



OPTIMIZATION OF FIBER REINFORCED CONCRETE IN DRAINAGE COVER APPLICATIONS

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ABSTRACT: Many a times the drainage covers that cover potholes for sewage and other underground civil access points are made from cast concrete. These structures lack durability owing to non-flexibility and do not sustain under cyclic load as in the vehicles on road moving over this drainage cover point . Considering that there are two load cycles per vehicle passing the durability study needs to be done for the structure. More over innovation needs to be done in this regards as to changes in material used for these drainage covers, FRC being a good option . This project will study the application of FRC technology to the drainage cover manufacturing , more over effect of specific gravity of mixture before it is cast (in form of slump test) on the structural durability and integrity of the product. The FRC will be developed, cast and tested in form of slabs that will be tested on the set up developed. Curing time will be same for all specimens as to 28 days. The durability of the specimens will be determined as to number of cycles the specimen with stands before failure, process variables being the specific gravity of mixture to be cast (tested by slump test) and percentage of fiber additive.

Keywords : FRC, slump test, durability

I. INTRODUCTION

Compared to other building materials such as metals and polymers, concrete is significantly bleeding, plastic settlement, thermal and shrinkage strains and stress concentrations imposed by external restraints. To produced macro-cracks due to an applied load, distributed micro-cracks propagate coalesce. When loads are increased the conditions of growth of critical crack rises.

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The micro and macro-fracturing processes can improve by using randomly distributed fiber materials. The formation of cracks smother by fiber. The resulting material with a random distribution of short, discontinuous fibers is termed fiber reinforced concrete (FRC) and is becoming a well-accepted mainstream construction material. Important progress has been made in the last thirty years towards perception of the short and long-term performances of fiber reinforced cementitious materials. Our ability to create safe reinforced concrete (R/C) structures has continued to grow with experience. The problem of infrastructure deterioration is not limited to the US alone. In countries like Japan and Korea, the annual outlay for infrastructure maintenance will soon surpass that of new construction. In Europe, it has been estimated that more than 50% of the European infrastructure needs improvements.

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