

Session ID: BCI-8

Title

THE RENAISSANCE OF ACCELERATED BRIDGE CONSTRUCTION: THE EASIEST PATHWAY TO BUILD SEISMIC RESILIENCE

Convenors

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Description

Since the 1994 Northridge earthquake, the poor performance of precast concrete bridges resulted in wider adoption of cast-in-place technology for the design and construction of bridges in several countries with seismic risk. However, the increasing urban densification in mega cities and the vehicle traffic demands have more than doubled in the last decades. This has forced the key stakeholders (Departments of Transportation, district, and councils) to increase the capacity of the horizontal infrastructures. However, their requirements became more stringent by limiting construction time and size of the construction site to avoid traffic and economic disruptions.

In the last decade, governments and Departments of Transportation started supporting large research programmes and one-off show case applications of Accelerated Bridge Construction (ABC) techniques. The outcomes of the experimental programmes have been encouraging. Bridge piers built with ABC techniques emulating cast-in-place scenarios performed similarly or in some instances even better.

More importantly, some researchers and practitioners further developed ABC bridge piers to be more resilient by limiting the post-earthquake damage through different design detailing. The researchers in this session will present few of those solutions and describe their performance through experimental testing. The solutions include the use of post-tensioning bars/tendons combined with novel and cost-effective damping devices, durable non-metallic reinforcing and/or shape memory alloys, emulative cast-in-place connections, and the use of novel cementitious materials.

Invited Speakers

P. Sideris ³, M. Tazarv ⁴, I. Mantawy ⁵, Ó.S. Haraldsson ⁶, M. Elgawady ⁷, P. Okumus ⁸, Y. Cancan ⁹

Affiliations

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