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**STUDY ON
THE BEHAVIOUR OF THE
CONCRETE SLEEPER**

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SYNOPSIS.

This experimental project consists of preparing, fabricating and testing of prestressing post-tensioning concrete sleeper. The test specimen is tested simply supported and two point loads placed on the location of rail seats. The load applied until the prestressed post-tensioned concrete sleeper fails.

In this study only two samples of concrete sleeper is prepared and tested. The experimental results will be compared to the finite element programme "ANALYSIS SYSTEM" (ANSYS).

The test specimen load-deflection relationship, load-strain relationship will be produced, and the location of cracking will be shown.

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1.0 INTRODUCTION

Generally prestressing can be defined as the application of a predetermined force or moment to a structural member in such a manner that the combined internal stresses in the member, resulting from this force or moment and from any anticipated condition of external loading, will be confirmed within specific limit *(after James R. Libby, 1977)*.

Prestressed concrete goes two steps beyond reinforced concrete :

- i. all the concrete on the tensile side of neutral axis is put under an initial compressive stress of such a magnitude that all design loads which are to be applied to the structure in the future can reduce this stress but will not put the concrete in tension.
- ii. the prestress is applied in such a manner that it creates a moment of opposite sign to those which will be produced by applied dead and live loads.

In the ideal design this negative moment carries all the dead loads and creates the maximum allowable compressive stress in the concrete on the tensile side of the member.

The principles of prestressing have been applied to steel, timber, concrete and other materials. Both axially loaded and flexural members can be prestressed. Whether prestressing is applied to concrete, steel or orthes, its ultimate purpose is two folds :