

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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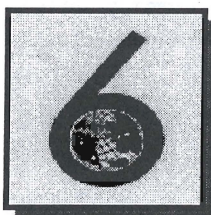
The 6IGC: an Excellent Conference

The 6IGC, held in Atlanta, GA, USA, was a great success. There were 1869 attendees, including exhibitors, representing 61 countries (see box, p2). Of those 1869, there were 707 full conference registrations (including students), which was more than twice the expected number. Thirty-seven percent of the attendees were from outside the USA.

The huge trade show featured 126 exhibitors, representing 18 countries – an undeniably international event. Exhibitors included all facets of the geosynthetics industry – from fibers to wall materials to erosion control and pavement applications. Many vendors illustrated their products with models and demonstrations that emphasized the functioning of the material in situ. The trade show also featured large, catered buffet lunches and dining that brought many attendees together for networking.

In addition to the exciting technical paper sessions (see related article, p3), the venue included discussion sessions, where almost all the allotted time was devoted to questions and discussions. Here, manufacturers, researchers, installers and others engaged in lively give-and-take discussions about every aspect of geosynthetics. This unique format was the perfect forum for advancing the fast changing world of geosynthetics.

At the closing dinner, Miss Danette Fettig, Conference Secretary General, presented plaques to Dr. J.P. Giroud, former President of the IGS, Dr. C.J.F.P. Jones, immediate Past President of the IGS, and Dr. Robert Koerner, Conference Chair, commemorating their dedication and services to the International Geosynthetics Society.



Miss Fettig also gave flowers to Mrs. Paula Koerner, Mrs. Rosemary Stevenson of the IGS Secretariat, and Mrs. Pat Jones. Their formal and informal contributions to making the 6IGC such a success were well received by the assembled attendees, as witnessed by the outstanding applause.

Perhaps the best news of all was the announcement of the venue for the 7IGC – Nice, France, in 2002. At the closing dinner, Dr. Philippe Delmas gave a wonderful parallel slide and video presentation on the venue. Here, the attendees were shown scenes of the wonderful city of Nice while being entertained simultaneously by a video of a fashion show featuring top French models displaying the latest in geosynthetic outerwear. The models were attired in woven, nonwoven, geomembrane and geogrid attire, much to the amusement of the attendees. The 7IGC promises to be equally large and successful. (*note: the fashion show video is available from Dr. Philippe Delmas at Fax (33) 1 34 23 53 64 or email philippe.delmas@bidim.com*).

Near the end of the closing dinner, Dr. Koerner, who conducted the ceremonies, spoke movingly of the many people who have made the geosynthetics industry successful and of the many dedicated people that made the IGS and the conference so successful. He then invited Mr. Gert den Hoedt, one of the first IGS members, to briefly address the closing dinner assembly. Mr. den Hoedt regaled the audience with several anecdotes and historical notes describing the development of the International Geosynthetics Society, which were graciously received by the membership.

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

Sixth International Conference on Geosynthetics Atlanta, GA 25-29 March 1998 Attendance Breakdown by Country							
Argentina	3	Costa Rica	2	Lithuania	4	Sri Lanka	1
Austria	18	Denmark	6	Luxembourg	5	South Africa	14
Australia	11	Dominican Republic	3	Malaysia	7	Spain	10
Belgium	10	Egypt	1	Mexico	11	Sweden	2
Bolivia	2	Ecuador	4	Netherlands	28	Switzerland	20
Brazil	23	Finland	9	New Zealand	5	Taiwan	21
Brunei	1	France	41	Norway	9	Thailand	1
Canada	83	Germany	46	Pakistan	1	Trinidad	6
Chile	11	Greece	1	Panama	2	Turkey	4
China	16	Guatemala	4	Peru	10	United Arab Emirates	1
Columbia	18	Hungary	2	Philippines	4	United Kingdom	59
		Iceland	1	Poland	4	United States	1173
		India	13	Portugal	13	Venezuela	5
		Indonesia	1	Romania	2	Total	1869
		Israel	11	Russia	2	Total Country Count	61
		Italy	38	Saudi Arabia	1	International	37%
		Japan	46	Singapore	6		
		Korea	11	Slovakia	1		
				Slovenia	1		



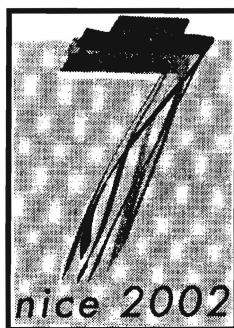
The IGS Council and Officers: (Left to right) G.P. Karunaratne (Singapore), A. Scuero (Italy), J.-P. Gourc (France), P. Rimoldi (Italy), R. J. Bathurst (Canada – President), J. Paul (UK), C.J.F.P. Jones (UK – Immediate Past President), C. Lawson (Malaysia), J. Collin (USA), G. Heerten (Germany), C.V.J. Varma (India), F. Tatsuoka (Japan), D. Cazzuffi (Italy – Vice President), H.S. Chung (Korea), S. Corbet (UK), P. Delmas (France), T. Akagi (Japan), J. Lafleur (Canada), B. Christopher (USA), P. Stevenson (USA – Secretary). (not shown: E. Palmeira (Brazil), W. Voskamp (The Netherlands – Treasurer))

7IGC To Be Held In 2002 in Nice, France

At the meeting held in March 1997, in Long Beach, CA, USA, the IGS Council approved a location and organizing body for the Seventh International Conference on Geosynthetics (7IGC). The French Chapter of the IGS (CFG) will sponsor the 7IGC in Nice, France in 2002.

The history of the IGC conferences is:

- First IGC, Paris, France 1977
- Second IGC, Las Vegas, USA 1982
- Third IGC, Vienna, Austria 1986
- Fourth IGC, The Hague, The Netherlands 1990
- Fifth IGC, Singapore, Singapore 1994
- Sixth IGC, Atlanta, USA 1998
- Seventh IGC, Nice, France 2002.



The CFG has strong support from sister French organizations to hold the 7IGC, and will associate with corresponding international organizations to ensure participation of their members. In addition, Nice is a well known famous historical city with a marvelous surrounding region where the mountains meet the sea and sun. It is also the second French city with respect to the international air connections from Europe, East Asia/Oceania, Africa and America.

The conference objective is 1000 attendees with 40% from outside the IGS. The conference proceedings will include all special lectures and refereed papers.

