



## PAUL UNO

BE MBdgSc MIE(Aust) CPEng NER RPEQ APEC Engineer IntPE(Aus)

- 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).

## WORKSHOP SUMMARY 16 hours of CPD

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. Most calculations are by hand.

### DAY 1 (8.30am Registrations at Venue)

#### 9.00 - 11.00 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  $c'$ ), ( $\phi$  and  $\phi'$ ).
- 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  $\phi_b$  as per AS2159.
- Tutorial exercises.

#### 11.00 - 11.15 Morning Break

#### 11.15 - 1.00 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.
- Examples using FINE Geo5 software.
- Tutorial exercises to determine settlement values (by hand).

#### 1.00 - 1.30 Lunch Break

#### 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  $\alpha$ ,  $\beta$  or  $\lambda$ ), End Bearing (eg  $9s_u$ ), Uplift Loads.
- Examples using FINE Geo5 software.
- Tutorial exercises.

#### 3.00 - 3.15 Afternoon Break

## CALCULATORS REQUIRED

- Two day course – **\$1,600**

### FURTHER INFORMATION

- (02) 9899 7447
- +61 413 998 031
- [registrations@etia.net.au](mailto:registrations@etia.net.au)

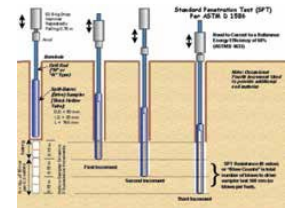
- To register, visit our website [www.etia.net.au](http://www.etia.net.au)
- OR scan the QR Code.



### Recommended Text:

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

Beletich, Hymas, Reid and Uno



#### 3.15 - 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 Geo5 vs Broms vs Hansen vs PY method) and their application for soil types & loads.
- Tutorial exercises.

### DAY 2

#### 9.00 - 11.00 Session 5

##### - PILE GROUP – AXIAL & LATERAL LOADS

- Pile group design, pile spacing, load sharing between piles.
- Negative friction effects and settlement methods.
- Examples using FINE Geo5 software.
- Tutorial exercise to determine load capacity (by hand).

#### 11.00 - 11.15 Morning Break

#### 11.15 - 1.00 Session 6

##### - PILES ON ROCKS

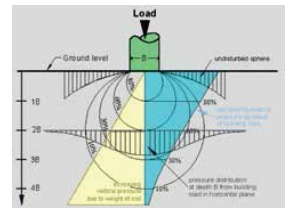
- Axial load capacity for piles on Sandstone and Shale.
- Zhang and Einstein Method as well as Pell Method
- Shaft Capacity vs End Bearing Capacity.
- Explanation of terms such as RQD and roughness class.
- Tutorial exercise to determine bearing capacity (by hand).

#### 1.00 - 1.30 Lunch Break

#### 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.



#### 3.00 - 3.15 Afternoon Break

#### 3.15 - 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.

Certificate of Attendance will be emailed

## FACE-TO-FACE (SYDNEY)

**Rydges Norwest**

(1 Columbia Ct, Baulkham Hills, NSW)

**R Y D G E S**