

IGS NEWS



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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EuroGeo 1, a Success! *by Wim Voskamp* **Treasurer of the IGS**

The First European Geosynthetics Conference and Exhibition took place in Maastricht, The Netherlands, from 30 Sep until 3 Oct. It was a very attractive and sometimes fatiguing event, covering three days of paper presentations and a one day technical visit. The Conference was visited by a total of 512 people from 49 countries. The European countries were best represented. However, visitors from all over the world found their way to Maastricht, including attendees from Chile, New Zealand, and South Korea. There were particularly large contingents from Japan and North America.

One of the goals of the Organizing Committee was to attract at least 50% new specifiers and users of geosynthetics. This goal was not completely achieved. Approximately 30 to 40% of the attendees were engineers, contractors, and consultants who were coming for the first time to a geosynthetics conference and exhibition.

A total of 58 companies and institutions were represented at the exhibition, making this event a real success. In fact, a few weeks before the Conference opened, the exhibition closed to new exhibitors due to lack of space. The exhibition was particularly well attended. Industry participants distributed entrance cards to the exhibition to their customers, who otherwise might not have been able to attend the three day Conference but could attend the exhibition for a day.

Although this was done only some months before the Conference started and vacation time influenced the communication with potential visitors, approximately 350 people came to the exhibition, in addition to the 512 Conference delegates.

Keynote Lectures

More than 150 papers were presented at the Conference. The following five keynote lectures were given:

Prof. J.P. Gourc presented the keynote lecture on walls titled: "Retaining structures with geosynthetics, a mature technique, but some questions pending".

Prof. S.F. Brown discussed the use of geosynthetics in pavement engineering.

Dr. E. Gartung presented the keynote lecture on landfill liners and covers.

Prof. R.M. Koerner discussed the state-of-the-practice regarding in-situ monitoring of geosynthetics in his keynote lecture.

Prof. K. d'Angremond presented the keynote lecture on erosion control and bank protection.

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

Technical sessions

The five European IGS Chapters each organized a session on a subject related to the geosynthetics experience in their countries. In addition, there were ten workshops, three short courses, and eight discussion or poster sessions. New, and very instructive, were the demonstrations given on practical subjects including:

- sewing and bonding of geotextiles
- leak detection systems
- welding of geomembranes

Intensive and very interesting discussions were held in the discussion sessions on subjects including:

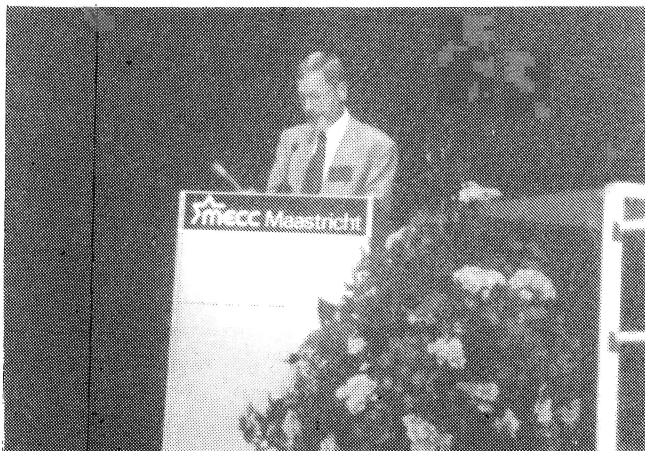
- soil-geosynthetics interaction
- durability of geosynthetics
- CEN testing methods

In addition, practical case studies were presented daily, grouped by subject. Workshops were also held to get practical information and to discuss the experience of various speakers. Short courses were given by well-known lecturers as part of the Conference.

Daily Highlights

All activities were completed in three days, which sometimes led to difficult decisions on which event of the six parallel sessions one would attend.

On Wednesday, 2 Oct, the Mercer lecture was presented by Prof. Fumio Tatsuoka. He spoke on "Geosynthetic-reinforced soil retaining walls as important permanent structures". His lecture was followed by the presentation of the IGS Awards by the chairman of the IGS Awards Committee, Dr. E. Gartung, and members of the committee (see related article on p5).



Mr. Gert den Hoedt presides at the Opening Ceremony.

On Thursday most participants attended a technical excursion to newly built landfills near Maastricht. At the landfill near Urbach, the construction of a cap with a VLDPE geomembrane could be seen. The next landfill was at Landgraaf. This landfill is made in accordance with the latest available technology. The lining system consists of two layers of HDPE geomembranes and 500 mm of clay. Composite geosynthetic drainage mats are installed in two layers for gas collection and rainwater drainage above the liner.

Conclusion

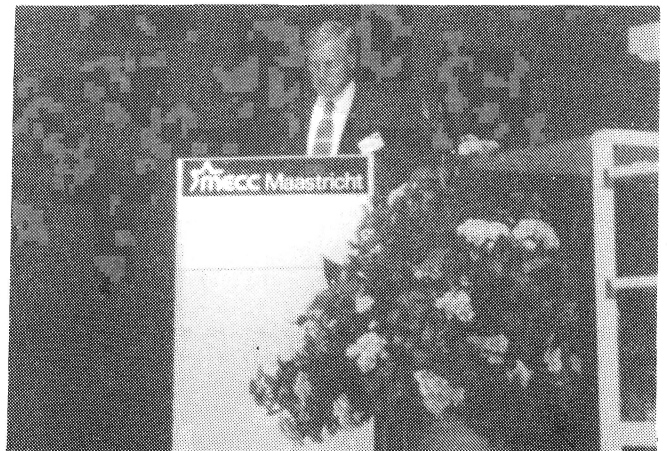
The Conference was closed by Mr. E.H. de Leeuw, chairman of the Organizing Committee. He handed over the EuroGeo flag to Ing. D. Cazzuffi, representative of the Italian Chapter of the IGS. Bologna, Italy, was selected as host of the EuroGeo2 Conference and Exhibition to be held in the year 2000.

The Organizing Committee must be complimented for the success of this Conference. It is always difficult to be the first, since there are no precedents. Nonetheless, they did a perfect job and set a standard for future EuroGeo Conferences.

The IGS European Activities Committee will summarize and evaluate the experiences gained from EuroGeo1 in the coming months and advise the organizers of EuroGeo2 accordingly to further expand on the success of this Conference and exhibition.

How to Order Proceedings

Those who could not attend the Conference are encouraged to purchase the 1066 page Conference Proceedings from Balkema (Postbus 1675, NL-3000 BR Rotterdam, The Netherlands) or in Brookfield, USA, which contain the text of the keynote lectures and all of the papers.



IGS President Jones at the Opening Ceremony.

President's Message on the Occasion of EuroGeo1

Prof. C.J.F.P. Jones

IGS President

The first European Conference (EuroGeo1) devoted to geosynthetics and related products represents another milestone in the history of the IGS. The Conference, which was held in Maastricht, The Netherlands, was organized by the The Netherlands Chapter of the Society and was a notable success (see related article on p1).

The primary objective of the Conference's organizing committee was to arrange the proceedings to meet the needs of users and potential users of geosynthetics.

The format adopted involved themes with state-of-the-practice rather than state-of-the-art lectures. This was followed by interesting parallel presentations involving work-

shops, case histories and demonstrations. This format clearly succeeded.

The percentage of delegates to the Conference and exhibition who were new to geosynthetics and their uses was estimated to be between 30 and 40 percent. Although intended as a specific European conference, visitors from over 40 different countries attended, attesting to the usefulness of the subjects and the variety of topics covered.

The success of this Conference, attested by the number and variety of attendees, reflects the outstanding efforts of the organizers, who are to be congratulated. As a profession, we look forward to EuroGeo2.

IS Kyushu - The Third International Symposium on Earth Reinforcement Fukuoka, Japan 12-14 November 1996

by Prof. R. Kerry Rowe, Past President of the IGS

The IS Kyushu series of conferences on Earth Reinforcement (1988, 1992, 1996) have established themselves as the key conferences in the field. This is evidenced by the number of participants (445), the number of countries represented (33) and the number (151) and high quality of papers presented.

The conference was opened by a special lecture on "Geosynthetic materials with improved reinforcement capabilities" by IGS President Prof. C.J.F.P. Jones. There were three keynote lectures: "Review of seismic design, analysis and performance of geosynthetic walls, slopes and embankments" by IGS Vice President Prof. R.J. Bathurst; "Applications of geosynthetics to embankments on soft ground and reclamation using soft soils" by Dr. H. Miki; and "Design of reinforced excavations and natural slopes using new European Codes" by Dr. G. Gassler.

Other highlights were the two special reports describing the excellent performance of reinforced slopes and walls during the Northridge Earthquake (California, USA: 17 Jan 1994) and the Hyogo-ken Nanbu Earthquake (Kobe, Japan: 17 Jan 1995) presented by Mr. D. White and Dr. F. Tatsuoka respectively.