Dr. Philippe Delmas presented the French Chapter's bid to hold the Seventh International Conference on Geosynthetics, in Nice, France in 2002. The CFG has experience organizing conferences and has had good attendance and partici-

ation. The IGS Council encourages all members to mark their calendars and to encourage their colleagues to do the same. The 7IGC promises to be a productive and useful conference.

reported by D. Elton, Editor



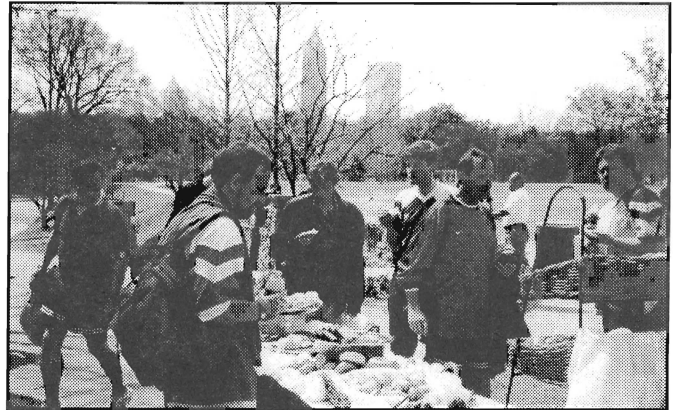
The gateway to the 6IGC trade show where over 120 exhibitors displayed every geosynthetic product and service.



A. Comer, R. Holtz and B. Christopher enjoy a light moment at the 6IGC opening social.



E. Palmeira, D. Cormany, D. Cazzuffi, Y.G. Hsuan, R. Bathurst and T. Allen enjoy a moment at the 6IGC closing dinner.



IGS football players enjoy camaraderie and refreshments after tough matches.

6IGC Conference Session Reports

Editors note: the following reports are summaries from the conference sessions at the 6IGC, held in Atlanta, GA, USA in March 1998 (see IGS News, v14, no.1, p7)

Workshop 13 – Micro-reinforcement

Chairs: J.-P. Gourc and D. Chill

The so-called Micro-reinforcement, or reinforcement of soils by fibers, appears to be a technology with a huge potential area of applications, presently unexploited. This workshop explored this important topic. Some recent applications were displayed during the workshop: reinforcement of cohesionless soils by continuous threads, in France; reinforced layers of thickness 1 to 2 mils used as vertical retaining structures or veneer protection for spheric gas reservoirs; reinforcement of low cohesive strength fine soils by short fibers in the USA to remediate a slope instability.

The composite soil-fiber needs, in every case, a preliminary study, to optimize the percentage of fibers and the tensile stiffness of the fibers. The mode of mixing soil and fibers in order to obtain the most efficient composite and the influence of amount of fibers and soil density on strength were presented during the workshop. The two papers, presented by J.-P. Gourc and G.H. Gregory, clearly demonstrated the efficiency of fibers to increase the strength and often, more importantly, the ductility of the soil. However,

the technique remains underexploited.

Jean-Pierre Gourc suggested some research needs in this area. For cohesionless soils, the fatigue behavior under cyclic compressive triaxial tests needs more research. These reinforced soils exhibit significantly better behavior, which could be applied in the field to soil surface layers (perhaps in a road subbase) subjected to traffic loads. The fibers not only increase strength, but also decrease compressibility (which in particular induces better permeability for drainage). With cohesive soils, the increased resistance to bending and cracking could be used in environmental applications such as steep clay liners and covers for landfills.

Session 2B Report - Land Reclamation and Ground Improvement

Chairs: Y. Rogbeck and J. Sprague

Four papers were presented in this session focusing on various techniques for improving challenging soils. The first two papers, by Voskamp, Troost, and Koerner and Karunaratne, Tan, Chew and Loh, respectively, provided insight into the properties required of prefabricated vertical drains (PVDs) and how to test them. Both strength and resistance to kinking were examined using a unique testing apparatus that effectively simulated anticipated field conditions. The third paper by Sharma provided a theoretical analysis of

stone columns reinforced with geogrid layers near the top. A computer model demonstrated a clear benefit from adding grid reinforcement. However, questions and comments from practitioners in the audience suggested that it may not be practical to install geogrids in layers and that a tube- or sock-type reinforcement has proven effective. The final paper by

Nettleton, Jones, Clarke and Hamir explored the concept of electrokinetics using electrically conductive geosynthetics. Laboratory testing has demonstrated the potential of electrokinetic geosynthetics to be used to hasten the consolidation and associated strength gain of fine-grained soils and to enhance bioremediation of contaminated soils.

6IGC IGS Football: the final report.

The 6IGC was the scene of a quadrennial rivalry of football (soccer) enthusiasts who masquerade as mild-mannered geosynthetic engineers in the intervening years. This year, representatives from 14 countries contested the 6th International Conference on Geosynthetics (6IGC) football competition on 25 March 1998.

Four teams, primarily middle-aged men, played the full 90 minutes, twice, resulting in the predictable excitement and injuries (it was felt by some contestants that a four-year interval was a sufficiently long interval to allow adequate recovery and forgetfulness to allow the spirited rivalry to resume).

The primary account of the IGC matches was given in the March 1998 edition of the IGS News (v14, no.1, p9). Here, the team photo of the winning "American" team is presented (below). The affiliations of the team members are also

given to illustrate that the IGS is truly an international organization.

The next matches will be played in Nice, France, site of the 7IGC in 2002 (see p2 for related article). This competition will undoubtedly be as keen as in past matches if not more so. It is reported to the IGS News staff that preparations are already underway, particularly in the host country (where Zidane has reportedly signed a three year contract with the French IGS Chapter).

In addition, there are unconfirmed reports that Ronaldo (Brazil) has recently joined the Brazilian Chapter of the IGS. It is felt that these early preparations are the result of the excitement generated by the results of the recent World Cup competition. Further reports will be forwarded to IGS members as they develop, through the official channel: the IGS News.



Left photo: The Winning IGS Football team: the "Americans": Front row, from left: Jacques Cote (Canada), ??, ??, Ciarla Massimo (USA), ??, ??.

Rear row, from left: Blu Alexander (USA), Mike Stevenson (USA), Ken Robinson (USA), ??, George Koerner (USA), Bill Hawkins (USA)

Right photo: Action was often fierce and fast around the goals of both teams on the football fields.

Editor's note: players not identified in the left photograph are invited to send their names to the Editor, for republication in the next edition of the IGS News.



Proceedings of the 6th IGC Available

Conference Proceedings of the Sixth International Conference on Geosynthetics are available. The prestigious conference, held 25-29 March 1998 in Atlanta, GA, USA attracted more than 1,800 participants and 126 exhibitors. The multi-volume proceedings include the Giroud Lecture, keynote lectures, as well as all papers presented at the conference in the areas of Environmental Applications, Soil Reinforcement Applications and Geotechnical & Hydraulic Applications. Individuals who did not attend the conference or

conference attendees who need additional copies may order the conference proceedings in print or CD-ROM format by contacting the Industrial Fabrics Association International Bookstore, 1801 County Road B West, Roseville, MN 55113-4061 USA; Tel.: 1 (612) 222-2508 or 1 (800) 225-4324; Fax: 1 (612) 631-9334; email: bookstore@ifai.com Prices: paper version US\$150; CD-ROM US\$75; both US \$199 (plus shipping). IGS Chapters are eligible for a discount on orders of five or more copies.

