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Deterministic and reliability analysis of RC bridges including soil-structure interaction

Kamel Bezih¹, Alaa Chateaneuf², Tayeb Bouzid¹, Mehdi Kalla¹ and Claude Bacconnet²¹Mostefa Ben Boulaid University, Algeria²Institut Pascal, France

The objective of the present research is to show and to quantify the importance of soil parameter uncertainties on the redistribution of internal forces in RC bridges, as well as their effect on the safety assessment of these structures. In this paper, a reliability-mechanical approach was developed to study the effect of soil-structure interaction for RC bridges. The modeling of soil-structure interaction is incorporated in the mechanical model of RC continuous beam, by considering nonlinear elastic supports. The deterministic and reliability analysis allows us to evaluate the safety of the RC bridge regarding the soil parameter uncertainties. The numerical analysis allows us to evaluate the safety of the RC bridge regarding the soil parameter uncertainties. Furthermore, the obtained results indicate that soil-structure interaction effects and uncertainty of soil parameters should be considered in the reliability assessment of RC structures. This analysis can have significant impact on the design rules of redundant RC structures, especially when large soil uncertainties are involved.

Recent Publications

1. Bezih K, Chateaneuf A, Kalla M and Bacconnet C (2015) Effect of soil-structure interaction on the reliability of reinforced concrete bridges. *Ain Shams Engineering Journal* 6(3):755-766.

Biography

Kamel Bezih has graduated with a Master research and specialization in mechanical of soil and rock, from Pierre and Marie Curie University (Paris 6), France in 2002. In addition, a Magister degree in Civil Engineering, from University of Batna, Algeria in 2004, and PhD degree in Structure and Geomaterials from Mostefa Ben Boulaid University (Batna 2), Algeria in 2017. His research interests include numerical modeling of structure, geotechnical modeling tools, the mechanical behavior of soil, soil-structure interaction and the evaluation of the reliability of structures in Civil Engineering. He has also participated in several national and international conferences.

kamelbezih@yahoo.fr

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