Recognizing that soil reinforcement techniques have been developed and used for over 30 years, the last day of the conference was devoted to two summary discussion sessions - one on "Testing methods and materials" chaired by IGS Past

President Prof. R.K. Rowe and one on "Design methods" chaired by Dr. M. Bolton. The objective of these sessions was to summarize the present status and identify new directions. Much of the discussion at these sessions (which will be reported in Volume 2 of the proceedings) focused on the development of limit states design and the overconservatism that is evident in the approach being developed in Europe.

The 151 presentations at the conference covered most geosynthetic applications and topics. The array of presentations included 32 papers on "Testing and Materials", 20 papers on "Embankments", 48 papers on "Wall Structures", 27 papers on "Foundations", and 24 papers on "Slopes and Excavations".

The two volume proceedings is available from A.A. Balkema, Postbus 1675, NL-3000 BR Rotterdam, The Netherlands for Hfl265 (approximately US\$160).

The conference Chairman, Professor Hidetoshi Ochiai, Professors Hayashi, Otani and Yasufuku and the rest of the organizing committee are to be congratulated on the outstanding success of the conference. The organization was superb; the sessions were run on a tight schedule; there was excellent discussion; and, as always, the hospitality was wonderful.

There is no doubt that the attendees are already looking forward to the next IS Kyushu.

Letter to the Editor: Geosynthetics Education

Editors note: The following letter, addressed to Prof. Holtz, past chair of the IGS Education Committee, and his reply are printed below.

I read with interest your article in the July 1995 issue of the IGS News regarding the IGS Education Committee. I have some comments for the committee and the IGS to consider.

As a background note, I am employed as a geotechnical engineer by the U.S. Army Corps of Engineers (USACE) St. Paul, MN, USA, District.

1. I concur with and heartily support the "Educate the Educators" programs being considered by the IGS. One of my professional goals is to teach at the university level and I hope to take advantage of such a program some day. I know two professors who have been to the IFAI course and several others who have attended the similar ADSC course. These professors feel they gained much from the courses.

2. The use of "standard design procedures" is satisfactory as long as rules-of-thumb or design charts are not employed. Too many unqualified individuals would use this information in an incomplete manner. Users of geosynthetics should be required to consult with a geotechnical engineer, even during the alternatives formulation phase. The standard design procedures should also be considered to be included in local building codes (reinforced wall and slope designs) and state and regional regulatory requirements (for environmental issues). The Minnesota Geotechnical Society is considering a position paper to accomplish the former. I realize developing design standards that will not be abused and incorporating these standards into codes and regulations will be difficult. The St. Paul District recently recommended the development of a USACE "Designing With Geosynthetics" Engineering Manual (EM) to our Headquarters. The reasoning was to centralize the large amount of geosynthetics design information available. Unfortunately, the recommendation was denied because headquarters believed that the industry is still in a state of flux and development, with technology changing too rapidly for an EM to be worthwhile at this time.

3. Computer Programs.

a. Computer programs need to be developed and made

available universally at a minimum cost and with no limitations. At the present time, most of the design programs for MSE walls and slopes are developed by manufacturers. You can obtain their program for free or at a nominal cost, but the manufacturers place many restrictions on the use of the program and the programs are specific to their products. I realize the litigation-minded society we live in these days is a partial driver behind some of these restrictions, but the ethics and professional integrity of the designer has to come into play somewhere.

b. Two glaring deficiencies exist in most available retaining wall design programs: they do not include (1) a global stability (slope stability) routine, or (2) a bearing capacity routine which includes bearing capacity factors, such as ground slope, shape, load inclination, etc. Most walls the St. Paul District has designed are controlled by global stability or bearing capacity. Since most users of such programs are not geotechnical engineers, these users may not recognize the design implications other than those provided by the program. These analyses need to be included in future design programs.

c. Most of the programs are DOS programs which may work under the Windows or Windows for Workgroups environments. However, we utilize the Windows NT environment and the DOS programs do not always execute. I don't know enough about operating systems, but DOS execution with Windows95 may be a problem. Portable packages with graphics should be developed.

4. Expert Systems. These products could be used as a tool during alternatives formulation processes and seem like a great idea, as long as the right person is using the expert system. Some problems to consider include the expert system shell regarding its portability and dissemination limitations; data queries; data range checks; building design programs into the expert system; etc. I agree that development costs could be high, but perhaps the items I discussed in paragraph c above could be incorporated into the expert system development.

I appreciate the opportunity to comment. Feel free to contact me if you have any questions.

*Mark S. Meyers
IGS Member*

Reply to Letter to the Editor

Prof. Robert Holtz, Past Chair, IGS Education Committee

Editor's note: Prof. Holtz completed his term as Education Committee Chair in Sep 1996 and was succeeded by Mr. James Paul.

I appreciate Dr. Mark Meyers' very thoughtful comments on the proposed IGS educational program. I hope other inter-

ested IGS members will also join in the discussion, because the IGS Council feels that education is the key element in the long-term health of the geosynthetics industry and the IGS.

In response, I will follow Dr. Meyers' main points one by one.

1. Thanks for your strong endorsement of "Educate the Educators" programs. Our approach is to encourage other IGS Chapters to follow the example provided by the North Americans and their successful short courses for university professors.

2. "Standard design procedures" was mentioned early in my article only as an example. I was thinking of common design procedures such as are often found in textbooks. A good example might be the "method of slices" we use for slope stability analyses - it's almost a standard design procedure, although no official group has standardized it. I appreciate your concerns about standard designs, rules-of-thumb, and the like, and I have no ready answer to the problem of unqualified personnel misusing design examples and charts. My feeling is that this problem is not unique to geosynthetic systems. I'm sure you have seen conventional retaining walls and other similar structures develop problems because of an inadequate soils investigation or inappropriate design assumptions. I disagree that standard design procedures should be included in local building codes. (Perhaps our European colleagues involved with the development of Eurocode 7 for geotechnical design can convince me otherwise.) In my opinion, variable site geology and geotechnical properties make every site and thus every design essentially unique. A qualified geotechnical engineer who is also knowledgeable about geosynthetics needs to be involved in, for example, reinforced wall and slope projects. I was interested in your comments about the USA Corps of Engineers and your management's concern about rapidly changing geosynthetics technology. It is a shame they have this attitude; they should follow the lead of the US Federal Highway Administration. The FHWA first produced a geotextile design manual in 1983. To keep up with rapidly changing technology, they sponsored major rewrites in 1988 and 1995. It is interesting to me that in 1987, the Corps produced a manual on "Engineering Use of Geotextiles", a draft of which I have on my bookshelf. Why wasn't it

ever released, even as a "draft - subject to revision", to aid Corps engineers in using geosynthetics?

3. On computer programs, our intention is exactly as you stated - to make design programs widely available at minimum cost. And I agree with your point about internal vs. external stability of geosynthetic reinforced walls. However, I am concerned about your remark that "most users...are not geotechnical engineers." This point is similar to my point in No. 2, above. Are unqualified people designing conventional retaining walls? No, of course not routinely. Then why are they designing walls reinforced with geosynthetics? I have no ready answer to the problem of computer operating systems (DOS, Windows, Macintosh, etc.) and design program software. The problem of program portability is one that has been with us since the advent of the digital computer. The IGS cannot solve this one. All we can do is encourage the dissemination of generic design programs - and hope for the best as far as their portability is concerned.

4. Any tool, including expert systems, can be misused by improperly trained persons, and we are aware of some of the problems you mentioned. As noted in my article, just as with computer programs, the IGS role would probably be limited to the dissemination of high-quality expert systems for the selection of geosynthetics. I doubt that we would ever be involved with their development.

Finally, I would like to thank Dr. Meyers again for his thoughtful and useful comments.

I would like to encourage other IGS members to present their views and suggestions so that we can develop more meaningful and useful ways to spread geotechnology. Please join in the debate. After all, among these points lies the future of our Society.

IGS Awards for 1996 *by Dr.-Ing. E. Gartung*

The International Geosynthetics Society gave awards for outstanding contributions to geosynthetics at EuroGeo1, in Maastricht, The Netherlands, in Oct 1996. The awards are for the promotion of advances in the scientific and engineering development of geosynthetics. Dr. Gartung presided over the IGS Awards ceremony as chairman of the IGS Awards Committee.

The application of geosynthetics to civil engineering and environmental geotechnics has been expanding successfully worldwide. Many people involved in the geosynthetics profession have contributed to this success. The joint efforts of the many have been stimulated and guided by achievements of a few highly ambitious and talented individuals. The IGS recognizes such merits by conferring awards at two year intervals. The IGS Awards of 1996 cover the period 1992 to

1995. Great advances were made in the understanding of composite soil-geosynthetics systems and their practical application, as reflected by the entries.

