

Session ID: BCI-3

Title

SEISMIC ANALYSIS AND STRENGTHENING OF MASONRY ARCH BRIDGES

Convenors

L. Sorrentino ¹, D.V. Oliveira ², P. Clemente ³

Description

The study of unreinforced masonry arch bridges is an evergreen topic, given their widespread use and long life. Historically, the arch has represented the most relevant solution to cover a large span while using a material with low and uncertain tensile strength. There are many still-standing ancient bridges, but even more were built during the second half of the 19th century and the first half of the 20th century, especially along railways.

In all practical cases, unreinforced masonry arch bridges were designed for gravity alone. Therefore, they can be very vulnerable to earthquakes, especially if they are multi-span and have slender piers. An accurate assessment of the static and seismic capacities of the structure, based on reliable material properties and comprehensive knowledge as well as structural modeling, is the first step towards risk assessment. If necessary, a strengthening intervention should guarantee the achievement of a suitable level of safety. Additionally, when historical and artistic concerns prevail, seismic strengthening interventions are restricted to those compatible with the architectural characteristics and heritage value of the bridge.

The objective of this technical session is to compare experiences on the seismic assessment and strengthening of existing unreinforced masonry arch bridges from different countries. The technical session is organized under the patronage of FABRE Consortium (www.consorziofabre.it), the Italian scientific alliance on risk assessment and monitoring of civil infrastructural systems.

Invited Speakers

S. Atamtürkür ⁴, A. Bayraktar ⁵, T. Kaminski ⁶, M.S. Marefat ⁷, E. Niederleithinger ⁸, B. Pantò ⁹, L. Pelà ¹⁰, B. Pulatsu ¹¹

Affiliations

¹ Sapienza University of Rome, Roma, Italy, ² University of Minho, Guimaraes, Portugal, ³ ENEA, Roma, Italy, ⁴ Pennsylvania State University, Pennsylvania State University, USA, ⁵ Karadeniz Technical University, Trabzon, Turkey, ⁶ Wroclaw University of Science and Technology, Wroclaw, Poland, ⁷ University of Tehran, Tehran, Iran, Islamic Rep, ⁸ Federal Institute for Materials Research and Testing, Berlin, Germany, ⁹ Durham University, Durham, United Kingdom, ¹⁰ Technical University of Catalonia, Barcelona, Spain, ¹¹ Carleton University, Ottawa, Canada