Map of Research and Development

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Basic Research on Pressed-in Pile

1. Bearing capacity of pressed-in pile
   - Sheet pile and circular pile (open end and closed end piles)
   - Vertical and horizontal bearing capacities
   - Vertical and batter piles
   - Soil type (clay, silt and gravel)
   - Relation between CPT and bearing capacity
   - Soil plug
   - Effect of friction cutter
2. Point resistance and skin friction during pressing-in and extraction
   - Clay and silt (disturbance and thixotropy)
   - Sand and silt (pore water pressure and creep)
   - Gravel (bearing mechanism)
   - Soil plug of open end pile
   - Speed of press-in
   - Effect of friction cutter
3. Elasto-plastic relation between force and displacement
   - Axial, lateral and torsional forces
   - Vertical and batter piles
   - Soil type (clay, silt and gravel)
4. Prediction of bearing capacity based on press-in behavior
   - Sheet pile and circular pile (open end and closed end piles)
   - Vertical and horizontal bearing capacities
   - Vertical and batter piles
   - Soil type (clay, silt, sand and gravel)
   - Relation between CPT and bearing capacity
   - Soil plug
   - Effect of friction cutter
5. Pile-pile friction during pressing-in and extraction
6. Bearing capacity of pile installed by back and forth rotating press-in machine
   - Skin friction in sand, gravel and rock
   - End bearing in sand, gravel and rock
7. Bearing capacity of pile pressed-in with auxiliary water jetting
   - End bearing and skin friction
   - Sand and gravel
   - Press-in and extraction resistances
8. Bearing capacity of chemical grouted pile
   - Clay, silt, sand and gravel
   - End bearing, press-in and extraction resistances
   - Material to be used and its mix proportion
9. Bearing capacity and control of machine in press-in method with augering
   - Sand, gravel and rock
   - Press-in force, torque, shape of auger head
   - Excavation of soil plug
10. Development of monitoring method under construction and after construction of pressed-in pile
11. Development of quality control method of press-in piling
12. Environmental impact assessment of press-in construction

Application and Extension of Press-in Method

(Investment of additional value)

1. New concept of geotechnical structure
   - Implant structure
   - Anti-liquefaction structure and aseismic structure
   - Inclined revetment
   - Composite structure
2. Improvement and reinforcement of construction by press-in method
3. Quick recovery construction method to hazard due to heavy rain and strong ground motion
4. Improvement of construction method (prevention of ground deformation, etc.)

Others

(Improvement and extension of use of press-in machine)

1. Improvement of machine and lightening of machine
2. Automatic operation system on press-in machine
3. Improvement of operation manual for press-in machine
4. Accuracy of pile installation (control of position and inclination)
5. Extension of use of press-in piling to other fields