

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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Announcing the Candidates for IGS Council: Term 2004 to 2008

A call for candidates for the IGS Council appeared in the March, July, and November 2003 issues of *IGS News* and was posted on the IGS web site, www.geosyntheticssociety.org.

We are delighted to report that the response has been very positive with a total of 17 declared candidates for the eight available council positions. The geographical diversity of the candidates is a positive sign, reflecting the amount of outreach and growth that the IGS has experienced in recent years.

The following five candidates are standing for re-election: J. Cowland, D. Fettig Halloran, M. Kamon, M.-L. da Costa Lopes, and B. Myles. E.-S. Lee decided not run for re-election.

The remaining 12 candidates standing for election are A. Bouazza, P. Fantini, V. Feodorov, N. Freitag, H. Girard, V. Herle, C. Jenner, M. Kermani, G. Li, M. Sadlier, E. Shin, and J. Zornberg.

The IGS bylaws stipulate that a Council Member may only serve two

consecutive four-year terms and, thus, the following individuals were not eligible to run as candidates in this Council election: J. Lafleur and J. Paul.

Election of candidates will be held by postal ballot in April 2004 for a four-year term, starting in June 2004. Biographies of the candidates are below and will also appear with the election ballot package that IGS Members will receive by the end of April 2004.

IGS Members are asked to carefully read the biographical information and consider the merits of the individual candidates with respect to geographical location and background. It is important that the IGS Council be comprised of motivated individuals who reflect the geographical breadth of the Society and the wide range of disciplines and experience associated with the Society.

2003 in Review and Upcoming Events in 2004

The Year 2003 was witness to the Society's 20th Anniversary. In the Novem-

ber 2003 *IGS News*, Daniele Cazzuffi, IGS President, commented on the past, present, and future of the IGS. The IGS Past Presidents (J.P. Giroud, R.K. Rowe, C.J.F.P. Jones, and R.J. Bathurst) each provided valuable insight on a specific geosynthetics application; collectively, their insight represents many decades of geosynthetics experience. Also, Prof. William van Impe, ISSMGE President, described a possible framework for improved collaboration between international geotechnical societies.

Looking ahead, 2004 is gearing up to be a very exciting year for the IGS. First, *EuroGeo3* is being held in March, then *GeoAsia 2004* in June, followed by *GeoFilters 2004* in October. These conferences are in addition to the IGS Council Elections and the announcement of the recipients of the IGS Awards and the IGS Student Awards.

*reported by Karina McInnis
IGS News Editor*

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NEW IGS MEMBERSHIP BENEFITS REQUIRE ELECTRONIC COMMUNICATION

Visit the IGS WWW site: www.geosyntheticssociety.org

IGS Council Member Candidates

Abdelmalek Bouazza

Dr. Abdelmalek Bouazza is an Associate Professor in Geotechnical Engineering and Head of the Geomechanics Group at Monash University, Melbourne, Australia. He received his diploma in Civil Engineering in 1984 from the Ecole Nationale Polytechnique d'Alger (Algeria) and his Ph.D. in 1990 from the University of Glasgow (United Kingdom). Dr. Bouazza has been conducting research on geosynthetics for the past 15 years. His skills and experience are focused on soil reinforcement, barriers systems for waste containment systems, and soil and ground water remediation using geosynthetics. He has authored/co-authored more than 120 papers and serves on a number of national and international technical committees. Currently, he is the President of the Australasian Chapter of IGS. He is a member of ISSMGE TC5 (Environmental Geotechnics) and a corresponding member of the International Association for Engineering Geology and the Environment (IAEGE) Committee No. 14 on Waste Disposal, a member of Standard Australia Committee on Geosynthetics, and Editorial Board Member of *Geotextiles & Geomembranes* and the *Journal of Lowland Technology*.



John Cowland

John Cowland is an independent consulting engineer based in Hong Kong, China. He provides advice on geosynthetics and geotechnical engineering throughout the Asia Pacific region. After graduating in Civil Engineering, John completed a Master's degree in Soil



Mechanics at Imperial College, London. He then worked in Britain and the Netherlands for five years before moving to Hong Kong 25 years ago. Initially working on slopes and tunnels, he was assigned to work on solid waste landfills in 1986. He soon became involved in the design of liner systems for a new generation of landfills, which led to a continuing interest in the use of geosynthetics in all aspects of civil engineering. He has published over 30 papers on geosynthetics and geotechnical engineering. Mr. Cowland is Chair of the IGS Policy Committee and Secretary of the IGS Asian Activities Committee. If re-elected to the Council, he would like to continue to take an active role in the IGS and to promote the use of geosynthetics in the region.

Pierpaolo Fantini

Pierpaolo Fantini obtained his Chemical Engineering Degree in 1982 from the University of Trieste, Italy. Since 1984, he has been involved in developing geosynthetic design specifications and construction techniques for civil engineering projects in Italy, Slovenia and Croatia, particularly in soil reinforcement, drainage systems and erosion control. He is the author of numerous papers presented at national and international conferences. Presently, he is managing director of Huesker Italy in Trieste. Since 1995, he has been an active member of various CEN TC 189 (Geosynthetics) Working Groups, in addition to being a member of ISSMGE TC 3 (Geotechnics of Pavements). Since 1989, he has been Treasurer of the Italian Society for BioEngineering (AIPIN). Mr. Fantini was a Board Member of the *EuroGeo 2 (Second European Geosynthetics Conference and Exhibition)* Organising Committee in Bologna, Italy, in October 2000. In 2003, he was elected



Vice-President of AGI-IGS, the Italian Chapter of IGS.

