



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

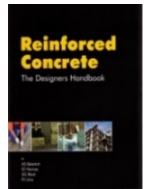
- Over 40 years of experience in the design and construction industry.
- Part-time Senior Lecturer – UNSW and University of Sydney.
- Designed many foundations and addressed soil slope issues for mining developments, electricity transmission towers and other such structures.

**Recommended Text:**

**Reinforced Concrete: The Designers Handbook**

(2015 Revised Edition)

Beletich, Hymas, Reid and Uno



## WORKSHOP SUMMARY

This one-day workshop is primarily aimed at civil and structural engineers who wish to design against the potential failure of sloping sites. This can be done by determining the likelihood of failure of the existing soils and slopes on site or designing retaining walls to resist any potential soil slope failures. The software **FINE GEO5** will be addressed.

Australian Design Standards AS4678 (applicable in New Zealand) and their requirements as well as Eurocode provisions will be addressed. A series of slope stability methods will be addressed and compared.

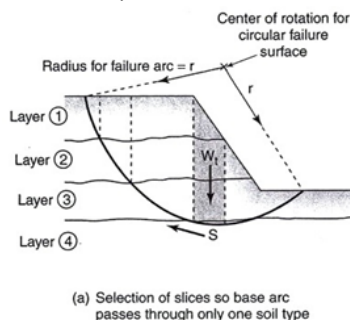
All sessions provide worked examples, tutorial exercises and solutions.

## PROGRAMME (8.30 - 9.00 Registration)

### 9.00 - 10.30 Session 1

#### - SOIL CLASSIFICATIONS, TESTS & SOIL MECHANICS

- Soil Basics – Bulk vs Dry vs Saturated vs Submerged Density
- Angle of Repose vs Angle of Internal Friction
- Cohesion vs Shear Strength
- Proctor Density Test and Unit Weights of Various Soils
- Clay vs Sand Basic Soil Type Classification to AS1726/NZS4402
- Shear Box Test vs Oedometer Test vs Triaxial Test
- Factors of Safety – Ultimate vs Serviceability
- HILF Density Classification
- Cracked vs Uncracked Soils
- Active vs Passive Pressure
- Coulomb vs Rankine Theory
- Pore Pressures
- Drained vs Undrained Soils
- Atterberg Limits (LL PL PI)
- Tutorial



### 10.30 - 11.00 Morning Tea

### 11.00 - 12.30 Session 2

#### - SLOPE STABILITY I (Basic Principles)

- Australian and Overseas Examples of Wall and Soil Failures
- Soil Pressure Theory – active vs passive
- Causes of slope failures eg rainfall, inadequate drainage, poor construction, soil properties
- Modes of Slip Failure eg toe, base, slope
- AS4678 information regarding Slope Stability Failure
- Australian Standards vs Eurocode
- Tutorials using worked example by hand AND use of FINE software

### 12.30 - 1.30 Lunch (Provided at Venue)

**CALCULATORS REQUIRED**

#### COURSE COST

- 1 day course – \$765 pp

#### DATES, VENUES & REGISTRATION

- Registration form (back of catalogue)
- Visit our website [www.etia.net.au](http://www.etia.net.au)

#### FURTHER INFORMATION

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

### 1.30 - 3.00 Session 3

#### - SLOPE STABILITY II (Basic Design Methods)

- Method of Slices
- Swedish (Fellenius) Method
- Determination of Safety Factor
- Drained vs Undrained
- Water Table effects on Slope Stability
- Phreatic Water line effects
- Tutorials using worked examples, as well as FINE GEO5 Software

### 3.00 - 3.30 Afternoon Tea

### 3.30 - 5.00 Session 4

#### - SLOPE STABILITY III (Advanced Design Methods & Software)

- Slope Stability Method Comparisons
- Morgenstern-Price method
- Soil over Rock situation
- Total vs Effective Stresses vs Pore Pressures
- Stability Charts and Friction Circle Method
- Force Equilibrium vs Moment Equilibrium
- Soil Vertical Cuts vs Tension Cracks in Soils
- Bishop method vs Janbu method vs Spencer Method
- Slope Stability Software packages – FINE Software vs Plaxis
- Tutorials using worked examples, as well as FINE GEO5 Software
- Taylor Charts
- Eurocode provisions
- Effects of Water Table

### 5.00 - 5.15 Certificate of Attendance & Feedback sheets

**Download FINE GEO5 demo version via the link**  
[www.etia.net.au/geo5-demo-version](http://www.etia.net.au/geo5-demo-version)



#### Stability Analysis

Analysis of slope stability, rock slopes and MSE walls



#### Shallow Foundations

Bearing capacity and settlement of spread footing, strip footing and slabs



#### Excavation Design

Design and verification of retaining structures, diaphragm and pile walls



#### Walls and Gabions

Complex design of gravity, cantilever and prefab retaining walls



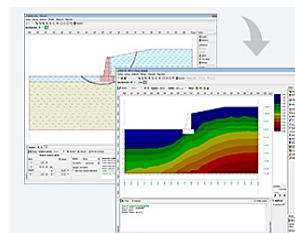
#### Deep Foundations

Bearing capacity and settlement of piles and pile groups



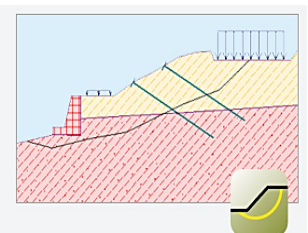
#### Settlement Analysis

Analysis of settlement and consolidation of foundation soil



Combination of Analytical Methods and FEM

GEO5 enables comparison of two independent solutions.



Each program solves one structure type

Thanks to that, the programs are intuitive and easy to use.