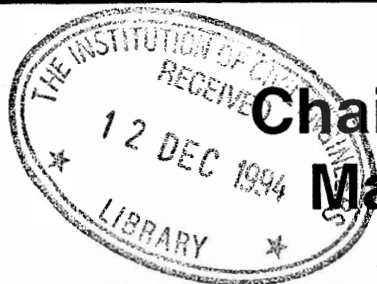


SECED NEWSLETTER

Volume 8, Number 2, April 1994



Chairman's Annual Report May 1993 to April 1994

Once again, it is time for the Chairman to report to the membership on the activities of the Society over the past twelve months. I hope that this will not be a one-way conversation, and that members will make the effort of responding, commenting or criticising this report. I will start, as I did last year, by summarising the structure and activities of SECED, for the benefit of those who may consider helping with the running of our Society in the future.

The business of SECED is dealt with through a committee, a number of sub-committees and technical reporters. It is essential to recognise a priority that all activities are undertaken by individuals on a voluntary basis; in today's world, it is no minor feat to find willing and capable individuals for such a type of work. This is the main reason behind the change from technical reporting groups (as in last year's annual report) to technical reporters (individuals) and the loosening of the terms of reference of the latter. The sub-committees meet as often as necessary, depending on the activity requirements. For instance, the conference sub-committee springs into action only about 18 months every three years prior to the event. The steering sub-committee and the main committee meet approximately once a month, with the exception of the summer recess. The seven sub-committees (membership, steering, Mallet-Milne, research and education, newsletter, conference and finance) and the four technical reporters (geotechnics, structural dynamics, earthquake engineering and engineering seismology) report to the main committee where all decisions are

taken, often based on recommendations from the sub-committees. New blood is always most welcome; I consider the further involvement of the membership in SECED administrative business to be a top priority.

Our technical programme comprising evening, half-day and full-day gatherings continued to be very successful, as witnessed by the near full-house attendance at most meetings. The objectives of diversification, as opposed to concentration on earthquake engineering topics, have by and large succeeded, with presentations on blast, vibrations, wind and wave forces and response. A one-day seminar on conservatism in design of nuclear plant, held at Risley jointly with the British Nuclear Engineering Society and expertly organised by Peter Merriman, has been extremely successful, both technically and financially. We continue to co-operate with the Wind and Offshore Engineering Societies as well as with sister organisations in Europe. A two-day colloquium was organised jointly with the French Association of Earthquake Engineering (AFPS) near Paris. This focused on experimental dynamics and attracted a large audience from the UK and France, as well as a few other European delegates. Ed Booth continues to play the role of Liaison Officer for this activity. Moreover, Professor Mazars, of AFPS, gave a presentation on the experimental and analytical work carried out within the co-ordinated programme CASSBA, thus emphasising the strength of the links between SECED and its French counterpart. It is gratifying to note that

all meetings of SECED are well-attended, and that a substantial proportion of the attendees are not members of SECED.

The Mallet-Milne biennial lecture continued its success story, with the fourth lecture delivered by Professor Tom Paulay. Not only was the lecture a unique occasion where Pauley excelled in outlining his seismic design philosophy, but the pre- and post-lecture events were also very enjoyable. [During the post-lecture reception, I had the pleasure of announcing the award of the status of Life Member to Bryan Skipp, who continues to serve the Society as very few are able to do]. The reputation of the lecture series was no doubt strengthened by our fourth most distinguished speaker. The text was published by John Wiley, with a biographical note written by Professor David Key. Preparations for the fifth lecture are afoot; our lecturer for 1995 is Professor Bruce Bolt and we are all looking forward to the occasion.

The newsletter is entering its fourth year and continues to be a source of valuable technical information as well as its role as a communications medium. Current developments include more articles on structural dynamics and company profiles. Nigel Hinings, our able Editor, is now supported by two Committee members. We have also expanded the mailing list of the newsletter both at home and abroad.

On the whole, the membership is on the increase. We are currently re-designing the membership leaflet and mulling over a paper prepared by John Inkester on possible means of increasing the membership and its involvement in the work of SECED.

There has been, and continues to be, vigorous activities on the Conferences front. Our fourth conference, organised jointly with the Royal Society and the Royal Academy, has been extremely successful. The IDNDR banner attracted a very large gathering and the papers were, on the whole, of high quality. This should not distract us from running purely SECED conferences, with invariably a smaller audience, which are highly technical in nature. In this respect, there are plans for holding a conference in 1995 on European seismic design practice. Moreover, we are in the process of preparing a bid to hold the 1998 European conference in London. If we are successful, this activity will require the participation of many more individuals, and I hope that our members will be amongst the earliest volunteers. We are currently discussing the possibility of launching mid-career training courses on earthquake engineering and on

structural dynamics. We are also considering the publication of a structural dynamics introductory book.