The contributions nominated for the 1996 IGS Awards covered all the entry categories listed in the IGS Awards Rules, namely:

- product development
- testing and testing equipment
- instrumentation, monitoring and performance evaluation
- design and design methods
- fundamental aspects

The members of the IGS Award Committee were:

- Dr. Robert Koerner of the Geosynthetic Research Institute, Philadelphia, Pennsylvania, USA
- Mr. Chris Lawson of Nicolon, Kuala Lumpur, Malaysia
- Professor Hidetoshi Ochiai of Kyushu University, Fukuoka, Japan, and
- Professor Gerald Raymond of Queen's University, Kingston, Ontario, Canada

It was not easy for the IGS Awards Committee to select the most outstanding entries. After deliberation, the committee unanimously decided that three IGS Awards and one Young IGS Member Award would be conferred in 1996.

The 1996 IGS Award winners are (in alphabetical order):

Karl-Heinz Blume for: Basal Reinforcement of Highway Embankments "Long term evaluation of an 8 year instrumented geosynthetic reinforced embankment utilizing high load conditions on the geosynthetic reinforcement". The award was presented by Prof. Hidetoshi Ochiai, Japan.

Ennio Palmeira for: Contributions to the Geosynthetics Discipline in South America "Laboratory modeling and full scale monitoring of a variety of transportation related applications using geosynthetics". The award was presented by Prof. Gerald Raymond, Canada.

R. Kerry Rowe for: Diffusive Behavior through Composite Systems "Predictions and computer modeling of the diffusion of pollutants in landfill leachates through geomembranes / compacted clay liner systems". The award was presented by Prof. Robert M. Koerner, USA.

Jorge Zornberg (Young IGS Member Award) for: Evaluation of the Performance of a Reinforced Soil Slope "Complete suite of analysis of the behavior of a slope using conventional design, centrifuge, full scale monitoring and back analysis of design assumptions". The award was presented by Mr. Chris Lawson, Malaysia.

The winning entries demonstrate a high scientific level in theoretical and experimental research work. They comprise examples of sound engineering application of geosynthetics and the monitoring of their performance by systematic field measurements. The entries reflect the commitment to the transfer of knowledge and practical experience and to the in-

stallation of appropriate standards and regulations as well as to the development of new and advanced products.

Experience shows that the scientific community was well represented among the nominated candidates. However, excellent practitioners, who are members of our Society, were scarcely nominated. Practicing engineers and particularly the corporate members are encouraged to participate by making nominations for the next IGS Awards (see article on p9).

As most of you will know, Dr. J.P. Giroud presented an outstanding special lecture on the occasion of the 5th International Conference in Singapore. In recognition of Dr. Giroud's contributions, the IGS initiated a series of highly prestigious presentations that will be enjoyed in the future: The Giroud Lectures. The IGS Council authorized the 1996 Awards Committee to nominate the First Giroud Lecturer, who will give the prestigious talk in 1998 in Atlanta. Dr. Robert Koerner, of the Geosynthetic Research Institute, will be the first Giroud Lecturer (see related article on p8).

A special thanks goes to the Secretary of the IGS, Peter Stevenson, who has done an excellent job advertising the IGS Awards, collecting the entry documents from the candidates, distributing them to the members of the Award Committee and serving us as Secretary.

Unfortunately, not all of the nominations can be honored by an award. I congratulate all those candidates who have not been selected this time. Thank you for your participation in the competition and for your work. I want to take this opportunity to encourage all IGS members to nominate qualified candidates for the next Awards, covering achievements over the period 1994 to 1997.

The next IGS Awards will be presented in 1998 on the occasion of the forthcoming Sixth International Geosynthetics Conference in Atlanta, USA. In the future, the volume of the entry documents must be reduced. Since the achievements of a certain period are recognized, rather than a lifetime of work, candidates should not submit overly extensive files. Their achievements should be documented by a few characteristic papers, probably no more than about four. If too many papers are submitted, the members of the committee are unable to read them all. Excellent work can be recognized on the basis of a few significant examples.



IGS Award winners (l to r): J. Zornberg, E. Palmeira, K.H. Blume, R.K. Rowe.



IGS Awards Committee (l to r): G. Raymond, E. Gartung, C. Lawson, H. Ochiai, R. Koerner.

Professor Alan McGown Awarded CBE

In July 1996, Prof. Alan McGown's research and development work on geosynthetics was uniquely recognized when Her Majesty Queen Elizabeth of the United Kingdom presented him with a very prestigious honor at an investiture at Holyrood Palace in Edinburgh, Scotland. He was awarded a Commander of the British Empire (CBE) for his sustained work over 25 years on geosynthetics, working in conjunction with many industrial companies and government agencies.

Professor McGown was one of the pioneers in the geosynthetics industry and continues to be actively involved in his research on new products, test methods, and design techniques. He still very much enjoys the scientific and engineering challenges presented by geosynthetics. The profession can look forward to many more years of his special "Scottish" contributions to geosynthetics engineering. Professor McGown will be a keynote lecturer at the 6IGC, in 1998.



A very proud Professor McGown with his wife, Beatrice, shortly after receiving his CBE in July.

*contributed by R.J. Bathurst
Vice President of the IGS*

Results of IGS Council July 1996 Elections (Term 1996-2000)

A postal ballot was held during the summer of 1996 to elect eight members to the IGS Council for a four-year term, starting in July 1996.

The elected/re-elected Council Members are:

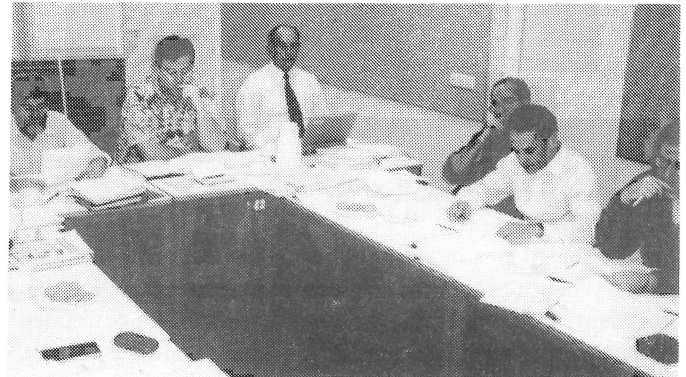
- Dr. Toshinobu Akagi (Japan) (re-elected)
- Dr. Barry R. Christopher (United States) (re-elected)
- Prof. Hyung-Sik Chung (Korea)

- Dr. Jean Lafleur (Canada)
- Mr. Chris Lawson (Malaysia) (re-elected)
- Mr. James Paul (United Kingdom)
- Mr. Alberto M. Scuero (Italy)
- Mr. C.V.J. Varma (India)

Brief biographical sketches can be found in the March 1996 edition of the IGS News, p2, or on the IGS Web site.



IGS Council meeting in Maastricht.



IGS Council meeting in Maastricht: (l to r): R.K. Rowe, C. Lawson, P.E. Stevenson, R. Bathurst, J. Collin, B. Christopher.

Proceedings of *Soil Reinforcing in Europe* Available

Written by practicing engineers, the twenty-two papers provide case histories which illustrate current applications in soil reinforcing. The Practice of Soil Reinforcing in Europe (ISBN 0 7277 2083 X, 309pp) is essential reading for those considering the design, specification, and construction of soil reinforcing techniques. Copies are available for £55.00 UK and Europe / £62.00 elsewhere by air. Order from:

Thomas Telford Services Ltd.

1 Heron Quay
London E14 4JD
UK

Tel.: 44 171 987-6999 Fax.: 44 171 537-3631

Contact Fiona Shepherd at 44 171-987-6999 ext 423, or Dr. T.S. Ingold at 44 1727 842433 for further information.

Professor Robert Koerner Honored with the IGS Giroud and ASCE Terzaghi Lectures

Prof. Robert Koerner has been honored this year by the geosynthetics and geotechnical professions with two prestigious honors.

The IGS has honored Dr. Koerner with the Giroud Lecture - the keynote lecture at the forthcoming 6IGC, to be held in Atlanta, GA, USA in 1998.

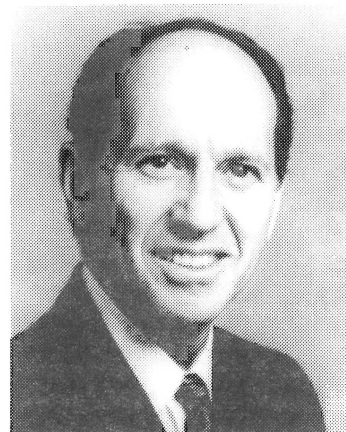
This lecture is named in honor of Dr. J.P. Giroud, in recognition of his numerous contributions to the technical advancement of the geosynthetics discipline over a quarter century and his many contributions to the development of the IGS. Dr. Giroud is a past president of the IGS.