Nicolas Freitag

During Mr. Freitag's engineering studies at the Ecole Nationale des Ponts et Chaussées (ENPC) in Paris, France, he spent a 12-month training period in the Research and Development (R&D) Department of Terre Armée Internationale. This training led him to work on design and justification methods of reinforced soil structures for the companies Reinforced Earth and Freyssisol, as well to other R&D projects. During his last year of study, he specialised in geotechnics and modelling at the Ecole Centrale de Paris. After graduating in 2001, Mr. Freitag joined the R&D team of Reinforced Earth, which had in the meantime merged with the R&D Department of Ménard Soltraitement (both companies belong to the Freyssinet Group). His activities in the company comprise technical assistance to the many Reinforced Earth companies worldwide and their respective R&D programs. In particular, his work involves promoting the use of geosynthetic reinforcing strips and developing new systems and applications that also use steel reinforcement. Mr. Freitag's special interests are long-term geosynthetic durability, innovation in geosynthetic reinforcement, concepts, and design methods, and new numerical methods.



Valentin Feodorov

Dr. Feodorov is President of the Romanian IGS Chapter and has held this position since 1996. He has been promoting geosynthetics for more than 12 years and



will continue to do so if elected to Council. In 1997, he obtained his Ph.D. from the Technical University of Civil Engineering Bucharest. In 1990, he became an Associate Professor at the Faculty of Environmental Engineering and Land Reclamation – University of Bucharest (teaching geosynthetics) and co-founder of Iridex Group, a private company dealing with geosynthetics. Dr. Feodorov is the author of the book *Soil Reinforced with Geosynthetics* and co-author of the two volumes titled *Geosynthetics in Civil Engineering*. He has published many geosynthetics-related papers. He is President of the Romanian Solid Waste Management Association (full member of the International Solid Waste Association), a member of the International Society for the Trenchless Technology, and a member of the International Society for Soil Mechanics and Geotechnical Engineering.

Hugues Girard

Dr. Hugues Girard was the Scientific Secretary of the 7th International Conference on Geosynthetics held in Nice,



France, in 2002, which was organised by the French IGS Chapter (CFG). He is involved in the activities of the CFG as Vice-President and Convenor of the Working Group on Puncturing Resistance of Geomembranes. Over the last 10 years, he has been involved in geosynthetics standardisation at the European level and the organisation of geosynthetics-related conferences held in France (e.g., he was Chair of *Rencontres 99*, a bi-annual conference on geosynthetics, and co-organiser of two conferences on geosynthetics for dams). He is a member of the International Working Group “Geomembranes for Dams” of the International Commission on Large Dams (ICOLD). Dr. Girard studied civil engineering at the *INSA* in Lyon and obtained his Ph.D. at the University of Bordeaux. He has worked for

Cemagref (French Research Institute in Agricultural and Environmental Engineering) since the beginning of his career in 1972. During the first 15 years, he studied the design of earth dams and managed the Soil Mechanics Laboratory. He then became a geosynthetics research engineer, focusing on geomembranes-soil interface behaviour research (e.g., stability on slopes, damage, and durability). He has published approximately 50 papers as author or co-author and has chaired sessions and reviewed papers for international geosynthetics conferences (*EuroGeo 1, 2 and 3*, and the *Sixth and Seventh International Conference on Geosynthetics*).

Danette Fettig Halloran

Danette Halloran has worked with the geosynthetics industry for 14 years. She edited *GFR*



magazine from 1990 to 1995, transforming the publication from its early, small circulation domestic format into an international discussion of geosynthetic design and selection. This coincided with major developments in the field, and particularly with the IGS. In 1994, the Industrial Fabrics Association International (IFAI), in a joint venture with the IGS, developed the technical journal *Geosynthetics International*. Halloran, representing IFAI, helped to develop the establishment of the paper protocol and marketing strategy of the Journal. Following that, she served as the Secretary-General for several industry conferences including the *Sixth International Conference on Geosynthetics*, *Geosynthetics '97*, *Geosynthetics '99*, *Geosynthetics '01* and *Geosynthetics '03*. She presently serves on the Organizing Committee for *GeoFrontiers 2005*. Along the way, she served as an advisory committee member for numerous industry-affiliated conferences as well as the division manager for the IFAI Geotextile and Geomembrane Divisions. In 1998, she worked with industry to

establish the Geosynthetic Materials Association (GMA, a division of IFAI). She is currently its Managing Director. She was elected to the IGS Council in 2000.

Vitezslav Herle

Vitezslav Herle is a Czech civil engineer, who has been working as geotechnical consultant for 34 years on engineering projects worldwide (e.g., Tran Saharan Road in Algeria, Mali and Niger; landslide stabilisation in Peru; construction of industrial complexes in Cuba; reconstruction of highways and bridges in Laos; road rehabilitation and landslide protection in Nepal; highway construction supervision in the Philippines; motorway feasibility studies in Uzbekistan; public works projects in Jordan; and reinforced retaining wall design in Serbia). Mr. Herle's particular interests are the use of geosynthetics for soil improvement and soil strengthening. In 1997, he prepared (together with Prof. Vanicek) the first Czech design code, TP97, on the use of geosynthetics in highway construction. He was member of the CEN/TC 288/WG9 (Reinforced Soil and Soil Nailing) that prepared the proposal of prEN 14475 on Reinforced Fill, and he is currently a member of ISSMGE TC9 (Soil Reinforcement). He was Chair of General Session B11G “Embankments on Soft Soil” at the 7th International Conference on Geosynthetics held in Nice, France, in 2002.



Chris Jenner

Chris Jenner is the Chief Civil Engineer of Tensar International Ltd. UK, where he is responsible for the Civil Engineering Design Group and Applications Research. He has been associated with the IGS for the past nine



years working for the UK IGS Chapter as Secretary, Vice-Chair, and Chair. During his tenure as Chair, the UK Chapter was accepted into the Ground Forum Group in the UK giving the membership the opportunity to discuss important issues for the ground-based industries at a very high level in Government. In 1998, he was an IGS Award winner along with three other IGS members for work on the British Standard BS8006, and he serves on the British Standards Institute Committee B524/6 (Reinforced Soil), which continues to review BS8006. He has been involved in the presentation of reinforced-soil design methods in North America and in the UK, and has worked with a number of universities at the Master's of Science level to increase the awareness of graduates to reinforced soil techniques and applications.