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 (President of the IGS, address on p15) for inclusion on the IGS home page (<http://igs.rmc.ca>). Chapters are requested to please submit the full address of the institution, student contact person and faculty member sponsor.

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 are most welcome and can be sent to Prof. Bathurst.

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

This part of the IGS webpage will be used to post any

Call for IGS Awards Nominations for the Period 1996-1999 (deadline for nominations 1 October 1999) (deadline for submissions 1 December 1999)

Purpose

IGS Awards will be granted in 2000 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. 1996 through 1999 inclusive).

ered for both award categories (unless requested otherwise by the candidate). However, a candidate may only receive one award for the 1996-1999 period.

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 December 1999.
- 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 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 the IGS News, in special press releases, on the IGS World Wide Web home page, and in other publications.

Candidates

At least one member of an award entry must be a member of the IGS. Each entry is restricted to a maximum of four (4) persons. 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 consid-

Nominations

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

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, include a full reference to the report; if a construction method, a clear description of the method and any references, etc.),
- 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 except 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 for 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 se-

lected 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 Committee as a non-voting observer and coordinator.

Further Information

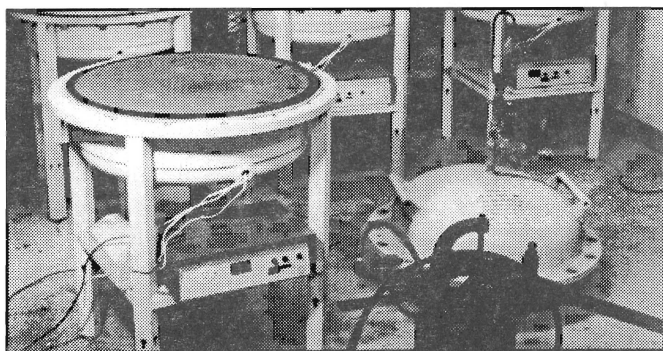
The full text of the IGS Awards rules can be obtained by contacting the IGS Secretariat (p16).

Puncture Protection of Geomembranes ***by Drs. R.F. Wilson-Fahmy, D. Narejo and R.M. Koerner***

Editor's note: this article describes the IGS Award winning work of the authors (see IGS News, v14, no. 1, p5).

The general tendency for leachate collection layers beneath landfills is to use coarse sand or gravel so that gravitational flow to sumps is unimpeded. As the particle size becomes larger, e.g., in Germany the gravel must be between 16 and 32 mm, the underlying geomembrane must be protected against puncture. Even further, isolated stones on subgrades present possible puncturing objects to geomembranes. In both cases, a needlepunched nonwoven geotextile can be considered, but the type (in particular its mass per unit area) is still being discussed. This project was focused towards development of a design methodology to obtain the minimum mass per unit area for such a geotextile.

The study was embodied in the doctoral dissertation of Dr. Narejo and the mathematical developments of Dr. Wilson-Fahmy, both with GRI/Drexel University. It was published in *Geosynthetics International* (v3, no.5, 1996).



Puncture apparatus (open in front; assembled in rear).



Geotextile over sand with puncture probe beneath it.

Evaluation of the Reinforcing Mechanism of Geosynthetic Reinforced Embankments ***by Dr. Hiroshi Miki*** ***Director, Soil Mechanics Division, Public Works Research Institute*** ***Ministry of Construction, Japan***

Editor's note: this article describes the IGS Award winning work of the author (see IGS News, v14, no. 1, p5).

This report is the result of research conducted during ten years, focusing on "the hidden reinforcing mechanism" of geosynthetic reinforced embankments, which is not usually accounted for in design.

This report has the same content as Dr. Miki's doctoral thesis at the University of Tokyo, March 1996. The author

gives special thanks to Professor F. Tatsuoka for his kind and persevering guidance.

The report deals with the following applications:

- 1) Reinforcement of embankments taking advantage of the tensile reinforcing effects of geotextiles.
- 2) Reinforcement of embankments with high water content cohesive soils using the drainage function of geotextiles.
- 3) Reinforcement of soft ground as embankment foundation using the tensile reinforcing function of geotextiles.

The main results obtained concerning these three applications are:

a) Based on the results of a series of large-scale model tests and on-site trials with a geotextile reinforced embankment, the reinforcing mechanism is clarified. Through this, "the hidden reinforcing mechanism", not usually accounted for in design was discovered.

b) One of the hidden reinforcing mechanisms discovered is the pseudo-retaining wall effect produced by the surface zone of the embankment where sand-bags and geotextiles are densely installed. A design method that takes this effect into account is proposed. In the future, it is important to establish a method of assessing the anisotropic apparent cohesion in the densely reinforced surface zone.

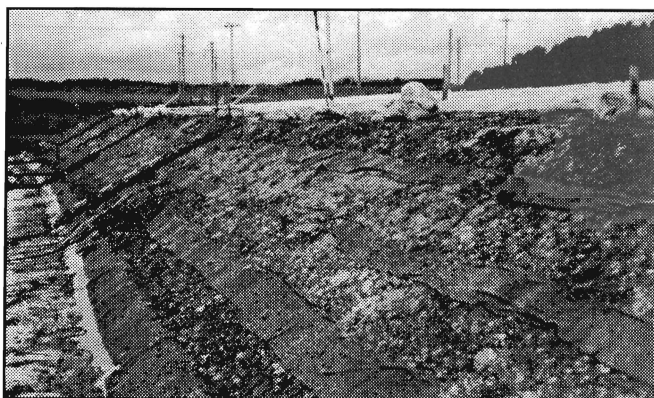
c) Another hidden reinforcing mechanism, when geotextiles with a drainage function are used, is the seepage water drainage effect during rainfall. This helps to delay the weakening of the embankment due to seepage of rainwater. Additionally, geotextiles installed in the surface zone of the embankment at intervals of about 30 cm and with a length of 1 or 2 meters develop an effective erosion resistance during heavy rainfall.

d) A series of on-site trials confirmed the effectiveness of a construction method which uses geotextiles as horizontal drainage materials, employing high water content cohesive soil to dissipate the excess pore water pressure during construction of the embankment, and increasing the stability of

the embankment. A design method based on the formula proposed by Dr. J.P. Giroud has been proposed and verified.

e) Applicability of the finite element method to elastoplastic-consolidation coupled analysis using joint elements was clarified based on the simulation of the on-site trials of a geotextile reinforced embankment on soft ground.

