

NEWSLETTER OF THE INTERNATIONAL GEOSYNTHETICS SOCIETY

*Dedicated to the scientific and engineering development of geotextiles, geomembranes,
related products, and associated technologies*

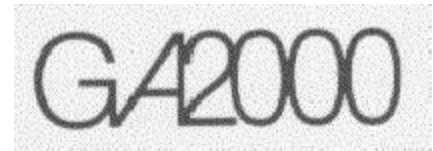
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Geosynthetics Asia 2000

2nd Asian Regional Conference on Geosynthetics

29 to 31 May 2000, Kuala Lumpur, Malaysia



Geosynthetics Asia 2000, the 2nd Asian Regional Conference on Geosynthetics, was held in Kuala Lumpur, Malaysia on 29 to 31 May 2000, under the auspices of the International Geosynthetics Society. It was jointly organised by the Institution of Engineers, Malaysia and the Southeast Asia Chapter of the IGS (SEAC-IGS).

Malaysia has massive ongoing infrastructure construction activities and the use of geosynthetics is rapidly growing. The three-day conference was attended by more than 200 participants from Malaysia and neighbouring countries, and from countries around the world. A concurrent geosynthetics exhibition enlightened civil and environmental engineers and land users of the potential benefits of geosynthetics.

The scientific content of the Conference was strictly monitored and controlled by the Conference Technical Committee, maintaining a high level of technical content in the papers. Approximately 50 papers in Volume 2 of the Proceedings were accepted for presentation. Of the 50 papers, 40 were presented, covering the following topics:

- D reinforced slopes and walls;
- D filtration, drainage, and vertical drains;
- D soft soil stabilisation and roads;
- D erosion control and natural geotextiles;
- D landfills, waste containment, and lining systems; and

D testing, quality control, and durability.

These presentations were complemented by the following special presentations:

D *Keynote Lecture*: "Lessons Learned from Full Scale Model Tests of Reinforced Walls and Slopes" by R.J. Bathurst (Canada); and

D *Special Lectures*:

"Lessons from the Failure of Full-Scale Models and Recent Geosynthetic-Reinforced Soil Retaining Walls" by F. Tatsuoka, M. Tateyama, Y. Tamura, and H. Yamauchi (Japan)

"Reinforcement by Membrane Effect: Application to Embankments on Soil Liable to Subsidence" by J.P. Gourc and P. Villard (France)

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Visit the IGS WWW site: <http://igs.rmc.ca>

“Bank Protection Systems Incorporating Geosynthetics: Environmental Aspects and Geotechnical Design Criteria” by D. Cazzuffi (Italy)

“Geogrid Reinforced Steep Slope at Motorway A9, Berlin-Numberg” by R. Floss and R. Stiegeler (Germany)

“Reinforced Soil Structures using Geogrids” by S.F. Chan (Malaysia)

“The Use of Geosynthetics in Landfills in Hong Kong” by J.W. Cowland (Hong Kong, China)

“Interaction Coefficient between Silty Sand Backfill and Various Types of Reinforcements” by D.T. Bergado and P. Voottipruex (Thailand)

“Review of Clogging Behaviour by

the Modified Gradient Ratio Test System with Micro Pore Pressure Transducers Measurement” by D.T.T. Chang and Y.H. Ting (Taiwan)

“Use of Geonatural and Geosynthetic Technology in Bangladesh” by M.H. Kabir and M.J. Alam (Bangladesh)

“Critical Assessment of PVD: Testing, Design, Specifications and its Future” by G.P. Karunaratne and S. H. Chew (Malaysia)

On the last day of the Conference, a Panel Discussion on “Design, Specifications and Construction Practice in Reinforcement and Landfill Applications” was held and chaired by Prof. C.J.F.P.

Jones. The Panel generated great interest from the Conference participants and raised many questions on geosynthetics.

A special feature of the Conference was the IGS Student Award presentation (see this page for Award recipients).

The Conference Organisers arranged four technical site visits within the state to view different landfills, reinforcement applications, and stabilisation work, which invoked a significant amount of interest in geosynthetic applications used in Malaysia.

reported by G.P. Karunaratne
GA2000 Organising Committee,
SEAC-IGS Representative



Local dance troupe entertaining the GA2000 Conference participants at the closing banquet.



GA2000 Conference participants with the IGS President, Prof. R.J. Bathurst (sixth from the right).

IGS Student Award Recipients

The IGS has established a Student Award in order to disseminate knowledge and to improve communication and understanding of geotextiles, geomembranes, related products, and associated technologies among young geotechnical and geoenvironmental student engineers around the world.

Nine Student Award winners attended *GeoAsia 2000* in Kuala Lumpur, Malaysia, 29 to 31 May 2000, representing Chapters in China (Mr. Jinghai Wu), India (Mr. J.P. Sampath Kumar), Japan (Mr. Mashiro Shinoda), Korea (Mr. Young In Oh), Malaysia (Mr. Liang Hong Lim), North America (Mr. Dave

Walters), Singapore (Ms. Xia Zhu), Thailand (Mr. Chairat Teerawattanasuk), and the Western Pacific Regional Chapter (Mr. Yuen-Hao Ting, Taiwan).

The IGS Student Award consists of a check of US\$1,000 for each winner, which has to be used to cover conference participation costs (i.e. registration fee, travel, accommodation, subsistence, etc.). For more information on the IGS Student Award see the March 2000 issue of *IGS News* (p. 6) or visit the IGS WWW site.

October 2000 will see Student Award winners from Brazil, France,

Germany, Italy, the Netherlands, Romania, South Africa, Spain, and the United Kingdom attend *EuroGeo2* in Bologna, Italy. The students will be honored in an award ceremony in the morning of the opening day of the Conference (16 October 2000). Following the ceremony all students will participate in a workshop dedicated to education and teaching.

The second IGS Student Award period will be 2001 to 2002 and awards will be assigned in the year 2002. All successful candidates will attend the *7th International Conference on Geosynthetics* in Nice, France, 22 to 27 September 2002.



IGS Student Award recipients (left to right): Mr. Peter Stevenson (IGS Secretary), Mr. Chairat Teerawattanasuk (Thailand), Ms. Xia Zhu (Singapore), Mr. Liang Hong Lim (Malaysia), Mr. Mashiro Shinoda (Japan), Mr. Yuen-Hao Ting (Taiwan), Mr. Young In Oh (South Korea), Mr. J.P. Sampath Kumar (India), Mr. Jinghai Wu (China), and Mr. Dave Walters (Canada).

IGS Awards

The IGS Awards Committee met on 12 May 2000 at the Royal Military College of Canada, in Kingston, Ontario, Canada.

IGS Awards are granted to individuals or groups of individuals who have made an outstanding contribution to the development and use of geotextiles, geomembranes, related products, or associated technologies through their scientific and technological achievements.

The Awards recognise the achievements completed and/or the validity of which has been demonstrated during a four-year period preceding the year of the Award (i.e. 1996 through 1999 inclusive). For more information on the IGS Awards visit the web site <http://igs.rmc.ca/igs/IGSAwards.html>.

The IGS Award

Geosynthetic System for Rehabilitation of Concrete and Embankment Dams

Ing. Daniele Cazzuffi, Ing. Pietro Rimoldi, Ing. Alberto Scuro, and Ing. Piero Sembenelli

The team of Cazzuffi, Rimoldi, Scuro, and Sembenelli received the IGS Award for the development of a system and procedure for underwater installation of a geomembrane, the development of related tests, and for demonstrating successful applications of the technology. The technology developed by this team

is unique, cost-effective, and an excellent example of an innovative application of geosynthetics.

Educational CD-ROM titled: "Retaining Structures with Geosynthetics"

Prof. Jean-Pierre Gourc and Dr. K. Warlousel

A principle mandate of the IGS is to promote all aspects of geosynthetics through education. The educational CD-ROM by Gourc and Warlousel is an excellent example of a state-of-the-art educational tool to meet this objective. Their CD-ROM package is self-explanatory, easy to use, well-illustrated, and is an effective educational tool for students, academics, geosynthetics specialists, and other professionals who are less familiar with geosynthetics.

The Young IGS Member Award

Preloaded-Prestressed Geogrid-Reinforced Soil Bridge Pier

Mr. Taro Uchimura

The award is for developing the working principle and theoretical basis of a new innovative construction method for

preloading and prestressing reinforced soil construction structures, along with the monitoring of the long-term performance of the first prototype geogrid-reinforced soil bridge pier using this innovative method. The technique was also verified from results of shaking and cyclic loading tests on model geosynthetic-reinforced soil structures. Model tests showed that these prestressed structures have a high seismic resistance.

