FINAL YEAR PROJECT REPORT

BACHELOR OF ENGINEERING (HONOURS)(CIVIL)

FACULTY OF CIVIL ENGINEERING

MARA INSTITUTE OF TECHNOLOGY

SHAH ALAM

SELANGOR

FATIGUE LIFE ASSESSEMENT OF PRESTRESSED CONCRETE RAILWAY SLEEPER

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"May Allah Bless Them All"

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ABSTRACT

The track modernization programmed involved the use monoblock prestressed concrete sleeper instead of wooden. A concrete sleeper has to withstand repeated loading of several million cycles during its estimated life of about 50 years. But to date, only a few research has taken place therefore a study on a fatigue life assessment of the sleepers is suggested.

Investigation on the prestressed concrete sleeper subjected to repeated constant amplitude sine load conducted at a constant frequency of 10 Hertz was carried out. Five specimens were tested of which one specimen as for a trial test, two specimens are tested on the static loading and the other two specimens on the fatigue test. The analysis will be focussed on the response of deflection to the applied load and no of applied load cycles, stress-strain relationship and crack behavior.

From the analysis, result Load versus Deflection, stress-strain relationship, behavior of crack mouth and crack length and Displacement versus no. of cycles were plotted. 75 % from yield load will be the mean load for fatigue test.

CHAPTER ONE
INTRODUCTION

1.1 GENERAL

As part of the ambitious track modernisation programs, railway industry have introduced prestressed concrete sleeper on the tracks at trunk routes. More than 2 million sleepers are now being produced by about 40 factories located at different parts of this country. A concrete sleeper has to withstand repeated loading of several millions cycles during its estimated life of about 50 years.

1.2 SCOPE OF STUDY

This experimental work was carried out to study life behaviour of prestressed concrete sleeper (PCS) under static and a simple fatigue load. A total of five specimens will be tested, where 2 specimens will be tested under the static load and the other 2 specimens will be tested under fatigue loading. The purpose of static load test being done is to determine the yield load of the beam, hence 75 % of yield load will be used as the mean load for the fatigue test.