Most of the research work was based on large-scale model testing and on-site trials conducted with the cooperation of eight private companies and branch offices of the Ministry of Construction in Japan. Therefore, this award can be said to have been granted to all of the cooperative research members. The report is being translated into English now. This work is published as a Report of the Public Works Research Institute, Ministry of Construction, v197, March 1997, Japan.



On-site trial of the author's work.

IGS Chapter Reports

Dutch Chapter (IGSN)

Activities in 1997

General Assembly of NGO/IGSN, held in Gouda on 2 Apr 1997.

A lecture about 'Stutz-und Tragsysteme mit Geokunststoff-Bewehrung' was given by Prof. Dr.-Ing R. Floss on 2 Apr 1997.

A third course on the use of geosynthetics was given in April. This course was intended for Dutch polytechnic students. This course was attended by 24 students.

The NGO participated in the following current research projects: Geotextiles and geomembranes in civil engineering; Durability of welding connections in geomembranes; and Preliminary advice committee concerning reinforced soil. The following research projects have just started: Requirements con-

cerning soil protection; and Manual for soil protection.

Planned project in 1998

The project "Quality control of geosynthetic materials on site" will start this year.

Publications

Six NGO newsletters were published and sent to all IGSN members.

Membership and officers

The Dutch chapter started in 1997 with 125 members.

President: Koos A.G. Mouw
Vice President: Wim Voskamp
Secretary: Andries Steerenberg
Treasurer: Max Nods

*reported by K.A.G. Mouw
President, NGO*

Activities Report of the German IGS Chapter

At the end of 1997 there were 77 members of the German IGS-Chapter within the 254 member special section "Geosynthetics in Geotechnics" (FS-KGEO-"Fachsektion Kunststoffe in der Geotechnik") of the "German Society for Geotechnics" (DGGT).

The FS-KGEO and the German IGS Chapter have distributed the third circular letter in October 1997 to inform the members about conferences, abstract deadlines, actual research works and new publications.

The fifth national conference FS-KGEO '97 was held on 4-5 Mar 1997 in Munich. There were sessions on reinforcement, testing and product development, shear-testing, durability, and clay liners.

All 26 reports are published (in Ger-

man) in the proceedings, which are available at:
Deutsche Gesellschaft für Geotechnik e.V. (DGGT)
Hohensollernstr.52
D-45128 Essen

The accompanying exhibition was formed by 14 producers and consultants. About 250 engineers, consultants, and students attended the conference.

Within the conference, the general meeting of the German IGS Chapter was held. The main topics were new activities and new thoughts on increasing the membership, especially student membership. Therefore, as a first step, a special offer at the FS-KGEO '97 conference from NAUE Fasertechnik for students was introduced.

Students attending the conference could join the special section FS-KGEO and IGS with no fee for the first year. Extension of this policy is being considered.

The next conference FS-KGEO '99 will be held in March 1999 in Munich.

The FS-KGEO and the German IGS Chapter have installed an Internet website at: <http://www.ccip.bauwesen.tu-muenchen.de/bau-verm/grundbau/fs-kgeo.htm>. In addition to other information, geosynthetic related links (also the IGS web page) are given. The email address of the special section is: FS-KGEO@LRZ.TU-MUENCHEN.DE

Two new books have been published from the working groups of the special section FS-KGEO:

Empfehlungen für Bewehrungen aus Geokunststoffen - EBGEO (Recommendation on Soil Reinforcement with Geosynthetics-EBGEO), in German, edited by the German Society for Geotechnics (DGGT), Berlin, Ernst & Sohn Verlag, 1997.

Empfehlungen Doppeldichtung Tunnel (EDT) (Recommendation on Dual Sealings in Tunneling), in German, edited by the German Society for Geotechnics (DGGT), Berlin, Ernst & Sohn Verlag, 1997.

Another geosynthetic related book was published by the DGGT:

Empfehlungen der Arbeitskreise zur "Geotechnik der Deponien und Altlasten": GDA, 3. Auflage (Geotechnics of Landfill Design and Remedial Works, Technical Recommendations, third edition), in German, edited by the German Society for Geotechnics (DGGT), Berlin, Ernst & Sohn Verlag, 1997.

At the end of 1997 the chairmanships and this special section of the FS-KGEO and the German IGS Chapter were confirmed by written election for the period 1998 to 2001.

Chairman:
Univ.-Prof. Dr.-Ing. R. Floss, Lehrstuhl und Prufamt für Grundbau, Bodenmechanik und Felsmechanik der Technischen Universität München.

Vice-Chairmen:
Dr.-Ing G. Heerten, Naue Fasertechnik GmbH & Co, Lübbecke
Dr. W. Wilmers, Baustoff-und Bodenprüfstelle, Wetzlar

reported by
Univ.-Prof. Dr.-Ing. R. Floss
Head, German IGS Chapter

Committee For International Geosynthetics Society (India)

1.0 Fourth General Body Meeting of CIGSI

The fourth general body meeting of the committee was held on 25 Nov 1997 at Bangalore. The meeting was chaired by Mr. H.V. Eswaraiah, President of the Committee. Dr. G.V. Rao, Dean (Student Affairs) and Professor, Civil Engineering Department, IIT, Delhi was elected as the new president of the committee during the meeting. The committee placed on record its deep appreciation and gratitude to Mr. H.V. Eswaraiah, the outgoing president of the committee.

Mr. A.R.G. Rao, Director-cum-Treasurer of CIGSI was redesignated as Treasurer of CIGSI.

2.0 Geosynthetics Asia'97 - First Asian Regional Conference

The Committee for International Geosynthetics Society (India) and the Central Board of Irrigation and Power organized the First Asian Regional Conference "Geosynthetics Asia'97" in Bangalore (India) from 26-29 Nov 1997, under the auspices of the IGS.

The Central Board of Irrigation and Power as a part of technology forecasting activities, identified in 1985 the use of geotextiles and geosynthetics as futuristic but simple technology. After continued efforts, the use of geosynthetics has reached more than one billion m². per year and is increasingly being accepted as a building and construction material not only in developed countries but also in the developing nations whether it is for highways, maintenance of slope stability or land slip repair, quick construction of bridge abutments, construction on soft soils, erosion control works, dams, tunnels, fly-overs, or tailing dams.

A limited experience has been gained in some of these applications, yet the scope is so large that the actual use can be stated as almost insignificant. Keeping this in view, the First Asian Regional Conference "Geosynthetics Asia'97" was organized.

The conference was inaugurated by the Governor of Karnataka, Mr. Khurshed Alam Khan, on 26 Nov 1997. The inaugural function was presided over by the Hon. Minister for Major and Medium Irrigation, Govt. of Karnataka, Mr. K.N. Nage Gowda.