The IGS will hold a special ceremony during *EuroGeo2* in Bologna, Italy, 15 to 18 October 2000 to present this years IGS Awards.

*reported by G.P. Raymond
Chair, IGS Awards Committee*



IGS Awards Committee (left to right): Dr. Ennio Palmeira (Brazil); Dr. G.P. Raymond, Chair (Canada); Prof. Andrea Cancelli (Italy); Mr. Joseph Fluet, Vice-Chair (USA); Prof. J. Müller-Rochholz (Germany).

Second European Conference on Geosynthetics



EuroGeo2

Conference Date and Venue

EuroGeo2, the *Second European Geosynthetics Conference and Exhibition* will be held in Bologna, Italy, 15 to 18 October 2000.

Conference Organisers

The Conference is organised by the Italian Geotechnical Society (AGI) and the Italian IGS Chapter.

Schedule of Events

Short-Course "Geosynthetics: types, functions and applications"

An introductory short-course is scheduled for Sunday 15 October 2000 (from 9:00 to 16:30). Registration for the short-course is included in the full conference registration. A limited number of 100 participants will be admitted: registration will be accepted on a "first-come first-serve" basis. The official language of the short-course is English. The short-course program is as follows:

- G 9:00-10:00 Registration
- G 10:00-10:30 Introduction
Prof. J.P. Gourc (France), Short-course convenor
- G 10:30-11:30 "Different types of geosynthetics, tests to characterise the materials and their functions in interaction with soil"
Prof. J. Müller-Rochholtz (Germany)
- G 11:30-12:30 "Geosynthetics in reinforced structures: main applications, interaction with soil, design methods, related tests"
Prof. C.J.F.P. Jones (United Kingdom)
- G 14:00-15:00 "Geosynthetics in hydraulic engineering: main applications, interaction with soil, design methods, related tests"
Dr. J.P. Giroud (USA)

15:00-16:00 "Geosynthetics in environmental engineering: main applications, interaction with soil, design methods, related tests"
Prof. J.P. Gourc (France)

16:00-16:30 Conclusions

For each presentation, time will be dedicated to discussion.

Technical Visits

Three technical visits are organised for Sunday 15 October 2000 (from 9:00 to 16:30). The meeting location for all technical visits will be Palazzo dei Congressi (Piazza della Costituzione) in Bologna. Registration, accepted on a "first-come first-serve" basis, will be from 9:00 to 10:00 (included in the full conference registration) and departure is scheduled for 10:00. A limited number of participants will be admitted depending on work site constraints. Accompanying persons will be admitted to technical visits only if registered in the accompanying persons program.

Technical Visit 1: canals, rivers, and inland waterways.

Technical Visit 2: roads, railways, and underground structures.

Technical Visit 3: sanitary landfills.

Opening Ceremony and Mercer Lecture

The opening ceremony will take place in Palazzo dei Congressi (Europauditorium) on Sunday 15 October 2000, starting at 17:30 and includes the European presentation of the Mercer Lecture 1999-2000 by Prof. A. McGown (United Kingdom) on: "The Behaviour of Geosynthetic Reinforced Soil Systems in Various Geotechnical Applications".

Technical Sessions, Workshops, and Keynote Lectures

Technical Sessions and Workshops will take place from 16 to 18 October 2000 in

Palazzo dei Congressi. Two Technical Sessions and one Workshop will be organised in parallel, according to the preliminary technical program. Each day's program will include one Keynote Lecture in a plenary session in the Europauditorium.

Monday 16 October 2000: Keynote Lecture 1 by Prof. H. Brandl (Austria) "Special Applications of Geosynthetics in Geotechnical Engineering."

Tuesday 17 October 2000: Keynote Lecture 2 by Prof. S. Kohlhasse (Germany) "Coastal Protection Using Geosynthetics: Conventional and Innovative Solutions."

Wednesday 18 October 2000: Keynote Lecture 3 by Dr. J.P. Giroud (USA) "Lessons learned From Successes and Failures of Geosynthetics."

The final program, including the time schedule of all presentations, will be printed in Bulletin 3 and will be available in Bologna to registered participants.

Poster Presentations

Posters will be on display for three days (from Monday 16 October morning to Wednesday 18 October afternoon). Authors will present and discuss their posters with participants during coffee breaks. The papers selected for poster presentation have been judged by the International Scientific Committee to be those best suited to this style of presentation.

EuroGeo2 Technical Exhibition

The official opening of the Exhibition will be after the Mercer Lecture on 15 October 2000 at 19:30, in conjunction with the Welcome Reception of *EuroGeo2*. The Exhibition will take place during the full period of *EuroGeo2*.

Social Program

Sunday 15 October 2000: Welcome Reception in Palazzo dei Congressi at the

end of the Opening Session, in conjunction with the official opening of the Technical Exhibition.

Monday 16 October 2000: traditional football (soccer) match between the Latin and Anglo-Saxon teams.

Tuesday 17 October 2000: official banquet (Gala dinner) in Villa Cicogna (special registration fee required and limited availability).

Companion Program

Sunday 15 October: participation in one of the three technical visits.

Monday 16 October: excursion to Ferrara, capital city of the Estensi Dynasty (half day).

Monday 16 October (evening): football (soccer) match.

Tuesday 17 October: excursion to Ravenna (Byzantine monuments) and Faenza (ancient and artistic ceramics) (full day).

Tuesday 17 October (evening): Gala Dinner in Villa Cicogna.

Wednesday 18 October: guided visit to Bologna (half day).

A special registration fee is required for both the accompanying persons program and the Gala Dinner.

Post-Conference Tours

Several post-Conference tours will be organised. The departure times will be on Wednesday 18 October 2000, after the Closing Ceremony of the Conference.

The tour destinations include: Rome, Naples, and the Amalfi coast; Florence, Pisa, and Tuscany; Venice, Padova, and Verona; and Sicily. "Bologna Congressi – Convention and Travel" has been appointed as the official travel agency for *EuroGeo2*.

IGS Meetings

EuroGeo2 will be preceded by two IGS meetings in BolognaFiere: the IGS Officers meeting on Friday 13 October 2000 (9:00 to 18:00) and the IGS Council meeting on Saturday 14 October 2000 (9:00 to 18:00).

IGS Awards

The Young IGS Member Award and the IGS Award will be presented to individuals or groups of individuals in recognition of achievements demonstrated from 1996 to 1999. Also, for the first time in Europe, IGS Student Awards will be presented.

ISO and CEN Meetings

On 19 and 20 October 2000, joint meetings of ISO TC 221 (the new ISO Technical Committee on Geosynthetics replacing the previous ISO TC 38 (Textiles)/SC 21 (Geotextiles)) and CEN TC 189 (Geotextiles and Geotextile-Related Products) will be held in Milano at the offices of the Italian National Standard Body (UNI) (Via Battistotti Sassi, 11b).

Conference Registration

Both full registration and one-day registration are possible.

A special registration fee reduction for participants under 35 years of age is being offered to attract young individuals to *EuroGeo2*.

Full registration fees for Conference participants include:

- D admission to all sessions;
- D Conference Proceedings (2 volumes and one CD-Rom);
- D simultaneous translation from English to French, German, and Italian for keynote lectures and technical sessions;
- D admission to the *EuroGeo2* technical exhibition;
- D admission to the SAIE main exhibition (Wednesday 18 October);
- D conference bag;
- D short course or technical visits — limited number of places available;
- D welcome reception;
- D participation in the football match as a player or spectator; and
- D lunches and coffee breaks (Monday 16 to Wednesday 18 October).

One-day registration fees for Conference participants include:

- D admission to all sessions during the registered day;
- D Conference Proceedings (2 volumes and one CD-Rom)
- D admission for the day to the *EuroGeo2* technical exhibition;
- D admission to the SAIE main exhibition (only for Wednesday 18 October);
- D conference bag; and
- D lunch and coffee breaks during the registered day.

Registration fees for accompanying persons include:

- D technical visits — limited number of places available;
- D welcome reception;
- D excursion to Ferrara;
- D participation in the football match as a spectator;
- D excursion to Ravenna and Faenza (full day including lunch);
- D guided visit to Bologna (half day); and
- D admission to the *EuroGeo2* technical exhibition.

