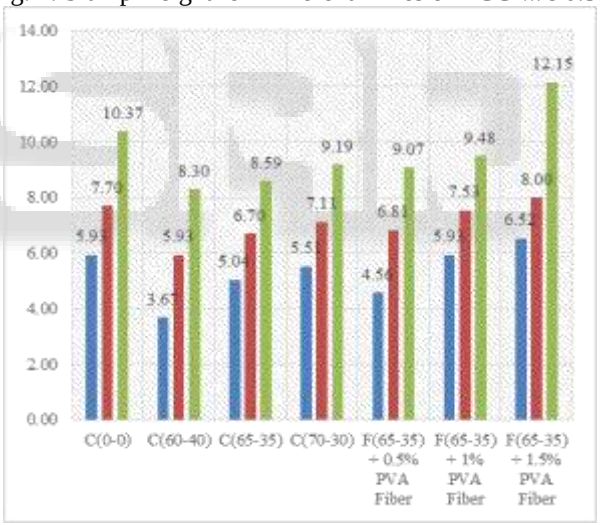

Fig. 3: Compressive Strength of Different Mix in Different Curing Periods

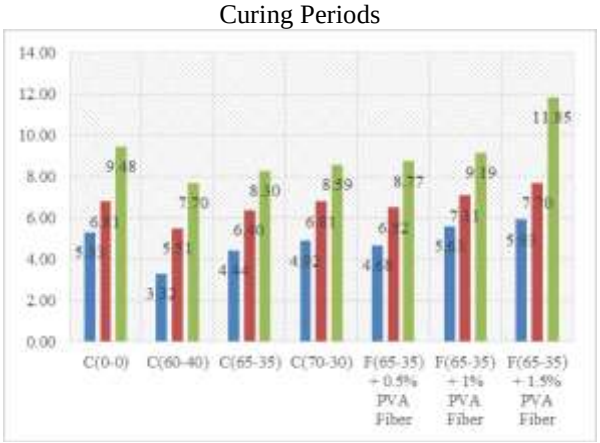

Fig. 4: Compressive Strength of Different Mix in Different Curing Periods

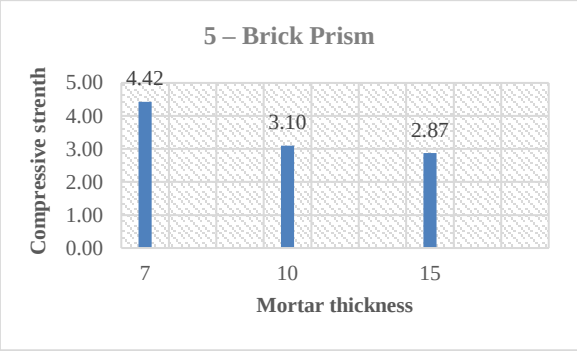

Fig. 5: Compressive Strength of prism (Different mortar thickness)

(a) Prism sample (b) During Compression (c) Loading after cracking

Fig. 6: Prism Test perform

III. CONCLUSIONS

The increment of fly ash in mortar increase workability but decreases the compressive strength. According to the Indian standard percentage of fly ash in cement is limited to 15 to 35% but we are increasing the percentage up to 45%, this increment gives higher workability and lesser strength.

The increment thickness of the mortar joint will directly reduce the compressive strength of the prism. The compressive strength testing on the 5-bricks prism specimen showed that the brickwork with a 7.0 mm thick mortar joint has higher compressive strength as compared to 10.0mm and 15.0 mm thick mortar joints.

The compressive strength testing on the cube showed tha the different water-cement ratio with fly ash gives higher workability but reduced compressive strength. 35% fly ash, 0.5 w/c ratios, 7mm thickness of mortar, and 1% PVA fiber are more economical because compressive strength and workability are also high.

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