APPLICABILITY OF WAVE EQUATION AND FEM FOR DETERMINATION OF THE BRIDGE EIGENVALUES IN TRANSVERSAL DIRECTION

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Abstract: Behavior of bridges in transversal direction is very difficult to foresee because of the large number of parameters which influences them. Ratio between stiffness of the piers and bridge deck is one of the most important parameters of the bridge response. If the piers are relatively high and slender the response of the bridge is dictated with deck stiffness. Then it is important to determine the exact ratio of the stiffness when the piers do not disturb the response. One method uses wave equation to determine the behavior of structure and another uses finite elements. It is impossible to solve all construction static systems with wave equation but only simple ones and it has a shortfall that it can determine only first few accurate modal shapes. Although less accurate, with the FEM it is possible to determine larger number of modal shapes. In this paper example of continuous bridge will be analyzed using both methods.

Key words: transversal direction, wave equation, finite element method.

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