For the Gala Dinner, a special registration fee is required both for participants and accompanying persons.

Official Language

English is the official language for both papers and oral or poster presentations. Simultaneous translation into French, German, and Italian will be organised.

Accommodation

"Bologna Congressi — Convention and Travel" is the official travel agency for *EuroGeo2*. Due to the concurrence of many cultural and exhibition events in Bologna, hotel reservations cannot be guaranteed after 15 September 2000. For information on accommodations in Bologna, visit the Web site: <http://www.iperbole.bologna.it>.

Conference Contact

See the contact information on p. 17.

GeoEng2000, 19 to 24 November 2000

An International Conference on Geotechnical & Geological Engineering and Pre-Conference Geosynthetics Symposium

Conference Date and Venue

The Conference will be held at the Melbourne Exhibition and Convention Centre, Melbourne, Australia, 19 to 24 November 2000.

Conference Themes and Topics

The Conference combines five themes of common interest, with a number of invited lectures reflecting the activities and interests of delegates from all participating organisations. The five themes are Geotechnical Earthquake Engineering, Underground Works, Stability of Natural and Excavated Slopes, Environmental Geotechnics, and Ground Improvement and Ground Support, with Geoenvironmental Education and Piling also included.

For each of the five themes, a combination of invited keynote and issues lectures, discussion sessions/workshops and selected paper presentations is planned. Although parallel sessions will be necessary for some of the invited lectures, lectures will be scheduled to provide the maximum opportunity for delegates to attend those of common interest.

The 12 papers judged to be the best of those submitted will be presented in Plenary Session (the best three will be recognised by an award), and others may be presented in workshop sessions. There will also be both general and invited poster sessions

Geosynthetics Symposium

The Pre-Conference Geosynthetics Symposium is organised by the IGS and will be held Saturday, 18 November 2000 from 09:00 to 17:00 at Victoria University (300 Flinders Street, Melbourne). It is planned to provide an opportunity for participants of *GeoEng2000* and others to benefit from a unique gathering of international and local expertise in the field. It will be a

showcase for geosynthetic applications in civil engineering and environmental applications with presentations from invited eminent speakers.

The following are the specific topics and speakers participating in the Geosynthetics Symposium:

Geotextiles, Filtration & Drainage

- G J.J. Bowders (University of Missouri-Columbia)
- G E.M. Palmeira (University of Brasilia, Brazil)

Reinforcement, Walls & Slopes, Roads & Embankments

- G R.J. Bathurst (Royal Military College of Canada)
- G J.P. Gourc (University of Grenoble, LIRIGM, France)
- G C.J.F.P. Jones (University of Newcastle-Upon-Tyne, UK)

Waste Containment

- G R.K. Rowe (formerly, University of Western Ontario, Canada, now Queen's University, Canada)
- G J.W. Cowland (Consultant, Hong Kong, China)

Geosynthetic Testing

- G G. Hsuan (Geosynthetic Institute, USA)
- G S. Allen (TRI, USA)

The presentations will be structured to include both practical and theoretical aspects and will give both an international and Australian perspective. It is intended that proceedings will be published in order to provide a valuable research resource. Opportunities will be provided for exhibitors and other sponsors.

The cost is A\$120. Delegates attending any pre-Conference Symposium will be sent further details on the location, including information on how to arrive at the destination. For more details on registration and venue, e-mail: jayantha.kodikara@vu.edu.au or mal-ek.bouazza@eng.monash.edu.au.

Other Pre-Conference Symposia

Other Commissions and Technical Committees of the participating International Societies have arranged specialist symposia on the Saturday or Sunday before the Conference commences. All of these Symposia will be held at the University of Melbourne.

The following is a list of the other symposia and their organising societies:

- D *International Symposium on Carbonate Sediments*, organised by the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) Technical Committee On Calcareous Sediments, TC 26 (18 November 2000)
- D *Professional Practice Symposium*, organised by the ISSMGE Technical Committee On Professional Practice, TC 20 (18 November 2000)
- D *Symposium on Estimating Flow Deformations and Their Effects on Structures and Foundations*, organised by the ISSMGE Technical Committee On Earthquake Engineering, TC 4 (18 November 2000)
- D *An International Workshop on Limit State Design in Geotechnical Engineering*, organised by the ISSMGE Technical Committee On Limit State Design, TC 23 (18 November 2000)
- D *3rd International Workshop on the Application of Geophysics to Rock and Soil Engineering*, jointly organised by the International Society for Rock Mechanics (ISRM) Commission on the Application of Geophysics in Rock Engineering and ISSMGE Technical Committee On Geophysical Site Characterisation, TC 10 (18 November 2000)
- D *International Symposium on Scour of Foundations, IS-Scour 2000*, organised by the ISSMGE Technical Committee on Scour of Foundations, TC 33 (19 November 2000)
- D *AUCTA Workshop — Planning for Tunnelling in the Urban Environment*,

organised by the Australian Underground Construction and Tunnelling Association (18 November 2000)

Exhibition

GeoFair2000 will be held in the Melbourne Convention Centre, in the midst of the *GeoEng2000 Conference* space. There will be a wide and varied exhibition of equipment, software, instruments and machinery for geotechnical and geological education, investigation, design, and construction.

Technical Tours Social Program

There will be an array of tours of Mel-

bourne and the surrounding area for delegates and their accompanying persons. The technical tours include: Latrobe Valley (Slopes), Seismology Research Centre (Earthquakes), Melbourne Docklands (Geoenvironment), and Sovereign Hill (Underground Works and Historic Village). There are also several planned pre- and post-Conference tours.

Conference Sponsors and Supporters

The Conference is sponsored by the ISSMGE, ISRM, and the International Association of Engineering Geology and the Environment (IAEG) with the

support of the International Tunnelling Association, the IGS, the International Association of Hydrogeologists, the International Association for Computer Methods and Advances in Geomechanics, the International Commission on Large Dams and the IUGS CoGeoenvironment group. The Conference is being organised for and on behalf of the Australian Geomechanics Society and is underwritten by the Institution of Engineers, Australia.

Conference Contact

See contact information on p. 17.

The IGS Welcomes the New Spanish Chapter

The IGS would like to take this opportunity to welcome its newest and 17th IGS Chapter — the Spanish Chapter. The remainder of this article announces the Chapter Council and outlines its objectives for the Year 2000.

Chapter Council

The Spanish IGS Chapter was formed in the Fall of 1999. The following are the Chapter Council Members:

- G *President:* Mr. Vicente Cuéllar
- G *Vice-President:* Mr. Angel Leiro
- G *Treasurer:* Mr. Julio García-Mina
- G *Council Member:* Mr. Mario García
- G *Secretary General:* Mr. Julio García-Mina

Chapter Objectives for Year 2000

The Spanish IGS Chapter has a clear outline of their plans and objectives for the year 2000.

Increasing the Number of Members

To increase and build upon the Chapter Membership a Press Release will be prepared to announce the recent formation of the Spanish Chapter.

The Chapter President has written a letter that will be sent to all individuals and companies who may be interested in

the objectives of the IGS and its Spanish Chapter. This mailing will also serve as a database of individuals and companies with a potential interest in the IGS and the Spanish IGS Chapter in particular.

Dissemination of Information

Chapter news and information will be published in selected magazines. The primary publications of interest are *Boletín de la Sociedad Española de Mecánica del Suelo* and *Ingeniería Civil* from Centro de Estudios y Experimentación de Obras Públicas (CEDEX), but other publications will also be considered.

A newsletter, *Hoja de Noticias IGS*, will be established. In addition to providing Chapter news, the Newsletter will publish articles on geosynthetics.

A WWW site linked to the IGS WWW site will be created. It too will provide information on the current activities of the Chapter.

Committees

Two committees, coordinated by CEDEX, have been created to report on the following subjects: "Landfill Capping: Design Alternatives" and "Reinforcement Materials: Reduction Factors." Each committee will evaluate the existing information/technology on these subjects and will prepare a one- or two-

day Monographic Workshop to be held during the latter half of 2000.

Chapter Vice-President, Mr. Angel Leiro, was nominated to oversee Product Certification protocols.

Increasing the Number of Chapter Council Members

Four more Chapter Council Members will be selected to work on the following specific subjects: "Geotextiles: Filtration, Separation, and Protection," "Geomembranes, GCLs, and Other Geosynthetic Liners," "Reinforcement Geosynthetics," and "Drainage and Erosion Control Geosynthetics." The new Chapter Council Members will assist in the creation of future Chapter Committees to deal with these subjects.

