ENGINEERING TRAINING INSTITUTE AUSTRALIA

www.etia.net.au
ABN 27 830 322 080

IMPORTANT NOTICE

- ALL COURSES WILL BE LIVE STREAMED (AEST).
- PLEASE REFER TO THE REGISTRATION FORM AT THE BACK OF THIS CATALOGUE (OR THE ETIA WEBSITE) FOR FURTHER DETAILS ON LIVE STREAMING.

July and August 2020 Courses

LIVE STREAMED COURSE LIST

• Tue 7 July 2020	Risk Management Workshop
• Thu 9 July 2020	Cold-Formed Steel Design Workshop
• Tue 14 July 2020	Precast & Tilt Up Design & Construction Workshop
• Thu 16 July 2020	Industrial Buildings Design Workshop
• Tue 21 July 2020	Detailing in Practice Workshop
• Thu 23 July 2020	Composite Steel & Concrete Structures Workshop
• Tue 28 + Wed 29 July 2020	Cement & Concrete Theory & Practice Course
• Fri 21 August 2020	Masonry Design Workshop
• Tue 11 + Wed 12 August 2020	Structural Steel Design Workshop
• Tue 18 + Wed 19 August 2020	Residential Slabs & Footings Design Workshop
• Tue 25 August 2020	Forensic Engineering Workshop
• Wed 26 August 2020	Cement & Concrete Technology Workshop

ANNUAL SPONSORS OF ETIA

ENGINEERING TRAINING INSTITUTE AUSTRALIA

CEMENT & CONCRETE TECHNOLOGY WORKSHOP

NEW 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 & VIC

Independent Cement

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

1.30 - 3.00 Session 3
- CONCRETE PROPERTIES & TESTS VS SPECIFICATIONS (eg. B80 Bridge Spec)

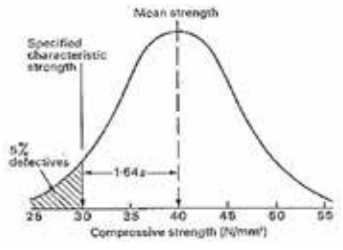
- Plastic Shrinkage Cracking principles (eg. Bleed evaporation rates vs Weather conditions vs APP's)
- Plastic Shrinkage Cracking potential, determination using the UNO evaporation equations and/or ACI nomographs
- Plastic settlement factors and identification of these types of cracks
- Thermal Cr5acks 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

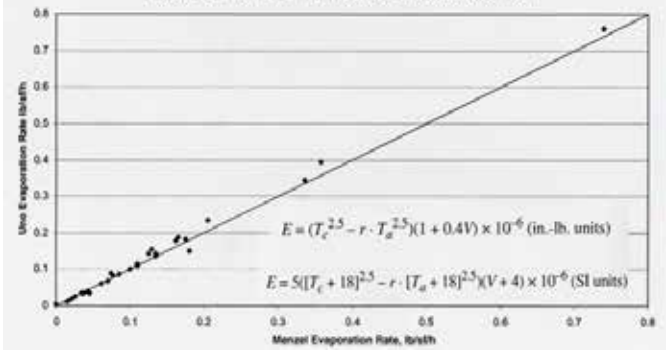
3.00 - 3.15 Afternoon Break

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





Live streamed via zoom

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

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ENGINEERING TRAINING INSTITUTE AUSTRALIA

CEMENT & CONCRETE THEORY & 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 & VIC

Independent Cement

DAY 1 (8. 30 - 9.00 Zoom invite link will be emailed)

9.00 - 11.00 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.

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2
- ADMIXTURES

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

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3
- CONCRETE & REINFORCEMENT PROPERTIES

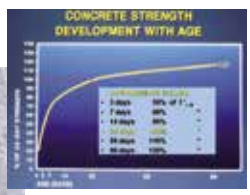
- Concrete properties
  - Water to cement ratio effects, workability and stiffness, air content, heat of hydration, setting time, shrinkage, strength development as a function of time (concrete maturity) and temperature, bleeding, permeability and porosity.
- Reinforcement properties
  - Yield, bond 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 - 3.15 Afternoon Break

3.15 - 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.

Live streamed via zoom



DAY 2

9.00 - 11.00 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).

11.00 - 11.15 Morning Break

11.15 - 1.00 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)

1.00 - 1.30 Lunch Break

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 - 3.15 Afternoon Break

3.15 - 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.

Certificate of Attendance will be emailed

COURSE COST

- 2 day course – **$1,420 pp**

DATES, VENUES & REGISTRATION

- *Registration form (back of catalogue)*
- *Visit our website* www.etia.net.au

FURTHER INFORMATION

- *Office* (02) 9899 7447
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ENGINEERING TRAINING INSTITUTE AUSTRALIA

COLD-FORMED STEEL DESIGN WORKSHOP

SASAN SAIDIAN *MIEAust CPEng NER APEC Engineer IntPE(Aus)*

- Two decades of industry experience in the design and construction of light steel framing
- Director, Cold-Formed Steel Engineers Australia
- Academic researcher at Western Sydney University

Live streamed via zoom

WORKSHOP SUMMARY

This workshop provides a theoretical background to the behavior of thin-walled members and presents methods and tools that engineers employ for the analysis and design of cold-formed steel.

The content of the course is tailored for both practitioners with previous experience and for engineers who are interested in extending their knowledge in cold-formed steel. The workshop delivers concise information about buckling analysis of thin-walled structures, stiffness and strength predictions for cold-formed steel members and light steel framing design. Several exercises are included, focusing on typical day-to-day design implementations. THIN-WALL-2 elastic buckling analysis software is practiced through the course.