The Society and its members continue to play a vital role in the field of earthquake engineering and civil engineering dynamics at home and abroad. We are recognised nationally as the centre of expertise in the field. Abroad, through the high profile afforded us by our conferences, lectures and publications, the Society is recognised and praised. This is by no means a reason for complacency. There is much more to be achieved, and we should continue our endeavours to establish links with other bodies on the European and international levels.

As for the future, I believe that the priority is for more devolution of SECED business and more involvement of the membership in the running of the society's activities. Whilst recognising the importance of

building a financial surplus and taking account of profitability, SECED should continue to be a technical club run on an informal basis with the primary task of disseminating information on earthquake and civil engineering dynamics.

This statement marks the end of my chairmanship of SECED. These have been a very challenging two years, made all the more trying by personal circumstances. However, I have immensely enjoyed the experience, and I hope that I have contributed in some small way to furthering the objectives of SECED. I leave this prestigious post, in the very able hands of Nigel Hinings, whom I know will not only consolidate the achievements of previous chairmen, but will also add his mark in the form of new initiatives and ideas.

Amr Elnashai
27th April 1994

Call for Contributions

Dynamic Analysis and Testing of Bridges

Joint SECED/MMB Seminar
26 April 1995

A half-day seminar is currently being planned, relating to the dynamic analysis and testing of bridges. It is being organised jointly by SECED and MMB (Management and Maintenance of Bridges, a study group of the Institution of Structural Engineers). This 'call for contributions' is an open invitation to those who would like to be considered to contribute to the seminar.

The aim of the seminar is to inform delegates of current developments in this area. It should be of interest to:

- analysts and testers
- designers
- assessors
- industrialists
- academics
- consultants
- owners

Technical issues to be addressed are

planned to include:

- loading due to traffic, wind and earthquake
- response to traffic, wind and earthquake
- ambient versus forced response testing
- correlation of analysis and test results
- the effect of Eurocode 8, Part 2 (bridges)

Anyone wishing to be considered for contributing to the seminar is invited to contact either

Dr J R Maguire
(SECED representative)
c/o Lloyd's Register
29 Wellesley Road
Croydon
Surrey CR20 2AJ
Tel: 081 681 4764
Fax: 081 681 6814

or

Mr G Davison
(MMB Study Group Convenor)
c/o Institution of Structural Engineers
11 Upper Belgrave Street
London SW1X 8BH
Tel: 071 235 4535
Fax: 071 235 4294

Engineering Integrity Assessment Conference May 1994

This conference was jointly organised by the Dynamic Testing Agency (DTA) and Engineering Integrity Society (EIS) and held at East Kilbride, Glasgow. It was the second international conference on this subject to be promoted by the DTA, the first having been held in Manchester in 1992. Over 30 papers were presented to an audience of over 50 delegates from a wide range of industries. There were only a few papers relating directly to civil engineering dynamics, which are listed below. The conference proceedings are published by EMAS Ltd, 330 Halesowen Road, Cradley Heath, Warley, West Midlands B64 6PH, reference ISBN 0 947817 71 9.

J R Maguire, Lloyd's Register

'Dynamic FE Model for Post-tensioned Concrete Floors, Calibrated against Field Test Results' A Pavic, M S Williams & P Waldron

'The Structural Integrity of Wall Cladding of Large Panel Systems' D R Green, R W Watson & W U Khalifa

'...Forced Vibration of Cracked Beams' J A Brandon, K M Holford & O N L Graham

'Fatigue Assessment of Steel Bridges using NDE Techniques' A W Davies & K M Holford

Book Review

Engineering Analysis Using Pafec Finite Element Software

C H Woodford, E K Passaris, and Bull, JW Blackie Publishing Group, Glasgow

1991, pp 209 \$82.50

The book sets out to provide professional engineers and students with a sound working knowledge of the finite element (FE) method for engineering analysis and design using the PAFEC finite element program.

The layout of the book falls into three sections. The first presents a brief non-mathematical guide to the history, development, and basic theory of the FE method. As such it is a concise and useful introduction to the subject, but can, by its nature, be no more than a summary; more comprehensive texts should be referenced for the reader who requires further information in this area.

The second section (Chapters 2-5) explains, in general terms, how the FE method has been implemented within PAFEC. While some general guidelines on FE techniques are included in this section, it will be of

interest primarily to PAFEC users who have access to the program's user and theory manuals. In this respect the second section provides a useful overview of the program's capabilities and analysis options available. Indeed it is within this section that the only reference to the dynamic and vibration analysis capabilities of the program is made. For readers with a particular interest in this subject the book generally fails to explain the capabilities of PAFEC in calculating natural frequencies and mode shapes and in predicting the response under dynamic loading. The strong emphasis on engineering judgement and experience is soundly placed and the reference to the support work of the UK NAFEMS (National Agency for Finite Element Methods and Standards) organisation is laudable.

