Deep Foundation – Pile Groups

Factors of Group Efficiency
- The number, length, diameter, and spacing of the piles
- The load transfer mode (friction vs. bearing)
- The sequence of installation
- The soil type
- The elapsed time since the piles were driven
- The interaction, if any, between the pile cap and the soil
- The direction of the applied load

Hypothetical Group efficiency
- \( Q_{pg} = N \cdot Q_p \); \( Q_{sg} = \eta \cdot N \cdot Q_s \)
- Equations for Group Efficiency of Frictional Piles
  - Converse-Labare equation
  - Equation from block failure
Pile group in clay

Efficiency of pile group in clay

Efficiency of pile group in sand (model test)

Pile groups in sand (model tests)
Load distribution below piled foundation

Stress increase below pile group

Settlements below pile group in sand

Settlement of pile group
Load distribution below pile group in sand

Settlement of pile group in clay

Load distribution in pile group

Eccentric loading in pile group (example)
Eccentric loading in pile group (example cont.)

Effect of negative skin friction on piles in clay

Protection piles for reduction of negative skin friction