Masashi Kamon

Dr. Masashi Kamon is a Professor at the Graduate School of Global Environmental Studies, Kyoto University, Japan. He obtained his Doctoral Degree from Kyoto University in 1973. He conducts research in the area of ground improvement, particularly, research focused on improving the function of prefabricated band-shaped drains (PBDs) and developing geosynthetic horizontal drain material and its application to reinforced soft clay soil embankments. He is also involved in environmental geotechnics research and organized the *Second International Congress on Environmental Geotechnics* in Osaka, Japan, in 1996. He was awarded the Society Award for Authors by the Japan Society of Material Science in 1991 and 1997. He has published more than 130 papers in refereed international and national journals and conferences in the geotechnical field. He is the Secretary General of the Organizing Committee of the *16th International Conference on Soil Mechanics and Geotechnical*



Engineering that will be held in Osaka, Japan, in 2005. He has been an IGS Council Member since 2000 and is Chair of the Asian Activities Committee of the IGS.

Moghaddasadeh Kermani

Mr. Moghaddasadeh Kermani graduated from NJIT New Jersey Institute of Technology, USA with a B.Sc. in civil engineering 1983, a M.Sc. in geotechnics 1985, and a M.Sc. in construction engineering Management 1987. He is currently working toward his Ph.D. in Civil Engineering and has worked with well known US-based engineering firms, e.g., French and Parrello and Lounakamoli & Associates, in the field of geotechnical and environmental engineering with extensive use of geosynthetics materials. He currently works for Mokarrar Geosynthetic Engineering Company in Teheran, Iran as both the Director and Technical Representative. Mokarrar Geosynthetic Engineering consults and works on numerous geosynthetic applications projects, predominately geomembranes and composites. Mr. Kermani's goal is to disseminate geosynthetics science and technology knowledge to the developing nations of the Middle East region. As a Technical Representative in the Middle East region, he is confident that his dynamic participation in the Council would have fruitful outcomes, providing benefit to the IGS.



Guangxin Li

Dr. Li received his undergraduate (hydraulic engineering), M.Sc. and Ph.D. degrees in geotechnical engineering from Tsinghua University, China in 1966, 1981, and 1985, respectively. He has been a Professor at Tsinghua University since 1991, and held the title of



Academic Visitor at the University of Colorado at Denver, USA (1993) and at the National University of Singapore (1998). Dr. Li is Vice-President of the Chinese Institution of Soil Mechanics and Geotechnical Engineering, Academy Committee Member of Tsinghua University, Vice-President of the IGS Chinese Chapter, and Council Member of the International Association of Lowland Technology. He has conducted research in the field of geosynthetics for 20 years and has published more than 50 papers in the field. Under his supervision, six students have received either their Ph.D. or M.Sc. degrees in geosynthetics-related research.

Maria-Lurdes da Costa Lopes

Prof. Lopes graduated as a Civil Engineer from the Faculty of Engineering, Porto University, Porto, Portugal, in 1977. She received her Masters Degree from the New University of Lisbon, Portugal, in 1986 and her Ph.D. from Porto University in 1992. In 1982, she became a researcher at the Polytechnic School of Porto, and, in 1986, she joined the Faculty of Engineering staff at Porto University, where she currently is responsible for teaching several subjects, namely, geosynthetics in civil engineering, environmental control materials, and geosynthetics. Prof. Lopes' research interests are geosynthetics applications (mainly environmental applications) and environmental geotechnics. Since 1994, she has supervised the research of 20 students and is currently supervising nine (seven Ph.D. and two M.Sc. students). She has been involved in 16 research projects (three are still ongoing), being the principal investigator in 11. She has 102 scientific publications, 16 publications with students, and 58 consultancy reports. She is Vice-President of the Portuguese IGS Chapter and the representative from Portugal at CEN TC 189 (Geotextiles and Geotextile-Related Products) and ISSMGE TC



Bernard Myles

Mr. Bernard Myles is a Geosynthetic Consultant based in the United Kingdom and has been an IGS member since its formation. He requests your support for a second term on the Council after serving four years (2000 to 2004). Since his last election to Council, much has happened in the IGS with the high point being the 7th *International Conference on Geosynthetics* in Nice, France, in 2002. Nevertheless much goes on at the IGS grass roots level and, although the Council has significant ambitions and has achieved a great deal over the last four years, I feel that more authority and power has to be moved to the Chapter level, particularly for the large and well-established Chapters. The challenge of better integrating geosynthetic manufacturers' viewpoint into the Society's aims and goals remains. The diversity of the geosynthetics industry often hinders the formulation of a collective manufacturer's view and some thought must be given to establishing product or application sectors within the Society, which may better capture the industry's needs. Since the last election, the IGS Standards Committee has been amalgamated into the Education Committee; nonetheless, those on the Council, like myself, who have an active interest in Geosynthetic Standards, have continued to work with the National, Regional, and International Standards Organizations to disseminate good practice, achieve uniform standards, and represent the perspective of the IGS.



Mike Sadlier

Mike Sadlier is an Australian Civil Engineer who has been involved with geotechnical, geosynthetic and other construction as a contractor, consultant, or



material supplier for 30 years with experience across Australia, the Asia-Pacific, and other regions. He first worked with geosynthetics in 1972 and, since 1992, he has operated a geosynthetic specialist consultancy. He has actively participated in many geosynthetic events across the world. He believes that the IGS holds a unique position in that it provides a very broad forum for academics, manufacturers, practitioners, and others to interact and move the geosynthetic discipline forward for the benefit of all. He wants to see the IGS mature and continue to foster growth in the geosynthetic discipline by working with and providing benefits for all of its membership. He especially wants to see our accumulated years of experience, which has produced established geosynthetic methodologies, documented in a way that will legitimize these methods and make it easier for a geosynthetic option to achieve acceptance.