The third section is a mixture of more detailed explanation of element formulations and examples of real problems. The chapters dealing with the constitutive equations involved in various types of elements is particularly useful and extends from simple two-dimensional and three-dimensional beams through membrane, plate bending, and shell elements. The chapters dealing with the non-linear formulations within the program will also be of use particularly to the student, and engineers using

the techniques for the first time. The examples extend from a simple framework analysis to complex geotechnical and fracture mechanics problems. They demonstrate the basic characteristics of PAFEC and provide some sound advice on basic principles and limitations. The full data listings are useful although a little unwieldy and disruptive to the narrative style.

The general layout of the book is clear and concise with the use of chapter summaries and conclusions being very good. It would have been useful if this format had been followed in Chapters 9-11. At the end of each chapter there is a list of useful references, and the book finishes with an index, which is brief yet definitive.

The book provides a useful introduction to the finite element method and covers in depth the development of the PAFEC program. Some areas have been covered in great detail while others, eg, dynamics, have been somewhat sparsely treated. This may reflect either the author's interests and experiences, or weaknesses in the program. The price probably prohibits the book from finding its way to many students' bookshelves, but the book would be a useful library addition and of particular benefit to the new PAFEC user.

Gavin Trott, R T James Ltd

New Publications

Vibration of Buildings to Wind and Earthquake Loads

*Editor: T Balendra
National University of Singapore*

pp 143. 108 figures. Hardcover: £80.00
ISBN 3-540-19833-4

Recent advances in the development of high strength materials, coupled with more advanced computational methods and design procedures, have led to a new generation of tall and light buildings. These structures are very sensitive to the most common dynamic loads; winds and earthquakes. A design approach is required which provides safety while taking into account serviceability criteria.

Vibration of Buildings to Wind and Earthquake Loads gives a well-

balanced and broad coverage of the information needed for the effective design of structural systems for wind and earthquake-resistant buildings.

The text is fully illustrated and supported by numerical examples. It will be of great interest to practising engineers and researchers in structural, civil and design engineering as well as architects.

Earthquake-Resistant Design with Rubber

*James M Kelly
University of California, Berkeley,
California, USA*

pp 123. 43 figures. Hardcover: £70.00
ISBN 3-540-19787-7

Earthquake-Resistant Design with Rubber deals with the new technology of base isolation. It presents detailed

design methods and guidelines developed through extensive research and development at the author's laboratory.

The topics covered include:

- Vibration Isolation
- Seismic Isolation
- Application of the Theory to Buildings
- Code Requirements
- Coupled Lateral Torsional Response of Base-Isolated Buildings
- Behaviour of Multi-Layer Bearings under Compression and Bending
- Buckling Behaviour of Elastomeric Bearings
- Design Process for Multi-Layer Elastomeric Bearings

This book will be of interest to practising structural engineers, design engineers, graduate students, building officials and building owners. It will enable the reader to use the technology with confidence and to design cost effective seismic resistant structures.

