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STEEL BRIDGE MEMBER RESISTANCE: EN1993-2 COMPARED TO AASHTO (USA)

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SUMMARY

This paper contrasts the different approaches to steel member resistance calculations for bridges from Eurocode EN1993-2:2006 and the corresponding American standard (AASHTO 8th edition). An example steel truss footbridge is used to compare resistances and utilisations determined from each Code (on the basis of identical loading). The paper also examines the effects of some basic analysis assumptions on the load effects and therefore utilisations.

Keywords: *Steel design, Bridge Engineering, Codes of Practice.*

1. INTRODUCTION

The Eurocode suite reflects best practice, established by reference to many preceding national Codes of Practice (COPs) and recent research, compiled over several decades leading to publication in 2007. The current AASHTO LRFD Bridge Design Specifications used in the United States and published in 2017 can be traced to a single 1931 publication.

Despite these quite separate traditions, we would expect that the underpinning engineering theory surrounding strengths of materials, buckling and the like would lead to a great deal of similarity between these COPs – and likewise for others, such as their Canadian counterpart. This paper explores the clauses for steel-only (non-composite) member resistance, primarily comparing the Eurocode [1], [2] and AASHTO 8th [3] (also occasionally considering CSA S6-14 [4]) using a steel truss bridge (Fig. 1) to illustrate some of the differences.

For brevity, code references in this paper are prefixed with an 'E' for EN1993-1-1 or EN1993-2, 'A' for AASHTO, and 'C' for CSA S6-14; other code references are explicit.

The comparison of these COPs has been made possible by the development of detailed code-checking facilities for these – alongside other international standards – within the LUSAS software, with validation against many published examples ([5],[6],[7],[8],[9]) under the same lead engineer.

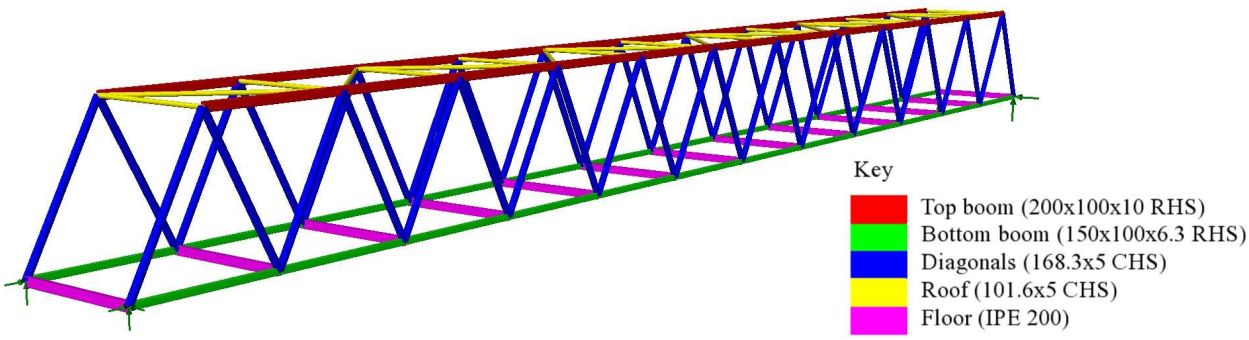

Fig. 1. *Example truss footbridge.*

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