Improved Soil Pile Interaction Of Floating Pile In Sand

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Improved Soil Pile Interaction Of

The present study explored the efficacy of pile shaft surface treatment on the improvement of soil-pile frictional resistance for floating or friction piles. 4 surface conditions of model piles measuring 200 mm long and 20 mm in diameter were examined, namely smooth (control), roughened, fishbone and checked shafts. A pile cap made of plywood was fixed to the top of the pile with 10 mm ...

[PDF] IMPROVED SOIL-PILE INTERACTION OF FLOATING PILE IN ...

the piles and other bridge components after propagating through the inelastic behavior of pile-soil interaction. • However, near-field properties in the superstructure are not as significant as when the degradation of soil springs due to the pore water pressure is considered. Summary of Findings

SOIL-PILE-STRUCTURE INTERACTION - Geotechnical

Kinematic soil-pile interaction Even in the absence of a superstructure, piles tend to diffract the upward propagating S -waves, thereby modifying soil deformations, so that the horizontal displacement of the pile-head, Up may be different from the free field surface motion, Uff.

Soil-pile-structure kinematic and inertial interaction ...

The influence of the improved zone size was reflected on the identified natural frequencies of the soil-pile-top mass systems. Seismic interactions between the soil and pile were simulated by adapting a hysteretic model that integrated phenomena such as soil-pile separation, material degradation, and radiation damping. The developed interaction elements calibrated for one shaking event were deployed to predict the soil reactions in another shaking event.

Development of Soil-Pile Interaction Models in Improved ...

This study develops an improved analytical solution to evaluate the effects of adjacent excavations on a pile. The pile–soil interaction is simulated using a Timoshenko beam resting on a Vlazov foundation and the explicit solutions are derived using the finite differential method, based on which the pile shear characteristics and inhomogeneity of multilayer soils are further considered.

Improved analytical method for pile response due to ...

A parametric study clarifies the role of the parameters involved, illustrates the interaction between the soil and the pile and shows the stiffness and damping properties of the soil-pile system for typical values of the governing parameters. ... Bowen Nan, Kanghe Xie, An improved model for the horizontal dynamic response of piles in ...

Soil-pile interaction in horizontal vibration - Novak ...

The soil-pile interaction problem is considered as an extension of the soil-structure interaction problem and analyzed subdividing it into sub-systems (sub-structuring approach): (1) the pile (as part of the structure) and (2) the displaced soil are both described and formulated using the finite element method, and (3) the site is described and formulated in terms of a compliance matrix (soil flexibility matrix) using the flexible volume method.

SOIL-PILE-STRUCTURE INTERACTION ANALYSIS: IMPLEMENTATION ...
This urges the need for developing improved analytical techniques for the evaluation of complex dynamic response of pile-supported high-rise structures. Dynamic analysis of a soil-pile interaction system is one of the most complex problems in the field of geotechnical engineering.

Modeling and Analysis of Soil-Pile Interaction for Dynamic ...
modeling of piles, which incorporates an explicit interaction surface between soil and pile. The formulation is herein implemented for lateral loading of piles but is able to represent soil–pile ...

(PDF) Improved embedded beam with interaction surface
The additional deformation caused in the soil due to the transmission of inertial force to the soil by the superstructure is called as the inertial interaction. When the ground shaking is of low level, the kinematic effect of SSI is more prominent. This results in the lengthening of period and there is increase in the radiation damping.

Soil-Structure Interaction -Effects, Analysis and ...
The problem of soil-pile interaction, which is of integral importance to the Kealakaha Bridge project, is addressed with respect to the parameters that affect the response under lateral loading in cohesionless soil. To model the soil-pile interaction effect, a thin layer ... 1.7 Improved Far-Field Boundary Simulation for Soil-Structure

CONSTITUTIVE AND NUMERICAL MODELING OF SOIL AND SOIL-PILE ...
Based on the displacement compatibility and force equilibrium at the pile-soil interface, the pile group-soil interaction equations are established and solved. The accuracy of the proposed method ...

(PDF) Interaction Factors for the Analysis of Pile Groups ...
Development of Soil-Pile Interaction Models in Improved Soils Using Centrifuge Test Data and System Identification Methods dc.contributor.advisor Muraleetharan, Kanthasamy

Development of Soil-Pile Interaction Models in Improved ...
The macroelement is an intuitive assembly of various basic elements, each of which incorporating a particular aspect of the soil–pile interaction. The modular structure of this macroelement allows straightforward adaptation of improved constitutive models for its building blocks.

A Robust Macroelement Model for Soil–Pile Interaction ...
governed by pile diameter D. In comparison with full soil model, the main difference is the fact that the pile-soil contact is modeled along the pile axis, instead of pile circumference. Pile-soil interaction is modeled with special interface 3-node spring elements in axial and

MODELING OF LATERALLY LOADED PILES USING EMBEDDED BEAM ...
The results showed that grouting can improve the bearing capacity of bored piles and precast concrete piles by increasing the degree of pile-soil interaction and the density of soil around the pile [15, 16].

Experiment on Improving Bearing Capacity of Pile ...
To further develop the understanding of the pile-soil interaction, there is a clear need for more fully instrumented (subsoil, pile, and building) case studies (either in the field or on a model scale) and advanced calculation models to study the combined effect of axial and lateral response of piles close to deep excavations.

Pile-Soil Interaction and Settlement Effects Induced by ...
SUMMARY A substructuring method has been implemented for the seismic analysis of bridge piers founded on vertical piles and pile groups in multi-layered soil. The method reproduces semi-analytically both the kinematic and inertial soil—structure interaction, in a simple realistic way. Vertical S-wave propagation and the pile-to-pile interplay are treated with sufficient rigor, within the ...