

Comparative Study of Flexural Strength of In-Service Concrete Pavement

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Abstract - One of the key developments required to characterize and improve the performance of (PCC) pavements is a better understanding of its in situ properties. Of great importance is the accurate estimation of in situ concrete strength, because it has a major impact on concrete performance. Damage identification of concrete structure has become a matter of primary importance in quality assessment and load capacity rating of the civil infrastructure, as well as in the planning of a maintenance schedule. There are currently many methods used to estimate in situ strength, each providing unique benefits. This investigation examined an experimental study of compressive strength and modulus of elasticity of in-service concrete pavement. The Compression test is conducted to determine the compressive strength further which is used in finding the flexural strength. The flexural strength is further used for calculation of life expectancy of the pavement.

Keywords: Concrete pavement; Life Expectancy; properties

I INTRODUCTION

Distresses of Cement Concrete pavement (CCP) is generally caused by a combination of self defect, environmental influence, and heavy load of repetitions. As concrete pavement influences by repetitive fatigue loadings, the fatigue properties and fatigue life of concrete have to be estimated for the consideration in design. For this purpose the evaluation of the service life is often necessary to measure its performance. Further, the damage identification of CCP has become a matter of primary importance in quality and load capacity. The flexural strength is expressed as "Modulus of Rupture" (MR) MPa. In this study the relation developed by (Raphael 1984), correlating flexural strength and compressive was used in finding flexural strength of concrete. In the present study measuring or comparing the strength of in-place concrete include: rebound hammer, penetration probe, pullouts, cast-in- place cylinders, tests of drilled cores, and load tests of the structural element. The core cutter samples were collected from the pavement, of which the flexural strength was determined. The portable mini core cutter was used to extract samples from the

pavement. Figure 1 shows the Flexural-to-compressive strength relationship.

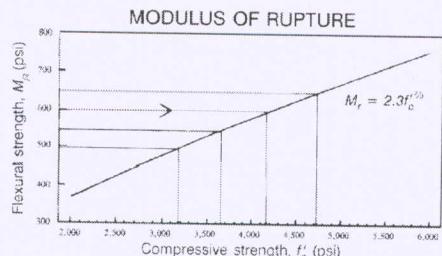


Figure 1. Flexural-to-compressive strength relationship

II OBJECTIVES OF THE STUDY

The present study was undertaken with the following objectives.

1. To study the compressive and flexural strength of in-service concrete pavement.
2. To study the life expectancy of the pavement slab.

III DESCRIPTION OF STUDY AREA

In order to make the "Comparative Study of Flexural Strength of In-service Concrete Pavement" the pavements were selected. These three pavements fall under the area of KUDA. The samples were collected under the wheel path. The Pavement stretches are

1. Battala Bazaar to MGM Hospital (Near Kasam. PullaiahColth Shop) (abbreviated as BB to MGM).
2. Pocham Maiden to Warangal Cross Road(Near Masjid) (abbreviated as PM to WGL).
3. Public Garden Road (abbreviated as PGR).

Mini core cutter (Twinstoneoy, type 32, made in Finland), is used to cut the samples from the pavement. It runs by petrol, the accelerator provided on the side of the equipment used to accelerate the machine.

IV EARLIER CORRELATIONS

Many investigations have been conducted in attempts to develop an accurate relationship between compressive, tensile, and flexural strength. The articles and opinions on the correlation between the different strength test