

**COMPARATIVE STUDY ON SIMPLY
SUPPORTED PRE STRESSED BOX GIRDERS AND
DOUBLE T BEAMS FOR TWO LANE HIGHWAY BRIDGES**

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This dissertation was submitted in requirements for the Master of Engineering degree Master of Structural
Engineering Design

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December 2009

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ABSTRACT

There are about 3800 bridges on National Road Network with length varying from 3.0 m to 300.0m. These bridges have varying widths about 3.0m to 20.0m and some of these have been constructed more than 50 to 100 years back. Most of the bridges span 30m and above. They were constructed using steel concrete composite or steel. Steel is a very costly material, even though it has some very good structural advantages.

Few bridges have been constructed in the recent past using T,M,Y,I beams in the span around 30m by launching side by side. And this was a very tedious procedure. Aesthetic view of a bridge has been neglected during the past 50 years or more due to the design complexity. Time for completion of a bridge has become an uphill task these days due to the price fluctuation and other constraints such as traffic and utility services.

This study is concentrated on the design of a simply supported 30m pre-stressed post tensioned box girder and comparing the properties and other advantages mainly with the Double T beams. Mainly the geometry of the box girder was selected with the help of past research papers and the geometry of the double T beam was selected where the cross sectional area is approximately equal to the cross sectional area of the box girder.

Design of the box girder is done using three dimensional finite element method and the spine beam method. Although the Finite Element method is very versatile and powerful manual, calculations is also done as box girders designs are very rare. As the history of the double T beams are also very rare, it is also designed using SAP 2000, spine beam, and three dimensional Finite Element methods.

Both beams are analyzed for HA,HB moving loads. Load combinations are considered, dead plus HA live load as load combination 2 and dead plus HB as load combination 3 Shear force, bending moment, torsional moment, support reactions, stresses, amount of tendons were compared. In spite of that, the launching method, capability for utility services were also compared. Conclusions and the recommendations of the study will be laid down based on the results in the study

ACKNOWLEDGEMENT

I am especially grateful to the Prof. M. T.R. Jayasingha for his dedication and commitment right through the research work as my project supervisor. His guidance and constructive criticism helped me to execute the project successfully. Also I wish to thank the course co-coordinator Mrs.Nanayakkara and the research co-coordinator Dr.Baskaran

I wish to thank Vice Chancellor, Dean of the Faculty of Engineering and the Head of the Department of Civil Engineering for allowing me to use the facilities available at the University of Moratuwa.

I wish to thank all the lectures of the postgraduate course on Structural Engineering Design for their untiring efforts during the lecture series by giving with encouragement and valuable guidance which helps to achieve the goals in my professional career and to make a success of this study.

Also, I am grateful to the General Manager and Director Training RDA, for making all arrangement to sponsor this postgraduate course. Special thanks to my superiors, Director Engineering Services RDA, Mr.D.K.R.Swarna and Deputy Director Mrs. Dammika Jayakody for nominating me for this course and providing office facilities to complete the task..

Finally, I am grateful to my family members for their wholehearted support and encouragement kindly extended to me during this period.

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