

Structural Parameter Identification of Old Steel Truss Bridges

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Abstract : The conditions of existing structures change in the course of time and can hardly be characterized particularly if a bridge has long been in function and there is no design documentation related to it. To define the real conditions of a structure, detailed static and dynamic analysis of the structure has to be carried out and its modal parameters have to be defined accurately. Modal analysis enables a quite accurate identification of the natural frequencies and mode shapes. Presented in this paper are the results from the performed detailed analyses of a steel truss bridge that has been in use for more than 7 decades by the military services of R.N. Macedonia and for which there is no documentation at all. Static and dynamic investigations and ambient vibration measurements were performed. The acquired data were used to identify the mode shapes that were used for comparison with the numerical model. Dynamic tests were performed to define the bridge behaviour and the damping index. Finally, based on all the conducted detailed analyses and investigations, conclusions on the conditions of the bridge structure were drawn.

Keywords : ambient vibrations, dynamic identification, in-situ measurement, steel truss bridge

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