Effects of Vertical Load and Velocity on the Isolation Bearing Performance. Lead-Rubber Bearings.

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ABSTRACT
Even though the fundamental performance of the most common isolation devices is largely documented in literature, the behavior of large-size devices has been often extrapolated from experimental results of model scale prototypes and from numerical simulations. In this paper results are reported obtained from an experimental investigation on the effects of axial load and strain rate on the performance of a full scale lead-core elastomeric bearing for bridge applications.
The main objective of the research was to extend the database of performance data of bridge elastomeric devices tested as part of the Caltrans Toll Bridge Program, with specific attention to the modifications of the bearing response due to the applied vertical loads and strain rate. The results, in line with similar tests performed on similar full scale bearings at the Caltrans SRMD Testing Facility, University of California San Diego, indicate a moderate effect of the vertical load values, but a significant effect of the strain rate on all the response parameters. The response was analyzed with particular attention to the variation of critical performance characteristics in order to produce a set of information that will be implemented in a physically motivated numerical model (in progress).

Keywords: lead-rubber bearing; bearing response modification; vertical load; velocity.