
Map of Research and Development for Press-in Construction ver.14 Apr 2008

1. Basic Research

- 1-1. Bearing capacity of press-in pile
 - 1-1-1. Sheet pile and circular pile (open end and closed end piles)
 - 1-1-2. Vertical and horizontal bearing capacities
 - 1-1-3. Vertical and batter piles
 - 1-1-4. Soil type (clay, silt and gravel)
 - 1-1-5. Relation between CPT and bearing capacity
 - 1-1-6. Soil plug
 - 1-1-7. Effect of friction cutter
- 1-2. Point resistance and skin friction during press-in and during extraction
 - 1-2-1. Clay and silt (disturbance and thixotropy)
 - 1-2-2. Sand and silt (pore water pressure and creep)
 - 1-2-3. Gravel (bearing mechanism)
 - 1-2-4. Soil plug of open end pile
 - 1-2-5. Speed of press-in
 - 1-2-6. Effect of friction cutter
- 1-3. Elasto-plastic behavior between force and displacement
 - 1-3-1. Axial, lateral and torsional forces
 - 1-3-2. Vertical and batter piles
 - 1-3-3. Soil type (clay, silt and gravel)
- 1-4. Prediction of bearing capacity based on press-in behavior
 - 1-4-1. Sheet pile and circular pile (open end and closed end piles)
 - 1-4-2. Vertical and horizontal bearing capacities
 - 1-4-3. Vertical and batter piles
 - 1-4-4. Soil type (clay, silt and gravel)
 - 1-4-5. Relation between CPT and bearing capacity
 - 1-4-6. Soil plug
 - 1-4-7. Effect of friction cutter
- 1-5. Pile-pile friction during press-in and extraction
- 1-6. Bearing capacity of pile installed by gyropress machine
 - 1-6-1. Skin friction in sand, gravel and rock
 - 1-6-2. End bearing in sand, gravel and rock
- 1-7. Bearing capacity of pile press-in with auxiliary water jetting
 - 1-7-1. End bearing and skin friction
 - 1-7-2. Sand and gravel

- 1-7-3. Press-in and extraction resistances
- 1-8. Bearing capacity of chemical grouted pile
 - 1-8-1. Clay, silt, sand and gravel
 - 1-8-2. End bearing, press-in and extraction resistances
 - 1-8-3. Material to be used and its mix proportion
- 1-9. Bearing capacity and control of machine in press-in method with augering
 - 1-9-1. Sand, gravel and rock
 - 1-9-2. Press-in force, torque, shape of auger head
 - 1-9-3. Excavation of soil plug
- 1-10. Development of monitoring system on ground information during pile press-in
- 1-11. Development of method for guarantee of pile quality and quality management of pile based on ground information during press-in
- 1-12. Environmental impact assessment of press-in construction

2. Application

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

3. Others (machine, operation, etc.)

- 3-1. Improvement of machine and lightening of machine
- 3-2. Automatic operation system on press-in machine
- 3-3. Improvement of operation manual for press-in machine
- 3-4. Accuracy of press-in pile installation (control of position and inclination)
- 3-5. Quality control of press-in piles
- 3-6. Extension of use of press-in piling to other fields

4. Remarks

- 4-1. Basic research on press-in and on extraction mechanisms
- 4-2. Improvement of additional value
- 4-3. Extension of use