Laptops, Calculators and Australian Standard AS4600-2018 Required: *THIN-WALL-2 must be installed on laptops, prior to the workshop. Upon registration, information regarding THIN-WALL-2 will be sent to all attendees.*

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

9.00 - 11.00 Session 1
- INTRODUCTION
- BEHAVIOUR & DESIGN OF THIN-WALLED MEMBERS

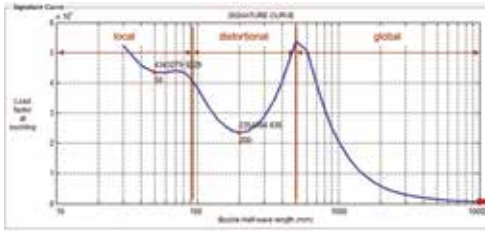
- Applications
- Advantages
- References
- Design Tools
- Global, Local and Distortional Instabilities
- Plate Theory and Post-Buckling Reserve
- The Effective Width Method of CFS Design
- Exercise #1: Compressive Axial Strength of a Square Hollow Section via EWM

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2
- BUCKLING ANALYSIS

- The Finite Strip Method of Stability Analysis
- The "Signature Curve"
- Exercise #2: Buckling Analysis of a Lipped Channel in Bending (Computerized & Manual)

1.00 - 1.30 Lunch Break



1.30 - 3.00 Session 3
- THE DIRECT STRENGTH METHOD OF CFS DESIGN

- What is DSM?
- DSM vs. EWM
- Exercise #3: Wall Stud Design via DSM (ULS & SLS)

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4
- DESIGN CONSIDERATIONS FOR WEBS
- CONNECTIONS

- Failure Modes of Webs
- Webs in Shear
- Web Crippling
- Exercise #4: Stud-to-Track Connection Capacity
- Bolted Connections
- Screwed Connections
- Exercise #5: Stud Splice Design

Certificate of Attendance will be emailed

AUSTRALIAN STANDARD AS4600-2018, LAPTOPS & CALCULATORS REQUIRED

COURSE COST
- 1 day course – **$910 pp**

DATES, VENUES & REGISTRATION
- *Registration form (back of catalogue)*
- *Visit our website* www.etia.net.au

FURTHER INFORMATION
- *Office* (02) 9899 7447
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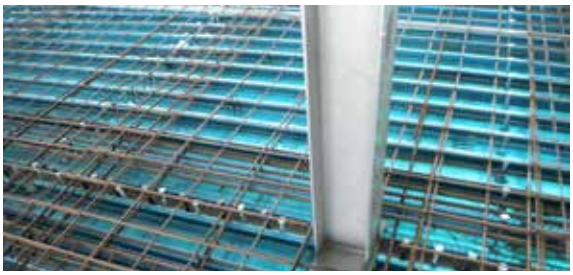
ENGINEERING TRAINING INSTITUTE AUSTRALIA

COMPOSITE STEEL & CONCRETE STRUCTURES WORKSHOP

IAN HYMAS

BSc (Hons) MEngSc

- Structural engineer for over 40 years.
- Founding partner of the firm Henry and Hymas.
- Member of the current BD-066 Standards committee for the Prefabricated Concrete Standard AS3850.



WORKSHOP SUMMARY

This one-day workshop will provide an overview of the **new standard AS2327-2017**.

The standard AS2327-2017 on composite steel – concrete members has considerably expanded its scope when compared to the previous addition that only considered simply supported composite beams.

As well as updating the old standard the latest edition includes continuous beams, composite slabs, composite columns and new information on fire ratings.

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

9.00 - 11.00 Session 1 - COMPOSITE BEAMS

- What's new in the recently published standard AS2327-2017
- History elastic design – ultimate design.
- Section properties.
- Shear connections and their ductility
- Full and partial shear connection.
- Detailing shear connections
- Simply supported beams – ultimate strength.
- Continuous beams ultimate strength.

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2 - COMPOSITE CONCRETE SLABS

- Available sections
- Section properties
- Testing for shear connection verification
- Strength as formwork
- Detailing
- Simply supported – ultimate strength
- Continuous - ultimate strength.

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3 - SERVICEABILITY: BEAMS AND SLABS

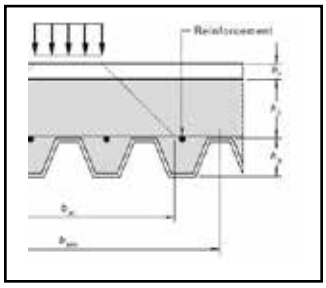
- Calculating deflections simply supported and continuous.
- Effects of creep and shrinkage.
- Effects of propping and construction stages.
- Detailing for crack control.
- Potential for ponding of wet concrete.
- Detailing for crack control

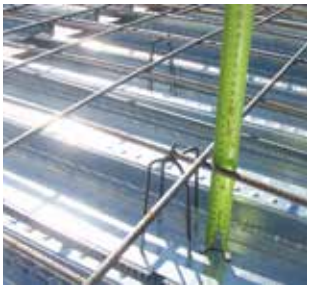
3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4 - COLUMNS AND FIRE RATINGS

- An overview of:
  - New section in AS2327-2017 on composite steel concrete columns.
  - Fire rating
  - Composite precast- in situ concrete

Certificate of Attendance will be emailed





Max Tension in Composite Steel Profile :

$$N_{yp.d} = \phi f_{up} A_{pc} \quad (where\ \phi = 0.9)$$

Live streamed via zoom

CALCULATORS REQUIRED

COURSE COST

- 1 day course – **$840 pp**

DATES, VENUES & REGISTRATION

- *Registration form (back of catalogue)*
- *Visit our website* www.etia.net.au

FURTHER INFORMATION

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ENGINEERING TRAINING INSTITUTE AUSTRALIA

DETAILING IN PRACTICE WORKSHOP
(for Steel Reinforcement & On-site Construction Issues)

IAN HYMAS *BSc (Hons) MEngSc*

- Structural engineer for over 40 years.
- Founding partner of the firm Henry and Hymas.
- Member of the current BD-066 Standards committee for the Tilt Up and Precast Concrete (Prefabricated) Standard AS3850.

Recommended Text:

Reinforced Concrete: The Designers Handbook
(2015 Revised Edition)

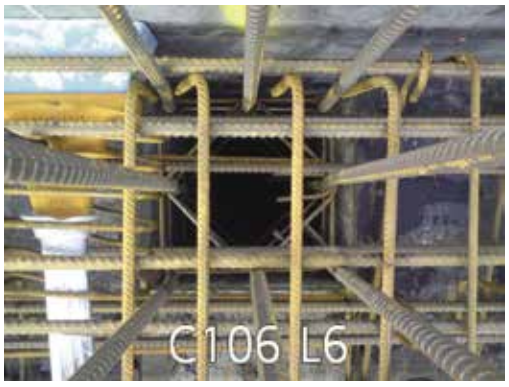
Beletich, Hymas, Reid and Uno

WORKSHOP SUMMARY

This course is designed to provide a raised level of awareness about how to detail the steel reinforcement, where the construction joints should be placed for each pour and the issues that may arise on-site from poor detailing.

