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N.Z. GEOMECHANICS NEWS

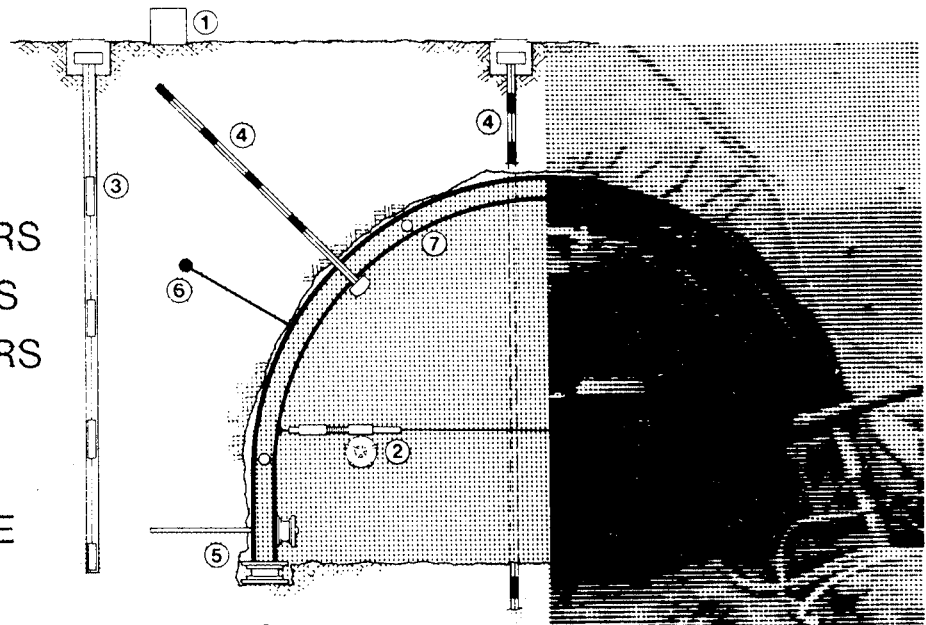
No. 43

DECEMBER 1991

A NEWSLETTER OF THE N.Z. GEOMECHANICS SOCIETY

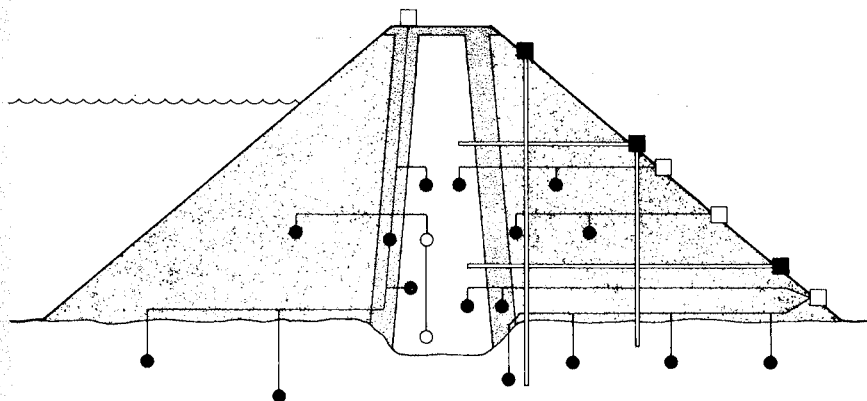
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**NZ GEOMECHANICS NEWS
NO. 43 DECEMBER 1991**

A NEWSLETTER OF THE NZ GEOMECHANICS SOCIETY

C O N T E N T S

	Page No.
Editorial	3
Notes for Contributors	4
Report from the Management Secretary	5
Report from Australasian Vice President for ISRM	7
Report from the Vice Chairman for ISSMFE	9
Report from the Vice Chairman for IAEG	11
Report from the Vice Chairman for ISRM	12
Local Group Activities	13
Auckland Branch	13
Wellington Branch	13
Christchurch Branch	14
Otago/Southland Branch	14
The NZ Geomechanics Society Award	15
NZ Geomechanics News Questionnaire	17
Sixth ANZ Conference on Geomechanics	19
Forthcoming Conferences	22
Articles and Technical Papers	27
Notes on Report Writing for Geotechnical Engineers	27
Registration of Engineering Geologists	31
Report on the Second International Conference on	33
Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics	

THIS IS A REGISTERED PUBLICATION

"NZ Geomechanics News" is a newsletter issued to members of the NZ Geomechanics Society. It is designed to keep members in touch with recent developments. Authors must be consulted before papers are cited in other publications.

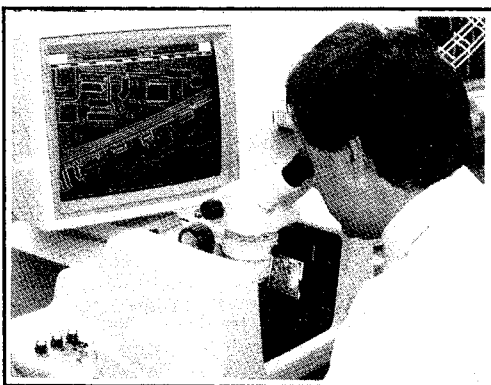
Persons interested in applying for membership of the Society are invited to complete the application form at the back of the newsletter. The basic annual subscription rate is \$35.00 and is supplemented according to which of the international societies, namely Soil Mechanics (\$15.00), Rock Mechanics (\$15.00) or Engineering Geology (\$35.00) the members wishes to be affiliated. Members of the Society are required to affiliate to at least one International Society.

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EDITORIAL

This editorial is penned in the damp heat of the North East monsoon on the east coast of Malaysia. Papers fly under the action of the ceiling fan whilst heavy rain outside prevents us from continuing our work walking the roads. Being so far from home it seems unlikely that this December 1991 issue will hit your desks much before February 1992. However, I must try! By that time, our two major conferences will be upon us.

The Management Committee has been asked to comment on the issue of "freedom of information" with regard to geotechnical reports submitted to local authorities in support of building permit application, etc. Whilst the Management Committee considers that the matter requires careful consideration and discussion, which is yet continuing, we consider also that comments and opinions should be sought from the society as a whole.

The issue arises out of a letter circulated to consultants from one District Council announcing its intention to "... make available to the public upon request its records as to the natural condition of land, albeit that the information may have been supplied to the Council by third parties." The letter explains that the "Council" has a duty to gather such information to carry out effectively its functions under Sections 35(1), (2) and (3) of the Resource Management Act. The "Council", however, recognises the privacy of "design solutions" and undertakes not to disclose such components without the consent of the person for whom it was produced. The "Council" therefore requires geotechnical reports to be submitted, either without restriction as to public availability (and endorsed as such) or in two parts :-

- (i) Geotechnical findings (available to the public) and
- (ii) Design solutions (not available to the public without the consent of the person for whom the information was produced).