Symposium

Depending on the available budget, the Chapter plans to participate in the *Symposium of the Spanish Society of Soil Mechanics*, which takes place in Barcelona, September 2000. The Symposium subject is "Geotechnics for Transport Infrastructures."

The possibility of participating in other symposia will be also explored.

*reported by Mr. Julio García-Mina
Secretary General and Treasurer,
Spanish IGS Chapter*

1st South American Symposium on Geosynthetics/ 3rd Brazilian Symposium on Geosynthetics

20 to 22 October 1999, Rio de Janeiro, Brazil

The 1st South American Symposium on Geosynthetics / 3rd Brazilian Symposium on Geosynthetics (Geossintéticos '99) were held simultaneously in Rio de Janeiro, Brazil, from 20 to 22 October 1999 at Othon Palace Hotel, in Copacabana Beach.

The Symposia were held under the auspices of the International Geosynthetics Society, the Brazilian Society of Soil Mechanics and Geotechnical Engineering, the Brazilian IGS Chapter, and the Brazilian Commission on Geosynthetics.

Approximately 300 professionals, academics, researchers, and students from different countries in South America attended the event. Invited speakers delivered the following keynote lectures:

- D "The Development of Geosynthetics in South America," by Laerte G. Maroni (Bidim-BBA Geosynthetics, Brazil)
- D "Large Scale Testing of Geosynthetic Reinforced Segmental Retaining Walls," by Prof. Richard J. Bathurst (IGS President, Royal Military College of Canada, Canada)
- D "Analyses of Failures in Sanitary and Industrial Landfills," by Prof. Robert Koerner (Drexel University, USA)
- D "The Use of Geosynthetics in Pavements," by Jorge Tosticarelli (Argentina)
- D "Analyses of Reinforced Soil Structures," by Prof. Mauricio Ehrlich (Coppe/Federal University of Rio de Janeiro, Brazil)
- D "Laboratory Testing on Geosynthetics," by Prof. Ennio M. Palmeira (University of Brasilia, Brazil)
- D "The Design of Geosynthetic Filters and Drains," by Prof. Delma M. Vidal (Aeronautics Technological Institute, Brazil)
- D "Geosynthetics in Waste Disposal Applications," Prof. Leandro M.C.



1st South American Symposium on Geosynthetics / 3rd Brazilian Symposium on Geosynthetics (Geossintéticos '99) Opening Ceremony (left to right): Dr. Ennio Palmeira (Brazilian IGS Chapter President), Mr. Paulo Brugger (Regional Section of the Brazilian Geotechnical Society), Mr. Francis Bogossian (Vice-President of ISSMGE for South America), Prof. Willy A. Lacerda (President of the Brazilian Geotechnical Society-ABMS), Dr. Mauricio Ehrlich (President of the Organising Committee), and Prof. Richard Bathurst (IGS President).

Costa Filho (Fluminense Federal University, Brazil)

- D "The Use of Geosynthetics in Nordelta: a City of the Future," by Angelo O. Lopez (Argentina)

The day before the Symposia was reserved for short courses on geosynthetics. The short courses and lecturers were as follows: "Geosynthetic Reinforced Embankments on Soft Soils" (Prof. Ennio M. Palmeira, University of Brasilia, Brazil), "Geosynthetic Reinforced Walls and Steep Slopes" (Prof. Mauricio Abramento, Institute of Technological Research-IPT, Brazil), and "Geosynthetics in Environmental Engineering" (Prof. Robert Koerner, Drexel University, USA). Also, there was a geosynthetic products and applications exhibition by manufacturers and installers. A field demonstration of geosynthetic applications was presented in the morning of the day following the Symposia. Social events comprised a cocktail and a banquet that took place at Botafogo Beach, close to Sugar Loaf Mountain. The Symposia were sponsored by State Agencies (CAPES, CNPq, FAPERJ, and FINEP) and geosynthetic manufacturers (Amo-

co, Bidim-BBA, Denver, Huesker, Ober, and Maccaferri).

Fifty-five technical papers were published in the Symposia Proceedings, which is one volume of 439 pages. A post-Symposia volume containing the keynote lectures is expected to be published soon. During the closing session of the Symposia, Prof. Marcio S.S. Almeida (Federal University of Rio de Janeiro) presented the following statistics of the proceedings:

- D Number and percentage of papers per country: Brazil (40 papers, 73%), Mexico (5 papers, 9%), USA (4 papers, 7%), Argentina (2 papers, 4%), Colombia (2 papers, 4%), Venezuela (1 paper, 1.5%), and Germany (1 paper, 1.5%).
- D Number and percentage of papers per subject: Soil Reinforcement (12 papers, 22%), Pavements (8 papers, 15%), Environmental Applications (8 papers, 15%), Laboratory and In Situ Testing (7 papers, 12%), Filtration and Drainage (6 papers, 11%), and Case Histories (14 papers, 25%).
- D Origin of the papers: 64% of the papers came from universities or re-

search institutions and 36% of the papers came from industry (consulting groups, manufacturers, etc.).

The city of Porto Alegre, capital of the state of Rio Grande do Sul, in the very south of Brazil, was chosen as the

site of the 4th Brazilian Symposium on Geosynthetics, in 2003.

The Organising Committee of the Symposia and its Chair, Prof. Mauricio Ehrlich, are to be congratulated for the success of the 1st South American Sym-

posium on Geosynthetics / 3rd Brazilian Symposium on Geosynthetics.

reported by Ennio Palmeira
President, Brazilian IGS Chapter

Toward Sustainable Waste Management: New Developments and Trends

Main Issues Discussed at *Sardinia '99, Seventh International Waste Management and Landfill Symposium*

From 4 to 8 October 1999, the *Seventh International Waste Management and Landfill Symposium, Sardinia '99*, was held in Santa Margherita di Pula (Cagliari, Italy). This biennial symposium had an attendance of 1,020 researchers, experts, and public and private operators. An International Scientific Committee selected 423 papers, among the over 560 received, to be presented at the Symposium.

Individuals from 44 different countries engaged in discussions and exchanges of experiences that resulted in many interesting ideas and concepts.

Waste-management strategies currently used in the most developed European countries are still inadequate for the needs of modern society. Choices made at a local level often come from unavoidable compromises instead of careful technical and economic assessments. The concept of integrated solid waste management had already been developed at the end of the 1980s (Cossu 1989) and the recent European Directives, as well as most current national legislation, have embraced it. According to this concept, actions should be planned to minimise waste production, recover the reusable fraction, recover energy by producing refuse-derived fuel (RDF), and allow landfilling of only non-reusable or, at least, pre-treated fractions (i.e., thermal or mechanical-biological pre-treated waste), which would have an inherently lower environmental impact. This calls for an overall approach contrary to the current approach of adopting emergency solutions

after a partial analysis and understanding of the system.

Within this framework, Life Cycle Assessment (LCA) represents a powerful tool to assess the effects of decisions and waste-management strategies on the environment as a whole, according to technical and economic considerations on products and wastes for their entire life cycle. The LCA methodology was recently improved. The presence of recoverable fractions in the waste stream forces a comprehensive assessment of potential benefits and costs associated with recycling glass, metals, paper, plastics, etc. compared to their production from raw materials. This kind of assessment requires the support of an adequate database containing essential information on all of the unit processes forming the system and, more significantly, data on the utilisation and costs of raw materials and energy and emissions to the environment during the different stages of production (Thorneloe et al. 1999).

Despite the large number of unit operations involved and the complexity of solid waste management systems, it is possible to develop mathematical models to evaluate alternative management strategies. An interesting example proposed by Barlaz et al. (1999) studied a hypothetical average-sized town with a known waste generation and a waste composition based on US averages. The model was used to analyse several scenarios with two model objectives: to minimise cost and to minimise CO₂-fossil fuel emissions. For the least-cost objective, 4% of the residential waste is

collected using a drop-off collection site and taken to a pre-sorted recyclables separation facility. The remaining 96% are disposed of in a landfill. On the contrary, for the CO₂-fossil fuel minimisation objective, all nonrecycled waste is routed to a combustor that recovers energy, and the combustion residues are disposed of in an ash landfill. The model allows the determination of costs associated with alternative management strategies, given a particular CO₂-fossil fuel constraint.