Typical questions that arise on-site for the structural designer:

- What reinforcement detailing is required for stairs, landings or retaining walls?
- What should be done when starter bars are in the wrong position?
- Where should construction joints be located to effectively control cracking?
- What is a practical spacing of joints?
- Is the reinforcement adequately distributed in your section?
- Should the reinforcement in your footings be cogged or straight?
- Are sawn joints better than key joints in slabs?
- Should you thicken a slab on ground over a joint?
- What are the development length requirements according to AS3600-2018?
- How do you handle penetrations in beams and slabs?



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

9.00 - 11.00 Session 1
- PRACTICAL DETAILING FOR 'FOOTINGS, PIERS & PILES'

- Reinforcement details required to ensure footings can be designed "to work".
- Practical on-site guidelines to solve issues including boundaries, column locations and off sets.
  - Localised soft soils or high water tables may require a redesign of a footing or one off adjustments to standard designs.

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2
- PRACTICAL DETAILING FOR 'SLABS ON GROUND'

- Reinforcement details required to ensure concrete slabs on ground are designed according to the detailing requirements of AS3600-2018.
- Practical on-site guidelines to solve factors such as boundaries, soil conditions and large eccentricities.

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3
- PRACTICAL DETAILING FOR 'COLUMNS AND WALLS'

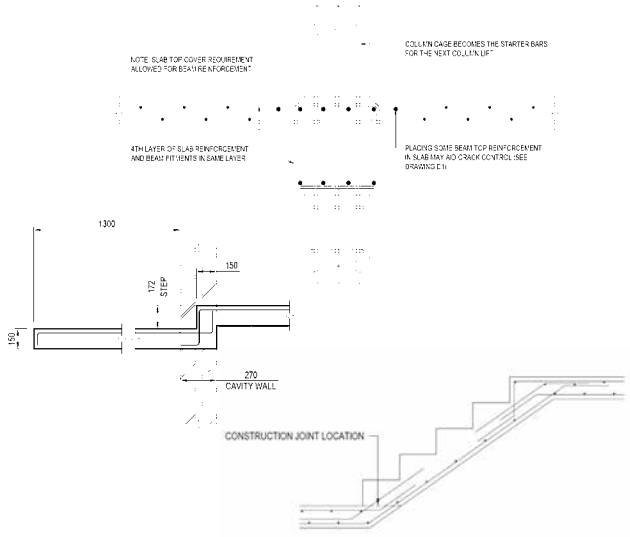
- Design and placement of steel reinforcement in columns and walls according to AS3600-2018.
- Examines requirements with respect to practicalities such as common reinforced concrete walls, retaining walls and soil conditions alerting designers to the pros and cons of detailing such members.
- Issues such as heavily loaded columns or columns in high rise construction (with very high percentages of steel) can lead to congestion and possible spalling.

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4
- PRACTICAL DETAILING FOR 'BEAMS, SLABS & STAIRS'

- Structural design of beams and slabs in various forms of construction according to AS3600-2018.
- Examines the detailing with respect to practical solutions that still fit within the frame work of the Australian Standard.
- Real life examples of such elements (eg stairs and where the reinforcement is actually required in such members).
- The problem of congested reinforcement in beams which then compromises concrete cover.

Certificate of Attendance will be emailed



Live streamed via zoom

COURSE COST
- 1 day course – **$740 pp**

DATES, VENUES & REGISTRATION
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ENGINEERING TRAINING INSTITUTE AUSTRALIA

FORENSIC ENGINEERING WORKSHOP

PAUL DAVIS *BE(Civil) MIE(Aust) CPEng NPER*

- Principal Engineer - Project X Solutions
- 30 years of experience in civil and structural design and construction.
- Investigated and reported on approximately 2000 damaged or defective structures.

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

- Over 40 years of design and construction experience.
- Part-time Senior Lecturer – UNSW and The University of Sydney.

WORKSHOP SUMMARY

Structures fail. The investigations of these failures are a field of engineering in itself but is also something that many engineers dip in an out of in the course of their work. As another strand of this work an engineer can sometimes be called upon to help stabilise a structure that has been damaged by fire, impacts or some sort of structural failure.

An investigating engineer requires deep experience and a well-rounded understanding of the underlying physical phenomenon, engineering theory, standards, design methodologies and construction process as well as a rigorous approach to investigation and reporting.

By examining fascinating cases from national and international experience, this course will provide some of the tools necessary for an engineer to investigate failed or damaged structures.

Additionally, knowledge of the environments and situations that can lead to failure can help design and construction professionals avoid their own mistakes. This is a form of risk management; it's far better to learn from someone else's mistakes than your own!

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

9.00 - 11.00 Session 1 *(Paul Davis)* - INTRODUCTION, SYSTEMIC CAUSES OF FAILURE & THE PHYSICAL INVESTIGATION

After introductions, we examine the human and technical factors that can lead to a structural fault and then look at how we might go about the site investigation the failure or damage.