NOTABLE EARTHQUAKES JANUARY - MARCH 1994

Reported by British Geological Survey

Year	Day	Mon	Time UTC	Lat	Lon	Dep km	Magnitudes ML MB MS	Location
1994	1	JAN	03 17	51 36N	3 56W	18	2.8	BRISTOL CHANNEL <i>Felt in the Minehead area of Somerset and in northern parts of Devon.</i>
1994	17	JAN	12 30	34.12N	118.54W	18	6.4 6.8	SOUTHERN CALIFORNIA <i>This earthquake caused extensive damage to buildings and bridges in the San Fernando Valley area of Los Angeles, particularly in the Northridge area. It was felt throughout most of southern California. More than 57 people died, over 9,000 were injured and 20,000 were made homeless. Estimates put the cost of this earthquake at 30 billion US dollars.</i>
1994	20	JAN	12 29	53.20N	1 13W	1	1.4	MANSFIELD, NOTTINGHAMSHIRE <i>Felt in Mansfield. This shallow earthquake was similar to other events which occur in this area which are believed to be related to coal-mining activity. Similar events were also recorded on 11 and 17 January with magnitudes of 1.2ML and 0.4ML respectively. These were also felt.</i>
1994	21	JAN	02 24	1 01N	127 73E	33	7.2	HALMAHERA, INDONESIA <i>Seven people were killed, 40 injured and 550 houses were damaged in the Kau area. Felt strongly at Temata.</i>
1994	5	FEB	23 34	0 58N	30 14E	10	5.8 6.1	UGANDA <i>At least 2 people were killed and several injured. Most buildings were damaged in the Fort Portal area of Uganda. Two people killed by landslides at Kasse, Uganda. Felt at Kampala and in eastern Zaire.</i>
1994	10	FEB	05 11	53.19N	4 15W	11	2.9	BANGOR, NORTH WALES <i>Felt throughout Gwynedd, North Wales</i>
1994	12	FEB	17 58	20 56S	169 36E	33	6.3 7.2	VANUATU ISLANDS <i>Felt at Port-Vila</i>
1994	15	FEB	10 15	52 57N	0 94E	10	4.0	NORWICH, NORFOLK <i>Felt throughout Norfolk, Suffolk and parts of Cambridgeshire</i>
1994	15	FEB	11 18	52 56N	0 93E	3	2.8	NORWICH, NORFOLK <i>Felt in the Norwich area.</i>
1994	15	FEB	17 07	5 05S	104.24E	15	6.0 7.0	SUMATERA, INDONESIA <i>At least 207 people were killed and more than 2,000 injured, 75,000 homeless and extensive damage from landslides, mudslides and fires in Lampung province. Much of the damage and loss of life occurred in the Liwa area. Damage is estimated to be about 169 million US dollars. Felt throughout much of southern Sumatra and parts of western Java.</i>
1994	23	FEB	08 02	30.19N	60.63E	10	6.0 6.1	NORTHERN IRAN <i>Six people were killed in the Sistan region, Iran. Aftershocks occurred on 23, 24, 26 and 28 February. The magnitude 5.9Ms aftershock on 26 February caused further damage to houses in the Sistan region.</i>
1994	1	MAR	03 48	28.94N	52.63E	10	5.8 6.0	SOUTHERN IRAN <i>At least two people were killed and fifty injured. Damage in the Firuzabad area.</i>

New Publications (continued)

Concrete Structures in Earthquake Regions: Design & Analysis

Edited by Edmund Booth
Published by Longman, pp 368. £70.00

Recent significant advances in design, analysis and construction technologies for earthquake resistant concrete structures have led to the need for an up-to-date survey of current practice.

Concrete Structures in Earthquake Regions: Design & Analysis provides this survey. The comprehensive coverage provides a guide through the new technology and practices in this highly complex area of construction.

Coverage includes an overview of earthquake resistant design; choice of earthquake resisting system; analysis for earthquake effects; behaviour of reinforced concrete under cyclic loading; design of frames, shear

walls and diaphragms; codes of practice; soils and foundations; base isolation; bridges, dams and industrial chimneys. Key features include:

- provides a fundamental understanding of structural behaviour with practical solutions to design problems
- emphasis is on reinforced concrete, + extensive additional coverage of precast and prestressed concrete
- includes a major review of current research knowledge on seismic response of concrete
- presents and compares seismic code requirements for the US, New Zealand, Japan and Europe

This is an essential reference for practising civil and structural engineers and architects involved with projects in earthquake regions. All students of earthquake engineering will welcome the comprehensive and approachable coverage.

SECED Events

13th April 1994

SECED Meeting

Damage and Intensities in the Magnitude 7.8 1929 Murchison Earthquake
Imperial College, London

21st April 1994

Damage Ratios for Houses in the MM10 Zone of the 1931 Hawkes Bay Earthquake
The Martin Centre
University of Cambridge

27th April 1994

SECED Meeting

Case Studies of Building Design for Earthquake Regions
Institution of Civil Engineers
+ SECED AGM
+ Biennial Dinner

18th May 1994

SECED Half Day Meeting

The Incredible British Earthquake (How Big and Bad can NW Europe Earthquakes be?)
Institution of Civil Engineers

13th June 1994

SECED Meeting

Socio-Economic Aspects and Low Cost Housing in the Latur Earthquake September 30 1993
Imperial College, London

SECED

SECED, The Society for Earthquake and Civil Engineering Dynamics is the British national section of the International and European Associations for Earthquake Engineering and is an associated society of the Institution of Civil Engineers. It is also sponsored by the Institution of Mechanical Engineers, the Institution of Structural Engineers, and the Geological Society. The Society is also closely associated with EEFIT, the UK Earthquake Engineering Field Investigation Team. The objective of the Society is to promote cooperation in the advancement of knowledge in the fields of earthquake engineering and civil engineering dynamics including blast, impact and other vibration problems.

For further information about SECED contact The Secretary, Institution of Civil Engineers, Great George Street, London SW1P 3AA, United Kingdom.