The above model does not include mechanical-biological pre-treatment before landfilling as a waste treatment option. This is due to the fact that it is difficult to estimate costs for the operation, closure, and aftercare of landfills for mechanical-biological pre-treated (MBP) waste. In fact, few data are available for this kind of landfill and there is no information on sites currently in the closure or aftercare stage. There is much debate amongst waste management researchers on MBP waste and its behaviour in landfills, how to determine landfill acceptance criteria for MBP waste (Cossu et al. 1999), and how to estimate quality and quantity of potential emissions from these landfills (Von Felde and Doedens 1999).

For MBP waste leachate tests carried out in landfill simulation reactors, the gas production rate, as well as chemical oxygen demand (COD), total organic carbon (TOC), and total nitrogen concentrations in the leachate, were 90% lower than that in untreated waste (Leikam et al. 1999). However, COD con-

centrations for MBP waste range from 800 to 1,800 mg/L; leachate with these COD concentrations must be treated as wastewater and active management of landfill emissions is required during aftercare. According to Sheelhaase and Bidlingmaier (1999), MBP waste landfills have low gas and hydraulic permeability values (approximately 10^{-16} m² and 10^{-8} m/s, respectively), due to the high storage densities (1.4 tonne/m³). Thus, the body of MBP waste landfills acts as a barrier much more effectively than the waste in traditional landfills, which may result in low leachate flows and, therefore, lower treatment costs. MBP waste landfill leachate quality will definitely differ from untreated waste landfill leachate — the biodegradable organic content of MBP waste landfill leachate is very low. Sheelhaase and Bidlingmaier (1999) believe that active gas collection systems should not be installed, given the low biogas emissions, as predicted by laboratory tests (10 to 15 nL/kg suspended solids).

The choice of an appropriate top cover system should enable methane oxidation, by methanotrophic bacteria, in the upper layers of the landfill. However, further investigations are required. Methane oxidation tests in biofilters (Dammann et al. 1999) show that degradation rates are significantly dependent on temperature; the influence of trace gases and their characteristics still requires assessment.

According to other authors as well, MBP waste landfills are not yet environmentally sustainable because of the predicted, significant residual environmental impact due to emissions during a long aftercare period. Applying the flushing technique to the landfilled waste could reduce this residual impact (Catalani and Cossu 1999). The disadvantage of this would be the concentration of leachate production over a short period of time, with higher leachate flows to be treated in the short term. However, the aftercare period would be significantly reduced. If flushing is to be implemented, it requires small deposit depths and low storage densities to guarantee high hydraulic conductivity. Flushing is also a worthwhile alternative

for stabilisation of old MSW landfills, given that leachate drainage systems are effectively working and there is a proper lining system.

Recovery of old MSW landfills is a key issue, considering the large number of MSW landfill sites that will represent environmental hazards for several future decades. The low degradation rate of landfill waste by anaerobic processes suggests that establishing aerobic conditions by injecting air in the waste deposit can accelerate the degradation rate. Preliminary lab tests, as well as investigations carried out in a pilot plant in Germany, show that this may be successfully carried out using basic equipment and with low energy consumption (Heyer et al. 1999).

The Symposium ended with a “face-to-face” regarding the implementation of the new EU Directive on Landfills. The discussion proved that there is a general consensus on the guidelines given by the Directive, although, not surprisingly, countries such as Denmark and Germany believe that the Directive is not going far enough and they would be able to easily meet the criteria even today. On the contrary, for most of the other EU Members, the implementation will imply high investment costs. This was stated not only by southern European country representatives, but also by United Kingdom representatives. And while countries such as Greece and Portugal are prepared to spend the necessary resources to reach the target values, the United Kingdom again is the most sceptic: given that society has many other primary needs (health, housing, etc.), will this money be well spent?

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Note: All of the following references, except for the reference by Cossu (1989), can be found in Proceedings of Sardinia 99, Seventh International Waste Management and Landfill Symposium (October 1999, S. Margherita di Pula, Cagliari, Italy, CISA).

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Barrier-Related Workshops at Sardinia '99

The *Seventh International Waste Management and Landfill Symposium (Sardinia '99)* was a resounding success. In addition to formal paper presentations, there were a number of well-attended workshops. The writer had the privilege of reporting on three of these workshops at the closing session of the Conference.

The workshop, "Geosynthetic Clay Liners (GCLs)," chaired by Dr. J.P. Gourc examined the role of GCLs in landfill covers and bottom liners used both in isolation and when combined with a geomembrane. One case history reported significantly different long-term behaviour of two different types of GCL, identifying the fact that not all GCLs are the same. This also highlighted the need to design for performance and the need to select an appropriate GCL for that required performance. The equivalence of GCLs and clay liners was also discussed. Reference was made to a number of recently published papers (including papers from the *Sixth International Conference on Geosynthetics*) providing a rational basis for assessing equivalence by including the consideration of advection, diffusion, and construction-related issues. In addition, the issue of clay-leachate compatibility with respect to sodium bentonite used in GCLs was discussed; it was concluded that while this should be considered, provided that the change in hydraulic conductivity resulting from reasonable exposure is considered in design, there is no reason a priori not to consider GCLs as an alternative to conventional liners.

The related workshop, "Cut-Off and Reactive Walls," chaired by T. Megyes, examined the advances in

construction technology and improvements for both single-phase and twin-phase construction. The use of more chemically resistant materials was discussed, as was the use of composite walls incorporating both HDPE geomembranes and glass elements. While well known in the hydrogeologic community, there was a growing awareness in the landfill community of the potential role of reactive barriers that can physically, chemically, and/or biologically remove contaminants in situ. Issues discussed in this workshop included new construction techniques that use jet technology, the construction of long deep (20 m) composite walls comprising cement bentonite slurry and HDPE geomembranes, laboratory and in situ tests for hydraulic conductivity, and the use of cut-off walls in funnel and gate systems with a reactive barrier.

The third workshop, "Monitoring and Repairing Liners," chaired by the writer, considered vacuum monitoring and grout injection for the repair of liners and the advantages and disadvantages of a new approach being developed in Japan. There was an extensive discussion on the need to better document and report, in the open literature, the number and size of holes in geomembrane liners. Conference Delegates expressed concern with the unrealistic expectations of designers regarding the number of geomembrane holes that can be expected even with good construction quality control (CQC) and construction quality assurance (CQA). It was noted that many leak detection studies are not reported. Concern was also expressed that even if a geomembrane is placed with no holes there is evidence to suggest that holes are created after

placement of the drainage material and the waste. Use of leak detection methods was discussed. Some delegates who had performed tests to check the reliability of these systems in actual field situations, indicated that although electrical leak detection techniques are very useful, at times they may give both a false indication of holes and on some occasions not detect actual holes. There was considerable discussion regarding the level of geomembrane protection required providing adequate long-term performance of geomembranes. It was emphasised that the design must recognise that it is not practical to avoid/detect/repair all holes in geomembranes and that the design should be robust enough to limit leakage and invite environmental impact for a reasonable number of holes. Having said this, the question still remains as to what is a reasonable number of holes, and what is the effect of wrinkles on contact conditions. As in past workshops, there was a call by some participants for a formal qualification of individuals installing barrier systems and the need for trained workers and good CQC/CQA was emphasised.

The involvement and active discussion of issues such as those outlined above by a large number of very knowledgeable individuals from around the world is a highlight of the Sardinia conference series. Individuals interested in more information regarding the issues raised above can refer to the *Proceedings of Sardinia '99* as well as the *Proceedings of the Sixth International Conference on Geosynthetics* held in Atlanta, Georgia, USA, in 1998.

reported by R. Kerry Rowe
Past-President, IGS

IGS Chapter Reports

Indian Chapter

The Committee for International Geosynthetics Society (India), CIGSI, was

established in June 1992 and acts as the Indian Chapter of the International Geosynthetics Society (IGS). The main goal of the Committee is to create awareness

of the use of geosynthetics in civil engineering applications. With this mandate, the Committee has organised various events at the national and international

levels, on numerous aspects of the use of geosynthetics.

Forthcoming Events

During the year 2000, CIGSI has planned to organise training courses on "Design of Embankments and Pavements Using Geogrids and Geotextiles" and "Use of Geosynthetics in Civil Engineering Applications."

Membership

During 1999, a total of 30 Members have renewed/opted for individual IGS Membership (26 Members in 1998).