- Systematic Causes:
  - Education
  - Experience
  - Uncertainties
  - Design environment
  - Design processes
  - Chain of responsibility
  - Construction
- Investigation techniques:
  - Investigation team
  - Initial investigation
  - Dealing with emergency services, professionals, media and stakeholders.
  - Safe investigation methodology
  - Stabilisation – "make safes"
  - Recording methods
  - Gathering evidence

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2 *(Paul Davis)* - TECHNICAL REPORT WRITING

Technical report writing demands a clarity of approach and style which can be beneficial in fields beyond forensic engineering. The session includes:

- Language
- Layout
- Style
- Common mistakes
- Professional responsibilities
- Logical argument structures
- Practical exercise

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3 *(Paul Davis)* - CASE STUDIES: MATERIALS

The examination of real world failures helps us learn from the past and examine our own practices. With a focus on materials this session includes:

- Steel
  - Large portal frame roof collapse
  - Walkway collapse
  - Portal frame in cyclone
  - Floor dynamic failure
  - Bridge collapse
  - Arch collapse
- Concrete
  - Precast failures
  - Tilt Up wall collapses
  - Waterproofing
  - Ground slabs
  - Reinforced concrete failures
- Timber
  - Roof failures
  - Deflection Failures
  - Dynamic Failures
- Masonry
- Geotechnical
  - Retaining walls
  - Residential slabs
  - Bored pier failures
- Practical exercise

3.00 - 3.15 Afternoon Tea

3.15 - 5.00 Session 4 *(Paul Uno)* - CASE STUDIES: ACTIONS

We continue our examination of real world failures with a focus on actions. This session includes:

- "Regular" actions:
  - Live loads
  - Wind
  - Snow
  - Earthquake
- "Exotic" actions
  - Fire
  - Water
  - Material deterioration
  - Impacts
- Practical exercise
- Course review

Certificate of Attendance will be emailed

Live streamed via zoom

COURSE COST

- 1 day course – **$795 pp**

DATES, VENUES & REGISTRATION

- *Registration form (back of catalogue)*
- *Visit our website* www.etia.net.au

FURTHER INFORMATION

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ENGINEERING TRAINING INSTITUTE AUSTRALIA

INDUSTRIAL BUILDINGS DESIGN WORKSHOP

IAN HYMAS

BSc (Hons) MEngSc

- Structural engineer for over 40 years.
- Founding partner of the firm Henry and Hymas.
- Member of the current BD-066 Standards committee for the Tilt Up and Precast Concrete Code AS3850.

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

9.00 - 11.00 Session 1 - PORTAL FRAME ANALYSIS AND DESIGN

- Portal frame analysis and member sizing
- Elastic vs Plastic design
- Tapered members in frames
- Latticed portal frames
- Frames with central columns
- Economies of frame spacing
- Fixed vs Pinned bases
- Footing considerations

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2 - ROOF AND WALL SYSTEM

- Roof structure layout & panel layout
- Alternative rafter designs
- Fly bracing
- Roof bracing systems.
- Economies of steelwork design
  - Portal frame vs load bearing panels
  - Various cladding systems that can be used for Industrial buildings such as steel sheeting (connected to purlins and girts)
- Design of purlins and girts, panels as cladding to portal frame and steel column buildings; fire ties.
- Advantages and disadvantages of cladding alternatives.

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3 - CONNECTIONS IN INDUSTRIAL BUILDINGS

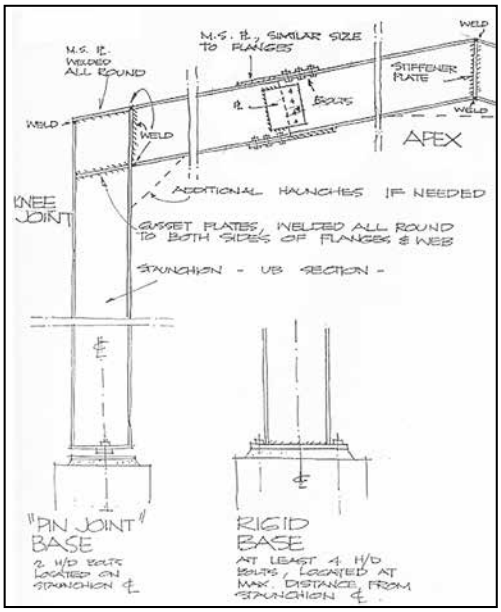
- Connections that are used in portal frame building.
- Steel to steel connections, portal frame knee and apex moment connections, bracing connections and prying forces on plates.
- Steel to concrete connections, holding down bolts, steelwork to concrete panel connections, fixings into concrete cast-in, and mechanical (expansion anchors) chemical anchors.

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4 - DEFLECTIONS, TOLERANCES, CASE STUDIES

- Deflections of portal frames and concrete panel supported rafters as well as deflections in bracing systems. Consideration of 'bolt slip', effect of tolerances on design assumptions and erection methods.
- Problems that have occurred while erecting industrial buildings.
- Actual jobs will be shown (in keeping with client confidence).

Certificate of Attendance will be emailed



Live streamed via zoom

CALCULATORS REQUIRED

COURSE COST

- 1 day course – **$810 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

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

ENGINEERING TRAINING INSTITUTE AUSTRALIA

MASONRY DESIGN WORKSHOP (to AS3700-2018)

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
- Inspected many concrete and clay masonry structures and written numerous reports on why masonry structures have failed.

Live streamed via zoom

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

9.00 - 11.00 Session 1
- MASONRY MATERIALS
- CLAY, CONCRETE, AAC, MORTARS, RENDERS

Raw Materials

- Materials used to make clay, concrete and AAC masonry structures.
- Cement types (GP, GB and Masonry cement), lime, SCM's (eg flyash), sand types and grading (beach, brickies and river sand), aggregates (eg basalt, scoria), water thickeners, admixtures (eg air entraining agents).
- Requirements for grouts used in hollow core masonry construction.
- How these materials are manufactured (eg clay vs concrete vs calcium silicate vs AAC)

Masonry Units

- Types of masonry available, their function and code identification (eg 20.01 hollow blocks vs 20.42 Notch vs 20.48 H block).
- Extruded vs pressed clay bricks vs hollow unit clay bricks, concrete bricks and hollow core concrete masonry blocks (including the different types of units available in various Australian states).
- How masonry unit strength is different to masonry wall strength.

Mortars, Renders, Oxides

- Mortar mixes required to satisfy AS3700-2018 (ie M1, M2, M3, M4) and the factors affecting the choice of these mortar classifications.
- Factors such as exposure to the elements [protected, general purpose, exposure (Mild, Moderate, Marine, Industrial)]
- Recommended types of render mixes (eg CIA publication "Render Finishes")
- Problems that can occur when the incorrect mix is used especially under adverse dry weather conditions.
- Colour oxides used in mortars and renders (ie colour vs quantity).
- Methods for cleaning brickwork and mortar restoration (eg pointing)

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2
- DURABILITY, TESTING, CLEANING, JOINTS, WALL TIES, DPC, FLASHING, LINTELS

Durability & Moisture

- Exposure classifications (eg industrial, marine) and how they dictate the choice of mortar class used (eg M4), component class (eg R4) and cover to reinforcement (in accordance with Table 5.1 AS3700-2018).
- Masonry unit suction and moisture absorption plus salt crystallisation and attack, waterproofing and masonry cleaning.

