



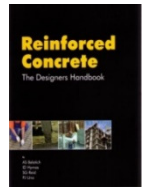
PAUL UNO BE MBdgSc MIE(Aust) CPEng NER

- Designed many concrete pile foundations as a civil/structural engineer including mine projects, large foundation piles for electricity transmission towers, bridges and other structures.
- Member of the Australian Geomechanics Society (AGS).

Recommended Text:

**Reinforced Concrete:
The Designers Handbook**
(2015 Revised Edition)

Beletich, Hymas, Reid and Uno



WORKSHOP SUMMARY

This two-day workshop will allow civil and structural engineers to gain a better understanding of the geotechnical parameters, theories and guidelines that are required to complete pile foundation design.

The course is specifically aimed at civil/structural engineers who do not have a geotechnical background.

DAY 1 (8.30 - 9.00 Registration)

9.00 - 10.30 Session 1

- SOIL GEOTECHNICAL BASICS

- Soil parameters that appear in geotechnical soil reports.
- SPT, CPT, DCP, Atterberg Limits (PL, SL, LL), CBR, N60 values, Relative Density, Proctor tests addressing Density, MDD, Triaxial, Oedometer addressing Cohesion and Angle of Internal Friction for both drained and undrained conditions (c and c'), (ϕ and ϕ').
- Correlations between these parameters (eg SPT vs DCP vs Bearing Capacity vs CPT vs Density).
- Pile types and methods of construction (eg CFA, Steel vs Concrete vs Timber, Bored vs Displacement)
- Durability issues and Capacity Reduction Factor ϕ_b as per AS2159.
- Tutorial exercises.

10.30 - 11.00 Morning Tea

11.00 - 12.30 Session 2

- SETTLEMENT OF PILE FOUNDATIONS

- Theory behind settlement of pile foundations in clay and sand.
- Comparisons between pile settlement theory and real-life examples.
- Simple rules such as pile settlement vs % pile diameter, single pile vs pile group settlement.
- Simple methods to analyse pile load vs pile displacement (using the Davisson method).
- Tutorial exercises to determine settlement values.

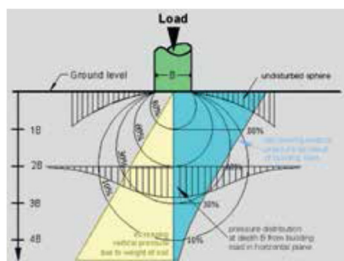
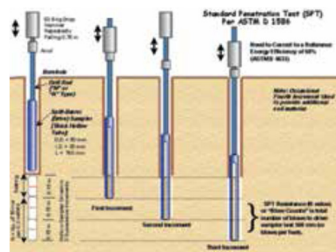
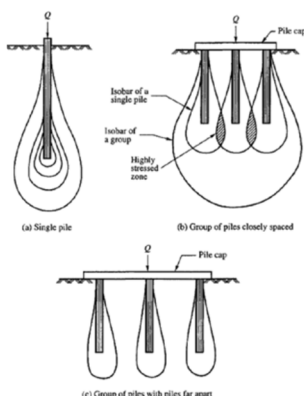
12.30 - 1.30 Lunch (Provided at Venue)

1.30 - 3.00 Session 3

- SINGLE PILES – AXIAL LOADS

- Basic pile design in accordance with AS2159.
- Pile design in both cohesive and cohesionless soils for Axial Loads.
- Static design will focus on Toe vs Shaft capacity by looking at comparisons between Skin Friction, Adhesion (eg α , β or λ) and End Bearing (eg 9Su).
- Uplift loads.
- Tutorial exercises.

3.00 - 3.30 Afternoon Tea



3.30 - 5.00 Session 4

- SINGLE PILES – LATERAL LOADS

- Pile design in cohesive & cohesionless soils for Laterally Loaded Piles.
- Pile design methods such as P-Y method (Winkler), Characteristic Load, Terzaghi, Broms, Reese & Matlock, and Meyehof vs Poulos.
- Axial vs Laterally loaded piles (both short and long).
- Summary table of models used in design (eg PLAXIS vs Broms vs Hansen vs PY method) and their application for soil types and loads.
- Tutorial exercises.

DAY 2

9.00 - 10.30 Session 5

- PILE GROUP – AXIAL & LATERAL LOADS

- Pile group design, pile spacing issues and load sharing between piles in a group.
- Negative friction effects and settlement methods.
- Tutorial exercises.

10.30 - 11.00 Morning Tea

11.00 - 12.30 Session 6

- PILES ON ROCKS

- Axial load capacity for piles on Sandstone and Shale.
- Pell Method.
- Zhang and Einstein Method.
- Shaft Capacity vs End Bearing Capacity.
- Explanation of terms such as RQD and roughness class.
- Tutorial exercises.

12.30 - 1.30 Lunch (Provided at Venue)

1.30 - 3.00 Session 7

- SCREW PILES (IN CLAY & SAND)

- Cylindrical Method vs End Plate Bearing Method.
- Deep Foundations Institute (USA) Method.
- Plate thickness vs Plate diameter.
- Uplift design capacity (wet vs dry)
- Corrosion rules of thumb.
- IPENZ Method.
- Tutorial exercises.

**CALCULATORS
REQUIRED**

3.00 - 3.30 Afternoon Tea

3.30 - 5.00 Session 8

- DYNAMIC PILING

- Dynamic design formulas (eg Modified Gates vs ENR & Hiley Formula)
- The Wave Equation (Goble, Rausche, Likins), Integrity Pile testing Case method/CAPWAP and buckling potential.
- Pile set up vs Time relationships.
- "Structural design" requirement (p%) for steel reinforcement in the pile as per the applied static & dynamic axial and bending moments.
- Tutorial exercises.

5.00 - 5.15 Certificate of Attendance & Feedback sheets

COURSE COST

- 2 day course – **\$1,360 pp**

DATES, VENUES & REGISTRATION

- Registration form (back of catalogue)
- Visit our website www.etia.net.au

FURTHER INFORMATION

- Office (02) 9899 7447
- Mobile 0413 998 031
- Email registrations@etia.net.au