Publications

Since 1993, CIGSI has published a biannual *News Bulletin* (January and July). CIGSI also plans to publish a manual on "Guidelines for the Use of Geosynthetics in Civil Engineering" in 2000.

The remainder of this article contains synopses of the CIGSI events that took place in 1998 and 1999.

Short Course on "Waste Containment With Geosynthetics," 17 to 21 February 1998, Indian Institute of Technology, New Delhi

Waste management has become a matter of great concern in India and other developing nations. Increasing generation of waste and the rise in pollutant levels has forced countries to search for new alternatives to conventional waste management systems. Until recently in India, geosynthetics have been used for conventional civil engineering applications such as retaining walls, roads, and canals; however, new avenues and uses in solid waste containment systems have opened. The use of geosynthetics has many advantages in terms of physical properties, as well as economy.

To assess the geotechnical requirements and to assist engineers to develop strategies for design, construction, and operation of landfills, the Indian IGS Chapter, Central Board of Irrigation and Power, Central Public Health Engineering Organization (Ministry of Urban Affairs, Government of India), and the Indian Institute of Technology, Delhi,

organised the short course, "Waste Containment with Geosynthetics," which was held at the Indian Institute of Technology (IIT), New Delhi, 17 to 21 February 1998. The Short Course was chaired by Prof. G.V. Rao (IIT), and more than 15 papers were presented by individuals with extensive expertise in the field of geosynthetics. Paper topics such as geosynthetic property characterisation, geotechnical properties of municipal wastes, lining systems, stability considerations, and installation guidelines were presented.

Symposium on "Rehabilitation of Dams," 4 November 1998, New Delhi

Dams have been constructed from time immemorial to harness water resources to cater to human needs such as drinking water supply, irrigation, hydropower generation, industry, etc. The ancient civilisations of India, Egypt, Mesopotamia, and China have shown that harnessing water for domestic use and irrigation, and controlling it for flood protection, were basic preoccupations of these societies. In India, there is ample evidence of this preoccupation.

As dam engineering developed with the advancement of technology, new types of dams using different construction materials that adopted modern design and construction methods began to operate. The accent is on the safety of these structures as it is considered imperative to derive economic benefits from these dams for as long as possible. This warrants special attention to older dams that do not conform to modern design and construction practices; these dams may require rehabilitation to make them completely safe.

Considering the importance of dam safety, the Indian Committee on Large Dams (INCOLD), the Central Board of Irrigation and Power (CBIP), and the Indian IGS Chapter organised a one-day symposium, "Rehabilitation of Dams," on 4 November 1998, in New Delhi, to facilitate the exchange of experiences and to expose/promote state-of-the-art technology in all aspects of dam rehabilitation. The Symposium was organised to coincide with the *88th Annual Meeting of ICOLD*, held from 1 to 7 Novem-

ber 1998, in New Delhi, in light of the fact that prominent dam experts from around the world would be participating in the Annual Meeting. There were 500 delegates from 54 countries. More than 30 papers on the following topics were presented by experts from 19 countries, including India:

- D Safety Inspection of Dams
- D Review of Hydrology, Spillway Capacity, and Free Board
- D Leakage/Seepage Control Measures
- D Seismic Design of Dams
- D Instrumentation in Dams
- D Structural Failures/Distress of Dams
- D Chemical Analysis of Deteriorated Dam Material
- D Risk Analysis
- D Environmental Considerations

Training Course, "Geosynthetics and Their Civil Engineering Applications," 3 to 4 September 1999, Mumbai

There is an emerging need to promote the use of geosynthetics in civil engineering applications in India. The Indian IGS Chapter co-sponsored a training course on "Geosynthetics and their Civil Engineering Applications," which was organised by Kusumgar Corporates and held on 3 to 4 September 1999, in Mumbai. The goal of the Training Course was to generate confidence in individuals using geosynthetics and to disseminate information on geosynthetics regarding applications, considerations, specifications, selection, installation, cost-effectiveness, etc.

The lectures were given by academic and industry experts on the following topics: conceptual use of geotextiles for geotechnical applications; functional properties of geosynthetics; geosynthetic specifications and test procedures; civil engineering applications of geosynthetics; and methods of designing with geosynthetics for particular end applications.

*reported by A.R.G. Rao
Treasurer, Indian IGS Chapter*

Dutch Chapter

At the commencement of 1999, the Dutch IGS Chapter (IGSN) had 113 Members. The Chapter Officers are:

- G *President:* Louis de Quelerij
- G *Vice-President:* Hendrik Bijnsdorp
- G *Secretary:* Andries Steerenberg
- G *Treasurer:* Max Nods

The following is an outline of the 1999 IGSN activities:

1. *13 April 1999:* The General Assembly of NGO/IGSN was held in Utrecht.
2. *25 March 1999:* A lecture titled "Geosynthetics and River Dike Improvements" was given by ir. W.A. de Haan and ir. R.E. Jorissen.
3. *19 September 1999:* A lecture on the long-term behaviour of welding connections and a review of the new "Protocols Geomembranes" was given on by ir. P. Oude Weme, Dr. J. Breen and H. de Bruin.
4. *May 1999:* The fifth course on the use of geosynthetics was given for Dutch polytechnic students. The course was attended by eight students.
5. The IGSN participated in the following ongoing research projects: *Requirements Concerning Soil Protection; Manual for Soil Protection; and Durability of Welding Connections in Geomembranes.*
6. Three IGSN membership information leaflets and three issues of *Magazine Geokunst* were published and sent to all IGSN members.

*Reported by A. Steerenberg
Secretary, Dutch IGS Chapter*

Chinese Chapter

*Recent Activities of Chinese Chapter
of the IGS (CCIGS)*

In 1998, mainland China suffered a catastrophic flood, one of the first of its kind in China. The Yangtze River, Songhua-jiang River, and Nunjiang River basins, in particular, all suffered severe damage. The Chinese Army and large numbers of

civilians were involved in the struggle to control the flood.

President Jiang Zemin and Premier Zhu Rongji attended the front lines of the struggle to control the flood on several occasions. They observed that the deployment of geosynthetics is a very effective measure for abating flood attack. Premier Zhu then successively promoted the necessity to develop these materials and their use with greater intensity. This would include improving geosynthetic quality and quantity, decreasing unit price, and compiling standards for products, design methods, and construction procedures.

As a unique authoritative organisation, the China Technical Association of Geosynthetics (CTAG) and CCIGS assists the Chinese Government, i.e., the Ministry of Water Resources, in promoting the application of geosynthetics. The following are the main activities of the CCIGS in conjunction with the Ministry of Water Resources and CTAG during the past two years:

1. The Ministry of Water Resources, supported by CTAG and CCIGS compiled and published the following: "Standard for Application of Geosynthetics in Hydraulic and Hydro-Power Engineering" (SL/T225-98); "Code for Test and Measurement of Geosynthetics" (SL/T235-99); and the National standard "Technical Standard for Applications of Geosynthetics" (GB50290-98). Shortly thereafter, the Ministry of Railways and the Ministry of Communications completed similar respective standards. In addition, the CCIGS has written and published a book titled "The Applicable Techniques of Geosynthetics for Dyke Engineering".
2. Expert teams organised and supported by CTAG and CCIGS went to many locations (more than 20 provinces and cities) to introduce the aforementioned standards and to help run various seminars.
3. Ten state-owned and 50 Ministry of Water Resources-owned construction engineering projects that utilise geosynthetics are underway, or are

already completed. The CCIGS is now preparing a collection of case histories based on these engineering projects, which will be published in 2000.

4. The Ministry of Water Resources has created a special educational video showing various construction engineering sites that comprise geosynthetics. The video is approximately 50 minutes long.
5. The Ministry of Water Resources has held many meetings, inviting many experts who are investigating the development of more types of geosynthetic products and techniques for use in emergency flood events, e.g., hinged fabric forms, effective measures for piping prevention, facilities for preventing overtopping, CAD design software, etc.
6. Many manufacturers are also actively taking part in the development and manufacture of new geosynthetic products. It is roughly estimated that, in 1999, the consumption of geosynthetics in China exceeded 200 million square meters.
7. In 1995, the CCIGS published the "Handbook for Practical Use of Geosynthetics," which quickly sold out. To meet the requirements of the wide readership, the CCIGS is currently revising the old edition. Some of the chapters have been rewritten and supplemented with a number of domestic and international construction engineering case histories. The new edition will be approximately 700 pages and will be published in 2000.
8. *The Fifth National Conference on Geosynthetics* sponsored by CTAG and CCIGS will be held 1 to 7 November 2000, in Yichang, Hubei Province, where the famous Three Gorges Project of the Yangtze River is under construction. Dr. J.P. Giroud, a world-renowned geosynthetics expert, will be giving a keynote lecture at the Conference. In addition, several IGS officials and friends from Taiwan, Hong Kong, and Macau will be our distinguished guests. We warmly welcome indi-

viduals from around the world to attend the Conference.