Eunchul C. Shin

Dr. Eunchul C. Shin is an Associate Professor and Chair of the Dept. of Civil and Environmental System Engineering at the University of Incheon, Korea. He received his B.Sc.E. from Chungbuk National University (Korea), M.Sc.E. from the University of Colorado (USA), and Ph.D. in Civil Engineering from Southern Illinois University (USA). He has been working with geosynthetics for the past 17 years. Prof. Shin is a leading researcher in the Korean Geosynthetics Society (IGS-KC) and has been actively associated with the IGS since 1990. He is an Editorial Board Member for *Geosynthetics International* and the *Journal of Geotechnical and Geological Engineering*. He has been a member of the scientific and technical committees of many national and international geosynthetics and geotechnical engineering conferences. He has published more than 70 papers in



the field of geotechnical engineering and geosynthetics, including airport runway reinforcement, basal reinforcement of railroad tracks, reinforced retaining walls, and various types of liners in sanitary landfills. He is a member of Organizing Committee of *GeoAsia 2004*, which will be held in June 2004, in Seoul, Korea.

Jorge G. Zornberg

Dr. Jorge G. Zornberg, P.E., is a Geotechnical Engineering Professor at the University of Texas at Austin. He received his B.Sc. from the Universidad Nacional de Córdoba (Argentina), his M.Sc. from PUC-Rio (Rio de Janeiro, Brazil), and his Ph.D. from the University of California at Berkeley (USA). Before recently joining the University of Texas, he was a Project Engineer at GeoSyntec Consultants and a faculty member at the University of Colorado, USA. He is a registered Professional Engineer with over 15 years experience in both research and practice in reinforced soil technology, design of waste containment facilities, and numerical and centrifuge modeling. He has authored over 100 technical publications in geotechnical and geosynthetics engineering. He is an Editorial Board Member for *Geosynthetics International* and the *Journal of Geotechnical and Geoenvironmental Engineering* (American Society of Civil Engineers, ASCE). He is a member of ISSMGE TC9 (Earth Reinforcement). Among other awards, Dr. Zornberg received the IGS *Young Member Award*, the ASCE *Collingwood Prize*, and the *Presidential Early Career Award for Scientists and Engineers* (PECASE) from the President of the United States.



Asian Regional Conference on Geosynthetics – GeoAsia 2004

Updated to include New Information in Bulletin 3

“Now and Future of Geosynthetics in Civil Engineering”

21 to 23 June 2004, Seoul, Korea



The International Geosynthetics Society-Korean Chapter (IGS-KC) is organizing *GeoAsia 2004* to be held on 21 to 23 June 2004, in Seoul, Korea, under the auspices of the IGS.

Conference Sessions

There will be eight technical sessions:

- Reinforced Structures I
- Soft Ground Improvement
- Materials, Testing, and Analysis I
- Roads and Railways
- Landfills and Hydraulic Applications
- Reinforced Structures II
- Materials, Testing, and Analysis II
- Durability and Damage

Mercer Lecture

The Mercer Lecture titled “A New Limit State Design Method for Design of Geosynthetic-Reinforced Soil Walls,” by IGS Past President, Prof. Richard J. Bathurst (Royal Military College of Canada), will be presented.

Keynote Lectures

F. Tatsuoka (Japan): “An Old by New Issue: Viscous Properties of Polymer Geosynthetic Reinforcement and Geosynthetic-Reinforced Soil Structures”
R.K. Rowe (Canada): “Resolving Some of the Outstanding Issues in Landfill Barrier Design”

R. Floss (Germany): “Design Fundamentals for Geosynthetic Soil Technique”

C.G. Bao (China): “Study on the Interaction Characteristics of Geosynthetics and Soil”

J-P. Gourc (France): “Friction Properties of a Geosynthetic Interface: Application to the Stability of Liner Systems on Landfill and Canal Slopes”

Important Deadlines (NEW dates!)

Paper Submission: 15 February 2004

Author Notification: 15 March 2004

Final Paper Submission: 5 April 2004

Pre-registration: 29 February 2004

Hotel reservation: 31 May 2004

Please submit paper(s) to:

Publications Committee Chair

Prof. Han-Yong Jeon

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Special Session by TC9 of ISSMGE

A special session organized by ISSMGE TC 9 (Earth Reinforcement) will be held 23 June 2004. The theme of the session is “Role of Numerical Analysis in Earth Reinforcement.” A special lecture will be delivered by Prof. Iizuka from Kobe University, Japan. Three panelists from Korea, Singapore, and Hong Kong will present case studies and address issues related to the session theme.

Training Course

A training course, organized by the IGS Education Committee, will be offered during the Conference. Three lectures will be delivered: Prof. R.J. Bathurst, Mr. B. Myles, and Mr. C. Lawson on a variety of geosynthetics topics. Any participant registered for *GeoAsia2004* can attend the course free of charge. Please reserve your seat early.

Technical Tour

A half-day technical tour will be held on Tuesday, 22 June 2004 to visit the Sudokwon Landfill site in Seoul (one of the largest worldwide) and is open to any registered Conference attendee, spouse, or guest. Registration is required and will be filled on a first-come, first-serve basis.

Technical Exhibition

The Exhibition will be held from 21 to 23 June 2004 at the Seoul Education and Culture Center and is being organized by the IGS-KC.