I am sure that the public at large would recognise the benefits of such actions, deemed by that Council to be both desirable and lawful. In general, the more information available, the greater the degree of confidence in the interpretations of the geotechnical conditions. However, with this in mind, the geotechnical engineering profession and members of this society are asked to consider the following questions :-

- a) Where does rightful ownership lie? Does the action of submitting a report to Council transfer ownership of the information to the Council, or does the person who pays to have the information brought into being remain the owner? If the latter, should not the owner be party to any decision regarding to whom the information is given and to what purpose it might be used?

There might also be a situation, rare but not unknown, when the party commissioning the work has failed to pay for it. Does this information, once lodged with the Council, become freely available to anyone, including the defaulting initiator?

- b) Is there an issue of professional liability? If another party were to rely upon information which the Council provided, and suffered as a result, would there be grounds for claim in tort? This question relates to the fundamental underlying issue of what is fact and what is interpretation. For example, it is now commonly accepted that even logs of boreholes are "interpretations" and not "fact". Only the physical soil or rock cores themselves could be regarded as "factual" data obtained from boreholes.

Tim Sinclair
EDITOR

NOTES FOR CONTRIBUTORS

NZ Geomechanics News is a newsletter for which we seek contributions of any sort for future editions. The following comments are offered to assist contributors:

- Technical contributions can include any of the following:
 - Technical papers which may, but need not necessarily be of a standard which would be required by the international journals and conferences,
 - Technical notes,
 - Comments on papers published in Geomechanics News,
 - Descriptions of geotechnical projects of special interest.

- General articles for publication may include:
 - Letters to the NZGS,
 - Letters to the Editor,
 - Articles and news of personalities

Submission of text material in camera-ready format is not necessary though typed copy is encouraged. Diagrams and tables should be of size and quality for direct reproduction. Photographs should be good contrast black and white gloss prints and of a suitable size for mounting to magazine format. Authors and other contributors must be responsible for the integrity of their material and for permissions to publish.

Tim Sinclair
EDITOR

REPORT FROM THE MANAGEMENT SECRETARY

1. INTRODUCTION

This is my first report as the 1991/92 Secretary. I look forward to reporting the activities of the Society and the Management Committee to you.

2. MEMBERSHIP

Since last report, we have had a large number of new members. We extend a warm welcome to :-

Pieter Fransen
Clayton Oldham
Mathew Free
Woei Lai
Jonathan Williams
Graham Fairless
Veronica Tam
Charles Watts
Gregory Cocks
Paul Russell
Paul Horrey
Leigh Dooley

3. 1992 ANZ AND ISL CONFERENCES

Planning for these major conferences is well advanced and registrations are rolling in. The Organizing Committees under the chairmanship of David Bell (ISL) and Nick Traylen (ANZ) have done an admirable job over the last 2 years. The ANZ Conference is held only once every 12 years in New Zealand while the ISL, being the first such International Conference to be held in the Southern Hemisphere, could well be a once-in-a-lifetime opportunity. I urge you to support these conferences by attending one or, if possible, both events. An informative and enjoyable time is guaranteed.

4. 1992 IPENZ CONFERENCE

The 1992 IPENZ Conference is to be held in Christchurch (16-19 February). Due to our commitments with the ANZ and ISL Conferences, the Society will not be actively contributing to the IPENZ Conference in 1992.

5. 1992 MANAGEMENT COMMITTEE

Eight nominations were received for the 1992 Management Committee, including two new members. As there are only eight elected positions an election will not be necessary. The 1992 Management Committee is as follows :

Dick Beetham	
Chris Graham	
Ian McPherson	
Trevor Matuschka	
John Sekula	
Tim Sinclair	
Colin Newton	
Stuart Palmer	
David Bell	co-opted to act as Convenor ISL Conference
Bruce Riddolls	co-opted to act as Otago/Southland Representative
Nick Traylen	co-opted to act as Convenor ANZ Conference

6. REVIEW OF AUCKLAND UNIVERSITY GEOLOGY DEPARTMENT

The society was recently requested to provide a submission to the Committee which was established to conduct the review of the Geology Department. The review is being conducted as part of normal ongoing review procedures of all Departments. A sub-committee consisting of Chris Graham, Guy Grocott and Bruce Riddolls met and put together a written submission.

7. BUILDING INDUSTRY AUTHORITY

We have been asked to provide comments on the draft Approved Document B1: Structure Foundations which will be used in establishing compliance with the New Zealand Building Code (NZBC). A sub-committee consisting of Chris Graham, David Jennings, Grant Loney and Trevor Matuschka has undertaken a review and will be reporting shortly. We have some concerns with this document in its current state. Copies of this document can be obtained from the Building Industry Authority, P.O. Box 11846, Wellington at a cost of \$5. We note that all interested parties are welcome to comment on this document and we recommend you do.

8. BRANCHES

The Otago/Southland branch has continued to be our most active branch in recent times with eight meetings this year. The Auckland branch held four successful meetings this year and is looking towards promoting more joint meetings with other technical groups next year.

Merry X'mas and a Happy New Year

Trevor Matuschka
MANAGEMENT SECRETARY

REPORT FROM THE AUSTRALASIAN VICE PRESIDENT FOR ISRM

This report summarises the activities of the International Society for Rock Mechanics since April 1991 and consists principally of matters considered at the Board and Council Meetings which were held in Aachen in September 1991.

1. Following a detailed study of the ISRM fee structure, draft proposals have been developed. These recommend that (a) the existing "quantity discount" which heavily favours the richer countries be abolished and (b) the new fee is based on United Nations GNP statistics. This would bring the fee structure into line with that currently used by ISSMFE. This to be finalised by incoming Board as a matter of urgency, preferably by early 1992.
2. A range of modifications were made to Statutes and By-Laws. Amongst these was the introduction of a statute requiring the Board to publish a continuously updated 8 year plan.
3. As a result of long discussions over the last year or so, the Board had formulated a scheme involving the formation of "Divisions" within the ISRM structure. The principal reason for this initiative was to facilitate ISRM membership for a group of specialists involved in blasting. This group of several hundred individuals have had a loose association for about 10 years, have held 3 international conferences (the last in Brisbane in 1990), and wanted formal involvement with an existing international society. While this proposal was fully endorsed by the Board, it failed to reach a 2/3 majority by council. The new board will consider future initiatives for the blasters.
4. The organisation for the 1995 International Congress to be held in Tokyo is well advanced with major sponsors to keep the registration costs to a minimum. It is understood that this will be a real cost minimisation as opposed to the apparent minimisation of the Aachen Congress (no lunches in registration, \$70 buffet dinner excluding drinks and only enough food for about 75% of those attending, etc. etc!). It has also been confirmed that there will be poster sessions in Tokyo.
5. The winner of the 1991 Rocha Medal (selected in 1990) was Dr. Thomas Kleine of the University of Queensland for his thesis on rock fragmentation by blasting. This is the second time the medal has been awarded for an Australian thesis since its inception in 1982. Since the confidentiality criterion of the award has now been lifted, it is possible to announce that the 1992 medal will be awarded to Dr. A. Ghosh of the University of Arizona for a thesis entitled "Fractal and numerical models of explosive rock fragmentation".
6. ISRM regional symposium sponsorship was approved for conferences to be held in Lisbon (June 1993), Madison, Wisconsin, USA (June 1993) and Vienna (July 1993).
7. The 1993 ISRM International Symposium location was selected as Lisbon and will take place in June 1993.