9. Finally, it is with great sorrow that we announce the death of Prof. Yang Canwen, the president of the CCIIGS, who passed away in November 1999. His death is a great loss to the CCIIGS. Prof. Bao Chenggang is the newly elected CCIIGS President.

*reported by Wang Zhenghong
Secretary General, Chinese IGS Chapter*

South African Chapter

Recently, the South African IGS Chapter has grown from 15 to 28 Members and anticipates significant further growth in membership in the forthcoming year.

The activities, which have led to greater interest include presentations and lecture courses by renowned international experts, including Prof. Colin Jones, who presented a two-day seminar on geosynthetic reinforcement, and David Barker, who presented a series of lectures at various venues around the country on soil erosion preventative techniques. Dr. Kerry Rowe was a key speaker at the *3rd National Conference on Engineering and the Environment*. There was also a presentation by Dr. Craig Benson on GCLs and CCLs, in October 1999 at the *12th African Regional Conference*.

The present elected Committee has a healthy representation from the South African geosynthetics industry, including: representatives from academia; consultants; materials manufacturers,

suppliers, and installers; as well as government representatives. It is indeed pleasing to see more active participation from young engineers.

The focus for 2000 is on education and awards. Funds are increasingly allocated to student assistance, and a series of three awards have been introduced to encourage development in technology, construction, and outstanding service to the Chapter. The IGS is thanked for its stimulation in this regard.

The Geosynthetics Interest Group of South Africa is active in advising the South African Bureau of Standards on a revised approach for testing of flexible membrane liner materials, as well as guiding the waste regulatory authority on geosynthetic specification—an exciting challenge in a constrained economy.

*reported by Kelvin Legge
President, South African IGS Chapter*

Korean Chapter

The Korean IGS Chapter elected the following Committee Members for the two-year term of December 1999 to December 2001:

- G *President:* Prof. Young-Shik Paik, Kyunghee University
- G *Vice-President:* Dr. Sung-Wan Hong, Research Engineer, KICT
- G *Secretary:* Prof. Chungsik Yoo, Sungkyunkwan University
- G *Treasurer:* Mr. Young-Yoon Kim, Director, E&S Eng. Co., Ltd.
- G *Executive Members:*

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Prof. Jae-Bum Shim,
Korean National Railway College
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Chonnam National University
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Inchon University
Prof. Soo-Sam Kim,
Chung-Ang University
Dr. Kwang-Joon Park,
Duck-Chun Engineering Co.
Mr. Jeong-Ho Kim,
Sambo Engineering Co., Ltd.

- G *Auditors:* Dr. Eun-Soo Lee,
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Mr. Kwan-Young Cho,
Dae Han Industrial Co., Ltd.

G *Past Presidents:*

Prof. Hyung-Sik Chung,
Hangyang University
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Inha University
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*reported by Dr. Eun Chul Shin
Past Secretary, Korean IGS Chapter*

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An Official Journal of the IGS

Geosynthetics International has established itself as a premier peer-reviewed journal on geosynthetics. The Journal publishes technical papers, technical notes, discussions, and book reviews on all topics relating to geosynthetic materials (including natural fiber products), research, behavior, performance analysis, testing, design,

construction methods, case histories, and field experience.

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journals. They are assisted by a first-rate Editorial Board composed of international experts that are appointed to four-year terms and who represent a broad range of geosynthetics expertise.

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Geotextiles and Geomembranes

An Official Journal of the IGS

Geotextiles and Geomembranes is ahead of schedule. Volume 18 (2000) will include a special issue on GCLs with Dr. Malek Bouazza as Special Editor.

Dr. Jean-Pierre Gourc is planning to prepare a Special Issue on Erosion. If you are interested in contributing to this special issue, please contact Dr. Gourc at the address on p. 19, or by e-mail: gourc@ujf-grenoble.fr

The Editorial Board Members and reviewers have worked very hard over the past year to provide detailed, constructive reviews in a very timely manner. The average review period is less than three months. Papers come from a wide range of countries with approximately a third of the papers coming from the Americas, Europe, and the rest of the world. The rejection rate is 44%. The Journal's Editor and Board Members are extremely appreciative of the authors' hard work in addressing the reviewers' comments and the quick return of revised papers.

All technical contributions and inquiries should be directed to:

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E-mail: r.k.rowe@uwo.ca

Authors should submit four copies of any paper for review by at least two reviewers. No original figures should initially be included.

Recent Contents

Volume 17, No. 4 (1999)

"Evaluation of side wall friction for a buried pipe testing facility", A.R. Tognon, R.K. Rowe, and R.W.I. Brachman

"Railway rehabilitation geotextiles", G.P. Raymond

"Opening size determination of technical textiles used in agricultural applications", W. Dierickx

"Properties of exhumed HDPE field waves", G.R. Koerner, A.W. Eith, and M. Tanese

Volume 17, Nos. 5-6 (1999)

Foreword, J. Lafleur

"Geotextile filter design and simulated bridge formation at the soil-geotextile interface", P.D.J. Watson and N.W.M. John

"Long-term performance assessed from compatibility tests", Th. Kossendey

"Selection of geotextiles to filter broadly graded cohesionless soils", J. Lafleur

"A new test apparatus for the study of geotextiles behaviour as filters in unsteady flow conditions: relevance and use", D.A. Cazzuffi, A. Mazzucato, N. Moraci, and M. Tondello

"Changes in filtration opening size of woven geotextiles subjected to tensile loads", A.B. Fourie and P.C. Addis

"Coastal scour stabilisation using granular filter in geosynthetic nonwoven containers", M.H. Heibbaum

"Analysis of geotextile filter behaviour after 21 years in Valcros dam", Y.H. Faure, B. Farkouh, Ph. Delmas, and A. Nancey

"Selection of silt fence filter to retain suspended toxic particles", K.S. Henry, M.R. Walsh, and S.H. Morin

Corporate Profile

Corporate Members of the IGS are encouraged to publish a Corporate Profile in IGS News. A maximum of three profiles can be published in each issue of IGS News. The criteria for the preparation and submission of Corporate Profiles are available from the Editor. There is no charge for having a Corporate Profile published; it is a benefit of corporate membership.

ARAIGUMI Corporation is a general contractor headquartered in Hyogo Prefecture in Western Japan and Tokyo. It was established in May 1944, employs 1,636 individuals, and has 35 domestic branch offices. The Company has successfully handled many urban redevelopment projects.

Regarding civil engineering, ARAIGUMI maintains an emphasis on “the best method, the best planning, and the most reasonable cost” for its customers by applying advanced technologies.

In the field of architecture, ARAIGUMI energetically participates in planning and executing the refurbish-

ment of high-rise buildings. Utilising the aseismic base isolation and vibration control methods developed by the Company, ARAIGUMI builds new structures and upgrades existing buildings for earthquake resistance. The Company also offers innovative plans and proposals for building renewal projects.

New Civil Engineering Technologies



DLW (Diaphragm Long-Wall Construction) Method

Reinforced concrete cast-in-site diaphragm wall having joints between walls of superior structural performance.



T.B.K. System (Tailvoid pressure)

Pipe-jacking method for long spans and sharp curves, which realises low thrust by decreasing the outside skin resistance of pipes.



AES (Araigumi Earth Supporting) Method

Environment-friendly and low-emission open sheathing method developed for constructing waterworks, sewers, and multi-purpose utility tunnels, as well as for repairing waterways.

RRR (Reinforced Railroad/Road with Rigid Facing) Method

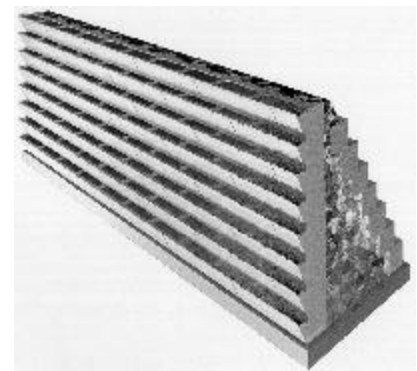
System developed to: (1) construct geotextile-reinforced soil retaining walls using relatively short geotextile sheets and a full-height rigid facing; and (2) reconstruct existing shallow slopes into near-vertical walls by excavating and using large-diameter nails and a continuous rigid facing.

