



STRUCTURAL STEEL DESIGN WORKSHOP



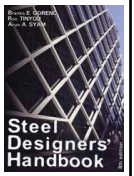
PAUL UNO BE MBdgSc MIE(Aust) CPEng NER RPEQ APEC Engineer IntPE(Aus)

- Over 40 years of experience in the design and construction industry.
- Former Part-Time Senior Lecturer – UNSW, UTS and University of Sydney.
- Previously Structural Steel Design Engineer for *Transfield* & for *H.H Robertson*.
- Development Engineer for AISC (now Australian Steel Institute).

Recommended Text:

Steel Designers' Handbook
(8th Ed. 2012)

Gorenc, Tinyou and Syam



WORKSHOP SUMMARY 16 hours of CPD

This two-day workshop is a back-to-basics course which addresses the key areas of steel design with reference to AS4100-2020, NZS3404-2009 and AS3990-1993 (mech) the 'Structural Design Handbook' by Gorenc, Tinyou & Syam. This text is invaluable to engineers wishing to design steel structures.

Sessions provide worked examples, tutorial exercises and solutions.

DAY 1 (8.30am Zoom invite will be emailed)

9.00 - 11.00 Session 1

- MATERIALS

- Basic terms and properties of structural steel.
- Loading parameters required for steel design.
- Terms & processes in producing Hot/Cold rolled sections, CHS, RHS.
- Parallel flange sections, Welded beams and residual stress relieving.
- Temperature effects on steel (hot, cold and transition temperatures), welding, hydrogen cracking, HAZ, quenched & tempered (Bisalloy), brittle fractures, and ductility.
- Creep, fatigue & hardness.



11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2

- DESIGN CODES

- Design aspects such as building height vs. terrain, wind velocity vs. region and wind speeds as per AS/NZS 1170.2.
- Basic aspects of loading including capacity reduction factors, deflection limits and relevant design codes, bulk material properties and imposed actions as per AS/NZS 1170.1.

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3

- STRUCTURAL ANALYSIS

- Structural framing (isolated beams, braced & unbraced frames FS1 to FS7), and minimum eccentricities.
- First and second order effects in columns via moment amplification methods, effective lengths, joint rigidity, buckled shapes, restraint stiffness, sway stiffness ratios, unequal end moment factors.

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4

- BEAMS & GIRDERS

- Member vs. Section capacity, slenderness reduction factors, lateral restraint (& the respective categories of lateral restraint F, P, L & U).
- Flexural torsional buckling, k values, slenderness α_s and moment α_m factors, moment magnification factors, compactness vs. slenderness for plate elements, buckling and shear capacity of webs (both stiffened and unstiffened).

CALCULATORS REQUIRED

• Two day course – **\$1,540**

FURTHER INFORMATION

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

• To register, visit our website www.etia.net.au
OR scan the QR Code.



Livestreamed via



DAY 2

9.00 - 11.00 Session 5

- WEB STIFFENERS/TENSION MEMBERS

- Requirements for the use of transverse and longitudinal web stiffeners in beams and columns. Especially critical in beams with high shear due concentrated loads and in portal frame column-rafter connections.
- Tension members e.g. UB & UC's as support columns or Angles (equal and unequal) in bracing.
- Both bolted and welded tension members are covered and the failure modes of 'fracture vs yield' are covered.

11.00 - 11.15 Morning Tea

11.15 - 1.00 Session 6

- COMPRESSION MEMBERS & BEAM COLUMNS

- Compression members and beam columns both with concentric and eccentric loading.
- Form factors (k_f), compression member constants, axial member capacities and design bending moments.
- Euler buckling loads, unequal moment factors and amplification factors allowing for reduced section capacities and biaxial effects.
- In plane and out of plane moment capacities.

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 7

- CONNECTIONS

- Types of bolts, i.e. snug, tensioned bearing and tensioned friction (4.6 S, 8.8 TB and 8.8 TF).
- Slip loads, minimum design actions on connections, tensile and shear strength (threaded vs. shank).
- Welding including the two main metal arc electrode categories E41XX & E48XX (alternatively W40X and W50X), fillet and butt welds, maximum and minimum fillet weld sizes, weld throat size, weld shrinkage cracking.
- Standardised connections e.g. angle seat, flexible end plate and base plate connections.

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 8

- FRAMING SYSTEMS & FAILURES

- Structural framing systems available including rigid frames, longitudinal bracing, roof trusses, open and closed sections, steel frames for low rise buildings, purlins and girts.
- Deflection limits, fatigue, fire and corrosion requirements.

Certificate of Attendance will be emailed



Cancellations made more than 5 working days prior to a course will incur a 50% processing fee of the full registration amount.

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