THE UNIVERSITY OF BRITISH COLUMBIA
Department of Civil Engineering
SIERA: Sustainable Infrastructure Research Group

IC-IMPACTS

SIERA Group 2020 Seminar Series – Seminar No. 20

Wednesday, September 2, 2020 @ 5:30pm PST

IC-IMPACTS Invited Speaker

Vibration Serviceability Design of Lightweight Pedestrian Bridges Under Human-Induced Excitations

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Chair in Educational Leadership on Sustainable Design of Aluminium Structures
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Dr. Pampa Dey joined the Department of Civil and Water Engineering at the Laval University, Canada in 2018 as an Assistant Professor. Currently, she also holds the Chair in Educational Leadership on Sustainable Design of Aluminum Structures and she is affiliated to the REGAL- aluminum research centre. She has received her Master's degree from the Indian Institute of Technology Kanpur (India), followed by her doctoral degree from the University of Waterloo (Canada). Through her research program, she aims at developing novel design and maintenance solutions for sustainable lightweight structures. Her research interests revolve around lightweight structures, human-induced vibrations, bridge design, reliability analysis, and condition monitoring of structures.

Abstract: The advancement in material technology has paved the way for the construction sector to build civil engineering structures such as bridges with various lightweight yet highly durable materials like aluminium. However, current requirements for more slender and lighter constructions have resulted in severe vibration problems for these structures. Typical example concerns aluminium pedestrian bridges, which are dynamically excited by crowds or groups of people. Vibration serviceability assessment for pedestrian's comfort has therefore become a central issue in their design. This talk will present the performance of the current design standards in predicting the vibration behaviour of lightweight aluminium pedestrian bridges. The presentation will start with a brief background on human-induced walking load models currently being employed by the existing design standards, followed by a description of the experimental study that was conducted on full-scale aluminium bridges. The key findings from the evaluation of the design provisions based on the experimental data will be presented. Finally, the talk will be concluded through introducing the modifications that are required for reconciling the design predictions with the measurements.

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