

Session ID: BCI-7

Title

BRIDGES IN MULTHAZARD ENVIRONMENT: MONITORING AND ANALYSIS UNDER FLOODING AND EARTHQUAKES

Convenors

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Description

Flood-induced foundation scour is the leading cause of bridge failures worldwide. Exacerbated by the effects of climate change, this phenomenon has caused a significant number of fatalities, traffic disruption, economic, and societal losses with ripple effects that may last for years. Thus, monitoring of scour is of paramount importance to ensure the continued safe operation of bridges and transport networks. Traditional scour monitoring often requires expensive instrumentation and maintenance, while it can be susceptible to debris damage during flooding. Due to the scour-induced deterioration of the bridge and the associated reduction of its foundation-bearing capacity, scour may affect the overall response of bridges to dynamic loads such as those induced by earthquakes. Thus, scour has a significant potential to alter the dynamic and seismic response of bridges, including a potentially critical role of the relevant soil-foundation-structure interaction mechanism. Since many bridges spanning waterways are in seismically active regions, the occurrence of earthquakes in the presence of flood-induced scour is very likely, and hence critical. Taking basis on the ERIES project SCOUR&SHAKE, this Technical Session addresses the problem of detecting foundation scour by means of low-cost strategies and of assessing the impact of scour on the seismic response of bridges. In particular, this TS will primarily (but not exclusively) focus on: (i) recent advances in monitoring strategies for bridge scour detection, (ii) experimental and numerical modeling approaches of the dynamic performance of scoured bridges, and (iii) remedial measures able to improve the dynamic performance of scoured bridges.

Invited Speakers

S. Argyroudis ³, F. Schmidt ⁵, L. Martinelli ¹, S. Foti ⁶, M. Loli ⁷, L. Prendergast ⁸

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