For Further Information Contact

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GeoFilters 2004 -- Call for Papers

4th International Conference on Filters and Drainage in
Geotechnical and Environmental Engineering

19 to 21 October 2004, Stellenbosch, South Africa

The Fourth International Conference on Filters and Drainage in Geotechnical and Environmental Engineering, *GeoFilters*

2004, will be held on 19 to 21 October 2004 just outside the University town of Stellenbosch, South Africa on the Spier Wine Estate. The Confer-

ence is being organized by the University of the Witwatersrand (School of Civil & Environmental Engineering), under the auspices of the IGS, the Envi-

ronmental Engineering Division of the South African Institution of Civil Engineering, and the Geotechnical Engineering Division of the South African Institution of Civil Engineering.

GeoFilters 2004 will be the fourth in a series of the following very successful specialist conferences on geofilters: *GeoFilters '92* (Karlsruhe, Germany), *GeoFilters '96* (Montreal, Quebec, Canada), and *GeoFilters 2000* (Warsaw, Poland).

Objectives of the Conference

- Establish the state of the art in developments relating to all aspects of filtration and drainage.
- Present cases of successful implementation of filtration and drainage systems and discuss criteria of success.
- Continue the vigorous debate of the equivalency between natural and synthetic filters.
- Bring together practitioners, researchers, manufacturers and all other users of natural and synthetic filters and drainage systems.

Conference Theme and Topics

The working theme of *GeoFilters 2004* is "Filter Requirements and Proven Performance." The Conference topics are as follows:

- New geofilter developments and products
- Case histories: proven performance

- Instances of geofilter failure
- Durability and long-term behaviour of geofilters
- Erosion control using geofilters
- Laboratory testing of geofilters

Keynote Lecture

The Keynote Lecture will be given by Prof. Kerry Rowe of Queens University, Canada, entitled, "Filtering and Drainage of Contaminated Water" and will deal with subjects including landfill leachate and agricultural drainage water.

Workshop

It is proposed to run a half-day workshop in conjunction with the Conference on the topic of "Capillary Barriers," emphasizing the use of these barriers in capping systems. The workshop is anticipated to be held on the day after the Conference. If you are interested in attending such a workshop, please contact Prof. Andy Fourie, Conference Chair, at the contact information given below. Please also indicate when you would prefer to attend such a workshop.

Call for Papers

Papers in all areas of filtration and drainage are welcome. Papers should address the Conference theme of "Filter Requirements and Proven Performance" and one of the Conference topics outlined above. Particularly welcome are papers addressing issues

of proven performance or proven non-performance.

Abstracts should be submitted in English. They should be double spaced and approximately 500 words in length. Illustrations that aid reviewers in evaluating the relevance of the abstract are welcome.

Important Deadlines

Abstract Submission: 29 February 2004
(**NOTE: deadline extended**)

Abstract Acceptance: 15 March 2004

Full paper: 31 May 2004

Acceptance Notification: 30 June 2004

Address for Correspondence

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Official Conference website:
www.wits.ac.za/geofilters2004
Conference venue website:
www.spier.co.za

Organising Committee

- Andy Fourie, Chair
- Nico Vermeulen
- Kelvin Legge, IGS Member
- Fritz Wagener



Geo-Frontiers 2005 Congress 24 to 26 January 2005, Austin, Texas, USA



Geo-Frontiers 2005 is a broad-based Congress that will combine the *Geo-Institute 2005 Congress* and the Geosynthetic Materials Association (GMA) *Geosynthetics 2005 Conference*. The Congress will showcase recent advancements in design, manufacturing, and construction; offer a forum to debate future directions for the industry; and bring together participants and exhibitors from multiple professional and trade organisations

The Congress is being organised by the Geo-Institute (ASCE) and the GMA

(Industrial Fabrics Association International, IFAI) and will be held at the Hilton Austin Convention Center Hotel in downtown Austin, Texas, USA from 24 to 26 January 2005. The IGS is one of several cooperating organisations.

Congress Tracks/Themes

Geo-Frontiers will have a broad and exciting technical program. The following are the nine Congress tracks:

- Earthquake Engineering and Soil Dynamics
- Erosion Control

- Foundations
- Geotechnical Professional Issues
- Pavements
- Site Characterization and Modeling
- Slopes and Retaining Structures
- Soil Improvement and Grouting
- Waste Containment and Remediation

Technical Paper Sessions

Authors are invited to submit technical papers related to session topics within each track (visit the Congress website given below for a list of the 48 session

topics). Papers presenting all facets of a specific project are encouraged and all papers will be published as part of the Congress proceedings. Authors invited to publish a paper are expected to register for the Congress at the appropriate fee(s), attend the Congress, and make their presentation(s) in person.

Panel Discussions

The panel discussions will be 90-minute sessions bringing professionals together for discussion and debate about technical and non-technical subjects and industry issues, such as political influences, social trends, and their impact on engineering, or career choices. A facilitator will be present with several panelists to present differing viewpoints. Proposals for panel discussions are welcome and should include an outline and title, a synopsis of the expected outcome of the discussion, preliminary names for facilitators and panelists, and any plans for publication.

Hands-On Workshops

Hands-on workshops will be two- to four-hour long sessions to describe and demonstrate real-world applications of

technology. The intent is for providers to focus on practical, "how-to" techniques that include planning, design, construction, and/or testing. Workshop participants will be able to "practice" presented ideas and procedures. Proposals for workshop themes are invited and should include a workshop outline and title, a description of desired outcomes and learning objectives, and a summary of handout materials.

Short Courses

Short courses will be emphasized in the technical program, because *Geo-Frontiers 2005* is committed to providing continuing education opportunities for participants. Proposals for short course topics are invited and should include the course title, a description of the course with a summary of its learning objectives, a list of instructors and their qualifications, and a summary of course handouts. Short courses can be one-half to one-day long and offered prior to, during, and/or immediately after the Congress. Also indicate whether the course will offer continuing education units (CEUs) or professional development hours (PDHs).

