

Bullet Points

Session 1: APPLICATION

APPLICATION OF MICROPILES – EUROPEAN REVIEW AND POTENTIAL ,Herbst

Comprehensive Table for Fields of Application
Geological Conditions and Design Requirements influence Spreading of Micropiles
Micropiles as Components of Construction Methods
Reinforced Soil Concept needs more Acceptance with Designers

Session 4: EXECUTION

AMERICAN MICROPILE PRACTICE , ARMOUR

FHWA Micropile Manual PTP Project
Micropile Definition & Description
Micropile Applications
Construction Techniques and Materials
Contracting Methods
Cost

DEVELOPMENT OF EXPANDING CEMENT GROUTS FOR PILES AND GROUT ANCHORS, DE COCK, MAERTEN

Expanding cements and mortars
Characteristics of CIMEX
Expansion volume
Compressive strength
Expansion pressure
Initial in-situ tests on grout anchors
Load test results

EXPERIMENTAL WORK AT AIT, K. MIURA

EXECUTION OF MICROPILES – A SYNOPSIS, HERBST

Definition of the term „Execution“
Synopsis of related Deep Foundation Elements
Method and Sequence of Execution
Anchorages for Micropiles
Recent Examples of Execution

THE CENTRIFUGAL MODEL TESTS ON LOAD SHARING BETWEEN THE EXISTING PILE AND THE MICROPILE, ICHIMURA

Test purpose
Test Method (loading equipment, model piles, test cases etc.)
Test Results (load-displacement, lateral ground reaction-displacement etc.)
Conclusions

ELABORATION OF A EUROPEAN STANDARD ON MICROPILES, MAERTENS

Introduction

Selection of important paragraphs:

- 8.4 Drilling
 - 8.4.2. Choice of drilling method
 - 8.4.3. Drilling methods with flushing for soil removal
 - 8.4.4. Boreholes supported by casings.
 - 8.4.5 Boring with continuous flight augers:
 - 8.4 Driving
 - 8.5 Reinforcement and load bearing element
 - 8.7 Grout preparation
 - 8.8 Grouting
 - 8.8.3. Filling up the hole with grout.
 - 8.8.4. Grouting under pressure
 - 8.8 Concreting
 - 8.9 Trimming of micropiles

PREPARED COMMENTS

GROUTING, TURNER

- Components and Admixtures
- Mixing and Pumping
- Flow and Strength Properties

SYMMETRIX DRILLING TOOLS, TARKKONEN

- Pilot bit – Ring bit – Casing shoe
- Straight holes –Effective – Reliable – for Soil and Rock
- Applications

ATLAS COPCO MACHINERY, PETTERSON

NDS - DUAL FLUID SYSTEM (DFS), AHONEN

- Strengthening of Old Wood Pile Foundations
- Drilled Piles with Bedrock Socket
- Encountered Problems
- The DFS System
- Advantages

TITAN PILE, ISCHEBECK

- Description
- Application
- Testing

RR PILES, ERONEN

SPECIAL COMMENTS:

DE COCK

1. Recently developed expanding cement-compositions have proven to be a good technical alternative for post grouting
2. Laboratory tests have demonstrated :
 - * free expansions of 15%, developing in the first 24 h (before hydration starts)
 - * compression strength nevertheless remains largely sufficient ($> 40 \text{ N/mm}^2$ - 28 days) * the strength develops very quickly ($> 30 \text{ N/mm}^2$ - 5 days) so that loading/prestressing can start very early
3. Initial comparative in situ tests on 6 anchors have demonstrated to high beneficial effect of the grout swelling on the anchor capacity (increase $> 50\%$ compared to global medium pressure

grouting)

4. Further applications have confirmed the high technical performances, combined with the advantages of simplicity of installation and short waiting time for preloading.

MAERTENS

For the CEN Standard on micropiles, micropiles have been defined as piles which have a small diameter (smaller than 300mm outer diameter for bored piles and smaller than 150mm for displacement piles) and can be installed with small rigs.

Due to the big variety of applied installation methods it was impossible to define for the CEN standard a limited number of micropile types as has been done in the Frech DTU standard.

The CEN standard contains:

- criteria for the corrosion protection
- general principles on injection criteria
- criteria for testing of micropiles.

As very different installation methods are used for the realisation of micropiles, related to:

- the soil conditions
- the loads to be taken
- the local experience
- the equipment

the elaboration of a CEN standard was a very hard work.

K. MIURA

Mechanism of bearing capacity of micropile foundation and the effect of prestress to improve the bearing capacity.

I would like to talk about the mechanism of bearing capacity of the footing reinforced with a group of micropile, based on the result of some series of laboratory model loading tests.

To clarify the mechanism of load bearing by micropile foundation, some series of model tests were carried out. From the test result, the main influence factors on the bearing capacity were revealed, and the remarkable interaction between the subsoil, footing and micropile group was recognized.

To enhance the interaction and improve the bearing capacity effectively, pre-stress was introduced on the group of micropile at initial stage of loading. Base pressure on footing from subsoil was increased more and the bearing capacity was improved even in medium dense ground.

Thomas Herbst