PREFACE

Concrete is the most widely used construction material in India and other countries also. It is difficult to point out another material of construction which is as versatile as concrete. It is the material of choice where strength, performance, durability, impermeability, fire resistance and abrasion resistance are required. It is so closely associated with every construction activity that it touches every human being in his day to day living.

The useful physical properties and relatively low cost make cement based materials most widely used of civil engineering materials. However these materials have a number of drawbacks. To overcome these draw backs, a large number of mineral admixtures which are available in market are being beneficially used in making quality concrete.

The continuous research in the field of Concrete Technology to improve the properties of concrete has resulted in many new types of concrete and one among them is “polymer concrete”. The porosity in concrete is due to the air voids or water voids or due to the inherent porosity of gel structure itself. Due the porosity the strength of concrete is naturally reduced.

The durability of the concrete which is reinforced with conventional rebars is a major concern in aggressive environments. Many efforts are being made in the recent investigations to develop alternatives to conventional rebars. Fibre reinforced plastics and fibre reinforced concrete by using various types of fibres have shown better results because of their inherent ability to stop or to delay crack propagation.

During the last decade, developments in admixtures and mixing and placing methods have made it possible to produce concretes with much higher strengths (70-100 MPa), Conventional Concrete which has compressive strengths of less than 50
Concrete having compressive strength greater than 200 MPa is classified as ultra-high-strength concrete. One of the additives that have been tried in recent years was polymer. The idea of using polymers in cement-based materials dates back to early 1920s when the first patents on using natural rubber polymer-modified cementitious systems were issued. The first patent on the use of synthetic rubber latexes in such application was issued in 1932.

In the present work, the effect of volume percentage of steel fibres and Natural rubber latex on workability, compressive Strengths, split tensile strength and Flexural strengths of high performance concrete are evaluated for various water binder ratios ranging from 0.325, 0.350, 0.375, 0.40 and 0.425. Similarly the effect of steel fibres and Natural rubber latex on durability characteristics are also be determined. The mineral admixture “Metakaolin” has been brought from Vadodara, Gujarat. The polymer “Natural Rubber Latex” is obtained from Calicut in North Kerala.

From the results of laboratory tests, the optimum dosage of polymer in HPC is found to be 0.5% by weight of Binder. The optimum dosage of fibre is recommended as 1% from the present study. Detailed and useful conclusions have been drawn on the usage of Natural Rubber Latex in the production of fibre reinforced High Performance Concrete.

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