

Proposing a New Design Method for Added Viscoelastic Damper's Application in Steel Moment-Frame

Authors : Saeed Javaherzadeh, Babak Dindar Safa

Abstract : Structure, given its ductility, can depreciate significant amount of seismic energy in the form of hysteresis behavior; the amount of energy depreciation depends on the structure ductility rate. So in seismic guidelines such as ASCE7-10 code, to reduce the number of design forces and using the seismic energy dissipation capacity of structure, when entering non-linear behavior range of the materials, the response modification factor is used. Various parameters such as ductility modification factor, overstrength factor and reliability factor, are effective in determining the value of this factor. Also, gradually, energy dissipation systems, especially added dampers, have become an inseparable part of the seismic design. In this paper, in addition to reviewing of previous studies, using the response modification factor caused by using more added viscoelastic dampers, a new design method has introduced for steel moment-frame with added dampers installed. To do this, in addition to using bilinear behavior models and quick ways such as using the equivalent lateral force method and capacity spectrum method for the proposed design methodology, the results has been controlled with non-linear time history analysis for a number of structural. The analysis is done by Opensees Software.

Keywords : added viscoelastic damper, design base shear, response modification factor, non-linear time history

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