

**INVESTIGATION ON FAILURE OF  
PRESTRESSED MONOBLOCK  
CONCRETE SLEEPERS SUBJECTED TO  
STATIC LOADING**

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By

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Report submitted in partial fulfillment of the requirements for  
the degree of  
**Bachelor of Engineering (Hons.) Civil (Infrastructure)**

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## **AUTHOR'S DECLARATION**

I declare that the work in this report was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This report has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## ABSTRACT

Railways in Malaysia are undoubtedly a various incorporated element that can possibly assume as an imperative part in the advancement of a manageable transportation framework in the nation. Therefore, failure of prestressed monoblock concrete sleepers under the static loading need to be investigate due to its role as one of the important part in railway. In this study, positive and negative moment test were used according to Australian Standard (AS 1085.14 – 2012) to investigate the design and ultimate load of the prestressed monoblock concrete sleeper under static loading. Many earlier researcher have conducted static test on the concrete sleeper such as D. K. Kumar, K.Sambasivarao, (2014), S. Kaewunruen and A. M. Remennikov (2005). However, the data they achieved cannot be relate completely with concrete sleepers in Malaysia due to several differences like standard and environment. This research will show the results of failure of prestressed monoblock concrete sleepers under the static loading that can be completely relevant to the concrete sleepers available in Malaysia. From positive moment test, no crack appeared on KTMB and EPMI sides when load of 176.94 kN which is its design load subjected to prestressed monoblock concrete sleeper, maintained for not less than 3 minutes. However, from negative moment test, crack appeared on EPMI side with the length of 10 mm when the design load of 176.94 kN subjected to concrete sleeper, maintained for not less than 3 minutes. Also, no changes for the earlier crack for both sides as well. And, 2 prestressed monoblock concrete sleeper were used in positive moment test and test until failure to obtain their ultimate load and load when the first crack appeared. The research proved that prestressed monoblock concrete sleeper can fail due to static loading for certain amount of load subjected to it, in this case which is 400 kN can fully damaged the sleeper. Hopefully, this research can be apply to improve the quality of concrete sleepers available in Malaysia and can be use as a references to other researchers.

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