عنوان مقاله:

Evaluation of seismic performance of bracing made of non-skewed memory alloys under dynamic loads

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خلاصه مقاله:

Structure design In the face of forces such as wind or gravity, the structure is designed in such a way that after removing the force, the displacement created in it returns to its original state and no deformation remains in the whole structure or its elements. . While in the design against moderate to strong seismic forces, the construction of structures that can withstand earthquakes without tolerating any paste deformation is uneconomical and sometimes impossible, so in the case of seismic design regulations, The structure is allowed to enter the area of nonlinear deformation, but the amount of this deformation must be limited by applying rules. In the first approach, the capacity of the structure can be increased so that all members can withstand the forces and deformations. In the opposite approach of this method, instead of increasing the dimensional capacity and strength of structural sections, the seismic force applied to them can be reduced. Non-buckling braces consist of a malleable steel core capable of flowing under both tensile and compressive forces. Among the advantages of this type of braces are the high capacity of energy dissipation and high ductility with the problem of buckling prevention. One of the most important drawbacks of this lateral bearing system is the high restrictions on the separation material of the filler material from the steel core, as well as the problems of placing the filler material and its high weight. In this paper, the effect of the optimal coating length on the compressive behavior as well as the amount of energy absorption is investigated and with this method, the optimal length of the core coating is obtained. Also in this study, the effect of three different core shapes including belt-shaped core, I-shaped and cross-shaped core with the same area on the optimal length of the coating was investigated. In another scenario, the effect of the separating layer material on the buckling behavior of the buckling was investigated. Existing and valid laboratory results will be used to validate the modeling and compared with the results obtained from ABAQUS.

کلمات کلیدی:

Seismic performance, Shaped memory alloys, Dynamic loads, Optimal coating length

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