

Cyclic wind and seismic loading tests of reinforced concrete coupling beams with different amount of transverse reinforcements

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ABSTRACT

Reinforced concrete (RC) coupling beams can act as an efficient energy dissipating fuse and force transfer element between reinforced concrete shear walls in high-rise buildings. Unlike seismic design, wind design is mainly dealt with in the linear elastic phase in the wind load provisions such as ASCE 7. This project aims to investigate the difference of actual behavior of RC coupling beams in the nonlinear deformation phase under seismic and across-wind loading protocols.

RC beams with span-depth ratio between two and four have no specific guidelines in ACI 318-14 in contrast to those under two. To understand the shear strength and the effect of transverse reinforcement on the strength of coupling beams, total eight RC coupling beams with a span-depth ratio of 2.5 were tested. The amount of transverse reinforcement was reduced by 1/3 for two conventional and two diagonal coupling beams, and 1/2 for two diagonal coupling beams. Based on test results to be obtained in 2021, the project will be expanded for purpose of proposing a new modeling methodology for similar coupling beams with reasonable energy dissipation and shear strength.

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