Joints, Wall Ties & DPC

- Mortar joints (raked vs flush); brick bond patterns (eg stretcher vs stack bond), corbelling, perpends, articulation joints (in accordance with Table 4.3 AS3700-2018).
- Spacing and choice of wall ties (L, M, H) will be covered with respect to their strength and durability requirements to satisfy AS2699 and AS3700 (eg R1-R4 class, plain vs galvanised vs stainless).
- Damp Proof Course and Slip Joint materials (in accordance with AS/NZS 2904).

Testing & Failures

- Tests on mortar &masonry units eg scratch test (vs chemical analysis), masonry compression tests, bond wrench tests, modulus of rupture.
- Test results of concrete unit shrinkage vs clay unit expansion.

CALCULATORS REQUIRED

Lintels

- Steel and reinforced masonry lintels.
- Load distribution, arching, galvanising, safe load lintel tables, composite action, propping, angle vs T-beam vs flat bar choices, lintels for various construction systems.

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3
- UNREINFORCED MASONRY DESIGN (including Masonry Veneer & Cavity Walls)

Structural Design

- Structural design of grouted and ungrouted masonry walls for vertical compressive loads, concentrated loading, one way bending (vertical and horizontal) and two-way bending, in plane and out of plane shear, and joint articulation.
- The effects of modes of failure, slenderness for walls for both 'simple rule' requirements and 'refined methods' as outlined in section 7 of AS3700-2018.
- Effective and minimum eccentricity, lateral instability and local crushing, perpend spacing, wall stiffening effects using engaged piers (in accordance with table 7.2 from AS3700-2018).

Masonry Veneer & Cavity Walls

- Masonry veneer and cavity (double brick) design and construction in the various Australian states including the relevant AS3700-2018 code requirements for these forms of construction.
- Tutorials will follow (with worked solutions).

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4
- REINFORCED MASONRY DESIGN

- Reinforced concrete design applied to reinforced masonry design.
- Explanation of all the formulas in the AS3700-2018 code (with worked examples).
  - This includes reinforced clay and concrete masonry subjected to Compression, Bending and Shear.
- Tutorial exercise on reinforced masonry design at the end of the session (with worked solutions).

Certificate of Attendance will be emailed

COURSE COST

- 1 day course – **$760 pp**

DATES, VENUES & REGISTRATION

- *Registration form (back of catalogue)*
- *Visit our website* www.etia.net.au

FURTHER INFORMATION

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- *Mobile* 0413 998 031
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ENGINEERING TRAINING INSTITUTE AUSTRALIA

PRECAST & TILT UP DESIGN & CONSTRUCTION WORKSHOP

IAN HYMAS *BSc (Hons) MEngSc*

- Structural engineer for over 40 years.
- Founding partner of the firm Henry and Hymas.
- Member of the current BD-066 Standards committee for the Tilt Up and Precast Concrete (Prefabricated) Standard AS3850.

Recommended Text:

Reinforced Concrete: The Designers Handbook (2015 Revised Edition)

Beletich, Hymas, Reid and Uno

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

9.00 - 11.00 Session 1 - LAYOUT AND DETAILING

- Key steps in determining panel layout from a structural system viewpoint
  - panel breakup
  - joint placement
  - structural steelwork
  - roof bracing
- Structural decisions such as number of panels per bay, smaller panels at corners, craneage required, wall openings, where to oversize and slot holes, connections to steel roof, panel to footing details, slab joint details, levelling of shims and tolerance issues.

11.00 - 11.15 Morning Break

11.15 – 1.00 Session 2 - PANEL DESIGN

- Structural design methods such as Moment Magnifier.
- Method according to Weiler and the ACI, as well as the J. Wyatt method (PCA) and the 'green book' method.
- Panel thickness versus various in-services loads, eccentricities, slenderness, P-Delta effects & fire issues.
- Reinforcement requirements (one layer vs two), reinforcement around openings, stresses during lifting.

1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3 - CONSTRUCTION ISSUES

- Design topics such as appropriate design of temporary bracing & props.
- Construction topics such as adequate preparation of detail drawings of panels, transportation of factor cast panels, casting layouts, inspection of panels prior to pouring, crane loads on floor slabs, erecting and bracing panels, steel erection, correct removal of braces and final inspection of steelwork, grouting panels and dowels.
- The speaker will outline many jobs he has been involved with, and where problems with craneage, props, steelwork erection, tolerance & temperature effect have had to be fixed.

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4 - ANCHORS AND CONNECTIONS

- Engineering involved in anchoring & transferring load into precast concrete from embedded non-reinforcement – both precast & post-installed anchor systems.
- Types of anchors, bolts and fasteners in the market place.
- Pull out capacities (Tension vs Shear)

Certificate of Attendance will be emailed

Live streamed via zoom

COURSE COST

- 1 day course – **$770 pp**

DATES, VENUES & REGISTRATION

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ENGINEERING TRAINING INSTITUTE AUSTRALIA

RISK MANAGEMENT WORKSHOP

PAUL UNO

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

- Over 40 years of experience in the design and construction industry.
- Part-time Senior Lecturer – UNSW and The University of Sydney.

ROSS FINNIE

- Over 40 years' experience in construction industry.
- Over 34 years of experience in managerial roles, site foreman, site manager, project manager, construction manager, IMS manager and Safety.

WORKSHOP SUMMARY

Effective risk management can benefit a whole range of areas. Those processes may be structural or mechanical engineering design. It may also be at the planning, and implementation stages of a building construction or the safety aspects on a civil engineering or construction site.

A key component of safety that will be discussed in detail is the "PCBU" (ie. Person Conducting a Business or Undertaking).

All these issues must still focus on doing the right projects, at the right time, for the right reasons.

