

# CEMENT & CONCRETE TECHNOLOGY & PRACTICE COURSE



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

Previously

- NSW Senior Engineer (Cement & Concrete Association of Australia CCAA)
- NSW Technical Manager (CSR Readymix - now Holcim)
- Materials Engineer (Boral)

Event Sponsors:  
NSW and VIC



## DAY 1 (8.30 - 9.00 Registration)

### 9.00 - 10.30 Session 1

#### - CEMENT AND CONCRETE MATERIALS

- Cement types (portland, blended, low heat, high early strength, low shrinkage, sulfate resistant, off-white, white, high alumina cements, geopolymers)
- Aggregates (fine/coarse), manufactured sands, water
- Supplementary cementitious materials (slag, flyash, silica fume)
- Green Star Rating and Sustainability.

### 10.30 - 11.00 Morning Tea

### 11.00 - 12.30 Session 2

#### - ADMIXTURES

- Standard admixtures (accelerators, retarders, water-reducers, superplasticisers, air entraining agents, waterproofer, corrosion inhibitors)

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

### 1.30 - 3.00 Session 3

#### - CONCRETE & REINFORCEMENT PROPERTIES

- Concrete properties
  - Water to cement ratio effects, workability and stiffness, air content, heat of hydration, setting time, shrinkage, strength development as a function of time (concrete maturity) and temperature, bleeding, permeability and porosity.
- Reinforcement properties
  - Yield, bond and anchorage, bars vs mesh, metal vs plastic bar chairs, detailing, prestressing.
  - Issues of using 500 MPa steel bars and steel mesh with regards to ductility and size
  - Use of plastic and steel fibres.

### 3.00 - 3.30 Afternoon Tea

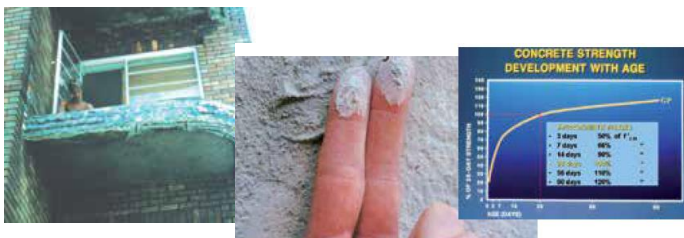
### 3.30 - 5.00 Session 4

#### - CONCRETING ON SITE

- Transport, place, compact, finish and cure concrete on site.
- Truck sizes, delivery time limits, site access, delivery rate, pumping, avoidance of segregation, vibration, screeding, floating by hand and by machine, curing methods and curing agents, and slip resistance.

**Class sizes limited to max. 15**

**Live streaming option available**



## DAY 2

### 9.00 - 10.30 Session 5

#### - TESTING

- Cement and concrete materials, fresh and hardened concrete (including core tests)
- VPV, permeability and consistency tests
- Slump: vertical and horizontal (spread/flow); in line with the J ring test for self-compacting concretes
- Standard tests: indirect tension, flex, shrinkage, creep, and impact rebound testing (Schmidt hammer).

### 10.30 - 11.00 Morning Tea

### 11.00 - 12.30 Session 6

#### - DURABILITY & CRACKS IN CONCRETE

- Durability aspects of concrete (abrasion, cover to reinforcement, concrete strength, carbonation, chloride penetration, concrete cancer, exposure environment, freeze-thaw conditions, salt attack)
- Cracks in concrete
  - Hot weather concreting, plastic shrinkage, plastic settlement, thermal cracking, building restraint, inadequate reinforcement.
  - Methods of crack identification and minimisation of cracking, curing compounds, use of fibres (polypropylene and steel)
  - Calculation of bleed water evaporation rates from concrete surfaces using UNO equation, ACI charts and APPs.
  - Joint design (types of dowels used in the marketplace such as round vs square vs flat vs diamond)

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

### 1.30 - 3.00 Session 7

#### - CONCRETE FOR INDUSTRIAL APPLICATIONS

- High strength and high performance concrete
- Formwork finishes (class 1 to 5) and colour control to AS3610, rendering high strength concrete
- Precast concrete and tilt up construction
- Concrete industrial floors and pavements
- Prestressed concrete.

### 3.00 - 3.30 Afternoon Tea

### 3.30 - 5.00 Session 8

#### - CONCRETE IN RESIDENTIAL CONSTRUCTION

- Residential slabs and footings to AS2870-2011, crack width and termite ingress, waffle pod slabs, cement rendering, brick mortars and the effect of air entrainers, shotcreting, sprayed concrete pools, stencilled and stamped concrete, colouring concrete using oxides.

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

#### COURSE COST

- 2 day course – \$1,420 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)

Cancellations made more than 5 working days prior to a course will incur a 20% processing fee of the full registration amount.

Cancellations made 5 working days or less will incur forfeiture of the full registration fee.