At the outset of the inaugural function, Mr. K. Shivashankar, Secretary to Government of Karnataka, Irrigation Department and Chairman, Organizing Committee of the conference, welcomed the dignitaries and the participants. Mr. C.V.J. Varma, Member Secretary, the Committee for International Geosynthetics Society (India) (CIGSI) and the Central Board of Irrigation and Power (CBIP), presented a brief account of the activities of CIGSI and CBIP. Mr. Chris Lawson, Chairman, Asian Activities Committee of IGS and Member, IGS Council, also addressed the participants.

The Governor of Karnataka, presented the second series of the following awards:

1. IGS India - Tenax Excellence Award to Prof. G.V. Rao, Dean (Student Affairs), IIT, Delhi.
2. IGS India - Tenax Technology Award to Mr. M.N. Decate, Executive Engineer of Public Works Department, Maharashtra (India).

The IGS India - Tenax Excellence Award carries a cash prize of Rs.20,000, citation and a plaque, whereas IGS India - Tenax Technology Award carries a cash prize of Rs.5,000 and a plaque.

The biannual awards were instituted by Committee for International Geosynthetics Society (India) in association with Tenax Group, to honor and recognize the services of the individuals for their outstanding contribution to the development of the discipline of geosynthetics in India.

In addition to the above, the following publications were also released by the Governor of Karnataka:

- Bibliography - The Indian Contribution to Geosynthetics
- Directory of Geosynthetics in India

More than 50 papers contributed by the experts from as many as 13 countries including India, were presented. Prof. G.V. Rao, Dean (Student Affairs), IIT, Delhi and Chairman, Technical Committee of the conference, acted as Coordinator for the technical sessions.

275 delegates from Bhutan, Canada, Germany, Hong Kong, Hungary, India, Italy, Japan, Malaysia, Netherlands, Sweden, UK, and the USA participated in the conference.

An exhibition was also organized along with the conference, to enable the participants to interact with representatives of leading manufacturers and organizations regarding the use of geosynthetics in civil engineering.

The exhibition was inaugurated by Hon. Minister for Major and Medium Irrigation, Govt. of Karnataka, Mr. K.

N. Nage Gowda, on 26 Nov 1997.

Leading companies from Canada, Italy, The Netherlands, the UK, USA and India participated in the exhibition.

The valedictory function, on 29 Nov 1997, was presided over by Mr. K.C. Reddy, Chairman, Technical Advisory Committee for Irrigation Projects, Govt. of Karnataka. Prof. A. Sridharan, Advisor, Indian Institute of Science, Bangalore (India), delivered the Valedictory Address. Mr. P. Rimoldi, Member, IGS Council and Director, TENAX S.p.A., Italy, also addressed the participants.

Mr. K. Shivashankar, Chairman, Organizing Committee announced the recommendations of the conference. A vote of thanks was proposed by Mr. P. N. Thussu, Consultant, CBIP.

3.0 IGS Asian Activities Committee (AAC)

The International Geosynthetics Society has approved the formation of IGS Asian Activities Committee, as proposed by CIGSI and CBIP. The IGS AAC would act as a coordinating and facilitating body within Asia for IGS sponsored activities.

At present, Mr. Chris R. Lawson of Malaysia and Professor H.S. Chung of Korea are nominated as Chairman and Vice Chairman respectively of IGS AAC by the IGS Council. Each Asian IGS Chapter will have automatic representation on IGS AAC through a nominated representative.

The inaugural meeting of the IGS AAC was held in Bangalore on 27 Nov 1997 during Geosynthetics Asia'97.

In the inaugural meeting, the committee accepted the offer of CIGSI to act as secretariat of IGS AAC. Mr. C.V.J. Varma will be the Secretary of IGS AAC.

4.0 Publications Brought Out by the Committee

- Proceedings of "Geosynthetics Asia'97"
- Bibliography - The Indian Contribution to Geosynthetics
- Directory of Geosynthetics in In-

dia, Volume-II

5.0 News Bulletin

The committee publishes a News Bulletin twice a year, published in January and July. The latest issue was July 1997. The 7 Jan 1998 issue is in press.

6.0 Forthcoming Events

6.1 Workshop on "Use of Geosynthetics in Water Resources Projects", April 1998, Port Blair, India. (Tentative).

6.2 Seminar on "Contribution of Large Dams in Economic Development of India", 21-23 Apr 1998, Vadodara, India.

6.3 Symposium on "Rehabilitation of Dams", 4 Nov 1998, New Delhi, India.

6.4 Workshop on "Financing and Private Sector Participation in Water Resources Projects", 6th Nov 1998, New Delhi, India.

6.5 Workshop on "Role of Geosynthetics in Hill Area Development", November 1998, Kathmandu, Nepal. (Tentative).

For further details please contact:

C.V.J. Varma

Member Secretary

Committee for International Geosynthetics Society (India)

c/o Central Board of Irrigation and Power

Plot No.4, Institutional Area

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New Delhi-110 021, India

Tel.: +91-11-611 5984/611 6567

Fax: +91-11-611 6347

*submitted by A.R.G. Rao
Treasurer, CIGSI*

Italian Chapter (AGI-IGS) (March 1997 - March 1998)

Activities

1. Collaboration with BolognaFiere for the organization of EuroGeo 2, Second European Geosynthetics Conference and Exhibition (Bologna, 15 - 18 Oct 2000) and preparation of the preliminary invitation bulletin (circulated in Atlanta, during the 6th International Conference on Geosynthetics).

2. Organization of the 11th Italian Conference on Geosynthetics (Bologna, 15 Oct 1997) attended by more than 130 persons. The main theme of the confer-

ence was "Geosynthetics in roadways and railways", including the introductory lecture by P.V. Righi, 12 oral presentations subdivided into 4 main sessions (embankments, tunnels, road pavements and retaining structures) and a special session devoted to standards and quality control.

3. Organization of the first bilateral meeting between the Italian and French IGS chapters (Milano, 30 Oct 1997) to discuss common issues.

4. Organization of a technical visit to the Geosynthetics Laboratory of Tenax Spa in Viganò Brianza (1 Mar 1998) attended by 14 persons.

Membership and Officers

Corporate Members: 2

Individual Members: 129

Student Members: 9

President: Andrea Cancelli

Vice Presidents: Daniele Cazzuffi and Pietro Rimoldi

Secretary-Treasurer: Pierpaolo Fantini

Council Members: Ezio Baldovin, Alessandro Ghinelli, Michele Maugeri, Leonardo Sarti, Alberto Scuero.

