

A Major Project Report on

**COMPARISON, TESTING AND STATISTICAL ANALYSIS OF
PRESTRESSED CONCRETE SLEEPERS MANUFACTURED
FOR INDIAN RAILWAY**

Submitted in Partial Fulfillment for the Award of the Degree of

**MASTER OF TECHNOLOGY
IN
STRUCTURAL ENGINEERING**

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CERTIFICATE

This is to certify that **Mr. Puneet Kumar Swarnakar**, a student of final semester M.Tech (Structural Engineering), Department of Civil and Environmental Engineering, during the session 2010-2012 has successfully completed the project work on "*Comparison, Testing and Statistical Analysis of Prestressed Concrete Sleeper Manufactured for Indian Railway* " under my guidance and supervision and has submitted a satisfactory report in partial fulfillment for the award of the degree of Master of Technology.

The assistance and help received during the course of investigation have been fully acknowledged. He is a good student and we wish him good luck in future.

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Declaration

I Certify that

- a. The work contained in this thesis is original and has been done by me under the guidance of my supervisor.
- b. The work has not been submitted to any other Institute for any degree or diploma.
- c. I have followed the guidelines provided by the University in preparing the thesis.
- d. I have conformed to the norms and guidelines given in the Ethical Code of Conduct of the Institute.
- e. Whenever I have used materials (data, theoretical analysis, figures, and text) from other sources, I have given due credit to them by citing them in the text of the thesis and giving their details in the references.

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ABSTRACT

A sound track is an important pre-requisite for the economic growth of the country. Concrete sleeper is the necessity of modern track all over the world to meet the challenge of higher speeds, higher density of traffic, higher axle load and long welded rails. Concrete sleeper is heavy, sturdy and capable of offering adequate lateral resistance to the track, where as wooden and metal sleepers were found to be lacking in fulfilling the requirements. Concrete is a versatile building material which can be moulded in any and size has made its impact in the field of railway engineering in the form of concrete sleeper and now a days India is in the position of producing more than one than one crore sleepers per annum after making its nascent beginning in 1969. The first experiment in production of concrete sleepers was made by Swiss Railway in 1904, French Railway in 1913 and German Railway in 1922. In India concrete sleeper are being manufactured by using either “longline method” or “stress bench method”. Concrete sleeper provides greater stability, best suited for machine maintenance, track circuited area and avoids fire, corrosion, theft etc.

Sleeper, after rail, is the most important component of track superstructure in conventional track. Keeping track geometry, bearing loads acted from rail and transferring to the ballast is the main duty of sleeper. Their quality conditions have considerable influence on geometry quality. Moreover, track maintenance costs affected by this element due to their higher number. For this, in order to reduce operation & maintenance volume and, in the other hand, for more recognition of concrete sleepers used in Indian Railways, some studies and field investigations carried out on concrete sleepers and its results expressed as categorization of concrete sleeper failures. This project, evaluates effective factors and the reasons of their creation, while considering failures and conventional defects during sleeper service life (including production stage, transportation, construction and operation), and proposed some approaches for their reduction.