8. The ISRM now has a number of promotional items for sale including hats, pocket knives, magnifiers, key rings and marker pens. All these have the ISRM logo displayed.
9. Professor Charles Fairhurst of the University of Minnesota is the new ISRM president for the 1991-1995 term. Professor Fairhurst defeated Professor Carlos Dinis da Gama of Portugal in a secret ballot. The new regional vice-presidents are Dr. Dick Stacey (Africa), Professor Sassa (Asia), Professor Mick Pender (Australasia), Professor Ove Stephansson (Europe), Professor Peter Kaiser (N. America) and Dr. Oscar Varde (S. America). The two vice-presidents at large will be appointed by the new Board within the next few months.
10. The ISRM Board and Council Meetings for 1992 will take place immediately before "Eurock 92" to be held in Chester, U.K., 14-17 September 1992.
11. It has been a privilege to represent the Australasian region as an ISRM vice-president for the last four years and I would like to thank the two national societies for providing the opportunity, support and encouragement. I would particularly like to thank the A.G.S, the Institution of Engineers, Australia, the Department of Civil Engineering at Monash University and the Dean of Engineering at Monash University for the financial assistance in allowing me to attend all Board and Council meetings for my term of office. I would also like to wish Professor Mick Pender of the University of Auckland good fortune in his role as the new ISRM regional vice-president.

Ian W. Johnston

ISRM VICE-PRESIDENT FOR AUSTRALASIA, 1987-1991

REPORT FROM THE VICE CHAIRMAN FOR ISSMFE**1. TECHNICAL COMMITTEE REPORTS****Earthquake Engineering, TC4: John Berrill**

John attended the Technical Committee Meeting in Florence at the end of May. At this meeting, it was decided to prepare a manual for the Estimation of Geotechnical Hazards from Earthquakes. Once a draft has been developed, it is proposed that committee members run pilot studies in their own countries.

John also attended the European Young Geotechnical Engineers Conference. He was very impressed and suggested it may be worth trying something similar. He would like to discuss this further on his return.

Tropical and Residual Soils, TC25: Laurie Wesley

Laurie has attended two meetings; Rio and the 3rd Conference on Tropical and Residual Soils in Lesotho.

The activities of the committee have centred on organising conferences with some attention given to identifying research needs and to the development of some sort of classification or grouping system for tropical and residual soils. A paper Laurie has prepared in the Singapore conference has been adopted as a basis.

It has also been decided that some sort of "Geotechnical Guidelines for Design Evaluation of Tropical and Residual Soils" be developed.

Landslides, TC11 : Graham Salt

The committee meets principally, every 4 years at the International Symposium on Landslides venue, as well as at ISSMFE and IAEG conferences. The work carried out by the committee is done by correspondence between members of the individual Working Groups, on aspects such as standardisation of terminology on rates of movement of landslides. A number of consequent reports will be presented at the next ISL. A long term project of the committee has been the compilation of a World Inventory of Landslides, a project to collate statistical information on landslides.

The next meeting will be in Christchurch in February where the venue of the 1996 symposium will be decided, with interest at the last meeting being registered by Norway, China and South American countries.

The committee has involved in determining the venue of the ISL's. The other main activity of the committee is the compilation of a World Inventory of Landslides.

2. XIII INTERNATIONAL CONFERENCE SMFE NEW DELHI

The NZ Geomechanics Society has received a letter concerning the lack of people pre-registering. A letter has been dispatched to outline the size of our Society and that we were interested in being kept informed. We have suggested that it would be 1993 before most people would register.

3. TECHNOLOGY TRANSFER

A task force has been established to promote technology transfer by our international societies. An initial report has been prepared and offers of assistance listed with a list of demands from several countries.

4. NINTH ASIAN REGIONAL CONFERENCE

The organisers are concerned about the very small turn out of New Zealand participants. They have issued further material to try and encourage people to attend the Conference.

Colin Newton
VICE CHAIRMAN, ISSMFE

REPORT FROM THE VICE CHAIRMAN FOR IAEG

A meeting of the IAEG Council was held in Amsterdam, the Netherlands, on August 4 and 5, 1990. The next meeting has just been held in Sfax, Tunisia, on 13 October 1991 immediately prior to the International Symposium on Urban Geology. A General Assembly of the IAEG will be held in Kyoto, Japan, in 1992.

The Australasian Vice-President of the IAEG is Mr John Braybrooke of D.J. Douglas & Partners Pty. Ltd., Sydney, Australia. He has just attended the Sfax, Tunisia Council meeting where he was acting as our representative. The following matters were raised at this meeting.

- It is proposed to make the IAEG Bulletin a better vehicle for communication between IAEG and its members by including letters to the editor, Vice-President's letters on Engineering, Geology, Bibliography, etc. We support this proposal and ask for any ideas/views from N.Z. members.
- ISSMFE and ISRM have requested to join the International Union of Geological Sciences. This is supported by Australasia!
- Are any of our IAEG members interested in being nominated to the Building Stones and Ornamental Rocks Commission? The meetings of this group are held in Europe and I am not sure that fares would be reimbursed.

PRESENT NZ MEMBERSHIP OF IAEG

At present the NZ Geomechanics Society has 133 members affiliated to the IAEG with 95 of these receiving the Bulletin.

Dick Beetham
VICE CHAIRMAN IAEG

REPORT FROM THE VICE CHAIRMAN FOR ISRM

The International Congress on Rock Mechanics was held in Aachen, Germany on 16 to 20 September 1991. This conference was attended by Prof. M Pender and Mr S Read and NZGS Chairman Mr C Graham attended the ISRM annual meeting as the Australia-New Zealand representative. A report on that conference is given elsewhere in this bulletin.

John Sekula
VICE CHAIRMAN ISRM

LOCAL GROUP ACTIVITIES

1. AUCKLAND BRANCH

Following on the successful 1990 year, the Auckland Branch of the New Zealand Geomechanics Society assembled much the same willing band of workers and organised another full programme for 1991.

Four formal meetings were held along with a fifth presentation to an informal gathering given by Hoechst Celanese on 9 October 1991.

