



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



WORKSHOP SUMMARY

This course is primarily aimed at engineers who wish to understand cement and concrete at a more professional technical level.

Emphasis on this course will be directed to more prominent engineered structures (eg. High Rise, Bridges etc) and their respective specifications and codes (eg. B80 Bridge Spec, AS3600, AS5100, AS1379).

Design life requirements for various structures will be addressed (eg. 50 year design life for normal structures vs 100 year design life for prominent structures).

PROGRAMME (8.30 - 9.00 Zoom invite link will be emailed)

9.00 - 11.00 Session 1

- CEMENT & SUPPLEMENTARY CEMENTITIOUS MATERIALS (Properties & Reactions)

- Portland cement types – General Purpose, Blended, Low Heat, High Early Strength, Low Shrinkage, Sulphate Resistant, Off-White
- Outlining the 4 main phases of cement (ie. C_3S , C_3A , C_2S and C_4AF) and their effects on cement properties.
- Non-Standard cement types (eg. High Alumina cements and geopolymers)
- Supplementary cementitious materials – Flyash vs slag vs silica fume, including formulas showing the pozzolanic reactions
- Green Star Ratings and Sustainability issues
- Tutorial exercises and solutions provided

11.00 - 11.15 Morning Break

CALCULATORS REQUIRED

11.15 - 1.00 Session 2

- CONCRETE MIX DESIGN (Theory & Practice)

- British Method vs Trial Mix Method vs ACI Method (including a detailed worked example)
- Water to Cement Ratio vs Compressive Strength vs Permeability
- Statistical Parameters (eg. Characteristic strength f'_c vs mean strength f_{cm} (target strength), standard deviation σ , coefficient of variation COV)
- Operating Characteristics Curves vs Optimum mix design
- Effects of Admixtures (eg. Accelerators, retarders, water-reducers, superplasticisers, air entraining agents, corrosion inhibitors)
- Tutorial exercises and solutions provided

1.00 - 1.30 Lunch Break

Live streamed via 

COURSE COST

- 1 day course – \$880 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

1.30 - 3.00 Session 3

- CONCRETE PROPERTIES & TESTS VS SPECIFICATIONS (eg. B80 Bridge Spec)

- Plastic Shrinkage Cracking principles (eg. Bleed evaporation rates vs Weather conditions vs APP's)
- Plastic Shrinkage Cracking potential, determination using the UNO evaporation equations and/or ACI nomographs
- Plastic settlement factors and identification of these types of cracks
- Thermal Cracks in concrete – what factors determine the potential for thermal cracking
- Long Term Concrete Shrinkage determination and Code limitations on crack size (AS2327 vs AS3600 vs AS5100 vs B80)
- Miscellaneous factors: curing, setting time, strength development vs time, concrete maturity, permeability vs porosity, VPV, fibres in concrete, permeability, slump drop vs spread, creep, impact rebound testing (Schmidt hammer).
- Tutorial exercises and solutions provided

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4

- CONCRETE DURABILITY & CORROSION vs SPECIFICATIONS (eg. B80 Bridge Spec)

- Ion Diffusion Process
- Carbonation (eg. Klopfer formula)
- Chloride Ingress (eg. Fick's formula)
- Corrosion process and steel corrosion formulas
- Effective Chloride Transport Coefficient determination using Nordtest NT Build 443 (as required by B80)
- Non-Steady State Migration Coefficient determination using Nordtest NT Build 443 (as required by B80)
- Acid-Sulphate Soils
- Alkali Aggregate Reaction AAR
- Tutorial exercises and solutions provided

Certificate of Attendance will be emailed

