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Seismic Performance of Isolated Bridge Configurations with Soil Structure Interaction

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Abstract : The most recent development of earthquake engineering is based on concept of design consisting in prescribed performance rather than the more traditional prescriptive approaches. The paper aims to assess the effects of isolation devices and soil structure interaction on a benchmark bridge adopting a Performance-Based Earthquake Engineering methodology. Several isolated configurations of abutments and pier connections are compared performing the most representative isolation devices. Isolation systems suitability depends on many factors, mainly connected with ground effects. In this regard, the second purpose of this paper is to assess the effects of soil-structure interaction (SSI) on the studied bridge configurations. Contributions of isolation technique and soil structure interaction are assessed evaluating the resistance effects applied to Peak Ground Acceleration (PGA) levels in terms of cost and time repair quantities.

Keywords : base isolation, bridge, earthquake engineering, non linearity, PBEE methodology, seismic assessment, soil structure interaction
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