Field Demonstrations & Technical Tours

Still in the planning phases, field demonstrations will demonstrate field operations and applications of new technologies, while technical tours will showcase local engineering works and/or industry resources. These events will be no more than one-hour driving distance from downtown Austin.

Important Deadlines

Abstracts Due: 15 March 2004
Notify Authors: March 31, 2004
Draft Papers: June 30, 2004
Paper Acceptance: August 15, 2004
Final Papers Due: September 27, 2004

For More Information

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E-mail: cbowers@asce.org
www.asce.org/conferences/geofrontiers05/index.cfm

Sardinia 2003, the Ninth Sardinia Landfill Symposium

6 to 10 October 2003, in Cagliari, Sardinia

More than 900 people from all continents attended the *Ninth Sardinia Landfill Symposium*, held in Cagliari, Italy, under the auspices of the IGS. Approximately 60 of the participants are involved with the scientific and engineering development of geosynthetics, related products, and associated technologies, including delegations from Australia, Canada, France, Germany, Italy, Japan, Korea, Poland, Slovakia, South Africa, South America, United Kingdom, United States, and other countries.

As in the past, this Conference gathered technical specialists and managers scouting for trends and novelties to include in their projects. Several important messages were delivered, the first being the need for geosynthetics-knowledgeable persons on site and not only Engineers. Second, government officers stressed that biogas emissions

will be an important consideration of the future. Third, the need for building bioreactors with re-circulating leachate was questioned based on data indicating that the amount of liquid available from many sites is probably not sufficient to accelerate the bio-reactions. Fourth, it was proposed that leak detection surveys should be an element of serious CQA programs.

Several landfill designers expressed concern regarding the careless use of gap-graded soils on landfill caps, which causes fine fractions to pass through the composite geotextile and clog the geonet (Richardson). Recycled components in landfills were increasingly discussed, from tire chips in drainage layers (Hudson), to polyethylene (PE) used in structured drainage composites (Hewitt, Ellard), and PE in structured "boxes" to stabilize soil on slopes (Lee, Jeon), the latter being somewhat like geocells.

There were several papers on GCLs including the most comprehensive one ever seen (Guyonnet et al.) that showed transmission electron microscope photos of bentonite platelets and graphic bar charts of the concentrations of different ions in different bentonites.

It was interesting to see that the creep performance of geomembranes on slopes is now being assessed (Gourc, Imaizumi, Forsman) due to the use of double textures, when, as a general principle, we are still trying to install geomembranes without stress. It was then interesting to hear of a recent failure where large breaks occurred in a geomembrane, but without damaging the overlying geotextile cushion and with no apparent movement in the waste. At other locations, there were movements in the waste.

After a session on leak location in

geomembranes, there was a very lively workshop, chaired by IGS President, Daniele Cazzuffi, discussing methods of repairing such leaks under waste. Several Japanese workers are leading these efforts, even going to the extent of introducing polyurethane geomembranes that can be more easily (that is to say, relatively easy) remotely repaired. They do, however, cost three to five times more than PE geomembranes.

More lively discussion ensued after presentations on exposed geomembrane landfill caps (Thiel) and the removal of

rainwater there from. There was a design paper describing how the author removes leachate from the bottom of landfills through drainage media above assumed clogged geotextiles and do not rely on the intended drainage geocomposite below (Richardson).

The social events were, as usual, outstanding with the Sardinian Dinner off-campus featuring the Pozzomaggiore Choir and their in-the-round magical surround-sound singing to a few individuals in the middle of their circle. On Thursday, the Divadlo Company

(musicians, dancers, and singers) presented songs from Andrew Lloyd Webber productions in the piazza of Forte Village. Friday ended with a wonderful Gala Dinner.

All in all, a great week was provided by Messrs Cossu, Stegmann, and Christensen, and their helpful support staff, particularly Michela and Elena.

reported by Andre Rollin and Ian Peggs, IGS Member

XVI Italian National Conference on Geosynthetics

Bologna, Italy, 15 October 2003

The XVI Italian National Conference on Geosynthetics was held on 15 October 2003 in Bologna, Italy. The Conference was organized jointly by the Italian Chapter of the IGS (AGI-IGS) and the Bologna Association of Engineers and Architects (ASSIABO) under the auspices of the University of Bologna, the Association of Offshore and Maritime Engineering (AIOM), the Italian Division of International Association of Navigation (AIPCN), and the Italian Association of Biotechnical Engineering (AIPIN). More than 150 participants (including some from abroad) attended the Conference, which was organized in two different sessions.

First Session

The first session, chaired by Prof. M. Maugeri (President of AGI-IGS), focused on the use of geosynthetics in coastal areas and comprised one general report and five paper presentations. The general report was presented by Prof. G. Matteotti and Prof. P. Ruol (University of Padua) and included a wide range of case histories describing possible applications of geosynthetics in coastal and maritime engineering. In particular, the potential and limitations of the major geosynthetics applications in this field were emphasized. Both traditional applications, such as beach stabilization structures, revetments, beach nourishment, dunes reconstruction, and drainage (for which geotextiles, geo-

tubes, sand bags, and geomattresses are traditionally required) and non-traditional applications (e.g., beach dewatering, environmental dredging, and pipeline or outfall stabilisation applications using various geosynthetics products) were analysed in depth.

The presented papers showed detailed design and construction problems related to these geosynthetics applications. In particular, the use of sand bags for shore protection, the utilization of geocontainers for the construction of a breakwater dam, the employment of geotextile-encased columns for embankment foundations, and the use of geosynthetics as liners in the construction of a reclaimed area close to a large harbour were discussed.

Second Session

The second session focused on the use of geosynthetics in mountainous areas and was chaired by D. Cazzuffi, IGS President. One general report and five papers were presented. The general report, by Prof. A. Cancelli (University of Milano Bicocca), described possible geosynthetics applications in mountainous areas. In particular, the primary and secondary functions of geosynthetics in these applications (e.g., reinforced earth, rock stop embankments, noise barriers, erosion protection, bank protection, filtration control and dewatering, dams, liners, and ski slope stabilization) were emphasized.