Special effort has been made to arrange joint meetings with other groups in order to maintain a free flow of information across the various specialty groups within the engineering fraternity. Attendances were lower than last year, a likely reflection of the shrunken economy and consequent number of engineers.

The formal topics presented during the year were:

- Earthquake Experience in the Philippines given in May
- Developments in Geotechnical Testing given in July
- Slope monitoring given in September
- Pavement Engineering given in November.

All the formal meetings were held in Room 1.401 in the Engineering School of Auckland University. Attendees gathered from 5.30 until 6.00 pm for refreshments and the technical sessions generally ran from 6.00 to 7.00 pm. Information discussions were continued after the meetings over meals usually at the University Club.

My thanks go to the joint convenors and speakers at each meeting and those who attended. A special thanks to Tony Henderson who has ably assisted in my absence.

John Sekula

2. WELLINGTON BRANCH

1991 was a relatively quick year for the Wellington Branch with two meetings being held.

On 18 June, Dr Bob Pyke a Geotechnical Consulting Engineer based in California presented an interesting talk on improvements on standard methods of seepage and slope stability analyses and their application to engineering practice in California. In particular he described the extension of limit equilibrium analyses to three dimensions and the use of finite elements as a routine tool for two dimensions analyses. He

illustrated his talk with natural landslides in the San Fransisco Bay area and waste landfills around Los Angeles.

On 18 September Rab Brown Project Manager for the Clyde Power Project delivered a talk on his experiences as a Senior Manager with the English Channel Tunnel Project prior to coming to NZ. He discussed the preparatory works associated with establishing the Tunnel Boring Machines. These included construction of the largest precast yard and sea wall (for spoil disposal) in Europe as well as large underground caverns.

The intentions are to develop a more active programme in 1992 and suggestions of possible topics would be appreciated.

Graham Ramsay

3. CHRISTCHURCH BRANCH

Members of the Christchurch Branch have been heavily involved in the organisation of the two forthcoming conferences to be held in Christchurch in February. Local society meetings have been sacrificed to this cause over the past year. It is hoped they will resume again later in 1992.

Editor

4. OTAGO/SOUTHLAND BRANCH

A meeting, attended by 59, was held in Cromwell on Wednesday, 11 September 1991, to provide an overview of progress on Clyde Power Project landslide stabilisation works. The Nine Mile Slide Area, the largest landslide complex ion the Cromwell Gorge, was selected to illustrate the various aspects involved. A 4-man panel consisting of Murray Gillon, Gary Smith, Dick Beetham and Dave Jennings, presented results of investigations, geological models, drainage of groundwater by tunnelling and underground drilling, piezometric and inclinometer monitoring, and predicted effects of lake-filling.

Bruce Riddolls

THE NEW ZEALAND GEOMECHANICS SOCIETY AWARD

GENERAL

With minor exception, the IPENZ awards for published papers each year are for specific technical groups, and accordingly papers of geotechnical interest prepared by our members who are not IPENZ members are generally not eligible. The Management Committee has therefore decided to promote a new award specifically for our own members and the rules pertaining to this award are presented below. Written nominations for the next award are required to be with the Management Secretary by 31 July 1992.

The last Geomechanics Society Award was presented in November 1988 for the following paper:

- "Development of Foundation Investigation Techniques" by T.J. Larkin & M.L. Pledsted, University of Auckland.
- Published in RRU Bulletin 73, 1984. Bridge Design and Research Seminar, Technical Papers by 23 Authors, National Roads Board.

RULES

1. This award may be awarded annually and shall be presented at the Society's Annual General Meeting.
2. The Award shall be made to the Society member or members producing the best published paper during the three years ending 31 July preceding the date of the Award, in any publication at the discretion of the Management Committee.
3. As to eligibility for the Award, all Society members who are authors of any paper published within the previous three years shall be eligible, provided that at least one author is a member and the paper is nominated in writing by a member during the current year.
4. Nominations for consideration as recipient of the Award shall be sought through the June issue of Geomechanics News each year.
5. The criteria for selection of the Award paper shall be merit and the degree to which the paper advances the objects of the Society.
6. The process of selection of the recipient of the Award shall be administered by the Management Committee of the Society.
7. The Award shall be a sum of money to be determined by the Management Committee for the purchase of books, plus a certificate.
8. The Award shall be known as the "New Zealand Geomechanics Society Award".

NEXT AWARD

The Management Committee are hoping that the members of the Geomechanics Society will forward nominations for the next Award to be made at the IPENZ Conference in February 1993.

NZ GEOMECHANICS NEWS QUESTIONNAIRE

In the last issue of Geomechanics News, members of the Society were invited to complete a questionnaire on the format of the news letter. Ten questionnaires were returned and the following summarises the results:

1. Format: Preferred size:

A4 :	9
A5 :	1

2. Content:

	More	Less	Same
• Technical material	3	2	6
• News of Society Members	4	1	5
• News on NZ projects	9		1
• Practical information on methods, techniques, material properties	9		1
• News from International Societies		3	7
• Lists of Conferences		3	7
• Reference Lists	2		8

3. Frequency:

Two issues/year	2
Three issues/year	2
Four issues/year	6

4. Suggestions and Comment for future content:
 - Articles on Resource Management Act and Building Bill and their effects on practitioners.
 - Comment on BIA's approved documents B1: Foundations.
 - Environmental geotechnics e.g. landfills, hazardous waste containment, mining, etc.
 - Copies of correspondence and submissions to SANZ, BIA and other bodies on geotechnical matters by Management Committee.

- Index of previous articles and authors.
- Computers and software applications.
- Comparisons of past and present practice and comments by experienced exponents relating theory and practice.
- Geology and rock mechanics input.
- Information on relationships with pavement bodies and affiliations.
- Book reviews.
- Technological breakthroughs and advances.
- Current and historical New Zealand projects.
- List of society officials (inside cover), addresses, advertising rates, etc.
- More advertisements from Consultants and Contractors.
- Reviews and updates on analytical methods, including computer methods.

These suggestions are welcomed by the Editor who now undertakes to action those that can be initiated by the Management Committee, and to encourage society members to address the others.

The Editor notes that there is a general acceptance of the present format and content except that there is a clear demand for more news on New Zealand projects and more practical information on methods, techniques and material properties. Although gratified by the implied compliment, the Editor is alarmed at the suggestion of four issues per year: Two issues per year is a real struggle!

The Editor was also gratified to receive the following comment:

"Very interesting publication and good balance. Articles generally at a level which the general practitioner can understand".

**SIXTH AUSTRALIA NEW ZEALAND CONFERENCE
ON GEOMECHANICS, CHRISTCHURCH, NEW ZEALAND**

FEBRUARY 3 - 7 1992

This Conference is the four-yearly meeting of the New Zealand and Australian Geomechanics Societies. It is a forum for geotechnical engineers, geologists, researchers and scientists active in the field of geomechanics to meet and exchange information about their work.

