

## Abstract Details

**Title:** Fiber Reinforced Concrete and Deck Slab Cracking

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**Abstract:** Many bridges in the state of India have been identified to have cracking in the concrete deck. Cracking has been identified in the negative and positive moment regions of bridges on both the top and bottom surface and can appear before or shortly after the opening of the structure to live loads. Significant cracks widths and various degrees of cracking exist in different bridge systems including both concrete and steel superstructures. A number of causes have been identified, including thermal movement, plastic shrinkage, and early age settlement, as well as a number of other issues. Polymer fibers are a possible solution to many of the causes of bridge deck cracking: they have been shown to help early age properties like shrinkage and movement, and as a bonus, fibers improve post-cracking behavior. More understanding of the benefits and uses of polymer fibers in concrete is needed. The study researched the properties of four-polymer fiber: two of the fibers were microfibers, and two were macrofibers. Each fiber was tested at several dosage rates to identify optimum dosage levels. Early age shrinkage, long-term shrinkage, compressive strength and tensile strength were investigated. The most likely causes of the observed early-age cracking were found to be inadequate curing and failure to properly eliminate the risk of plastic shrinkage cracking. Macro fiber and microfiber were found to have different impacts on concrete behavior, with different optimal dosage rates. Microfiber greatly dried out the concrete mixture, hindering workability. The microfiber substantially reduced plastic shrinkage and improved concrete strength at early age, Macro fibers, while not hindering workability did not provide benefit as great as the microfiber to the concrete strength.

**Keywords:** Concrete, Slab Cracking, plastic shrinkage, Macro fibers.