The following five presentations,

for example, analysed some of these applications in more detail: numerical and theoretical analyses studying the behaviour of reinforced rock stop embankments; case histories related to earth-reinforced works in Northern Italy; procedures used for the design of reinforced soil embankments for ski slope stabilization; examples of flexible facing soil slip stabilization; and general design methodology for the realization of bioengineering structures.

At the end of each session, fruitful and interesting discussions on the different topics took place.

*reported by Prof. Nicola Moraci
IGS Member*



Four attendees of the XVI Italian National Conference on Geosynthetics (from left to right): IGS President Daniele Cazzuffi, Janaina Colmanetti (Brazil), AGI-IGS Vice-President Pierpaolo Fantini, and Dimiter Alexiew (Germany).

28th Meeting of Technical Committee 189 of the European Committee for Standardization (CEN)

Delft, The Netherlands, 19 to 21 November 2003

The 28th Meeting of the Technical Committee “Geosynthetics” (TC 189) of the European Committee for Standardization (CEN) was organized by GeoDelft in Delft, The Netherlands. The meeting was sponsored by the NGO (the Dutch Geosynthetics Organisation and the Dutch IGS Chapter) and the companies Colbond, Ten Cate Nicolon, Ooms, and Tensar.

Approximately 60 persons nominated by the different national standardisation institutes of the CEN member states were present. A delegate from Lithuania was welcomed for the first time at a CEN/TC 189 meeting as an observer.

The following five of the seven Working Groups met on 19 and 20 November 2003:

- WG1 on Requirements for Geotextiles and Related Products, chaired by Ph. Delmas (France),
- WG3 on Mechanical Testing, chaired by D. Cazzuffi (Italy),
- WG4 on Hydraulic Testing, chaired by B. Myles (UK),
- WG5 on Durability, chaired by U. Bornmann (Austria), and
- Ad-hoc WG on Asphalt Reinforcement, chaired by H. Rathmayer (Finland).

Technical discussions during these meetings were the basis of the decisions made in the Plenary Session held on 21 November 2003.

In addition to attending Working Group meetings, the delegates also visited the laboratory facilities of GeoDelft, e.g., the large geotechnical centrifuge of



CEN/TC 189 meeting participants.

GeoDelft. A social event was held on the evening of 21 November 2003 comprising a tour through the historic city centre of Delft and a dinner in the City’s former weighing scales building.

Thirty six delegates of the 14 member countries and the Lithuanian observer attended the Plenary Session. Following the introductions, Dr. F. Foubert presented the Secretary’s Report. Dr. Foubert emphasised the necessity for the Technical Committee (TC) to work efficiently due to the new CEN rule that a CEN work item can only exist for three years and will then be automatically deleted. The focus of the TC must be: “what work items are absolutely necessary?” and not: “what would be nice to have?” This was followed by a synopsis by each Working Group of the discussions and action items set out in the last CEN/TC 189 Meeting in Gdansk (April 2003) and the progress to date.

Two resolutions were passed as a result of the November 2003 CEN/TC 189 Meeting:

- It was unanimously decided to re-elect the Chair, Mr. Adam Bezuijen (The Netherlands), for a second term of three years (2004-2006).
- It was unanimously decided to establish a liaison with the Notified Bodies Group (SG 11 Membranes). Dr. Philippe Delmas will act as the liaison officer.

Apart from the above mentioned resolutions, the Meeting resulted in a large list of actions that has already been circulated by the Secretary.

The 28th Meeting of CEN/TC 189 was a success. Many of the actions identified during the Meeting have already been implemented and the remaining will be implemented in the upcoming months. The next meeting of CEN/TC 189 is scheduled for 29 September to 1 October 2004 in the UK (city and location to be announced).

*reported by Adam Bezuijen
Chair of CEN/TC 189 and IGS Member*

ISO TC 221 Meeting (Seoul, Korea, 25 June 2004)

The fifth ISO TC 221 (Geosynthetics) Meeting will be held in Seoul, Korea, on 25 June 2004. The draft agenda for the Meeting is available at the following web site: <http://event.ats.go.kr/home/e2003003.asp>.

It is anticipated that there will be Working Group (WG) meetings held on 24 June 2004 (details of the WG meetings to be confirmed at a later date).

If you have items to add to the agenda, send them to Peter Greenwood

(Secretary, ISO TC 221) no later than 26 March 2004:

Tel: 44/20 8996 7197

Fax: 44/20 8996 7799

E-mail: peter.greenwood@bsi-global.com

To help plan for the Meeting, it is

requested that National Standards Bodies inform Peter Greenwood if they will be sending delegations to the Meeting and, if possible, send a list of the names

and affiliations of the delegates, indicating, in particular, who will be the head of the delegation.

Please note that anyone attending the Meeting should be a part of a national delegation through the National Standards Body.

Geosynthetics International

An Official Journal of the IGS: Electronic Journal Free to IGS Members

G *eosynthetics International* is an official journal of the IGS and 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, behaviour, performance analysis, testing, design, construction methods, case histories, and field experience.

Geosynthetics International will only be published electronically starting Volume 10 (2003) by Thomas Telford and is free to IGS Members. All others, e.g., corporations, companies, and university libraries, can subscribe at a rate of £325/US\$585. An individual rate for those non-members whose organisation subscribes, but would like an additional personal subscription (including the update CD) will be available for £60/US\$108.

The update CD is issued annually as part of the subscription for non-IGS Members and includes all papers published in that year. IGS Members can opt to buy the CD for US\$100.

Visit the Journal's website given below for subscription information and instructions for accessing the latest issues.

