EARTHQUAKE LOADING (ACTIONS) WORKSHOP
TO AS/NZS 1170 PART 4

PROGRAMME

8.30 – 9.00 **Registration**

9.00 – 10.30 **Session 1 – Basic S.H.M. and Vibration Theory - Paul Uno**

In order to understand the more complicated aspects of Earthquake design, engineers must first fully understand the basic principles of simple harmonic motion and vibration theory.

This session will revisit those areas of maths and science will outlined the relationship between force, mass, acceleration, spring stiffness, natural frequency, resonance, damping, simple and forced frequency.

10.30 - 11.00 **Morning Tea**

11.00-12.30 **Session 2 - Overview of Earthquake Loading - John Wilson**

This session provides an introduction to earthquake engineering including; plate tectonics, seismicity, earthquake design philosophy and damage from past earthquakes. The new Earthquake Loading Standard AS1170.4-2007 is then introduced and will form the basis for the remaining sessions. The changes from the AS1170.4-1993 will be highlighted and the relationship with the material standards and the BCA will be discussed.

12.30 - 1.30 **Lunch**

1.30-3.00 Session 3 - **Earthquake Actions - Static and Dynamic Methods - John Wilson**

This session will overview the static and dynamic methods for calculating earthquake actions in accordance with AS1170.4-2007. The concept of an elastic and inelastic design response spectrum which provides the basis for all earthquake loading will be described in detail. The calculation of the static base shear force, torsional effects and the distribution of forces up the height of the structure will be covered. The calculation of earthquake actions using the dynamic modal analysis technique will be summarised and a worked example provided. A tutorial exercise will follow.

3.00 - 3.30 **Afternoon Tea**

3.30-5.00 **Session 4 – Capacity Spectrum Method - John Wilson**

This session will overview an alternative displacement based approach known as the Capacity Spectrum Method for checking the seismic performance of structures. The advantage of this method is that a structure can be designed for gravity and wind loads and checked for seismic performance. The concept of an acceleration-displacement response spectrum (ADRS) to describe the seismic demand will be introduced using AS1170.4-2007. The force and displacement capacity of a structure will be presented in terms of a substitute structure. The Capacity Spectrum Method which compares the seismic demand with the structural capacity in terms of acceleration and displacement will be demonstrated using a worked example. A tutorial exercise will follow.

5.00-5.15 **Certificate of Attendance & Feedback Sheets**

VENUES

- **Sydney NSW Stamford Grand Hotel -** cnr Herring & Epping Rd, Nth Ryde
- **Brisbane QLD Mercure Hotel -** cnr Ann St and North Quay Brisbane
- **Melb VIC Hotel Grand Chancellor -** 131 Lonsdale St, Melbourne
- **Perth** TBA

SPEAKER

John L Wilson is a Professor of Civil Engineering at Swinburne University of Technology in Melbourne. Prior to this appointment he was an academic at the University of Melbourne for some 14 years and as a consulting engineer for over 10 years with the SECV and Arups in their London and Melbourne offices. He has a Bachelor of Engineering degree from Monash University, a Master of Science degree from University of California (Berkeley) and a PhD from University of Melbourne. He has a research interest and expertise in structural systems, earthquake engineering, structural dynamics and sustainable structures and has consulted widely in these fields. He was also the Victorian Chairman of Engineers Australia in 2002, representing the professional interests of some 14,000 engineers, and is Chairman of BD6/11, the committee responsible for the earthquake loading standard for Australia.

REGISTRATION

Please return to:
Seminar Services Australia (Attn: Joanne)
Earthquake Workshop
PO Box 913 Baulkham Hills NSW 1755
Tel: 02 9899 7447 Fax 02 9899 5995 Mob: 0413 998 031
Email: info@seminarservices.com.au

I / We wish to attend the **Earthquake Loading Actions Workshop** at

		tick
• Sydney NSW	Monday 19th April 2010	☐
• Melbourne VIC	Thursday 10th June 2010	☐
• Brisbane QLD	Wednesday 14th July 2010	☐
• Perth WA	TBA	☐

	Number		Total
Workshop		@ $500	

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NB A 20% processing fee applies to registration cancellations made earlier than 5 working days before the course date. Cancellations made 5 working days or less incur forfeiture of the entire registration fee. No discounts apply.

CALCULATORS REQUIRED