

Moment-Curvature Relation for Nonlinear Analysis of Slender Structural Walls

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Abstract : Generally, the slender structural walls have flexural behavior. Since behavior of bending members can be explained by moment-curvature relation, therefore, an analytical model is proposed based on moment-curvature relation for slender structural walls. The moment-curvature relationships of RC sections are constructed through section analysis. Governing equations describing the bond-slip behavior in walls are derived and applied to moment-curvature relations. For the purpose of removing the imprecision in analytical results, the plastic hinge length is included in the finite element modeling. Finally, correlation studies between analytical and experimental results are conducted with the objective to establish the validity of the proposed algorithms. The results show that bond-slip effect is more significant in walls subjected to larger axial compression load. Moreover, preferable results are obtained when ultimate strain of concrete is assumed conservatively.

Keywords : nonlinear analysis, slender structural walls, moment-curvature relation, bond-slip, plastic hinge length

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