The 1992 Conference is being organised by the New Zealand Geomechanics Society, a technical group of IPENZ, in association with the Australian Geomechanics Society and endorsed by the International Society for Soils Mechanics and Foundation Engineering, the International Association of Engineering Geology and the International Society for Rock Mechanics. The last conference was held in Sydney, Australia in 1988.

To coincide with the 1990's being designated "The International Decade for Natural Hazard Reduction", the overall theme of the Conference is "Geotechnical Risk - Identification, Evaluation and Solutions". Over the four and a half days of the Conference, papers will be submitted on this theme and a large variety of other geotechnical related subjects. One day of the Conference is allocated to half day and full day technical excursions in the Canterbury region.

In addition to the technical sessions outlined below, there are several special sessions. The keynote address will be presented by Professor James K Mitchell from the University of California, Berkely, on the topic "Mitigation of Ground Failure Risk - some lessons from the Loma Prieta Earthquake".

The 7th Geomechanics Lecture of the N.Z. Geomechanics Society, which is its premier award, will be given by Professor Geoffery R Martin from the University of Southern California. This award is in recognition of the contribution to geomechanics by a New Zealander. His address will be on "Geomechanics - the Art and the Science."

The John Jaeger Memorial Medal will be presented to Dr Brian G Richards, who will give the Jaeger Medal address on the topic of "The Development of the Geomechanics of Saturated and Swelling Soils." This award is made approximately once every four years and is to recognise contributions of the highest order in Australian Geomechanics.

There will be a special session dedicated to the Clyde Power Project. The reservoir will inundate twenty large landslides, several of which are active, with volumes of up to one thousand million cubic metres and depths of 200m.

Measures are being implemented to offset the destabilising effects of the new reservoir, and they are believed to be the largest stabilisation works undertaken for a hydro electric development in the world. The session will outline the investigation of the landslides and design of engineering works to offset the destabilising influence of lake filling. The remedial work is comprised of drainage tunnels, both gravity and pumped, and drill holes as well as toe buttresses with an estimated cost of about \$NZ400 million.

There will be seven technical sessions, covering papers and discussion on the following topics:

- Earth structures, Dams, Soil Improvement, Geofabrics, Foundations, Retaining Walls, Mining, Tunnels, Excavations, Soil Properties, Testing, Analytical and Probabilistic Methods, Slope Stability, Seismic Hazard and Professional and Legal Issues.

All papers will be published in a bound set of Conference Proceedings and the Conference will be followed up by a special edition of 'New Zealand Geomechanics News', the journal of the N.Z. Geomechanics Society. The Proceedings will be available from January 1992.

Technical excursions during the conference include visits to active faulting in the vicinity of the Hanmer Thermal resort in North Canterbury; a visit to the French settlement of Akaroa on Banks Peninsula, examining landslide and erosion features of the loessial and volcanically derived geology of the Banks Peninsula; and a visit to local sites of engineering and geological interest in the City of Christchurch and on the nearby Port Hills.

The Conference venue will be the Ngaio Marsh Conference Centre, at the University of Canterbury, Christchurch. The building is set in pleasant surroundings, nestled amongst trees and tranquil streams on spacious grounds at Ilam, about ten minutes from the City Centre.

Christchurch is the largest city in the South Island of New Zealand, with a population of about 350,000. It is central to all the major scenic attractions of the South Island, which is one of the leading holiday destinations in the world. For those delegates wishing to extend their stay, the South Island has all that a visitor could want.

Following the conference a Field seminar programme will be held on 8-9 February at Queenstown, a popular tourist resort some 350km south-west from Christchurch. The seminar is concerned specifically with the stability of large, schist derived landslides which occur on the slopes of major valleys formed by the Clutha River and its tributaries.

Some of these landslides have affected recent highway realignment, and also influence the filling of Lake Dunstan, a hydro electric storage reservoir under construction. Opportunities will exist for social and leisure activities in Queenstown and environs.

Accompanying persons programmes are organised for both the conference and the field seminar. There is an associated conference in the week following the 6th ANZ conference on Geomechanics. The Sixth International Symposium on Landslides (I.S.L.) is to be held at the Christchurch Town Hall from 10-14 February 1992, and is also being organised by the New Zealand Geomechanics Society.

For enquiries regarding registration for the 6th Australian - New Zealand Conference on Geomechanics, Conference Proceedings or sponsorship and trade exhibition opportunities, please contact the conference secretariat.

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Chairman
6th ANZ Conference of Geomechanics
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FORTHCOMING CONFERENCES

1. ISRM REGIONAL SYMPOSIUM ON ROCK SLOPES
NEW DELHI, INDIA
7-11 DECEMBER 1992

Papers are invited on the following themes:

- Geotechnical parameters, geological/aspects, investigations and data interpretation.
- Drilling and blasting techniques and innovative approaches.
- Slope stability analysis.
- Rock anchoring, other stabilising methods and drainage.
- Slope monitoring and instrumentation.
- Special problems of opencast mining.

The official language of the Symposium will be English.

Contact: C.V.J. Varma (Organising Secretary)
Regional Symposium on Rock Slopes - India
Plot No. 4, Institutional Area off Malcha Marg
Chanakyapuri, New Delhi-110021, India

Phone: (91) (11) 301-5984

Fax: (91) (11) 301-6347

2. SYMPOSIUM ON ASSESSMENT AND PREVENTION OF FAILURE
PHENOMENA IN ROCK ENGINEERING
ISTANBUL, TURKEY
5-7 APRIL 1993

The Turkish National Society for Rock Mechanics invites papers for the above Symposium.

Contact: Assoc. Prof. Dr. Abdurrahim Ozgenoglu
Middle East Technical University
Mining Engineering Department
06531-Ankara, Turkey

Phone: (90-4) 223-7100

3. EUROCK' 93: SYMPOSIUM ON SAFETY AND ENVIRONMENTAL ISSUES
IN ROCK ENGINEERING AND WORKSHOP ON SCALE EFFECTS IN
ROCK MASSES
LISBON, PORTUGAL
21-25 JUNE 1993

The themes of these functions will be:

(a) Eurock' 93:

- Modelling in Safety Evaluation
- Rock Engineering and Environment
- Stability of large underground structures
- Contribution of failures and incidents to the progress of rock engineering.

(b) Workshop:

- Deformability and strength of rock masses
- Internal stresses in rock masses
- Hydraulic properties of rock masses

The official languages will be English, French and German.

