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Behaviour and Design of the Candle-Loc Inter-Module Connection in High-Rise Modular Buildings under Seismic Action

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Abstract : A unique, fast and easy installed inter-module connection named Candle-Loc was developed and applied in several high-rise steel and reinforced concrete modular buildings in Singapore and Hong Kong, China. However, its effect on the global behaviour of modular buildings in high seismic zones was not studied. Therefore, the design concept and the structural performance of each component in this connection was investigated through analytical approach. Response spectrum, linear time-history, and nonlinear time-history analyses were conducted to investigate the effects of the different joint models of the Candle-Loc in the global analysis of high-rise buildings under high seismic loads. It is found that it is important to assess the level of plasticity developed in the inter-module connection under high seismic loads. The ductility of the lateral force resisting system influences the amount of load taken by the inter-module connections.

Keywords : high-rise, inter-module connection, nonlinear, seismic, time-history analysis
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