Development of intermediate moment frames constructed using precast concrete for seismic resistance in Thailand

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ABSTRACT

Low-to-mid-rise building construction using precast concrete structures is becoming popular in Thailand. Manufacturers have developed systems to connect the precast concrete beams and columns. Their focus is mainly on ease of construction and cost-effectiveness. Unfortunately, most of them do not consider safety against seismic load in the design. This study presents a development and design guideline for the systems. With this, two new configurations of intermediate moment frame beam-column connection aiming for moderate seismic area are proposed. The new connections' design emphasizes in seismic resistance suitable in Thailand while maintaining the ease of construction and cost-effectiveness from the currently available methods. Two sets of precast concrete beam-column joints were designed and tested. The results show that the load-deformation characteristics of the joints conform well to the requirements of the ACI 374.1-05 acceptance criteria.

Keywords: Seismic resistance, Precast concrete structures, Quasi-static reversed cyclic loading test

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