PSR (Polymer Cement Mortar Magnetite Reinforcement) Method

Special reinforcement mortar used on reinforced concrete slabs enabling easy repair and strengthening of reinforced concrete structures.

Araigumi Co., Ltd. has been a Corporate Member of the IGS since 1999.

<http://www.arraigumi.co.jp>



APG (Araigumi Precast Gravity-Wall) Method

Resource/labor-saving retaining wall using concrete blocks for forms and waste concrete for aggregate.



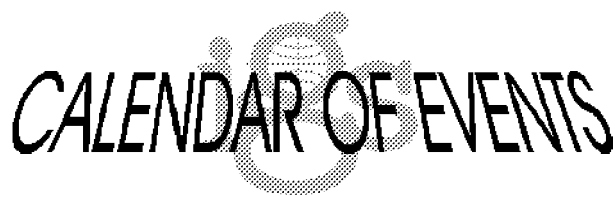
SUD (Slide Up Down) Method

Method employing suspended scaffolding of excellent workability and safety, which help painting, maintaining, and repairing bridge slabs.

CONFERENCES

SYMPOSIA

WORKSHOPS



CALENDAR OF EVENTS

SHORT COURSES

EXPOSITIONS

TRADE SHOWS

GeoDenver 2000

Boulder, Colorado, USA
3-8 August 2000
Contact: E-mail: conf@asce.org
<http://www.asce.org/conferences/geo2000>

Prague 2000 - Fifth International Symposium and Exhibition on Environmental Contamination
Prague, Czech Republic
12-14 September 2000
Contact: Prague 2000
Tel.: 1/850 644 5524
Fax: 1/850 574 6704
E-mail: Prague2000@mailers.fsu.edu

EuroGeo2

Bologna, Italy
15-18 October 2000
Contact: Susanna Antonielli AGI-IGS
Piazza Bologna 22, I - 00162 Roma, Italy
Tel.: 39/06 4424 9272
Fax: 39/06 4424 9274
E-mail: agiroma@iol.it

MONTREAL 2000

53rd Canadian Geotechnical Conference
Montreal, Quebec, Canada
15-18 October 2000
Contact: Conference Secretariat
Fax: 1/514 396 8584
E-mail: cgs2000@ctn.etsmtl.ca
<http://www.etsmtl.ca/CGS2000>

Techtextil Asia - International Trade Fair for Technical Textiles and Nonwovens
Osaka, Japan

18-20 October 2000
Contact: Messe Frankfurt GmbH
Tel.: 49/ 69 75 75 61 79/60 17
Fax: 49/ 69 75 75 65 41
E-mail: techtextil@messefrankfurt.com
<http://www.messefrankfurt.com>

China — Geo2000

Shanghai, China
1-3 November 2000
Contact: CNTA Co.
Tel.: 86/21 64812993
Fax: 86/21 64812993
E-mail: cnta-hq@online.sh.cn

10th Annual International TANDEC
Nonwovens Conference
Knoxville, Tennessee, USA
8-10 November 2000
Contact: Dr. Dong Zhang
Tel.: 1/865 974 3573
Fax: 1/865 974 3580
E-mail: tancon@utkux.utk.edu
<http://web.utk.edu/~tancon>

GeoEng2000

Melbourne, Australia
19-24 November 2000
Contact: Secretariat: c/o ICMS Pty Ltd.
84 Queensbridge St.
Southbank, Victoria 3006, Australia
Tel.: 61/3 9682 0244
Fax: 61/3 9682 0288
E-mail: geoeng2000@icms.com.au
<http://www.icms.com.au/geoeng2000>

GRI-14 Conference

Hot Topics in Geosynthetics
Las Vegas, Nevada, USA
15-16 December 2000
Contact: Ms. Marilyn Ashley
Tel.: 1/610 522 8440
Fax: 1/610 522 8441
E-mail: marilyn.ashley@coe.drexel.edu

Geosynthetics 2001

Portland, Oregon, USA
12-14 February 2001
Contact: Danette Fettig, IFAI
Tel.: 1/651 225 6942
Fax: 1/651 631 9334
E-mail: drfettig@ifai.com

Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics
San Diego, California, USA
26-31 March 2001

Contact: Dr. Shamsher Prakash
Tel.: 1/573 341 4489
Fax: 1/573 341 4729
E-mail: prakash@novell.civil.umn.edu
<http://www.umn.edu/~conted/conf8767.html>

2001: A Geo-Odyssey
Foundations and Ground Improvement

Blacksburg, Virginia, USA
9-13 June 2001

Contact: Prof. J. Michael Duncan
Tel.: 1/540 231 5103
Fax: 1/540 231 7532
E-mail: jmd@vt.edu
<http://www.geoinstitute.org>

XVth International Conference on Soil Mechanics and Geotechnical Engineering
Istanbul, Turkey
27-31 August 2001

Contact: Prof. Ergün Togrol
Tel.: 90/212 285 3747
Fax: 90/212 285 3582
E-mail: 15icsmge@itu.edu.tr
<http://www.itu.edu.tr/2001/>

International Symposium on Earth Reinforcement (IS Kyushu 2001)

Fukuoka, Kyushu, Japan
14-16 November 2001
Contact: Prof. Hidetoshi Ochiai
Tel. and Fax: 81/92 642 3285
E-mail: iskyushu@civil.kyushu-u.ac.jp
<http://www.civil.kyushu-u.ac.jp/geotech/iskyushu/>
Abstracts due 30 September 2000

4th International Congress on Environmental Geotechnics
Rio de Janeiro, Brazil
12-16 August 2002

Contact: Secretariat, 4ICEG-RIO 2002
c/o Dr. M.C. Barbosa, COPPE-UFRJ
Fax: 55/21 280 9545
E-mail: 4iceg@pec.coppe.ufrj.br
Abstracts due 1 June 2001

7th International Conference on Geosynthetics

Nice, France
22-27 September 2002
Contact: 7th IC IGS
BP 100, 95873 Bezons Cedex, France
Tel.: 33/0 1 34 23 57 92
Fax: 33/0 1 34 23 53 64

Note: Items in bold print are organised under the auspices of the IGS or with the support of the IGS.

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The International Geosynthetics Society



OBJECTIVES OF THE IGS

The International Geosynthetics Society was formed with the following objectives:

- to collect, evaluate, and disseminate knowledge on all matters relevant to geotextiles, geomembranes, related products, and associated technologies;
- to improve communication and understanding regarding geotextiles, geomembranes, related products, and associated technologies, as well as their applications;
- to promote advancement of the state of the art of geotextiles, geomembranes, related products, and associated technologies; and
- to encourage, through its Members, the harmonization of test methods, and equipment and criteria for geotextiles, geomembranes, related products, and associated technologies.

WHY BECOME A MEMBER OF THE IGS?

First, to contribute to the development of our profession.

By becoming an IGS Member you can:

- help support the aims of the IGS, especially the development of geotextiles, geomembranes, related products, and associated technologies;
- contribute to the advancement of the art and science of geotextiles, geomembranes, related products, and associated technologies; and
- participate in a forum for designers, manufacturers, and users, where new ideas can be exchanged and contacts improved.

Second, to enjoy the benefits.

The following benefits are now available to all IGS Members:

- a directory of Members, the IGS Directory, published every year, with addresses, telephone, e-mail, and fax numbers;
- the newsletter, *IGS News*, published three times a year;
- a reduced purchase price on all documents published by the IGS;
- a reduced registration fee and preferential treatment at all conferences organized under the auspices of the IGS;
- a reduced subscription fee for IGS-endorsed journals; and
- the possibility of being granted an IGS award.

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Membership of the International Geosynthetics Society (IGS) is open to individuals or corporations "... engaged in, or associated with, the research, development, teaching, design, manufacture or use of geotextiles, geomembranes, and related products or systems and their applications, or otherwise interested in such matters.". The annual fee for membership is US\$45 for individuals and US\$1000 for Corporate Members. Individuals of, or not of, corporations who voluntarily contribute a minimum of US\$200 annually to the IGS, in excess of their membership dues, will be mentioned in the IGS Directory in a separate list as benefactors.

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