عنوان مقاله:

A Continuum Shell-beam Finite Element Modeling of Buried Pipes with 90-degreeElbow Subjected to Earthquake Excitations

محل انتشار:

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خلاصه مقاله:

In the current work, the seismic analysis of bent region in buried pipes is performed, and effects of soilproperties and modeling methods on pipe's response are investigated. To do this task, beam, beamshellfinite element modeling, and a continuum shell FE model of a 90-degree elbow are employed. Inthe beam model, the pipe is simulated by beam elements while combined shell-beam elements are usedfor the continuum shell finite element model. The surrounding soil is simulated by nonlinear springsand solid elements; moreover, soil hardening behavior and soil-pipe slippage are considered in themodels. In addition, an equivalent boundary condition has been employed at the end of each elbow legto simulate far field effects more closely. From these analyses, it can be revealed that axial strain atbends is larger in stiffer soil due to smaller slippage. In addition, a full three dimensional soil-pipeinteraction using continuum shell FE model causes a substantial increase of elbow strain.

کلمات کلیدی:

Buried Pipe ElbowFinite Element MethodHybrid ModelContinuum Model

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