In addition, Dr. Koerner has been named the American Society of Civil Engineers (ASCE) Terzaghi Lecturer. This honor is bestowed by the ASCE Geotechnical Division for outstanding contributions to the geotechnical profession. The award is named in honor of Dr. Karl Terzaghi, considered by

many to be the father of modern soil mechanics. Dr. Koerner joins a long list of distinguished geotechnical engineers in accepting the Terzaghi lectureship.

Dr. Koerner's address was titled "Lifetime of Geosynthetics vis-à-vis Permanent and/or Critical Applications". The address was delivered at a special session of the ASCE National Convention which was held on 12 Nov 1996, in Washington, D.C., USA.

*contributed by D.J. Elton
Editor, IGS News*



Professor Robert Koerner

Call for Candidates for IGS President, Vice President and the IGS Council: Deadline for nominations 1 March 1997

The next IGS President and Vice President will be elected at the Ordinary General Assembly to be held during the 6th International Conference on Geosynthetics in Atlanta, Georgia, USA, 25-29 Mar 1998. In addition, the results of a postal ballot to fill eight positions on the the IGS Council will be announced. IGS members who wish to run for President, Vice President or Council are invited to write to the IGS Secretary. Signed letters of application together with a biographical note (not exceeding 12 lines) should reach the Secretariat of the IGS not later than 1 Mar 1997.

In their letter to the IGS Secretary, candidates should clearly identify their country of residence and the position that they are running for (President, Vice President or Council Member). IGS members may run for more than one position in which case a separate statement for each position is required. The names of candidates and biographical notes which do not exceed 12 lines will be published in the July 1997 issue of IGS News and on the IGS Web site.

Under the by-laws of the IGS, only IGS members are eligible for these positions. The election of IGS President and Vice President will be held during the Ordinary General Assembly. The election of IGS Council Members will be held by postal ballot during the fall of 1997 and the results of this ballot will be announced at the Ordinary General Assembly after the election of the new IGS President and Vice President.

Prof. R.J. Bathurst, currently Vice President of the IGS, has announced his intention to stand for President of the IGS.

According to the by-laws of the IGS, Professor Colin J.F.P. Jones will become an officer of the IGS in his capacity as Immediate Past President of the IGS following the Ordinary General Assembly. The Secretary and Treasurer, who are the other two officers of the IGS, will be elected by the new IGS Council from amongst its members at a meeting of the IGS Council held in Atlanta after the Ordinary General Assembly. The election of the IGS President, Vice President, Secretary, Treasurer and the eight new Council Members and the appointment of the Immediate Past President will be for a period of four years.

The members of the IGS Council whose term of office expires in March 1998 are: Mr. D. Cazzuffi (Italy), Dr. J. Collin (USA), Prof. J-P. Gourc (France), Prof. R. Holtz (USA), Mr. G. Heerten (Germany), Mr. P. Rimoldi (Italy), Prof. F. Tatsuoka (Japan), Mr. W. Voskamp (Netherlands).

Dr. Collin, Prof. Gourc, Prof. Holtz, Mr. Heerten, Mr. Rimoldi, and Prof. Tatsuoka are eligible for re-election having completed one four year term as Council Members in 1998.

If elected, candidates must be able to travel to and attend all IGS Council meetings which are held at least once a year.

Meetings of the IGS Council are generally held in conjunction with international conferences which many officers and Council members may be attending. The next two Council meetings following the Atlanta meeting will likely be held in Europe and in North America. The by-laws of the IGS prescribe that half of the Council be elected every two years.

Hence the next postal ballot to elect Council members after Atlanta will be held in the summer of 2000.

Should you need further information, please contact the Secretary of the IGS, Mr. P. Stevenson, or the President of the IGS, Prof. C.J.F.P. Jones (see p19 for addresses).

IGS Awards Nominations Sought for the Period 1994-1997 **(deadline for nominations 1 September 1997)** **(deadline for submissions 1 December 1997)**

Purpose

IGS Awards will be granted in 1998 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. Awards will be made for the recognition of achievements completed and/or the validity of which has been demonstrated during a four year period preceding the year of the award (i.e. 1994 through 1997 inclusive).

Types of awards

There are two awards:

- The Young IGS Member Award for IGS members who are less than 36 years of age on 31 Dec 1997.
- The IGS Award (regardless of age).

A maximum of five IGS Awards will be granted. Each award will consist of a specially commissioned medal and a diploma. The awards will be presented at the IGS Ordinary General Assembly to be held during the 6th International Conference on Geosynthetics, 25-29 Mar 1998 in Atlanta, Georgia, USA.

The winning entries will also be featured at the IGS booth at any conference held under the auspices of the IGS and will be publicized in IGS News, in special press releases, on the IGS World Wide Web home page, and in other publications.

Candidates

All candidates must be members of the IGS. All members of the IGS are eligible with the exception of the President of the IGS and the members of the Awards Committee.

In the case of a group submission to the Young IGS Member Award all members of the group must satisfy the age requirement. Any individual or group that is a candidate for the Young IGS Member Award is automatically considered for both award categories (unless requested otherwise by the candidate). However, a candidate may only receive one award for the 1994-97 period.

Nominations

Nominations of candidates should be typed in English on plain paper (not letterhead) and submitted to the IGS Secretariat at the address on p19.

The nomination must include: a clear statement of the contribution of the candidate that is to be considered (e.g. if a product, provide a clear definition of the product; if a paper(s) or book, give a full reference of the paper(s)/book; if a report, give a full reference to the report; if a construction method, give a clear description of the method and any references, etc.). Include a statement indicating the originality and significance of the candidate's contribution to the discipline (i.e. in the field of geotextiles, geomembranes, related products and/or associated technologies).

Nominations may be made by any IGS member other than members of the Awards Committee. Under the IGS Awards rules, any IGS member can nominate himself/herself for any award.

The Publications Committee, Education Committee, Corporate Members Committee and IGS Chapters are invited to make nominations. Candidates who have been nominated will be contacted by the IGS Secretary. Candidates will be asked to agree to stand for an award and will be required to submit materials on their candidacy as outlined in the IGS Awards Rules and Procedures. All nominations and award entries will be treated with the strictest confidence by the IGS Secretary and the Awards Committee.

IGS Awards Committee

The Awards Committee will comprise five regular members including its chairman (all members will be selected by the IGS President from a list approved by the IGS Council). The members will be selected so as to represent a broad cross-section of geosynthetic-related technologies and experience. The Secretary of the IGS will attend all meetings of the Awards Committee as an observer and coordinator.

Further Information

The full text of the IGS Awards rules can be obtained by contacting the IGS Secretary (p19).

Call for Titles and Abstracts of University Post-Graduate Geosynthetics Theses

The IGS is compiling a list of post-graduate theses related to geosynthetics. Additions to the list will be published in the IGS News, and compiled on the IGS Web Site (<http://igs.rmc.ca>) for permanent reference. The list will inform the IGS membership of recent topics in geosynthetics. Authors are encouraged to submit the following information to the IGS News Editor (p18), or the Vice President of the IGS (p19). Email submissions are encouraged.

- Author's name
- Thesis title
- Academic degree
- Date defended
- Supervisor
- Name of University and Department with mailing address
- Abstract (maximum of 250 words)

To be acceptable, the thesis should have been defended within a year of publication. Submissions should include the following information:

For verification purposes, the supervisor's postal address, phone/fax numbers, and email, should also be submitted.

Call for IGS Corporate Member Profiles on the IGS Web Site or Links to Corporate Member Web Sites

As an additional benefit to Corporate Members of the IGS, the IGS now offers Corporate Members the opportunity to link their Web site from the IGS Web site (<http://igs.rmc.ca>).

Member must submit an ascii copy of their Corporate Profile on diskette or by email to Professor R.J. Bathurst, Vice President of the IGS. High quality original black and white or color photographs or line drawings can be mailed to Prof. Bathurst at the address on p19.

If an IGS Corporate Member does not have a web site the IGS will publicize their company or organization directly from the IGS Web site. Each Corporate Member will be allowed the equivalent of one hardcopy page of space roughly equal to the size of Corporate Profile articles that appear in each issue of IGS News. A maximum of two photographs that illustrate products or projects will be permitted.

Any submitted articles will be edited to IGS News style as required. Alternatively, Corporate Members may advise the writer by email that they wish their most recent Corporate Profile that has appeared in IGS News to be used on the IGS Web site.

In order to take advantage of this offer each Corporate

*contributed by R.J. Bathurst
Vice President of the IGS*

FREE Copies of Geosynthetics Bibliography Available to University/College Libraries (deadline for nominated libraries 1 March 1997)

In keeping with the IGS mission to educate future engineers in the use of geosynthetics in civil and environmental engineering applications, free copies of the Geosynthetics Bibliography will be given to selected university libraries.

geosynthetic literature. IGS Chapters are invited to submit a prioritized list of candidate university/college libraries to receive the bibliography. Institutions that have a current IGS member will be given priority. The list must contain the full address of each university/college library and the name of at least one IGS member at the institution.

