

Model verification and assessment of shear-flexure interaction in pile foundations

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Resumen

Fiber models have been developed and applied to various structural elements such as shear walls, beams and columns. Only scarcely have fiber models been applied to circular foundation systems such as cast in drilled holes shafts (CIDH). In pile foundations with constraint head boundary conditions, shear deformations can easily contribute to the lateral pile response. However, soil structure interaction formulations such as the p-y method, commonly used for lateral pile design, do not include structural shear deformations in its traditional derivation method. A fiber model that couples shear and axial-bending behavior, originally developed for wall elements was modified and validated on circular cross sections (columns) before being applied to a 0.61 m diameter reinforced concrete (RC) pile with fixed head boundary conditions. The analytical response was compared to measured test results of a fixed head test pile to investigate the possible impact of pile shear deformations on the displacement, shear, and moment profiles of the pile. Results showed that shear displacements and forces are not negligible and suggest that nonlinear shear deformations for RC piles should be considered for fixed-head or similar conditions. Appropriate sensor layout is recommended to capture shear deformation when deriving p-y curves from field measurements.

Palabras clave

Palabras clave de autor: [piles](#); [lateral loading](#); [soil-pile interaction](#); [shear deformations](#); [reinforced concrete](#)

KeyWords Plus: [REINFORCED-CONCRETE BEAMS](#); [SQUAT STRUCTURAL WALLS](#); [FIBER ELEMENT](#); [RC STRUCTURES](#); [STRENGTH](#)

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