

Session ID: BCI-9

Title

EXPERIMENTATION AND MODELLING OF CORRODED BRIDGE PIERS: LIMITATIONS & FUTURE DIRECTIONS

Convenors

A. Palermo ¹, M. Kashani ²

Description

In the last decade the collapses of bridges due to material ageing increased dramatically. The lack of a robust planning, adequate government funding led to poor maintenance programmes, and, in fact, the American Society of Civil Engineers estimated over seven percent of the bridge stock in the United States to be structurally deficient. More importantly over one third of the population lives in seismic areas with most of the country's territory having their horizontal infrastructure built along the coastline and therefore exposed to harsh environment.

Although the research community widely investigated how material ageing, including concrete carbonation and corrosion of reinforcing steel, impacted on the mechanics of the materials and structural behaviour of reinforced concrete members, the cyclic or seismic performance still presents several research gaps to be filled.

The size of the specimens, the type of artificial corrosion, the different seismic design philosophy and construction details led to contrasting and diverse research outcomes. Current Guidelines and code provisions do not have any reference or guidance to practitioners on what is the maximum material ageing level allowed without comprising the cyclic behaviour of a concrete plastic hinge.

The aim of the session is to overview the most recent experimental and numerical campaigns and highlight the contrasting differences and limitations. The session will be also an important discussion vehicle to start implementing strategies for the next generation of guidelines and standards.

Invited Speakers

D. Coronelli ³, Y.-C. Ou ⁴, J. Su ⁵, B. Matthews ⁶

Affiliations

¹ University of California, San Diego (UCSD), San Diego, USA, ² University of Southampton, Southampton, United Kingdom, ³ Politecnico di Milano, Milan, Italy, ⁴ National Taiwan University (NTU), Taipei, TAIWAN, ⁵ Tianjin University, Tianjin, China, ⁶ University of Canterbury, Christchurch, New Zealand