

عنوان مقاله:

Seismic Response of ۴-Legged Self-Supporting Telecommunication Towers

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خلاصه مقاله:

Telecommunication tower is an important component of the basic infrastructure of communication systems and thus preserving them in events of natural disasters - such as a severe earthquake - is of high priority. In past studies, researchers have mostly considered the effects of wind and earthquake-induced loads on ۳-legged (triangular cross-section) self-supporting steel telecommunication towers. In this study, the seismic sensitivity of ۴-legged telecommunication towers is investigated based on modal superposition analysis. For this purpose, ten of the existing ۴-legged self-supporting telecommunication towers in Iran are studied under the effects of wind and earthquake loadings. To consider the wind effects on the prototypes, the provisions of the TIA/EIA code are employed and the wind is treated as a static load throughout the analysis. In addition, to consider the earthquake effects on the models, the standard design spectrum based on the Iranian seismic code of practice and the normalized spectra of Manjil, Tabas and Naghan earthquakes have been applied. Since Iran is considered to be located in a high seismic risk region, a base design acceleration of $A = 0.35 g$ is used for normalization of the spectra. It was observed that in the case of towers with rectangular cross section, the effect of simultaneous earthquake loading in two orthogonal directions is important. At the end, a number of empirical relations are presented that can help designers to approximate the dynamic response of towers under seismic loadings.

کلمات کلیدی:

Seismic response, Earthquake and Wind Loadings, self, Supporting ۴, Legged Telecommunication Towers

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