



Australian
Earthquake
Engineering
Society

AEEES NEWSLETTER

No 1/1991

Newsletter of the Australian Earthquake Engineering Society

The Society

The objects of the Society are the promotion and advancement of the practice of earthquake engineering and engineering seismology by organising technical conferences, symposia and meetings; publishing technical documents; and representing Australian interests in the International Association of Earthquake Engineering and other regional earthquake engineering associations and interest groups. Until elections are held, the executive is Charles Bubb (President), Kevin McCue (Hon. Secretary) and David Rossiter (Hon. Treasurer).

Student members are welcome at a reduced subscription.

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Presidents column

Welcome to the first issue of our newsletter! We are now a fully fledged Technical Society of the Institution of Engineers Australia (IEAust). Our association with IEAust will help us in many ways and indeed has made our start up practical by granting us significant funds for our first year. It is interesting to note that our New Zealand colleagues have also now taken the affiliation step with the NZ Earthquake Engineering Society.

Remember membership is open to all who are interested in or

working in the field of earthquake engineering or engineering seismology in Australia.

Membership of IEAust is not required except for the President and Treasurer but of course is no bar. This newsletter will devote itself to improving communication in Australia between all our members and to presenting, enhancing and strengthening the links with earthquake engineers in other countries especially through the International Association of Earthquake Engineers (IAEE).

Australia has had and still has formal links with IAEE for over 25 years and I should like to include some brief notes on our past association in this issue. These brief notes are based largely on my recollection rather than detailed documentation. Some of you may be able to fill in the gaps and we would be delighted to hear from you. If we get enough material we will print a more detailed history in the future.

I think the first full and formal contacts with IAEE on Australia's behalf, were made in Japan in the late 1960's by Professor Stan Shaw of the University of NSW. The IAEE Secretariat has always been headquartered in Japan.

In those days, IAEE membership was open to any country which formed a national committee on earthquake engineering and the chair of each national committee was formally recognised by IAEE as the National Delegate to IAEE. Consequently it was Prof Shaw who formed and chaired the Australian National Committee on Earthquake Engineering (NCEE) and became the first National Delegate from Australia to IAEE.

It is interesting that the very significant Adelaide

earthquake of 1 March 1954 caused very little general interest into the practical significance of earthquakes in Australia. It was the admittedly much larger Meckering earthquake of 10 October 1968 which virtually destroyed a small country town in WA which focussed attention of Australian engineers on the need for earthquake engineering in Australia itself.

It was at the first meeting of the NCEE where it was decided that some degree of earthquake resistance should be provided in the design of buildings and other structures in certain parts of Australia.

It is of interest to note that it was the NCEE which then commenced to prepare a draft Earthquake code for Australia on its own account and not the Standards Association of Australia. However there was a link in that the Engineer/Secretary of the NCEE Code Drafting subcommittee was Mr Hugh Knox of the Standards Association.

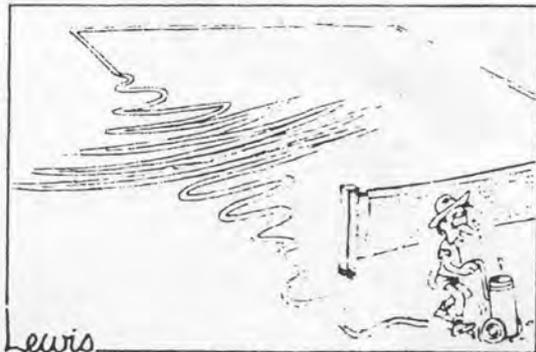
More in the next newsletter, especially if you help.