The course is ten (10) hours in length which satisfies IEAust requirements for minimum CPD accrual in this area of Risk. It will conclude with a one (1) hour examination.

A certificate will be issued in due course to all attendees (once the papers have been marked).

10 HOUR COURSE
(IE Aust CPEng requirement)

8am - 6pm

Live streamed via zoom

PROGRAMME (7.30 - 8.00 Zoom invite link will be emailed)

8.00 - 10.00 Session 1 *(Paul Uno)* - RISKS & FAILURES IN THE ENGINEERING & BUILDING INDUSTRY

- Construction and engineering failures both in Australia and overseas where risks were taken or oversights made which resulted in on-site failures and fatalities.
- Lessons learnt from these failures to avoid the risk in future projects.
- Risk issues in the mechanical, electrical and process engineering fields.

10.00 - 10.30 Morning Break

10.30 - 12.30 Session 2 *(Ross Finnie)* - WHS RISK MANAGEMENT

- Legal obligation of PCBU's, workers, officers and managers with regards to the WHS legislative framework.
- Particular focus on Harmonisation, Due Diligence, Duty of Care (Officers and their Obligations), Fingerprints, Manage Risk and Leadership.

12.30 - 1.30 Lunch Break

1.30 - 3.00 Session 3 *(Ross Finnie)* - HIGH RISK CONSTRUCTION WORK & MANAGING RISK

- 19 categories of High Risk Construction Work (HRCW)
- Key factors include:
  - Understand the importance of detailed development of Safe Work Method Statements.
  - Understand the importance of Risk Assessments covering the tasks carried out on site, how to manage them; reduce risk and methods of ongoing monitoring.
  - How a SWMS ties in with a Project Risk Assessment.

3.00 - 3.30 Afternoon Break

3.30 - 5.00 Session 4 *(Ross Finnie)* - SAFETY IN DESIGN

- Overview of design documentation which can be coordinated by the PCBU and attended by appropriately qualified personnel and key stakeholders (ie. the Client, Designer, Construction team, Architect; Service and Structural Engineers and the Client where practicable) prior to issue.
- Examples of safety in design literature, and examples of safety in design failure and methods of alert and awareness.

5.00 - 6.00 Session 5 *(Ross Finnie)* - EXAMINATION ASSESSMENT

- Examination will cover all sessions.

Certificate of Attendance will be emailed

COURSE COST

- 1 day course – **$900 pp**

DATES, VENUES & REGISTRATION

- *Registration form (back of catalogue)*
- *Visit our website* www.etia.net.au

FURTHER INFORMATION

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ENGINEERING TRAINING INSTITUTE AUSTRALIA

RESIDENTIAL SLABS & FOOTINGS

PAUL UNO

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

- Over 40 years' experience in the design & construction industry.
- Part-time Senior Lecturer – UNSW and University of Sydney.
- Inspected many concrete slabs and footings as well as written numerous reports on why slabs have failed.

Recommended Text:

Reinforced Concrete: The Designers Handbook
(2015 Revised Edition)

Beletich, Hymas, Reid and Uno

Live streamed via zoom

WORKSHOP SUMMARY

This course is aimed at civil and structural engineers in Australia and New Zealand who wish to design residential slabs and footings to either the current Australian Standard AS2870-2011 or NZ B1 Building Code, Structure NZ (inc Amdt 19) which is referenced in NZS 3604 Section 17, Expansive soils, or, by Basic Structural Engineering Principles.

This workshop will cover relevant topics relating to slabs and footings over the 2 day period and will also address FINE (GEO5) software.

DAY 1 (8.30 - 9.00 Zoom invite link will be emailed)

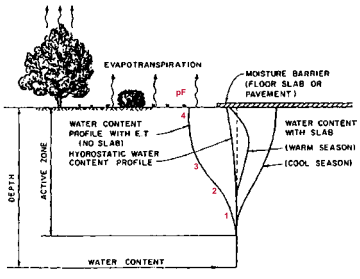
9.00 - 11.00 Session 1
- SOIL PROPERTIES AND SOIL SUCTION

- Clay mineralogy and swelling potential (Kaolinites, Illites, Montmorillonites)
- Clay cracking potential eg 2:1 vs 1:1 clay types
- Expansive clays distribution map for Australia
- Soil Salinity vs Soil Sodicity and its effect on Soil Swelling vs Concrete Degradation
- Soil Suction parameters (ie Matric vs Osmotic suction) vs Total Soil suction (pF scale)
- Effects of Sulphates in soil
- Soil Electrical Conductivity Extract (Ece in dS/m) vs Osmotic Suction values (kPa)
- Cation Exchange Capacity (CEC) & Activity ratio (AR) for various clays
- Thornthwaite Moisture Index (TMI) and its relationship to Soil Suction Change Design Depth (H_s)
- Atterberg Limit Tests vs Shrink vs Swell Tests (as per AS1289)
- Correlation regression: Shrink-Swell Tests vs Atterberg limits (eg LL, PL, PI and LS)
- Shrink-Swell Index (I_{ss}) Soil properties
- Soil Classifications (S, M, H1, H2, E)
- Site Classifications (including P sites)
- Tutorial 1 (Soil Properties)

11.00 - 11.15 Morning Break

11.15 - 1.00 Session 2
- SITE CLASSIFICATION AND SWELLING POTENTIAL (including effect of Trees and Cut/Fill)

- Determination of Site Classifications (including P sites), Soil Suction Change Design Depth (H_s), and Characteristic Surface Movement (y_s)
- Example on calculating the surface movement y_s using soil shrinkage index values, suction values, soil layer thicknesses to then achieve a site classification (eg M, H1, H2, E)
- Determination of Surface Movement and Suction Design Depth due to Trees ie (y_t) and (H_t)
- Design suction change profiles
- Determination of Crack Depths
- Effect of Cut and Fill
- Effect of Trees on y_s and H_s
- Tutorial Exercise 1 (Soil suction only)
- Tutorial Exercise 2 (Soil suction including effect of trees)
- Tutorial Exercise 3 (Soil suction including cut and fill effects)



1.00 - 1.30 Lunch Break

1.30 - 3.00 Session 3
- DOMESTIC CONSTRUCTION CONSIDERATIONS (as per AS2870)

