

ABSTRACT

The Structural Behaviour of Bridge Decks

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A general method for the analysis of simply supported slab, pseudo-slab, and beam-and-slab right bridge decks is presented herein. Such an analysis is usually warranted for economical and efficient design.

The method utilizes harmonic analysis and the semi-continuum idealization of Hendry and Jaeger (1955). Two semi-analytical formulations are initially developed and critically examined. These are as follows:

- A differential equation approach;
- A direct stiffness approach using harmonic displacement shape functions.

The relationship between the stiffness matrices arising from these two approaches is discussed.

The close resemblance of the idealization of a deck as a semi-continuum and as an orthotropic plate has been investigated. It is shown inter alia that