At the Officers and Council meetings held at Maastricht in September 1996 it was decided to purchase a total of 100 copies of the Geosynthetics Bibliography (Volume 1 and 2) and to offer them at no cost to university/college libraries in countries with IGS Chapters. The bibliography volumes have a retail value of US\$158/set for IGS members and US\$198/set for non-IGS members.

Chapter lists must be submitted to the IGS Secretariat by 1 Mar 1997 at the address on p19. Since the supply of volumes is limited, Chapters are requested to submit their list of libraries as soon as possible.

This comprehensive bibliography contains listings from books on geosynthetics, papers in over 400 different technical publications, and research reports. In addition there are special listings of publications by more than 100 authors of

The IGS will ship the Geosynthetics Bibliography set to the Chapters at IGS expense. Each chapter will be responsible for shipping the volumes to each library at Chapter expense.

*reported by R.J. Bathurst
Vice President of the IGS*

International Seminar and Technomeet on ENVIRONMENTAL GEOTECHNOLOGY WITH GEOSYNTHETICS (INTSEMEGG) New Delhi, India, 31 July-3 Aug, 1996

The Indian IGS Chapter and Central Board of Irrigation & Power celebrated a "Decade of Geosynthetics in India" on 1 Dec 1995 in New Delhi. During this event a workshop was organized on "Environmental Geotechnology". The workshop was attended by 70 key delegates from decision making bodies and government secretariats from around the world.

IGS President Prof. Colin Jones facilitated this workshop on a decade of geosynthetics research and application. During this workshop, the expert panel recommended the formation of a new society at the international level to deal with various aspects of environmental geotechnology.

As a follow up action of this recommendation, the Central Board of Irrigation and Power initiated the formation of the "Asian Society of Environmental Geotechnology" (ASEG). The objectives of the Society include collecting and disseminating knowledge, promoting advancement of state-of-the-art technology and improving communications in relation to environmental geotechnology.

Needless to say, geosynthetics are recognized as the most significant state-of-the-art contributor to this emerging new technology. The newly formed society, although termed "Asian" due to ease of initial administration, aspires to become an international society in the near future, serving all countries.

The newly formed Asian Society held its first International Seminar & Technomeet at New Delhi, from 31 Jul to 3 Aug 1996. The Seminar was presided over by the Chairman of the Central Pollution Control Board, Dr. Dilip Biswas, whose technical guidance has significantly supported formation of this society from its conceptual stages.

The seminar attendance was very pleasing. There were more than 150 professionals from Asia (including India), Europe and the USA. The participants were from the Defense, Roads, Railways, and Irrigation Departments, Eminent Construction Houses, Central Pollution Control Board, multinational manufacturers such as Polyfelt, Don & Low, Cetco, and Maccaferri, as well as eminent consultants and researchers.

From its inception a year ago, the ASEG organizing committee in association with others worldwide, adopted and instituted a special annual lecture to award and honor one international personality for his/her outstanding technical contributions in the field of environmental geotechnology. It was with pleasure that the first ASEG-Tenax lecture was awarded to Dr. C.J.F.P. Jones, Professor, University of Newcastle,

U.K. and President of the IGS. A citation acknowledging this honor was presented to Professor Jones by Mr. C. Beretta, President, Tenax USA, on behalf of the organizing committee for his outstanding contributions to the field of environmental geotechnology using geosynthetics. The inaugural lecture was delivered by Professor Jones at a special session immediately after the inauguration of the international seminar.

The seminar lasted three days, during which six technical sessions were held. Each session began with a keynote lecture and a special presentation on state-of-the-art technology. Each lecture was delivered by an eminent international speaker. Dr. B.R. Christopher, Mr. F. Montanelli, Prof. J-P. Gourc, Ing. Pietro Rimoldi, Prof. A. Cancelli, Prof. T. Akagi, Prof. G.V. Rao, Mr. Som S. Sarkar, Prof. P.K. Banerjee, Prof. S.C. Das, Prof. N. Som and Prof. M.R. Madhav were the lecturers.

The keynote lecture in the "Testing and Standards" session (Technical Session I) was delivered by Dr. B.R. Christopher, Chairman of the Geosynthetics Testing Committee of ASTM. The keynote lecture in the "Reinforced Walls, Slopes & Landslides" session (Technical Session II) was delivered by Ing. P. Rimoldi, Vice President International ASEG and IGS Council Member.

The keynote lecture in the "Roads, Railways & Ground Improvement" session (Technical Session III) was given by Prof. T. Akagi, Toyo University, Japan. Prof. J-P. Gourc, University Joseph Fourier, Grenoble, France, presented the keynote address in the "Landfills and Waste Management" session (Technical Session IV).

The "Drainage, Erosion & River Training" session (Technical Session V) keynote lecture was delivered by Mr. Som S. Sarkar, Vice President (India) ASEG. The keynote lecture in the "Natural Geotextile" session (Technical Session VI) was delivered by Prof. G.V. Rao, President of ASEG.

The other prominent speakers who delivered special lectures included Prof. A. Cancelli, Prof. M.R. Madhav, Prof. N. Som and Prof. S.C. Das, Mr. Bob Traugar, Mr. John Curtis, Mr. F. Ferraiolo, and F. Montanelli.

In the Technomeet sessions, Mr. Bob Traugar and Mr. Gunther Lux addressed the gathering while Mr. Marco Finelli, Mr. Robin Guild, and Ing. Pietro Rimoldi, presented their state-of-the-art lectures on technology of products.

An interesting exhibition was held where all the participating manufacturers displayed their products and services.

On the final day, an expert panel discussion was held. It was chaired by Prof. C.J.F.P. Jones. The panel discussed the problems and potential of geosynthetics applications in India and recommended the need to formulate design guidelines and adopt standards in consultation with ISO, CEN and ASTM models for the user departments.

It was recognized that in the context of developing countries like India, geosynthetics will play a major role in environmental stabilization. The ability of geosynthetics to blend easily and economically with the existing natural surroundings has made them an attractive engineering choice for solving

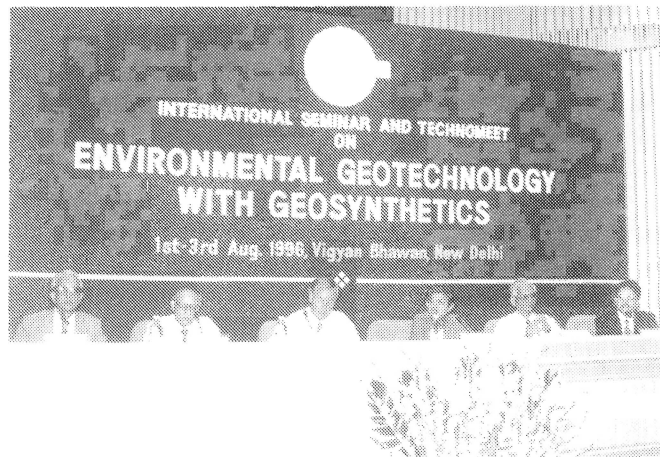
problems in environmental geotechnology.

The general opinion of the delegates was that the seminar was a great success and that these events should be repeated every three to four years, interspersed by regional events. The seminar provided a very useful platform for interaction between academicians, manufacturers and end users.

*reported by Som S. Sarkar
Organizing Secretary INTSEMEGG & Vice President
Asian Society of Environmental Geotechnology*



Prof. Jones (r), accepting the ASEG-Tenax lecture certificate from Mr. Beretta (l), while Mr. Rao looks on.



Inaugural session: (l to r): Prof. Rao, Mr. Varma, Prof. Jones, Dr. Biswas, Prof. Raju, Mr. Sarkar.

IGS Student Chapters on the IGS Web Page

The IGS invites all student chapters of the IGS to submit their membership list via email to Prof. R.J. Bathurst (Vice President of the IGS, p19) for inclusion on the IGS home page (<http://igs.rmc.ca>). Please submit the full address of the institution, student contact person and faculty member sponsor.

This page will be used to post any other information of interest to IGS Student Chapter members, including recent activities and opportunities for students to contact students at different institutions. Suggestions for improving this page can be sent to Prof. Bathurst at the address on p19.

*submitted by R. J. Bathurst
Vice President of the IGS*

New Officers of the CCIIGS Elected

*reported by Liu Zong Yao
Past President of the CCIIGS*

The Second General Assembly of the CCIIGS (Chinese Chapter of the IGS) took place on 18 Jun 1996.

The Assembly was part of the Fourth Chinese Conference, which was held in Shanghai. New officers of CCIIGS were elected in the Assembly.