News items

- Of particular interest to the Society is the release for public comment of a draft Australian Standard DR 91094 S: part 4 of Design Loads on Structures, AS 1170.4 - Earthquake Loads. It is proposed that this code will replace AS2121-1979, the SAA earthquake code and AS2121M-1979, the seismic zone map.
- Professor Hiroshi Kagami from Hokkaido University, Japan will be taking part with BMR in a joint micro-zonation study of Newcastle. The exercise will be conducted from 22 July to 2 August, in the early hours of the morning when traffic is a minimum. A similar study has just been completed in Perth WA and the results are still being evaluated.
- The Society has received some information on a research project being undertaken at Cornell

University, New York by Peter Gergely, Professor of Structural Engineering. His research topic is, *lightly reinforced concrete frame behaviour in structures not designed for earthquake loads*. He is examining the behaviour of beam-column joints under seismic loading (for which the structures were not intended). This research work is very pertinent to our existing structural stock in Australia (Newcastle was a test of seismic loads on structures not intended to be loaded in that way). He has appealed for details of typical non-seismic-designed reinforced concrete beam-column joints.

The Society has some survey forms and would be grateful to any AEES members, or others, who could provide details to Professor Gergely for this research work. Please contact David Rossiter for further details and survey forms (ph: 06 282 4199 or 06 291 6445 ah).



Courses & Conferences

- First International short course on dynamics of structures and structure-foundation soil systems. 11-15 November 1991. University of Missouri-Rolla. Professor S Prakash, Professor of Civil Engineering, Fax (314) 341-4729.
- The 4th International Conference on Seismic Zonation, USA. Earthquake Engineering Research Institute, 6431 Fairmount Ave., Suite 7, El Cerrito, Ca 94530, USA
- International conference on Earthquake Blast and Impact. 18-20 Sept 1991, UMIST, Manchester UK, The Conference Office, Institution

of Engineers, 1-7 Great George St., London SW1P 3AA UK.

- Pacific Conference on Earthquake Engineering, Auckland NZ, 20-23 November, 1991. NZ National Society for Earthquake Engineering, PO Box 17-268, Wellington, NZ.

- The 11th Australian Geological Congress, 20-24 January 1992, Ballarat, Vic. The Secretariat, 11th AGC, Bloomsbury Conference Services, 232 Bridge Rd., Vic 3121. Fax: 61 03 427 0715

- International symposium on the effects of surface geology on seismic motion. 25-27 March 1992, Odawara Japan. Dr M Reichle, Dept of Conservation, Division of Mines & Geology, 630 Bercut Dr., Sacramento, Ca., 95814, USA

- The 10th World Conference on Earthquake Engineering, July 19-25, 1992, Madrid, Spain. Steering Committee, c/o Tulesa, Londres 39-1°B, 28028 Madrid, Spain.

Editorial

The President, Charles Bubb, has written a brief history of events leading up to the formation of the Society. It was almost born immediately after the 1968 Meckering WA earthquake, and despite the occurrence of other large earthquakes such as that at Cadoux WA in 1979 and at Tennant Creek NT in 1988, it was the combination of the Newcastle NSW earthquake and revision of the 1979 Earthquake Building Code that energised the committee to formally establish the society. The first task of the committee is to build the membership but publication of the new draft Code, AS 1170.4 Earthquake Loads, for public comment provides the ideal opportunity for the Society to have input into the review process and at the same time publicise its existence.

The Society will only enjoy a long and productive life if you the members support it. This can best be done in the short term by building up membership, providing material for the

newsletter, and organising and attending technical symposia and meetings.

So, for now, please distribute to your colleagues the attached *invitation to join* and send in to me your contribution for the next newsletter. Any offers for the post of Editor?

We are also interested in publishing news items from the States and would appreciate expressions of interest from potential correspondents (see the article on our visit to Melbourne Uni's Earthquake Engineering lab)

Sad news

It was with great sadness that we recently learned of the death earlier this year, of one of Australia's pioneering engineering seismologists, Dr Robert Underwood. Rob completed his PhD at the Australian National University in 1967 with a seminal work on the seismicity of Victoria. He spent a year at Blacknest, UK then moved to Hobart with the Tasmanian Hydro Electric Commission from which he retired due to ill health in 1990. Rob published the first earthquake hazard study in Australia, of Tasmania, and was joint author of the first seismic hazard map of Australia.