- Clad frame vs articulated masonry veneer vs masonry veneer, vs articulated masonry full vs full masonry (ie double brick), and the footing systems that are appropriate for those construction types
- Requirements of articulation in masonry walls (as per CCAA TN61)
- Footing systems include raft slab, footing slab (ie SOG), waffle slab, stiffened slab and strip footing
- Compaction of fill (rolled, controlled, sand and non-sand) in accordance with AS2870
- Drainage issues eg leaking pipes, poor drainage, pavement slope
- Incorrect usage of waffle pod system and potential litigation
- Properties of the polystyrene pods including proper disposal
- Pros and cons of using a waffle pod slab system
- Requirements of Steel Reinforcement
- Other void systems (eg domes)
- Measures to provide effective site drainage
- Tutorial Exercise

3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 4
- CONCRETE MIX DESIGN AND ON-SITE CONCRETE PLACEMENT ISSUES (eg Cracking)

- Materials used in concrete mixes for house slabs and footings (including flyash blends and market branding eg builders cement)
- Effect of Sulphates on Concrete used in domestic construction
- Polythene (ie polyethylene) VPM and DPM underlay requirements (as per AS4347.6)
- Water to cement ratios (including effects of slumps 80mm, 100mm and above)
- Typical Concrete Mix designs used in residential concrete.
- Types of cracking common to residential slabs (eg plastic shrinkage cracking, plastic settlement cracking and longer-term drying shrinkage) and use of trimmer bars
- Minimization of cracking on slabs by attention to weather conditions (ie temperature, humidity and wind speed) to be able to quantify the potential for plastic shrinkage cracking
- Use of admixtures, evaporative retarders and curing compounds (to assist in cracking minimization)
- Non-structural crack issues (ie crazing, dusting, durability and corrosion control points, especially in saline soils)
- Proper joint saw cutting techniques (where required)
- Effects of deteriorated wall ties and omission of slip joint material
- Effects of using low ductility mesh in suspended concrete slabs
- Relationship between concrete slab crack size and termite entry

DESIGN WORKSHOP

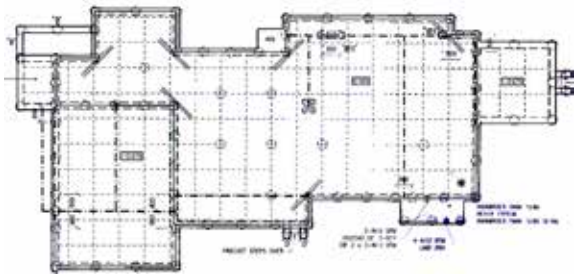
ENGINEERING TRAINING INSTITUTE AUSTRALIA

DAY 2

9.00 - 11.00 Session 5
- SOIL CAPACITY, APPLIED LOADS, ULTIMATE vs ALLOWABLE BEARING CAPACITY

- Soil Cohesion (C_u) and (C') vs Soil Angle of Internal Friction (ϕ)
- Drained vs Undrained Soils
- Soil Test Correlations DCP vs SPT vs y_s
- Typical dead loads on domestic slabs and footings (eg roof tiles, studs, frames)
- General Applied Loads (and Pressures) as per AS/NZS 1170.1
- Soil Bearing Capacity - Allowable vs Ultimate
- Basic Terzaghi (and Vesic) formulas to determine ultimate bearing capacities for rectangular, strip and circular footings.
- Tutorial Exercise (referenced in NCC (Aust) and NZS 3604 Section 17, Expansive Soils, Building Code B1).

11.00 - 11.15 Morning Break



11.15 - 1.00 Session 6
- SLAB DESIGN: Standard (Deemed to Comply) Method #3.0-AS2870 vs Chart 4.1

- Use of Chart 4.1 in Section 4.0 of AS2870 (and its derivation) in order to determine the footing beam depth
- Effective Slab Widths applicable to slabs in domestic construction
- Uncracked vs Cracked Second Moment of Area calculations (ie MOI)
- Beam depth, spacing and minimum reinforcement, trimmer bars
- Suspended slab design in domestic construction
- Tutorial Exercise

1.00 - 1.30 Lunch Break

CALCULATORS REQUIRED

Differential mound movement (mm), $y_m = 0.7\, y_s$

Edge distance from centre-heave (m), $e = \frac{H_s}{8} + \frac{y_m}{0.036}$

Edge distance from edge-heave (m), $e = 0.2\, L \quad \leq 0.6 + \frac{y_m}{0.025}$

Download *FINE GEO5* demo version via the link
www.etia.net.au/geo5-demo-version

1.30 - 3.00 Session 7
- ENGINEERED DESIGN (#4.0 AS2870) plus Steel Screw & Bored Concrete Piers Design

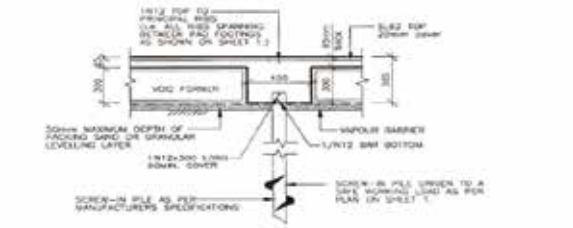
- Centre Heave (sometimes referred to as Hogging or as Edge Drop)
- Edge Heave (sometimes referred to as Sagging or as Edge Lift)
- Structural Design of Concrete Piers/Piles
- Structural Design of Steel Screw Piers for domestic beam and slab construction (using Individual Bearing method vs Cylindrical Shear method) and accounting for potential punching shear failure according to IPENZ Note 28 document and overseas documents
- Winkler method vs Walsh Method vs Mitchell Method
- Use of FINE (GEO5) Beams and Slabs on Elastic Foundations software
- Tutorial Exercise