The new officers are:

President

Mr. Yang Can Wen
Head of the Geotechnical Division
China Academy of Railway Science

Treasurer

Mr. Wang Yu Ren
Senior Engineer
Hebei Design Institute of Water Conservancy

Immediate Past President

Mr. Liu Zong Yao
Director of Technical Inquiry Committee of Water Conservancy Bureau of Hebei Province

Vice Presidents

Prof. Chen Huang
Department of Hydraulic Engineering

Tianjin University

Mr. Bao Cheng-Gang
Deputy Chief Engineer
Yangtze Water Conservancy and Hydroelectric Power Research Institute

Prof. Wang Tie Ru
Zhejiang University
Department of Civil Engineering

Secretary

Prof. Wang Zheng-Hong
Institute of Water and Hydroelectric Power Conservancy

CORPORATE PROFILES

The IGS Council has decided that in each issue of the IGS News, up to three Corporate Members will be allocated space to allow them to introduce their company or association and present their achievements. The criteria for selection of corporate profiles were described in IGS News, v4, no. 2, p7. Alternatively, you can get details by writing to the Editor. There is no charge for having a corporate profile published; it is a benefit of corporate membership.

STEEL DRAGON ENTERPRISE CO., LTD.

Chiayi, Taiwan, Republic of China

by *Craig M. Calvert, Sales Manager*

Founded in 1994, Steel Dragon Enterprise Co., Ltd. (SDE) brings together over 50 years of combined experience in the geomembrane field. A Sino-American operated business venture, with American based management, the corporate offices/factory are located in Chiayi, Taiwan, with sales offices located in Selangor, Malaysia and Chicago, Illinois, USA. In addition, SDE distributors can also be found worldwide.

The factory, in production since August 1994, is capable of producing more than 18 million square meters of geomembrane annually, utilizing the most advanced blown film extrusion die system in the industry. Here, through our coextrusion process, we are able to manufacture a variety of products to suit all of our customer's needs. These products include SD-HDPE (high density polyethylene) sheets, SD-HTX (high density polyethylene textured) sheets, SD-VFPE (very flexible polyethylene) sheets, SD-VFTX (very flexible polyethylene textured) sheets, and SD-AHD sheets (specifically developed for aquaculture).

Steel Dragon's high density polyethylene sheets are a widely used product for lining of solid waste sites, mines, and other fluid containment applications. They are preferred for sites requiring low permeability and have exceptional resistance to chemicals and ultraviolet light. Steel Dragon's high density sheets are also resistant to mold, mildew, fungus, and chemicals normally found in soil. Unlike other products, these geomembranes do not contain plasticizers. The high

density sheets are resistant to ultraviolet light or other environmental factors and do not need to be buried for protection.

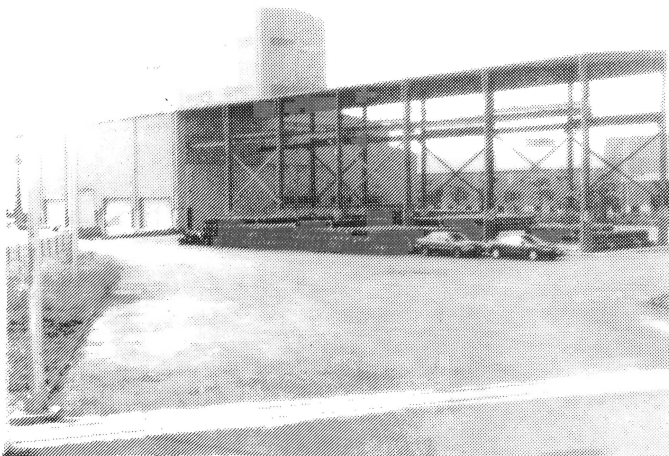
Our textured sheets are manufactured simultaneously with the extrusion of the solid barrier portion of the liner, as opposed to being added after extrusion. The rough surface is thus fully integrated with the sheet during the molten phase of manufacturing, as opposed to being added after extrusion. The result is a surface that remains intact regardless of the chemicals which may come in contact with the sheet. With the addition of texture to the surface of the sheet, an excellent rough surface is provided. This allows designing geomembranes for steeper slopes, resulting in added capacity for landfill sites. The textured sheets retain the properties of the smooth sheets.

For more information, contact:

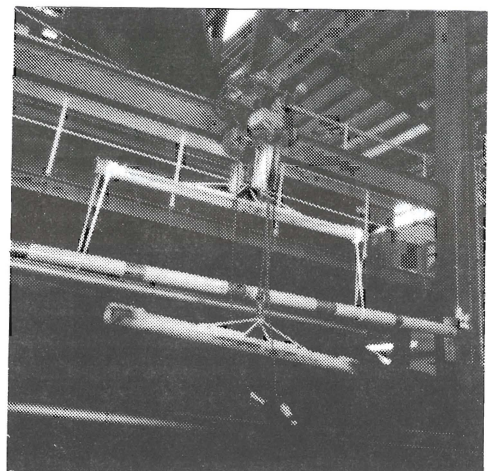
Steel Dragon Enterprise Co., Ltd.
20th Floor, Sung Teh Road
Taipei, Taiwan, R.O.C.
Tel.: 8862-759-7383
Fax: 8862-759-7375
email: sde01@msn.com

Please visit our web site at <http://www.steel-dragon.com>

Steel Dragon Enterprise Co., Ltd. has been a member of the IGS since 1996.



Steel Dragon manufacturing facilities.



Steel Dragon geomembrane manufacturing.

GEOTEXTILE TUBES

by Dr. Dov Leshchinsky, IGS Member

Geotextile tubes are made of several geotextile sheets sewn together to form a shell capable of confining pressurized slurry. The slurry is sufficiently fluid that it is possible to hydraulically fill the tube. After pumping the slurry in, the geotextile shell acts as a "cheese cloth," allowing seepage of the liquid out but retaining the solid particles. The availability of a wide selection of geotextiles makes many uses possible. For example, these tubes can be used to encapsulate contaminated material, or to rapidly construct a dike over soft and inaccessible soil such as wetland, or to rapidly construct a dike along a river bank to prevent flooding, or to construct groins to control beach erosion. These tubes can be used to contain fill in seismic areas where compaction is difficult (e.g., artificial islands) and therefore reduce the catastrophic effects of liquefaction (i.e., while the soil temporarily liquefies and turns into a heavy liquid, the geotextile shell prevents its flow through containment). The following description adds a case history to a growing list.

In 1992, four 150 m long tubes were filled with 100% clay (LL=120%, PL=32% and PI=88%), in a dredge material containment site at Gaillard Island, near Mobile, Alabama, USA. This experimental project was carried out by the Mobile District, US Army Corps of Engineers (USACE) and the USACE Geotechnical Laboratory, Waterways Experiment Station, under the direction of Dr. Jack Fowler. The tubes were made from two 4.20 m wide woven geotextile sheets. The wide-width strength of the geotextile was 70 kN/m in the warp direction and a minimum of 45 kN/m in the fill direction. The apparent opening size of the geotextile used in two tubes corresponded to US Standard Sieve No. 70 (0.212 mm) and in the other two tubes to sieve No. 100 (0.15 mm). Slurry was pumped through a 20 cm diameter branch pipeline (Figure 1), clamped by a flexible strap to the inlet opening of the tube. Tubes reached their full height in about 90 to 120 minutes. Immediately after pumping, the tubes attained an asymmetrical elliptical shape (Figure 2), about 1.5 m high and about 3.6 m wide. A pressure gage near the inlet indicated the pumping pressure did not exceed 30 kPa. Two tubes were lined with a nonwoven geotextile to reduce the loss of fines. It was quickly realized that despite the large openings of the woven geotextile, the fine particles blinded the geotextile within a few minutes. Hence, inner liners may not always be necessary for preventing the loss of fines. However, since defective seams are not uncommon (Figure 3), a nonwoven lining may add an inexpensive extra layer of protection against leaks.

Slurry samples from within the tube shown in Figure 3 had a water content and total unit weight (near the inlet) of 214% and 12.3 kN/m³; 70 m from the inlet it was 284% and 11.7 kN/m³; and 145 m away it was 308% and 11.5 kN/m³. A month later, the slurry turned into a soft clay and the respective water contents and total unit weights were 127% and 13.2 kN/m³, 153% and 12.7 kN/m³, 286% and 11.7 kN/m³. More

solids tended to accumulate near the inlet. The tubes lost 50% of their height during that month. In this case, a second pumping could force the tube to return to its original height while adding more solids. Interestingly, seedlings started to germinate through the unlined woven geotextile within a month.

Key design questions are: how to select a geotextile, and what will be the short and long terms dimensions of the tube. Leshchinsky et. al. ("Geosynthetic tubes for confining pressurized slurry: some design aspects," *Journal of Geotechnical Engineering, ASCE*, Vol. 122, No. 8, 1996, pp.682-690) address these issues. The paper indicates that the most critical factor needed to insure successful installation is regulating the pumping pressure to avoid rupture. The paper shows instructive results of a parametric study obtained from a design-oriented public-domain computer program (GeoCoPS), available from the USACE Waterways Experiment Station.