Recent earthquakes

The following table summarising recent Australian earthquakes during 1991 was supplied by the Australian Seismological Centre, BMR. The Centre publishes a more detailed monthly list for subscribers. The Kalgoorlie WA earthquake on 9 March was the only one to have caused damage. It was probably a mine-induced rock burst. Earthquakes occurred in all States and many of them were felt. The sequence following the 22 Jan 1988 Tennant Creek earthquakes continues, and only the largest one has been listed in the table. A quite remarkable swarm of 90 odd earthquakes has occurred near Bendigo Victoria. Seismology Research Centre seismologists set

up several digital seismographs and an accelerograph in the epicentral area before the sequence finished. The focal parameters are very well constrained and indicate that the focal volume was small and the foci very shallow (1 or 2 km).

Jan - May 1991 Earthquakes

Date	ML	Place
20 May	3.5	Cowra NSW
5 May	3.5	Flinders Ranges SA
4 May	3.8	Bendigo Vic
10 Apr	3.1	Kalgoorlie WA
9 Apr	3.5	Karratha WA
28 Mar	3.2	Bass Strait Vic
25 Mar	3.6	Spencer Gulf SA
25 Mar	3.0	Oatlands Tas
17 Mar	3.3	Kalbarri WA
15 Mar	3.0	Rawlinna WA
9 Mar	4.4	Kalgoorlie WA
4 Mar	3.2	Eyre Peninsula SA
23 Feb	3.0	Dalton NSW
9 Feb	3.3	Gulf Carpentaria
4 Feb	4.0	Dampier WA
14 Jan	3.1	Armidale NSW
10 Jan	3.2	South-East SA
9 Jan	3.7	Derby WA
8 Jan	3.3	Cadoux WA
4 Jan	3.6	Qld/NSW Border
3 Jan	4.7	Tennant Creek NT

Earthquake engineering in Melbourne

Charles Bubb and Kevin McCue recently visited the Civil Engineering Department at Melbourne Uni. A busy Professor Graham Hutchinson gave us a tour of a most surprising lab supporting 10 post-graduate students, elaborate finite element modelling software and a vast lab with multi dynamic loading facilities. The hydraulic actuators are computer driven and may provide simple harmonic motion or a real earthquake time history in one or two directions. There are two shake tables about 3m square.

Projects underway during our visit included; an experimental study of a relatively cheap technique to enhance the earthquake resistance of brick parapets, a simulation of soft-storey

response and analysis of hinge formation in a non-seismic designed beam-column joint.

The Director of the Seismology Research Centre, Gary Gibson, and senior systems analyst Vaughan Wesson hosted a tour of their lab at Phillip Institute of Technology in the afternoon. New software for the digital Kelunji recorder is under development as is a new analysis software package which will run on Macintosh computers making full use of their graphics and user friendliness. A new digital drum recorder is under production.

The SRC have about 30 recorders located around Victoria, many monitoring dams.

Earthquake publications

- The IEAust Newcastle Earthquake Study is now available at IEAust at the reduced price of \$30.
- There are a number of BMR Bulletins and reports describing earthquake activity in Australia which can be purchased from BMR. The Iseismal Atlas, parts 1 & 2, (Bulletins 214 & 222) contain maps and descriptions of 149 felt and damaging earthquakes. A third edition with another 80 odd maps is almost ready for publication. The Australian Seismological Centre also publishes an annual report featuring the year's seismicity with summary, glossary and descriptions of the larger earthquakes.

Reprints of papers on the Newcastle and other important earthquakes may still be available from the authors. A monthly summary of Australian and worldwide activity is distributed at cost to subscribers.

For sale

Set of Bulletins of the Seismological Society of America from Vol 62 n4 to 1991 — \$1250 the lot. Call Terry Lee ph: 06 - 249-9309.