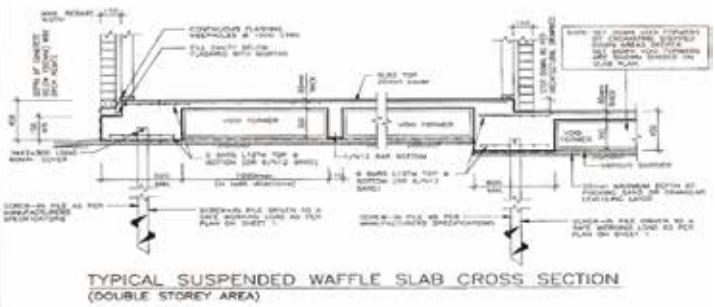
3.00 - 3.15 Afternoon Break

3.15 - 5.00 Session 8
- HOUSE SLAB DESIGN EXAMPLES

- Estimation of Wall loads, Roof loads and Floor loads (as per AS1170.1 and AS2870)
- Structural design of various concrete slabs using house plans from start to finish using both Stiffened Raft (conventional method) and Waffle Pod (Rib Raft) methods for various soil types eg M, H, E (incl. effect of trees) in various combinations, for example:
  - Single Storey home – Rectangular house plan – SOG Design
  - Single Storey home – Non-Rectangular house plan – Slab on Ground (SOG) Design
  - Double Storey home -Rectangular house slab plan + Suspended concrete slab

Certificate of Attendance will be emailed





Live streamed via zoom

COURSE COST
- 2 day course – **$1,590 pp**

DATES, VENUES & REGISTRATION
- *Registration form (back of catalogue)*
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FURTHER INFORMATION
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ENGINEERING TRAINING INSTITUTE AUSTRALIA

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.
- Part-time Senior Lecturer – UNSW 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

This two-day online workshop is a back to basics course which addresses the key areas of steel design with particular reference to NZS3404-2009, AS4100-1998 and AS3990-1993 (mech) the 'Structural Design Handbook' by Gorenc, Tinyou and Syam. This text is invaluable to engineers wishing to design steel structures.

Sessions provide worked examples, tutorial exercises and solutions.

DAY 1 (8.30 - 9.00 Zoom link 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.
- 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.

1.00 - 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

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 and 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

Live streamed via zoom

COURSE COST
- 2 day course – **AUD$1,520 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

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.

ENGINEERING TRAINING INSTITUTE AUSTRALIA

PO Box 913 Baulkham Hills NSW 1755 Ph: (02) 9899 7447 Mob: 0413 998 031
Email: registrations@etia.net.au Website: www.etia.net.au A.B.N. 27 830 322 080

REGISTRATION FORM

1	**CEMENT & CONCRETE TECHNOLOGY WORKSHOP (1 day course - $880 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Wed 26 August 2020		$
2	**CEMENT & CONCRETE THEORY & PRACTICE COURSE (2 day course - $1,420 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Tue 28 + Wed 29 July 2020		$
3	**COLD-FORMED STEEL DESIGN WORKSHOP (1 day course - $910 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Thu 9 July 2020		$
4	**COMPOSITE STEEL & CONCRETE STRUCTURES WORKSHOP (1 day course - $840 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Thu 23 July 2020		$
5	**DETAILING IN PRACTICE WORKSHOP (1 day course - $740 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Tue 21 July 2020		$
	RECOMMENDED TEXT: Reinforced Concrete: The Designers Handbook (2015 Revised Edition) – $170	**QTY:**	$
6	**FORENSIC ENGINEERING WORKSHOP (1 day course - $795 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Tue 25 August 2020		$
7	**INDUSTRIAL BUILDINGS DESIGN WORKSHOP (1 day course - $810 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Thu 16 July 2020		$
8	**MASONRY DESIGN WORKSHOP (1 day course - $760 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Fri 21 August 2020		$
9	**PRECAST & TILT UP DESIGN & CONSTRUCTION WORKSHOP (1 DAY COURSE - $770 PP)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Tue 14 July 2020		$
	RECOMMENDED TEXT: Reinforced Concrete: The Designers Handbook (2015 Revised Edition) – $170	**QTY:**	$
10	**RESIDENTIAL SLABS & FOOTINGS DESIGN WORKSHOP (2 DAY COURSE - $1,590 PP)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Tue 18 + Wed 19 August 2020		$
	RECOMMENDED TEXT: Reinforced Concrete: The Designers Handbook (2015 Revised Edition) – $170	**QTY:**	$
11	**RISK MANAGEMENT WORKSHOP (1 day course - $900 pp)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Tue 7 July 2020		$
12	**STRUCTURAL STEEL DESIGN WORKSHOP (2 DAY COURSE - $1,520 PP)**	**Attendee Name/s**	**Amount**
	• LIVE STREAM – Tue 11 + Wed 12 August 2020		$
	RECOMMENDED TEXT: Steel Designers Handbook (8th Edition 2012) – $90	**QTY:**	$
		TOTAL COST $ (GST included)	

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HOW TO REGISTER

Option 1: Register online www.etia.net.au *(Receive immediate tax invoice receipt & confirmation)*

Option 2: Fill in this form and email to registrations@etia.net.au *(Allow 3 – 5 business days for tax invoice receipt & confirmation)*

☐ VISA* ☐ MASTERCARD* ☐ AMEX*(additional 1.3% surcharge) ** All credit cards are charged a merchant fee of $0.50 per course*

															CVV#			

Cardholder's Name_____ Expiry Date_____ /_____ Signature_____

Person Handling Payment_____ Email_____

Company _____ Phone (_____)_____

Attendee #1 Email _____

Attendee #2 Email _____

Postal Address _____

Suburb _____ State _____ Postcode _____

HOW DID YOU FIND OUT ABOUT US? (Please circle)

1) Engineers Australia magazine 2) ETIA website 3) Brochure in mail 4) Sponsor 5) Email
6) Training manager 7) Google search 8) Other _____

LIVE STREAMING DETAILS

1. Register for the selected course/s. *(Email the completed registration form to registrations@etia.net.au OR register online www.etia.net.au)*
2. Registrations must be received at least **three (3) working days before** the live streamed workshop, to allow for course notes to be express posted. Course notes are only provided as a hard copy. Any registrations received after this period will result in a later delivery of course notes.
3. Please ensure the attendee provides their *own personal/work email* upon registration.
4. Attendees will be emailed a Zoom link between 8:30am - 9:00am on the day of the course, to join the live stream. (Note: Zoom needs to be downloaded on your device to view the live streamed workshop.)

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