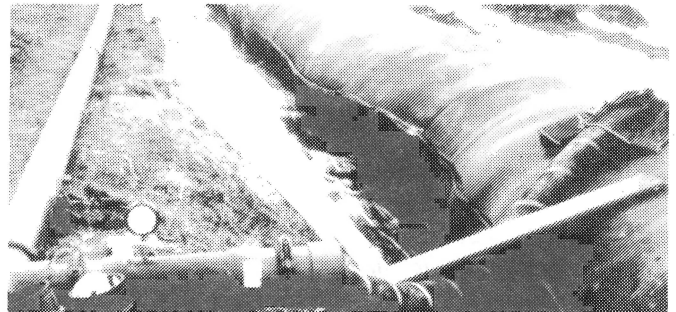


Figure 1. Clayey slurry pumped through single inlet for 2 hours to form 150 m long, 1.5 m high, and 3.6 m wide tube.



Figure 2. Geometry of tube filled with clayey slurry immediately after completion of pumping.

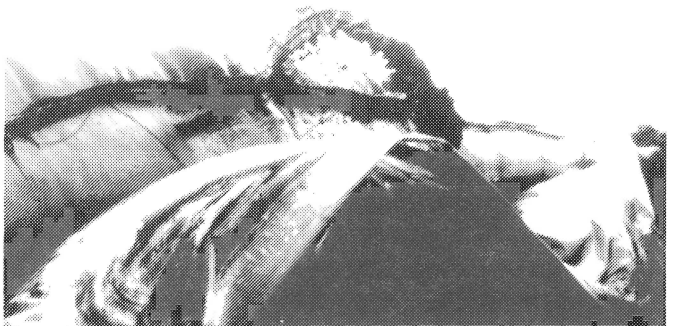


Figure 3. Slurry flowing through defective seam, (Note: nonwoven liner was not used in fabricating this tube).

Geotextiles and Geomembranes

an Official Journal of the IGS

Geotextiles and Geomembranes is an official journal of the IGS. Consequently, each issue of *Geotextiles and Geomembranes* is published with the IGS logo on the cover. Volume 15 of *Geotextiles and Geomembranes* is being published during 1997, and will comprise 6 issues. The full subscription price for 1997 is UK280, US\$454 or Dfl728. Individual members of the IGS may subscribe at an 80% discount, i.e. UK56, US\$91, Dfl146. Corporate members of the IGS may subscribe at a 50% discount, i.e. UK140, US\$227, or Dfl364. Reduced subscriptions are available directly from the publisher, and may be paid for by check or credit card. Please write to:

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Dr. Nigel W. M. John
Department of Civil Engineering
Queen Mary & Westfield College
University of London
Mile End Road
London E1 4NS
UK

Members are reminded that to take advantage of this discount they must inform Elsevier Science Ltd. that they are members of the IGS. IGS members are encouraged to use *Geotextiles and Geomembranes* as an outlet for their technical papers and thus contribute toward the continuing success of this high quality publication which now has subscribers in over 40 countries worldwide. Papers should

Instructions to authors are available from Dr. Nigel John.

Visit the *Geotextiles and Geomembranes* Web site at:
<http://www.elsevier.com/catalogue>

Geosynthetics International an Official Journal of the IGS

Geosynthetics International is an official journal of the IGS. Consequently, each issue of *Geosynthetics International* is published with the IGS logo on the cover.

couraged to use *Geosynthetics International* as an outlet for their technical papers and thus contribute toward the continuing success of this high quality publication.

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Fax: 1 (407) 995-0925

In recognition of the adoption of *Geosynthetics International* by the IGS, the Industrial Fabrics Association International (IFAI), publisher of *Geosynthetics International*, has introduced a special reduced subscription rate for individual IGS members. For individual IGS Members the rate is now US\$99 per six issues with the standard rate of US\$225 applying to non-IGS Members, IGS Corporate Members and other corporations or institutions. A special rate of US\$125 / 6 issues is available for university libraries. IGS members are en-

Papers should be work not published in full elsewhere and should be sent to any of the following:

For subscriptions, contact:

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Co-Editor, Dr. R.J. Bathurst (see p19)
Chairman of the Editorial Board,
Dr. J.P. Giroud

Visit the *Geosynthetics International* Web site at:
<http://geo.rmc.ca/gi>

European Association of Manufacturers Formed

In August 1996, a large number of the European geosynthetics producers formed the European Association of Geotextile and Geotextile-related Manufacturers, E.A.G.M., under the French law. The objectives of the association include: promoting individual or collective initiatives; sharing useful data; undertakings and missions of general interest; providing services likely to contribute to the development of geotextiles; officially representing E.A.G.M.

members versus European authorities and laboratories authorized to use European standards; promoting and maintaining a level of quality for geotextiles without introducing criteria that discriminate between types of fabrication; striving to establish free circulation of geotextiles in the European Community; and establishing certification of products applicable to all member countries.

The Association will be located at:

Institut Textile de France (I.T.F.)
Regional Office
185, rue de l'Illberg
F-68093 Mulhouse Cedex
France
Tel.: +33 89427408
Fax: +33 89429115

*contributed by Wim Voskamp
Treasurer of the IGS*

Italian IGS Chapter Visits Bovilla Dam

The Italian Chapter of the IGS organized a visit to Bovilla dam in Terana, Albania, on 3 and 4 Jul 1996. The earth-fill dam uses geosynthetics for waterproofing, making the visit of particular interest.

The delegation consisted of 13 European dam engineers, geologists and geosynthetics experts. The delegation, headed by Piero Sembenelli, designer of the dam's waterproofing system, included the general managers of the companies who constructed the waterproofing system: Alberto Scuro of Carpi Tech, and Maurizio Modena of Carpi Italia. The 91 m high dam spans the Terzuke River, 15 km northwest of Tirana, the capital of Albania. The dam is 130 m long at the crest. The dam was originally designed for irrigation sup-

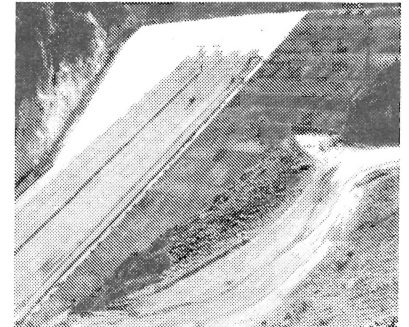
ply. Afterwards, the dam was modified to include drinking water supply for Tirana, and, eventually, power supply to exploit the existing gradient in the river. The reservoir will have a total capacity of 80,000,000 m³.

An upstream geocomposite forms the sole waterproofing for the dam. The geocomposite, a polyvinyl chloride membrane coupled to a heavy polyester geotextile, is installed directly over a gravel drain. The geocomposite is protected by concrete slabs cast on a geotextile.

Simulation tests were performed on the geocomposite to ascertain its capability to accommodate large differential settlements of the dam.

The protection was designed so that it would be capable of accepting large settlements without damaging the geomembrane. The 650,000 m³ dam was constructed on 1:1.6 slopes with compacted river sand and gravel from the upstream side of the dam.

*submitted by Gabriella Vaschetti
Member of the Italian Chapter, IGS*



Bovilla Dam, showing geosynthetics.

Call for Papers Special Issue of *Geosynthetics International* Geosynthetics in Earthquake Engineering

Abstracts due 31 Jan 1997
Papers due 30 Jun 1997
Publication date Dec 1997

The Editor and Co-Editor of *Geosynthetics International* invite papers for a special issue of *Geosynthetics International* devoted to Geosynthetics in Earthquake Engineering, to be published at the end of 1997.

A number of invited state-of-the-art papers are planned and original papers on the general topic by other authors will be considered. Abstracts of papers should be on one or more of the following topics as they relate to geosynthetic reinforced structures and landfills:

- Seismic analysis and design.
- Performance during earthquake.
- Construction techniques.
- Development of design codes.
- Properties of materials/systems under seismic loading.
- Laboratory modeling and testing.

Abstract submissions should describe original work and/or be significant extensions of previous work. Authors should submit abstracts to the Editor or Co-Editor at the addresses given below.

Dr. T.S. Ingold, Editor
Geosynthetics International
Mulberry Lodge
St. Peters Close
St. Albans, Hertfordshire AL1 3ES
United Kingdom

Tel.: 44 1727 842433
Fax: 44 1727 845266

or

Dr. R.J. Bathurst, Co-Editor
Geosynthetics International
Civil Engineering Department
Royal Military College of Canada
Kingston, Ontario
Canada K7K 5L0

Tel.: 613 541-6000 ext 6479

Fax: 613 541-6599
email: bathurst@rmc.ca

Abstracts may be up to five pages in length and must contain sufficient detail on the contents of the paper to permit the editors to properly evaluate proposed submissions.