*reported by Daniele Cazzuffi
Vice President of the Italian Chapter*

Korean Chapter (KC-IGS)

1. Annual National Conference

The Korean Chapter-IGS and Korean Geotechnical society hosted the 1997 annual Geosynthetics Conference on 28 Nov 1997 in Seoul, Korea. Prof. Richard J. Bathurst from the Royal Military College of Canada was the Keynote Speaker. The title of the Keynote Lecture was "Recent Developments in Geosynthetic Reinforced Segmental Retaining Wall Technology." Attendance was about 160 and 11 geosynthetics-related companies. The papers presented in the conference were: Analysis on Geogrid-Reinforced Wall Behavior, Finite Element Analysis on Mechanical Stabilized Earth Retaining Wall Behavior, Site Monitoring of the Retaining Wall Reinforced by Geogrid with Block Type Facings, Cost Analysis of Reinforced Soil Wall with Various Analysis Conditions, Long-Term

Performance Test for Geosynthetic Reinforced Soil, Bearing Capacity of Strip Footing Adjacent to Geosynthetics-Reinforced Slopes, Applicability of Prefabricated Horizontal Drain for Improvement Method of Soft Ground, A Study on Application of Lateral Plastic-board Drains for Drainage Improvement of Continuous Moist Paddy Fields, The Study on the Strength of HDPE on a Side-slope Liner System of Waste Landfills, The Effect of Scratch on Bursting Behavior of Geomembrane (I): Short-Term Behavior.

On the day following the conference, Prof. Richard J. Bathurst gave a Special Seminar titled "Seismic Induced Permanent Displacement of Geosynthetic-Reinforced Segmental Retaining Walls" at the E&S Engineering Co., Seoul, Korea.

2. Technical Trips

The KC-IGS organized two technical trips to visit geosynthetics application sites. (1) Sam-Jim Apartment construction site of geosynthetic-reinforced wall located in the suburb of Seoul on 20 Feb 1997. (2) Soft soil stabilization site using plastic board drain located in Cholra Province on 24 May 1997.

3. Book Publication

The Korean version of "Geosynthetics Design & Construction Guidelines" is now available in Korea. This work was sponsored by the Ministry of Construction & Transportation and the Korean Geotechnical Society. This book covers the various aspects of civil engineering works such as types of geosynthetics, test methods, filtering and drainage, separation in road construction, embankment construction, reinforced walls, slope stabilization, vertical drains, and geosynthetic liners.

4. 1998 Geosynthetics Events

The workshop "Geosynthetics Application in Various Field" will be held in Seoul, Korea 11-13 Feb 1998, '98 Geosynthetics Conference in Nov 1998, Seoul, Korea.

5. Corporate Membership

Three corporate members joined the IGS in 1997 for a total of five.

*reported by Prof. Eun Chul Shin
University of Incheon
Korean Chapter Secretary*

Romanian Chapter

Activities:

The General assembly of RAGG was organized in February 1997. Details concerning the activity for 1997 and the possibility of organizing the National Geosynthetics Symposium in 1998 were discussed.

The third Bulletin of the Romanian Association for Geotextiles and Geosynthetics was printed and published in February 1997.

A short course of lectures was organized in April 1997 by the Faculty of Land Reclamation and Environmental Engineering, concerning the use of geosynthetics for landfill technologies.

A geotextiles symposium was prepared in May 1997 together with a Romanian producer of geotextiles - Minet Rm. Valcea S.A. The topic of the symposium was "The problems and perspectives concerning the use of geosynthetics in Romania."

A technical tour was organized in June 1997 near the city of Craiova. The people participating in this tour saw an industrial waste disposal and a geogrid reinforced road.

A symposium organized by RAGG was held in July 1997, on geosynthetics in road construction maintenance technologies.

A symposium was held, organized by RAGG, in September, on protection of river embankments using woven geotextiles (case study-Danube River).

A technical symposium was organized in December 1997, regarding the specific use of woven geotextiles for different applications. This symposium benefited from the participation of a textile expert from Belgium.

In December 1997, the executive committee established the final details con-

cerning the National Geosynthetics Symposium to be held in June 1998.

Publications:

The first RAGG Bulletin was printed in February 1996. The fourth RAGG Bulletin was printed and published in February 1998.

Membership and Officers:

President: Dr. Valentin Feodorov - Index Group Ltd.

Vice Presidents: Mr. S. Constantinescu - Institute for Transport Designs, Prof. Corneliu Mitoiu - Ministry of Waters, Forest, and Environmental Protection.

Secretary General: Mrs. Magdalena Bostenaru - Institute for Textile Research.

Treasurer: Mrs. Mariana Olteanu - Iridex Group Ltd.

Editorial Board Secretary: Mr. Bogdan - Tronac-Iridex Group Ltd.

*reported by Dr. Valentin Feodorov
President, RAGG*

IFAI Forms Geosynthetic Materials Association

The Industrial Fabrics Association International (IFAI), Roseville, MN, USA, recently announced the reorganization of the its individual Geomembrane and Geotextile divisions into a single Geosynthetic Materials Association (GMA). The move was prompted by the need to further emphasize business and development issues. GMA activities further acceptance and use of geosynthetic materials in a variety of applications. Its membership represents all segments of the geosynthetics industry, including manufacturers as well as companies that test or supply materials or services to the industry.

GMA has two categories: Executive Council and General. The Executive Council members (suppliers of geosynthetic materials) serve as the board of directors for the association and manage its finances and bylaws. General members represent any segment of the geosynthetic industry.

GMA consists of two committees which are comprised of Executive Council and General members. These committees and their related task groups will focus on specialized issues in an effort to help advance the industry.

GMA plans to take a proactive approach to focus on five areas: engineering support, business development, education, government and industry relations, and geosynthetic industry recognition. With this approach, all GMA members will have the opportunity to play a vital role in the advancement of the geosynthetics industry.

For more information on GMA, contact Miss Danette Fettig, GMA Managing Director, 1808 County Road B West, Roseville, MN, 55113, USA.

*reported by Arik Hanson
Industrial Fabrics Association International*

EAGM Formed by Anders Kroer

The European Association of Geotextile and Geotextile Related Product Manufacturers (EAGM) was officially organized and registered in October 1997 under French law. The EAGM represents 90 percent of the European geotextile and geotextile related product manufacturers.

The objective of this association is to group together its members for the purpose of undertaking and carrying out all functions of a general nature relating to the development of geotextiles in Europe.

Among the first tasks the EAGM is concentrating on are:

- Establishing certification of products applicable to all European Community countries,
- Striving to establish free circulation of geotextiles in the European Community by excluding any system of protection that may be established by a member country for the purpose of denying access of one or more geotextiles to its market,
- Promoting and maintaining a level or quality for geotex-

tiles without introducing criteria that discriminate between types of fabrication,

- Officially representing EAGM members versus European authorities and laboratories authorized to European Standards.

The European Geotextile Manufacturers are very quality conscious and are aware of the important role their products play in construction. It seems counterproductive and costly for each European Country to require a separate certification program, causing an extra barrier to free trade among the European countries.

The EAGM strongly advocates a uniform European certification system. This European certification system has to be based on the established European Norms and carried out by European approved certification institutes.