Contact: Sociedade Portuguesa de Geotecnia
Laboratorio Nacional de Engenharia Civil
Av. do Brasil, 101
1799 Lisboa, Portugal

4. THIRD INTERNATIONAL CONFERENCE ON CASE HISTORIES IN
GEOTECHNICAL ENGINEERING
ST. LOUIS, MISSOURI, USA
1-6 JUNE 1993

Original papers are invited for the Third International Conference on Case Histories in Geotechnical Engineering, St. Louis (MO), June 1-6, 1993 on the following themes:

- Case Histories of Foundations
- Case Histories of Slopes, Dams and Embankments
- Case Histories of Geotechnical Earthquake Engineering
- Case Histories of Man Made Vibration Problems
- Case Histories of Retaining Structures and Deep Excavations
- Case Histories of Geological Engineering and Rock Engineering
- Case Histories of Soil Improvement, Geosynthetics, Dynamic Compaction, Vibroflotation, Blasting and Other Methods
- Case Histories of Forensic Engineering "Case Histories Where Things Went Wrong"
- Case Histories of Geo-Economy - Adequate Geotechnical Solution

- Case Histories of Geotechnical and Hydrological Management of Solid, Hazardous and Low-Level Radioactive Wastes
- Case Histories of Geotechnical and Hydrological Remediation of Solid, Hazardous and Low-Level Radioactive Wastes
- Case Histories of Liner and Final Cover Systems for Solid, Hazardous and Low-Level Radioactive Waste Manage Facilities
- Case Histories of New Solutions to Traditional Geotechnical problems.

Several State of the Art lectures will be presented by I.K. Lee (Australia), T. Yamanouchi (Japan), M.T. Davisson (USA), W.D. Liam Finn (Canada), David Daniel (USA), J. Barry Cooke (USA), George Gazetas (USA), K. Rainer Massarch (Belgium), Jim Mitchell (USA), M. Jamiolkowski (Italy), Alfred Hendron, Jr. (USA) and others. Abstracts are due by February 28, 1992.

For further details and Call for Papers, please contact:

Shamsher Prakash
 Conference Chairman, III CHGE
 308 Civil Engineering
 University of Missouri-Rolla
 Rolla (MO), USA 65401
 Telephone (314) 3341-4489
 Fax (314) 341-4729

5. XIII INTERNATIONAL CONFERENCE ON SOIL MECHANICS AND FOUNDATION ENGINEERING
NEW DELHI, INDIA
JANUARY 1994

The conference will include the following:

- **Terzaghi Oration**

The Terzaghi Oration will be presented immediately after the Opening Ceremonies.

- **Heritage Lecture**

A Heritage Lecture will be presented by an Indian Geotechnical engineer highlighting some aspect of the development of Geotechnical Engineering in India.

- **Themes To Be Discussed At The Conference**

Plenary Sessions:

- A. Soil Properties
- B. Foundations

- C. Design and Performance of Retaining and Buried Structures
- D. Embankment Dams and Dam Foundations
- E. Natural Hazard Mitigation

- **Parallel Sessions:**

1. Marine Geotechnology
2. Computer Application in Geotechnical Engineering
3. Construction Instrumentation and Real Time Management
4. Environmental Geotechnolgy
5. Ground Improvement
6. Foundations of Old Structures and Monuments
7. Geotechnical Engineering Education
8. Professional Practices
9. Arid Climate Soils
10. Liquefaction
11. Geophysical Characterization of Soils
12. Road and Track Subgrades

- **Poster Sessions**

All authors of papers published in the Conference Proceedings are encouraged to present their papers at Poster Sessions. Participating authors will be assigned a display area during a specified time period and provided with a pressboard panel for exhibiting the main features of their papers.

- **Pre and Post-Conference Tours**

A number of tours to different parts of India will be organized, some before and some after the Conference. These will combine sightseeing and visits to engineering projects.

- **Technical Visit**

During the Conference, a one day visit to places of geotechnical and sightseeing interest will be organized.

- **Technical Exhibition**

An exhibition of geotechnical methods, equipment, materials and services is planned.

- **Social Programme**

A social programme will be arranged with sightseeing and other activities; it will include a pre-conference village-style-fair, a reception and a banquet.

- **Programme For Persons Accompanying Delegates**

A parallel programme will be arranged for persons accompanying delegates to give them a feel for the Indian life style.

Contact: Dr. Shahsi K. Gulhati
Professor of Civil Engineering
Indian Institute of Technology
Organizing Secretary General XIII ICSMFE
Post Bag No. 28
Hauz Khas
New Delhi-110 016, India

Tel: 91 11 6852540, or 91 11 653798
Telex: 031-73087 IIT IN
Fax: 91 11 6852541

ARTICLES AND TECHNICAL PAPERS**NOTES ON REPORT WRITING FOR GEOTECHNICAL ENGINEERS**

L.D. Wesley

1. **GENERAL**

All reports are special documents to some extent, written to convey specific information to particular readers; geotechnical reports are possibly more special than most in that the information to be conveyed is extremely variable and often not easily amenable to precise description, and the reader to whom it is addressed may be a fellow geotechnical specialist, or may be a lay person with no technical background at all (I was going to say "a little old lady" but thought better of it; my apologies little old ladies). I have read some very good geotechnical reports in my time but I have also read some very poor ones. The notes below are an attempt to identify some of the weaknesses I have come across in geotechnical reports and hopefully provide some constructive comments for those involved in the preparation of such reports.

2. **PREREQUISITES**

2.1 Knowing your brief

Make sure you are clear as to what your brief is, i.e. what information you are being asked to provide, or what questions you are required to answer. If your brief is very general then it is up to you to fill in the detail, or to go back to your client for clarification. If the brief is simply "to carry out a site investigation for a particular building on a particular site" then this should be interpreted as "a site investigation adequate to answer all the geotechnical questions raised by the site and the proposed building".

Far too many geotechnical investigations and reports for buildings focus only on issue of bearing capacity and settlement (or length of piles) and fail to identify or deal adequately with much more critical issues of slope stability or ground retention measures.

It is very easy to become trapped in a sort of "ritual mode" whereby site investigations and reports simply become an exercise in repeating a familiar routine which you have gone through before. You need to look at each new site afresh and identify just what its geotechnical implications are.

2.2 Scope of investigation

This is relatively easily sorted out provided the above step of identifying the issues has been done adequately. There will of course always be cost constraints, and the important point here is to spend the budget answering the critical questions, and not on going through a routine or ritual operation in order to answer questions you already know the answer to.

2.3 Know the answers and what you are going to say.

Get quite clear in your own mind what it is you are going to say before you start writing. This seems to me to be the key to good report writing. This means you must sort out what the questions are which you need to address and what your answers to them will be, before you start on the report. It appears from some reports that the writer has hoped that answers will somehow "emerge" in the course of writing the report; such reports generally end up being vague or confusing on the key questions needing clear answers. It is useful to jot down on paper in a rough form the essential points you need to include in the report before starting on the final version.