Abstracts may also be submitted electronically by email to the Co-Editor. Authors of submitted abstracts will be advised by 28 February 1997 whether their paper has been tentatively accepted for publication.

Papers must then be prepared in accordance with the *Geosynthetics International* Instructions for Authors.

Three hard copies of accepted papers must be submitted to the Editor or Co-Editor by 30 Jun 1997. Papers will be peer-reviewed by at least two well qualified assessors.

Discussion Volume of the 5th IGC Available Soon

The organizing committee of the 5th International Conference on Geotextiles, Geomembranes, and Related Products (5IGC) is at the final stage of publishing the Discussion Volume of the Conference, held in 1994. This volume contains the special lecture, keynote lectures, panel discussions, and session discussions. This final volume will be made available in the first quarter of 1997.

Registered participants of the Conference will receive this volume free-of-charge at their registered address at the time of the Conference. If there is any change in the participant's mailing address, please notify:

Southeast Asian Chapter of IGS
Kent Ridge P.O.Box 1204
Singapore 9111
Fax: (65) 353-2424
email: cvecsh@nus.sg

before 31 Jan 1997.

The complete set of proceedings (Volume 1 to 4) as well as the CD ROM version of the proceedings (Volume 1 to 3 plus special lecture and keynote lectures) can be purchased from the above address. Please direct inquiries of the cost to the same address.

*submitted by Dr. Soon-Hoe Chew
President, Southeast Asia Chapter of
the IGS*

Romanian Chapter to Sponsor Seminar on Reinforced Soil Structures

The Romanian Training Center on Sustainable Development is sponsoring a seminar on Design and Technology of Reinforced Soil Structures, on 9 - 12 Dec 1996 in the Main University Building, Parterre, Amphitheatre Apa, Bucharest, Romania.

The program is in conjunction with the University of Newcastle and the UNESCO Chairs in Bucharest. The program tentatively includes speakers from the UK, Netlon, Ltd., the Romanian

Technical University of Civil Engineering, the Romanian Design Institute for Railways, and the Romanian Polytechnic University. Topics to be covered include: Principles and Philosophy of Reinforced Soil, Durability of Polymer Soil Reinforcement, the Tie-Back Wedge Method, Practical Examples of Reinforced Soil Walls, Computer Design Methods of Walls and Steep Slopes, Basal Reinforcement for Embankments, and Geocell Mattress Design. Other sessions include Design

of Road Pavements, Case Studies of Reinforced Soils in Romania, Confined Structures of Reinforced Soil, and Practical Design. Many discussion sessions will be interspersed in the conference, to facilitate learning and exchange of ideas. Translation into Romanian will be provided. The meeting will end with a farewell dinner at the Elisabeth Palace in Bucharest. Those interested in attending should email their intentions to: office@ecoland.sbnet.ro or ecoland@mail.sfos.ro.

IGS Technical Committee on Design Methodologies for Geosynthetic-Reinforcement of Walls, Slopes and Embankments

An IGS Technical Committee on Design Methodologies for Geosynthetic-Reinforcement of Walls, Slopes and Embankments was formed on 11 Nov 1996 at a recent meeting held in conjunction with IS Kyushu'96 in Fukuoka, Japan.

The Chairman of the committee is Prof. F. Tatsuoka.

Long Term Objectives

The long term objectives of the committee are to develop a set of guidelines for the analysis and design of geosynthetic-reinforced walls, slopes and embankments based on a synthesis of available national guidelines and other source materials. The guidelines will focus on empirical, analytical and numerical models to predict construc-

tion and post-construction deformations and reinforcement strains.

Short Term Objectives

The first step in this program is to collect all sources of information that will assist in meeting the long term objectives of the committee. References describing source materials on the following topics are requested: deformation of reinforced soil structures due to creep, as well as live, dead and seismic loading; design criteria for deformation and reinforcement creep; empirical methods for estimation of deformation and creep; papers, reports, etc. that contain results of numerical simulation of construction and post-construction deformations; case histories that report measured deformations and reinforcement strains; case histories used to cali-

brate numerical models.

All IGS members are requested to submit a list of reference materials by 1 Mar 1997 to the Committee Chairman (Prof. F. Tatsuoka) or any of the committee members listed below. Once this list is compiled, individuals will be contacted to supply selected source materials in full. The IGS believes that this process will avoid duplication of materials submitted by IGS members.

Committee Members

Prof. R.K. Rowe
Prof. C.J.F.P. Jones
Prof. R.J. Bathurst
Prof. D. Leshchinsky
Mr. W. Voskamp
Dr. H.I. Ling
Prof. J-P. Gourc

Prof. J.T.H. Wu
Prof. M. Fukuoka
Mr. P. Stevenson

Prof. F. Tatsuoka
University of Tokyo
Institute of Industrial Science
7-22-1 Roppongi
Minatoku, Tokyo 106 JAPAN

email:
tatsuok@hongo.ecc.u-tokyo.ac.jp

Next Meeting

IGS members who wish to become committee members and to actively participate in this project are invited to contact Prof. Tatsuoka at the following address:

Tel.: 81 3 3402 6231 x2570
Fax: 81 3 3479 0261
Telex: 2423216

The next meeting of this IGS Technical Committee is scheduled to be held during Geosynthetics'97 in Long Beach, California, USA, 11-13 Mar 1997.

GEOSYNTHETICS ASIA '97 ASIAN REGIONAL CONFERENCE

The Indian Chapter of IGS is organizing Geosynthetics Asia '97 - Asian Regional Conference and Exhibition from 26-29 Nov 1997 in Bangalore, India. This is being organized under the auspices of IGS. The registration fee is US\$650 for IGS members and US\$700 for nonmembers.

For more information, please contact:
C.V.J. Varma
Member Secretary
Committee for International
Geosynthetics Society (India)
c/o Central Board of Irrigation &
Power

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email: cbip@cbipdel.uunet.in

Calendar of Events



Field Performance of Geosynthetics and Geosynthetic Related Systems, Philadelphia, PA, USA, 10-11 Dec 1996
Contact: Marilyn Ashley, Geosynthetic Research Institute
Tel.: 1 (215) 895-2343 Fax: 1 (215) 895-1437

International Symposium on Mechanically Stabilized Backfill, Denver, CO, USA. 6-8 Feb 1997
Contact: J.T.H. Wu
Tel.: 1 (303) 556-8585
Fax: 1 (303) 556-2368

Geosynthetics '97 Long Beach, California, USA
11-13 Mar 1997
Contact: Danette Fettig, IFAI, 345 Cedar St., Suite 800
St. Paul, MN 55101-1088 USA
Tel.: 1 (612) 222-2508
Fax: 1 (612) 222-8215
email: ifaidan@aol.com

Sardinia '97 Sixth International Landfill Symposium, Cagliari, Italy 13-17 Oct 1997
Contact: Anne Farmer, CISA-Environmental Sanitary Engi-

neering Centre, Via Marengo 34-09123 Cagliari, ITALY
Tel.: 39/70-271652 Fax: 39/70-271371

Geosynthetics Asia '97 - Asian Regional Conference
Bangalore, India 26-29 Nov 1997
Abstracts due 31 Aug 1996
Contact: C.V.J. Varma, c/o Central Board of Irrigation and Power, Plot No. 4, Industrial Area Malcha Marg
Chanakyapuri, New Delhi, INDIA 110021
Tel.: 91 11 3015984/3016567 Fax: 91 11 3016347
email: cbip@cbipdel.uunet.in

Sixth International Conference on Geosynthetics
Atlanta, Georgia, USA
25-29 Mar 1998
Contact: Danette Fettig, IFAI, 345 Cedar St., Suite 800, St. Paul, MN 55101-1088 USA
Tel.: 1 (612) 222-2508 Fax: 1 (612) 222-8215
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Note: Items in bold print are organized under the auspices of the IGS or with the support of the IGS.

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The IGS News is published three times per year. Material for publication should be submitted to the Editor or one of the Associate Editors by 16 Feb, 16 Jun, 16 Oct for the Mar, Jul and Nov issues respectively. Short articles and/or good quality photos (with a caption) are always very welcome.

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note: date indicates earliest year of continuous membership

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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;
- to encourage through its members the harmonization of test methods, 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 a member of the International Geosynthetics Society 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 and related products, and associated technologies.
- 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 available now to all IGS members:

- A directory of members, the IGS DIRECTORY, published every year, with addresses, telephone, email and fax numbers.
- Newsletter, IGS NEWS, published three times a year.
- Reduced purchase price on all documents published by the IGS.
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- Possibility of earning 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 corporations who voluntarily contribute a minimum of US\$200 annually to the Society, in excess of their membership dues, will be mentioned in the IGS Directory in a separate list as benefactors.

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