The officers are Mr. Harry Groenendaal, Chair, and Mr. Anders Kroer, Secretary.

*submitted by Anders Kroer
Secretary, EAGM*

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.

GSE Lining Technology, Inc. Houston, Texas, USA

by Mr. Joseph G. Young, Vice-president of Sales and Marketing

GSE Lining Technology, Inc. (GSE) is a very experienced manufacturer, distributor and installer of geomembrane lining systems and products used world-wide in a range of containment applications for the prevention of groundwater contamination and environmental damage. Gundle/SLT Environmental Systems, Inc., the parent company of GSE, was formed in 1995, resulting in over 27 years experience developing liner products, complementary products and services. GSE assures high quality products with extensive quality assurance programs. The company's Quality Control / Quality Assurance Programs extends from resin specification through field installation. GSE tests all raw material prior to acceptance. All GSE sheet is spark tested for pinholes during the manufacturing process.

GSE provides an extensive family of geosynthetic products for environmental solutions, including geomembranes, geocomposites, geonets, geosynthetic clay liners, concrete embedment and other geotechnical products including geotextiles and geogrids. GSE operates six manufacturing facilities located in Texas(2), South Dakota(1), Germany(1), Egypt(1) and the UK(1). Five of the facilities manufacture flexible geomembranes using either the state-of-the-art flat-cast process or round die co-extrusion technologies. GSE liner is available in seamless widths ranging from 4m (13 feet) to 10.5m (34.5 feet) with thickness of 0.5 to 6.0 mm (20 to 240 mils). GSE's capacity for standard geomembranes is in excess of 200 thousand square meters (2 million square feet) per day. The South Dakota facility manufactures a unique geosynthetic clay liner with polyethylene backings ranging from 0.4 to 1.5 mm (15 to 60 mils).

Management of liner projects begins with Regional Sales Managers who present GSE's capabilities for consideration and assist with materials. Owners of almost 300 million square meters (3 billion square feet) of lining material have used GSE's Technical Support Department for geosynthetic expertise and guidance and have utilized GSE's global installation experience for liner system construction. GSE's Drafting Department provides proposed panel layouts and can assist with details to help facilitate design. The Fabrication Group provides prefabrication of piping, panels, and specialty items associated with geotechnical and industrial lining applications. GSE supplies all materials needed for liner system design including patented, state-of-the-art welding equipment. GSE assistance is available globally to work with local offices.

GSE has a wide network of dealer/installers. GSE provides customers with turnkey liner systems anywhere in the world. The GSE construction staff includes Projects Managers, Site Managers, Welding Technicians and Quality Control Technicians.

For further information, contact:

Mr. Joseph G. Young

Vice-president of Sales and Marketing

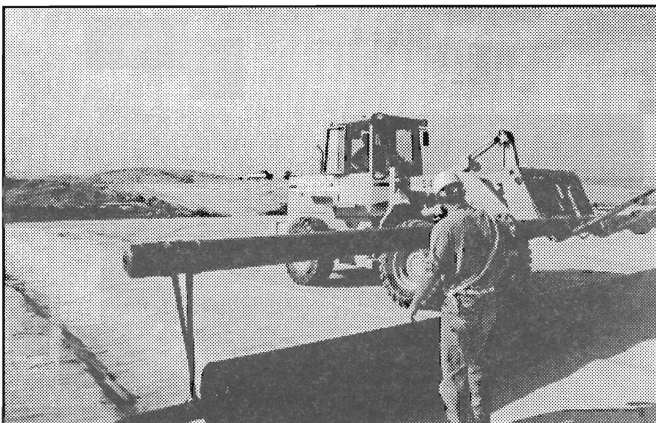
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19103 Gundle Road

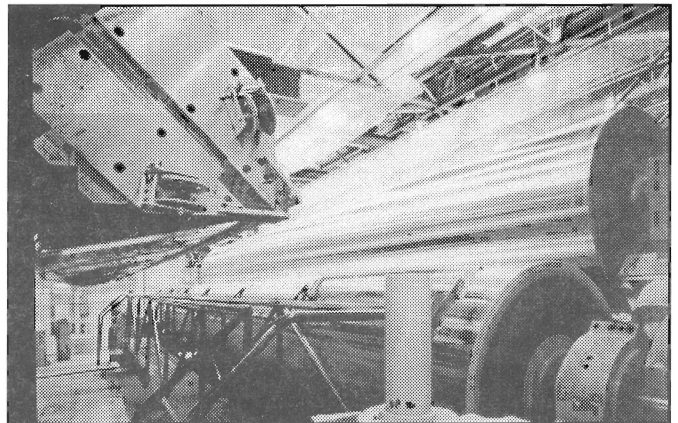
Houston, TX 77073 USA

Tel.: 1(800) 435-2008 Fax: 1 (281) 875-6010

GSE Lining Technology, Inc. has been a Corporate Member of the IGS since 1988.



GSE liner installation.



GSE manufacturing facility.

Geosynthetics International ***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.

The Editor of *Geosynthetics International* (Dr. T.S. Ingold), Co-Editor (Prof. R.J. Bathurst), and Chairman of the Editorial Board (Dr. J.P. Giroud) have more than 30 years of combined experience with the publication of technical 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. Rapid publication of papers provides subscribers with current papers covering geosynthetics research, design, construction methods and important case studies. Only papers peer-reviewed by experts are published. The journal has published over 750 pages of technical papers, technical notes, and discussions in each volume of the last two years. Special issues devoted to specific, state-of-the-art topics have included "Design of Geomembrane Applications" and "Liquid Migration Control Using Geosynthetic Liner Systems". A third special issue titled "Geosynthetics in Earthquake Engineering" was published in April 1998.

Geosynthetics International is dedicated to the mission of the IGS which is to promote the scientific and engineering development of geotextiles, geomembranes, related products, and associated technologies. *Geosynthetics International* offers a reduced subscription rate to individual IGS

members. Individual IGS members can subscribe for US \$129 per 6 issues. *Geosynthetics International* is offered to university and college libraries at US\$138 per 6 issues. The standard rate of US\$225 applies to all others.

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

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

Geotextiles and Geomembranes ***an Official Journal of the IGS***

Volume 14 of *Geotextiles and Geomembranes* was completed earlier this year, when issue 12 was published. This issue presented the results of the First Germany/USA Geomembrane Workshop held in Berlin. S. Corbet and M. Peters served as Guest Editors.

This was rapidly followed by the publication of Vol. 15, issues 1-3. This Special Issue dedicated to the subject of Geofoam has proved very popular, mainly due to the high quality of the work compiled and edited by Professor John Hovarth.

Volume 15 with issues 4-6 was mailed out in May. This volume, containing the best papers presented at the 10th Geosynthetics Research Institute Conference, is edited by Dr. Robert Koerner.

