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Comparison of analytical, numerical and experimental test of pile behavior under static cyclic vertical loading tests in layered elastic–plastic soils

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The design of piled involves the identification of the essential parameters, namely the number of piles, their diameter and the length along with Es value of the subsoil strata for an optimum design which can produce the required settlement reduction. The present study focused on a comparative study between static cyclic vertical loading tests scale on two piles of different lengths (in Layered elastic-plastic soil) using a finite element analysis to two dimensions (2D) using CESAR-LCPC as well as analytical methods. It was found that the 2D model is very effective for predicting the response of non-linear amplitude-frequency, given the non-linear phenomena of the complex soil-pile system in a layered medium.

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Seismic performance of cold-formed steel shear walls

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The use of cold-formed steel structures has grown dramatically in recent years all over the world but with greater rate of growth in non-seismic regions. Adequate bracing and brace performance is of paramount importance to improve the acceptability of these systems in earthquake prone regions. In this speech, the lateral performance of different configurations of cold-formed steel shear walls will be discussed based on some experimental tests on full scale walls of 2.4 m × 2.4 m under cyclic loading. Also, application of non-linear finite element analyses for investigating the seismic characteristics of the cold formed steel shear walls will be illustrated highlighting different structural characteristics including: Material non-linearity, geometrical imperfection, residual stresses and perforations. Of particular interest are specimens maximum lateral load capacities, load-deformation behavior, and evaluated seismic response modification factors. The speech also looks at the failure modes of the systems and investigates the main factors contributing to the ductile response of the CFS walls in order to suggest improvements so that the shear steel walls respond plastically with a significant drift and without any risk of brittle failure such as connection failure or stud buckling. In addition, prescribed seismic response modification factors for different CFS configurations by the standards will be examined. It becomes clear that while the suggested R factors in AISI-standard for some configurations are conservative, the values recommended by AS4600 seem to be too low.

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