

عنوان مقاله:

Inconsistency of Force-Based Design Procedure

محل انتشار:

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خلاصه مقاله:

The force-based seismic design procedure currently used assumes that the stiffness of the lateral force resisting elements is essentially independent of their strength. As a result, the period of the structure will remain the same as originally perceived, irrespective of how much the seismic base shear is reduced from the elastic strength. Current studies show that for a large class of reinforced concrete members such as piers, flexural walls and ductile moment resisting frames, their strength and stiffness are coupled. This leads to inconsistency between the assumed stiffness and the actual stiffness of the structure as designed. Using a wall structure as an example, this study examines the consequence of such inconsistency as it affects the estimation of ductility demand and seismic displacement of the structure, and points out the implication of continual use of the current force-based procedure. It is shown that the displacement-based procedure is a more simple approach to determine the seismic design strength of structures with stiffness-strength coupled elements.

کلمات کلیدی:

R/C Flexural Walls, Coupled Strength-Stiffness Relation, Force-Displacement Based Design Procedure

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