Professor R. Kerry Rowe has been extremely busy editing *Geotextiles and Geomembranes* from volume 16

onwards, ensuring that the Journal returns to the publication schedule, and raising the quality of material it contains. Volume 16, issue 1 and 2, have also been published and herald a bright era for the Journal, as this innovative field of engineering progresses.

All technical contributions and inquiries should be directed to:

Professor R. Kerry Rowe
Department of Civil and Environmental Engineering
The University of Western Ontario
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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

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D 81245 München

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submitted by Jim Hough, Publishing Editor



Calendar of Events



World Road Association (PIARC)
Granada, Spain, 11-13 Nov 1998
Contact: Asociacion Tecnica de Carreteras,
C/ Monte Esquinza, 24, 40 Dcha., 28010 Madrid, Spain
Tel.: 34 (91) 308 23 18 Fax: 34 (91) 308 23 19
<http://www.piarc.inrets.fr>

12th Annual GSI Conference
Philadelphia, PA, USA, 8-9 Dec 1998
Contact: Marilyn Ashley, Geosynthetic Institute
475 Kedron Ave, Folsom, PA 19033 USA
Tel.: 1 (610) 522-8440 Fax: 1 (610) 522-8441

Symposium on Grips, Clamping Techniques, and Strain
Measurement For Testing Geosynthetics
Memphis, TN, USA, 28 Jan 1999
Contact: ASTM, 100 Barr Harbor Dr.
West Conshohocken, PA 19428-2959 USA
Tel.: 1 (610) 832-9500 Fax: 1 (610) 832-9635
email: service@astm.org <http://www.astm.org>

6th National Conference on Geosynthetics in Geotechnique,
Munich, Germany, 2-3 Mar 1999
Contact: R. Floss, TU Munich, Lehrstuhl für Grundbau,
Baumbachstr. 7, D-81245 Munich, Germany, Tel.: 89 289
27131 Fax: 89 289 27189, email: fskgeo@lrz.tu-muenchen.de

Geosynthetics 99
Boston, MA, USA, 28-30 Apr 1999
Contact: Jeanne McGovern, IFAI, 1801 County Road B W,
Roseville, MN 55113-4061 USA

Tel.: 612-222-2508 Fax: 612-631-9934
email: jlmcgovern@ifai.com <http://www.ifai.com>

Sardinia 99 - 7th International Waste Management and
Landfill Symposium
Cagliari, Italy, 4-8 Oct 1999
Contact: EuroWaste, Via Altinate 96, I - 35121 Padova, Italy
Tel.: +39 049 663 860 Fax: +39 049 663 960
email: eurowaste@tin.it

EuroGeo 2 Second European Geosynthetics Conference and Exhibition

Bologna, Italy, 15-18 Oct 2000
Contact: Susanna Antonielli, AGI-IGS
Piazza Bologna 22, I - 00162 Roma, Italy
Tel.: +39 06 4424 9272 Fax: +39 06 4424 9274
email: agi@mercurio.it

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

Rio de Janeiro, RJ, Brazil, 20-22 Oct 1999
Contact: Dr. M. Ehrlich, Coppe/Federal University of Rio de
Janeiro, Cidade Universitaria, C.P. 68506, 21945-970 Rio de
Janeiro, RJ, Brazil, email: me@GEOTEC.COPPE.UFRJ.BR

7th International Conference on Geosynthetics

Nice, France, 22-27 Sep 2002
Contact: 7th IGC, 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 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.

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

The IGS Council

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Officers of the IGS

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Geofelt GmbH - Austria (1996)
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Geotechnics Korea Ltd. - Korea (1998)
Geotop Corporation - Japan (1994)
Golden-Pow Co., Ltd. - Korea (1996)
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Hong Kong Geosynthetics - Hong Kong (1996)
Hong Leong Plastics Pte Ltd. - Singapore (1994)
Huesker Synthetic GmbH & Co. - Germany (1987)
Industrial Fabrics Association International (IFAI) - USA (1985)
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Kumagai Gumi Co., Ltd. - Japan (1987)
Kuraray Co., Ltd. - Japan (1989)
Maccaferri do Brazil Ltda. - Brazil (1998)
Maeda Corporation - Japan (1988)
Maeda Kosen Co., Ltd. - Japan (1992)

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Nittoc Construction Co., Ltd. - Japan (1994)
Obayashi Corporation - Japan (1988)
Officine Maccaferri S.P.A. - Italy (1997)
Okasan Kogyo Co., Ltd. - Japan (1984)
Pavco S.A. - Colombia (1991)
Poly-Flex, Inc. - USA (1996)
Polyfelt Ges.m.b.H - Austria (1984)
Presto Products Company - Geosystems Division - USA (1996)
Reliance Industries, Ltd. - India (1998)
Sewon Geosyntech Co. Ltd. - Korea (1997)
Shimizu Corporation - Japan (1990)
Solmax International, Inc. - Canada (1997)
Steel Dragon Enterprise Co., Ltd. - Taiwan (1996)
SVG Geschaefsstelle Rueeger Systems AG - Switzerland (1984)
SVUG - Czech Republic (1993)
Synthetic Industries Inc. - USA (1991)
Taiyo Kogyo Co., Ltd. (Ocean) - Japan (1996)
Taiyo Kogyo Corporation (Sun) - Japan (1991)
Tanaka Co., Ltd. - Japan (1993)
TC Mirafi - USA (1998)
Tele Textiles AS - Norway (1995)
Ten Cate Nicolon B.V. - Netherlands (1984)
Tenax SpA - Italy (1991)
Terram Ltd. - UK (1988)
Thai Nam Plastic Public Co., Ltd. - Thailand (1994)
The Reinforced Earth Co. - USA (1989)
The Tensar Corporation - USA (1989)
The Zenitaka Corporation - Japan (1992)
Tokyu Construction Co., Ltd. - Japan (1984)
note: date is earliest year of continuous membership

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.
- Reduced registration fee and preferential treatment at all conferences organized under the auspices of the IGS.
- Reduced subscription fee for IGS endorsed journals.
- A central system for ordering selected publications.
- Possibility of earning an IGS award.

IGS MEMBERSHIP APPLICATION

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.

Attach card or fill in your address as you wish it to appear in the next IGS Directory

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USA

email: IGSSEC@AOL.COM
Tel.: 1 (864) 855-0504
Fax: 1 (864) 859-1698

- **Eligibility** (i.e. connection with geotextiles, geomembranes, related products and associated technologies)

PAYMENT

Membership fee schedule: Individual US\$45 Corporate US\$1000 Benefactors contribution (at least US\$200)

Mode of Payment:

Check enclosed

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Credit Card (circle one) MasterCard/Visa American Express

Account no.: _____

Expiration date: _____

Signature: _____

Name on card: _____

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