3. SETTING OUT

Reports are always improved by setting them out in sections, following a logical sequence. This is helpful both to you as the writer (so that you don't get muddled and don't leave things out), and to the reader, so that he or she gets a logical coherent story, and can find essential pieces of information without necessarily reading the whole report.

You should therefore sort out logical sections, and what should go into each section, before starting the writing. You should never blindly adopt the layout of a previous report; there are situations where the layout of a previous report will be acceptable, but there are also situations where you will end up producing a sub-standard or illogical report because you have tried to "mould" your report to a format to which it is simply not suited.

4. LANGUAGE

4.1 Technical jargon

Writers of technical reports use far too many technical words and obscure technical jargon, and geotechnical engineers are no exception. This may enhance our reputation as an obscure profession but does nothing to help readers to understand our reports. It seems that university training does not help here - studies have shown that the clarity with which students can express certain ideas decreases as they progress through their courses and give up the use of plain language in favour of technical jargon.

4.2 Language to suit the reader

Language and terminology must be varied to suit the person for whom the report is written. It is very depressing to find engineers using the same highly technical language in reports intended for non technical people as for members of their own profession. If we can't write reports for lay people which are comprehensible to lay people then we shouldn't be in the business of report writing.

4.3 Choice and clarity of wording

This may appear to have been covered in the previous section, but what I am trying to emphasise here is a somewhat different aspect, particularly related to geotechnical engineering. We must choose our words and phrases very carefully so that we convey to our readers no more and no less than we mean to say or are in a position to say.

For example, statements about soil conditions can never be blanket statements, or categorical statements. We must word our statements carefully so that they do not say more than is reasonable and truthful. Reports covering slips or slope stability appraisals must be even more carefully worded, so that we accurately convey to the reader precisely what we mean to say. Again, categorical statements are very unlikely to be appropriate. However, this does not allow us to adopt the other extreme of vague meaningless statements which don't really say anything at all. If for example, we have been asked to report on the stability of a prospective house site, we must come up with a clear statement as to whether we consider the site has sufficient stability to be used as a house site. We cannot put together a description of all the pros and cons influencing the stability of the site and leave it to the reader to deduce whether the site is acceptable or not. Of course, if there is still some element of risk involved then we need to convey this to the reader, using language and concepts which will accurately portray the level of risk. (This is a very difficult exercise but it is one which we cannot avoid).

5. COMPLETENESS

Your report must be complete in that it covers all the geotechnical issues involved in the site, unless you have a clear brief which excludes certain issues. Your report must tell the client what he or she wants to know; it must also tell the client what he (or she) needs to know, or what you need to tell him (or her) for your own protection. For example, you may have been asked to advise a client as to whether a cliff-top property is suitable as a house site, and you may have advised your client that the site is suitable provided the house is sited not closer than say 8m from the cliff edge. You have made a reasonable assessment that there is a risk of slips at the cliff edge but these are unlikely to involve more than 2 or 3m of the ground at the edge of the cliff, and hence will not affect the house. This piece of information needs to be conveyed to the client, together with the observation that although such slips will not affect the house itself they may have a dramatic effect on the value of the property. Just as cliff top views enhance the value of such properties, so do cliff top slips detract from their

value. The site of bare clay exposed by a recent slip is very effective in discouraging prospective buyers, even if the slip is well clear of the house itself.

6. MISCELLANEOUS

6.1 General observations and detailed advice

There is a tendency for those writing reports on site investigations to go directly into minute detail about bearing capacity and/or settlement, without any introductory remarks about the nature of the site and its general suitability for the client's proposed development. Before getting into any detailed advice, you should look carefully at the overall soil situation together with the designers proposals and discuss these along with possible alternative foundation options.

6.2 Basis of Advice

As far as possible, the basis of any advice or recommendations you give should be made clear to the reader, so that he or she understands your reasons and appreciates the implications should your advice not be complied with.

6.3 Put yourself in the reader's position

As you prepare your report you should try to put yourself in your reader's position. This should especially be done when you do your final check reading of the report. It is also very good practice to put the completed draft away for a day or two and then come back to it for a final check reading. Time seldom allows us to do this but it is a very useful exercise and often helps us to identify the defects and omissions in our reports.

(If the editor of Geomechanics News was not waiting for this article I would follow my own advice and hopefully get rid of some of its defects and omissions).

REGISTRATION OF ENGINEERING GEOLOGISTS

Dick Beetham, Cromwell

BACKGROUND

This issue has been around for many years now but was reactivated a few years ago, primarily by some Auckland based engineering geologists who were having trouble getting their reports accepted by local authorities, who required the reports to be certified by a Registered Engineer. At that stage some meetings of a sub-committee were held to talk through the issues and a low key approach was taken as it appeared that the Engineers Registration Act would be repealed and many changes were in the wind. The sub-committee felt that the time was ripe for Engineering Geologists to become affiliated with IPENZ, as IPENZ was proposing to formulate competency listings of which engineering geologists could be a separate listing. A questionnaire circulated in Geomechanics News elicited a fair response with the majority of respondents favouring affiliation of Engineering Geologists with IPENZ, should the option be available.

TRAINING

The requirements for training of a Professional Engineer are clearly set out by IPENZ (Handbook No. 2, 1990). There are basic academic and practical training requirements listed in this document, with a basic minimum requirement of engineering education to degree level (Appendix 1), and a list of acceptable degrees (Annex A). It is apparent that most Engineering Geologists do not meet these basic requirements of academic training.

Although Honours or MSc Engineering Geology graduates have academic qualifications equivalent to Engineers and therefore should be regarded as being of equal professional status, their basic academic training is in Geology and not Engineering. An Honours or MSc level Engineering Geology Graduate from N.Z. will typically have 3 years training in geology to achieve a BSc. After this the graduate Engineering Geologist will be required to take about eight papers, several of which will be in soil mechanics, rock mechanics and applied geology. The soil mechanics paper is identical to that taken by civil engineering undergraduates at second pro.level; while rock mechanics and engineering geology papers are equivalent to those taken by 2nd and 3rd pro. civil undergraduates. Thus an Engineering Geology graduate, in 4 years of study, undertakes approximately 3 papers which are equivalent to those taken in a 4 year civil engineering course. The engineering geology graduate has no training in design, an important basic requirement of the engineering curriculum.

