

# REINFORCED CONCRETE DESIGN WORKSHOP – MODULE THREE

(including High Rise Aspects)

## STUART REID *BE(Hons) ME PhD*



- Retired Associate Professor at School of Civil Engineering, USyd
- Previous employment:
  - Structural engineer in NZ with specialist earthquake engineering company.
  - CSIRO, Building Research, Melb VIC

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



- Over 40 yrs experience in the design and construction industry.
- Part-time Senior Lecturer - UNSW and USyd
- Chairman - Australian Standard AS3850 Precast (Prefab)

## ANDREAS BOOMKAMP



- MIEAust CPEng RPEQ CMEngNZ*
- National Technical Manager for Ancon Building Products Australia & New Zealand
  - Structural Engineer with 10+ yrs experience in anchorage & lifting of structural precast concrete.

## WORKSHOP SUMMARY

This workshop is aimed at civil and structural engineers who wish to understand the various design aspects that relate to tall buildings.

The sessions will address specialised areas such as high strength concrete column design (including AS3600-2018 requirements for confinement reinforcement in heavily loaded columns); load transmission from HSC column through NSC floors; connection design of façade elements on tall structures; tall buildings subjected to horizontal actions (eg seismic loads) and the corresponding effects on the structure (eg drift); refined methods of accounting for shrinkage and creep in long span floors of high rise structures.

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

### 9.00 - 11.00 Session 1 (Paul Uno)

#### - HSC COLUMN DESIGN CONSIDERATIONS/ FAÇADE CONNECTION DESIGN

- Identification of what constitutes high strength concrete (HSC) vs normal strength (NSC).
- HSC column design taking in to account confinement reinforcement pressures.
- Design for load transfer from HSC column through NSC floor back through HSC column.
- Design principles for connection of tall building façade elements to concrete beam elements.
- Tutorial Exercise

**CALCULATORS REQUIRED**

### 11.00 - 11.15 Morning Break

### 11.15 – 1.00 Session 2 (Stuart Reid)

#### - REFINED SHRINKAGE & CREEP DEFLECTION CALCULATIONS FOR LONG SPAN FLOORS

- AS3600 provides little information on how to determine the deflection of a beam in accordance with “refined” methods.
- Refined deflection calculation procedures using transformed section analyses based on effective elastic moduli to account for creep and shrinkage effects.
- These procedures can be quite involved but they produce a level of refinement that is consistent with the limitations of theoretical creep and shrinkage models.
- Limitations of theoretical models and the associated uncertainties.
- Tutorial Exercise

### 1.00 - 1.30 Lunch Break

### 1.30 - 3.00 Session 3 (Stuart Reid)

#### - DESIGN AND DETAILING OF TALL BUILDINGS TO RESIST HORIZONTAL LOADS (eg SEISMIC)

- Fundamental differences between the structural design rationale to withstand earthquakes vs other types of structural loading.
- New provisions of Section 14 AS3600-2018 re structural ductility
- Critical aspects of reinforced concrete detailing for EQ effects compared with common Australian practice for general design.

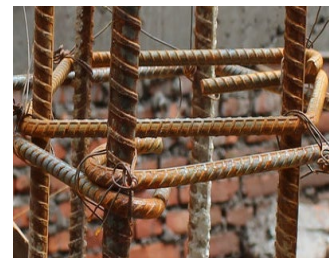
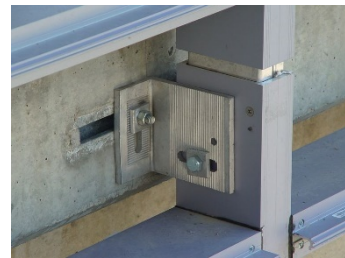
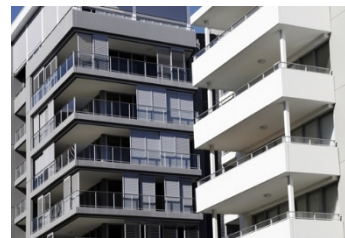
### 3.00 - 3.15 Afternoon Break

### 3.15 - 5.00 Session 4 (Andreas Boomkamp)

#### - ADVANCED DESIGN OF DETAILED CONNECTIONS

- Guidance and best practice advice covering the prequalification, design, selection and installation of post-installed and cast-in anchors as per AS5216-2018.
- Comparisons between current practice in Australia eg work being undertaken by Australian Engineered Fastener and Anchor Council (AEFAC), and internationally such as the Guidelines for European Technical Approval (ETAG) and the American Concrete Institute (ACI).

Certificate of Attendance will be emailed



**Live streamed via**

**Reinforced Concrete: The Designers Handbook**

(2015 Revised Edition)

Beletich, Hymas, Reid & Uno



#### COURSE COST

- 1 day course – **\$815 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
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