NONLINEAR NUMERICAL MODEL FOR SEISMIC ANALYSIS

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Abstract: This paper presents a possible application of materially and geometrically nonlinear models on nonlinear static analysis of spatial frames according to EN EUROCODE 8. The main assumptions of a developed model are described in brief. The model very accurately constructs the equilibrium curve (pushover curve) as the basis for application of the static nonlinear analysis of seismic effect. In a simplified way, this paper presents the application of the method of target displacement as the basis for the method of bearing capacity and then also the method of bearing capacity itself.

Cases of uniform and modal types of seismic loads were elaborated through examples. Attention was paid to values of displacements of the original mathematical model and their comparison with target displacements defined according to EN EC8. This model analyzed: (1) RC frames of various types and numbers of stories, (2) flexural walls, free-standing and connected with panels, and (3) walls with openings. The conclusion presents engineer's comment on the structural bearing of specific RC systems, with emphasis on the extent of expected deformations.

Key words: material nonlinearity, geometrical nonlinearity, incremental procedure, equilibrium curve, target displacement, capacity curve.

MODELING OF STRUCTURES

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