Because of these basic differences in academic training, there is little likelihood that the IPENZ Council could recognise an MSc Engineering Geology graduate as having received an Engineering training equivalent to a BE or Bachelor of Technology (Massey). It follows that Engineering Geologists would be unable to qualify as engineering graduates as set out by IPENZ regulations and rules which are tied to the Engineers Registration Act (1924), and would be unable to become Registered Engineers, except perhaps by:-

(i) The mature candidate route to corporate membership (Annex C)

or

(ii) Assessment of engineers whose academic qualifications are in science (Annex D)

Other Options

If Engineering Geologists are unable to become Registered Engineers through their basic training, but they still wish to be affiliated to IPENZ, then there is the option of two IPENZ membership classes:

(1) Companion (Comp IPENZ)

or

(2) Associate (Assoc. IPENZ)

There remains the possibility that IPENZ will still formulate and publish lists of competence in the various fields of engineering. In this case they may be able to be persuaded, through the Geomechanics Society, to include a listing of "competent" Engineering Geologists. It may be that the Geomechanics Society will be required to take over the vetting role for deciding competence.

**REPORT ON THE SECOND INTERNATIONAL CONFERENCE ON RECENT ADVANCES
IN GEOTECHNICAL EARTHQUAKE ENGINEERING
AND SOIL DYNAMICS, MARCH 1991**

by

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The Second International Conference on "Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics" was held March 11-15, 1991 at St. Louis, Missouri. The conference was organized and presented by the University of Missouri-Rolla, in cooperation with the American Society of Civil Engineers, International Society of Soil Mechanics and Foundation Engineering, International Association of Earthquake Engineering, Earthquake Engineering Research Institute, National Science Foundation, NCEER Buffalo and several other organizations. This conference followed the first conference on the subject by the University of Missouri-Rolla, held in 1981, a decade ago. The conference attracted 327 delegates from 27 countries around the world. The attendees included a vast majority of world experts on soil dynamics, geotechnical engineering, earthquake engineering, and seismology.

The principle goals of the conference, which included presentation and discussion of the advances in Soil Dynamics and Geotechnical Earthquake Engineering since 1981, and interaction between the researchers and practitioners in this area, were achieved by a careful organization of the sessions and selection of themes which covered a wide spectrum ranging from determination of relevant soil properties under dynamic loading conditions to their application in analysis and design, to liquefaction problems, comparison of observed and predicted behavior, and lessons learned from earthquakes. The main themes of the conference were:

- Static and Dynamic Engineering soil Parameters and Constitutive Relations in Soils
- Model Testing in Cyclic Loading
- Deformation and Liquefaction
- Dynamic Earth Pressure and Seismic Design of Earth Retaining Structures
- Soil Structures Interaction Under Dynamic Loading
- Earthquake Geotechnology in Offshore Structures
- Stability of Slopes and Earth Dams Under Earthquakes
- Soil Amplification During Earthquakes and Microzonation

- Seismology: Predicting Strong Ground Motion For Design
- Wave Propagation in Soils
- Dynamic Characteristics of Vibration Sources Other Than Earthquakes

A number of features contributed to the success of the conference. A series of "State-of-the-Art" presentations by well known experts which included Professors A.S. Veletsos (USA), John Wolf (SWITZERLAND), R.D. Woods (USA), O.C. Zienkiewicz (UK), R.S. Steedman (ENGLAND), Kenji Ishihara (JAPAN), Robert Whitman (USA), Ezio Faccioli (ITALY), Emilio Rosenblueth (MEXICO), W.E. Liam Finn (CANADA), George Gazetas (USA), Robert G. Bea (USA), Ken Stokoe, III (USA), and M. Novak (CANADA) on several selected topics, and "General Reports" on the papers selected for the sessions set the scene for subsequent discussions. Two special sessions were devoted to "Loma Prieta Earthquake - 1989", which included a dedication to the "Life and Philosophy of Late Harry Bolton Seed". The other topics dealt with damage due to the earthquake, liquefaction, and lessons learned. Other papers were presented in two poster sessions. A few simultaneous sessions were also organized so as to cover all essential themes within the available time frame.

An exhibition adjoining to the conference halls displayed some of the systems available for laboratory and field measurements of dynamic soil properties such as shear modulus and damping parameters. A field trip to the "New Madrid Fault" was a special highlight of the conference, and was arranged following the conference.

The proceedings (two volumes) of the conference have been edited by Professor Shamsheer Prakash, Conference Chairman. A third volume will be available in November 1991. The contents of the proceedings demonstrate that the understanding of Geotechnical Earthquake Engineering and Soil Dynamics has significantly advanced during the past 10 years. The technical quality of the papers should make the proceedings an important reference for all engineers, practitioners, and researchers interested in Soil Dynamics and Earthquake Engineering.

The impressions about the conference and plans for the future were discussed in the concluding session. It was felt that the conference was well organized and presented. A suggestion was made for the future that equal emphasis should be placed on "Man Made Vibration Sources" and simultaneous sessions should be as few as possible during future conferences on this subject.

Proceedings are available for US\$450.00 for 3 volumes (2500 pages hard bound) and \$100.00 air mail surcharge.

SIGNIFICANT POINTS

Several developments have taken place in the area of soil dynamics and earthquake engineering in the last 10 years. Many changes have taken place in the way the soil properties are obtained for dynamic and earthquake analyses. There have been several refinements in equipment and in interpretation of the results. Shear wave velocity has generally been considered to be a function of mean effective confining pressure. It is now considered that the shear wave velocity depends on the principal stress in the direction of wave propagation, and on the principal stress in the direction of particle motion, and is generally independent of the third principal stress. For liquefaction analysis, though the standard penetration test still remains a primary tool, the

procedures for running the test and processing the results are now well defined. The post liquefaction or residual strength has been found to show an excellent correlation with $(N_1)_{60}$ the N-value standardized to an energy level of 60% of free fall energy of the hammer. The cone penetration test is emerging as an alternative to the standard penetration test because it is much easier to conduct in a standard manner. The current drawback of the cone penetration test is the lack of a database relating the test data directly to liquefaction potential.

Considerable progress has been made in the dynamic soil structure interaction of piles and other structures during earthquakes. Kinematic effects are more important for embedded structures than for surface supported structures. For pile groups, kinematic interaction can be very significant. A single pile is observed to follow the earthquake motion of the soil with little deviation, a large group of still piles in soft soils on the other hand shows a response significantly different from the free field motion. Pile stresses therefore are the result of pile deflection due to ground motion, and inertial interaction. The pile group response also depends on the integrity of the pile cap and pile connection.

Loma Prieta earthquake, 1989 and the Philippines earthquake, 1990 provided a natural laboratory to test the progress made by the civil engineering profession in assessing the potential for earthquake damage and finding practical solution to minimize the same. The damage during the Loma Prieta earthquake occurred where it was expected to occur based on analysis and the earthquake of 1906. Both the Loma Prieta earthquake 1989 and the Philippines earthquake point to the fact that liquefaction is still the biggest problem. The performance during Loma Prieta earthquake has generally supported the concept that in situ improvement of hydraulic fills by densification is an excellent remedial measure for preventing liquefaction.

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