

Title Effects of Zone Based Detailing on Performance of Shear Walls

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Abstract

In tall concrete building, reinforced concrete walls are the major structural member to be resisted the loadings induced by winds and earthquakes. This study describes the effect of concentrated reinforcement distribution and the effect of confinement by using pushover static analysis and nonlinear time history analysis. It is used nonlinear layered shell element modeling technique to predict the nonlinear behavior. In order to verify the layered shell modeling technique, tested wall at Portland Cement Association were compared it was found in this study, that the layered shell element model provides satisfactory agreement with the experimental data.

A 30 story frame-shear wall building is considered in this study. The walls with different concentrated reinforcement distribution and different confinement are analyzed and compared the provision from NEHRP are considered for this purpose. From the analysis results, the results are presented in terms of PMM interaction curve, moment curvature curves, stress-strain curve, moment-top displacement responses, base shear-top displacement response and moment-rotation response. It is found that there is significantly increment of the moment capacity due to reinforcement zoning. The confined was produced better ductility increased capacity for compressive strain and can develop greater base shear..

Keywords Concentrated reinforcement distribution, confined concrete shear wall, pushover analysis, nonlinear time history analysis, nonlinear layered shell element