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

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Geotextiles and Geomembranes

An Official Journal of the IGS

G *eatextiles and Geomembranes* is an official journal of the IGS and provides a forum for the dissemination of information on geosynthetics amongst research workers, designers, users, and manufacturers. The Journal increases general awareness, prompts further research, and assists in the establishment of international codes and regulations.

The following are welcome contributions: refereed technical papers covering research, design, construction, applications, and case studies; technical notes, book reviews, reports of conferences, and meetings; and letters to the Editor. All technical papers are open to written discussion. No limit to length is

set and short notes are acceptable. Review articles may also be published at intervals, but the subject and contents of these should be discussed first with the Editor.

The Editorial Board Members and reviewers have worked very hard over the past year to provide detailed, constructive reviews in a very timely manner. The average review period is less than three months. Papers come from a wide range of countries with approximately one third of the papers coming from the Americas, Europe, and the rest of the world. The rejection rate is 59%. The Journal's Editor and Board Members are extremely appreciative of the authors' hard work in addressing the

reviewers' comments and the quick return of revised papers.

Authors should submit four copies of their paper, which will subsequently be reviewed by at least two individuals. No original figures should initially be included.

All technical contributions and inquiries should be directed to:

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CORPORATE PROFILE

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



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Tensor International is one of the world-wide leaders with over 20 years' experience in the provision and manufacture of best-value civil engineering solutions for soil reinforcement and ground stabilisation, with installations in roads, railways, runways, and embankments across the globe. Formerly the Netlon Group, Tensor International was founded in Blackburn, UK, in 1952.

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increase the load bearing capacity. These applications of Tensor geogrids are supported by independent research with German and British railway authorities.

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For more information visit www.tensor-international.co.uk, or call 44/1254 262 431.





EuroGeo3

Munich, Germany

1-4 March 2004

Contact: Technische Universitaet Muenchen

E-mail: eurogeo3@bv.tum.de

www.gb.bv.tum.de/eurogeo3

19th International Conference on Solid Waste Technology and Management Philadelphia, Pennsylvania, USA 21-24 March 2004

Contact: Ronald Mersky

E-mail: solid.waste@widener.edu

muse.widener.edu/~sxw0004/call.html

5th International Conference on Ground Improvement Techniques

Kuala Lumpur, Malaysia

22-24 March 2004

Contact: cipremie@singnet.com.sg

www.cipremier.com

A.W. Skempton Memorial Conference London, United Kingdom

29-31 March 2004

Contact: Sue Frye

E-mail: Sue.frye@iec.org.uk

www.skemptonconference.com

5es Rencontres Géosynthétiques

Fifth French Colloquium on Geotextiles, Geomembranes and Related Products Avignon, France

30-31 March 2004

Contact: Colloquium Secretariat

E-mail: secretariat.cfg@wanadoo.fr

www.cfg.asso.fr

Techtextil North America

Atlanta, Georgia, USA

30 March-1 April 2004

Contact: Daniel McKinnon

E-mail: ttna@usa.messefrankfurt.com

www.usa.messefrankfurt.com

Fifth RILEM International Conference

Cracking in Pavements

Limoges, France

5-8 May 2004

Contact: Chantal Iannarelli

E-mail: c2s@club-internet.fr

www.cp2004.unilim.fr/

International Conference on

Geotechnical Engineering

Beirut, Lebanon

19-22 May 2004

Contact: Dr. Youssam Kazan

E-mail: ykazan@ul.edu.lb

www.ul.edu.lb/activite/icge

World Tunnel Congress 2004 and 30th

ITA General Assembly

Singapore

22-27 May 2004

Contact: Conference & Travel

Management Associates Pte Ltd

E-mail: ita2004@singnet.com.sg

www.ita2004.com

IS-OSAKA 2004, Engineering Practice and Performance of Soft Deposits

Osaka, Japan

2-4 June 2004

Contact: Secretary of IS-Osaka 2004

E-mail: is2004@jgskb.jp

www.jgskb.jp/is2004/

GeoAsia 2004

Seoul, Korea

21-23 June 2004

Contact: Prof. Chungsik Yoo

Tel: 82/31 290 7518

E-mail: asyoo@yurim.skku.sc.kr

www.kgss.or.kr/geoasia2004

9th International Symposium on Landslides

Rio de Janeiro, Brazil

28 June -2 July 2004

Contact: Secretariat 9 ISL - Rio 2004

E-mail: 9isl@geotec.coppe.ufrj.br

www.abms.com.br/

European Young Engineers' Conference

Vienna, Austria

8-10 July 2004.

Contact: Dr. Fritz Kopf

E-mail: f.kopf@tuwien.ac.at

www.igb.tuwien.ac.at

International Air Transport Conference

Washington, DC, USA

25-28 July 2004

Contact: Mr. Chris Oswald

E-mail: chriso@leighfisher.com

www.asce.org/conferences/iatc2004

Geo Trans 2004

Los Angeles, California, USA

27-31 July 2004

E-mail: myegian@neu.edu

www.asce.org/conferences/geotrans04/

index.cfm

International Conference on

Geotechnical Engineering

Sharjah, United Arab Emirates

3-6 October 2004

Contact: Dr. Adnan A. Basma

E-mail: civeng@sharjah.ac.ae

www.sharjah.ac.ae/academic/

engineering/civil/icge2004/index.htm

Geofilters 2004

Stellenbosch, South Africa

19-21 October 2004

Contact: Prof. Andy Fourie

Tel: 27/11 717 7108

E-mail: andyf@civil.wits.ac.za

www.wits.ac.za/geofilters2004

57th Canadian Geotechnical Conference

Quebec City, Canada

23-27 October 2004

Contact: Jean-Marie Konrad

E-mail: Jean-Marie.Konrad@gci.ulaval.ca

www.geoquebec2004.org/

Geosynthetics 2004 Exhibition

Shanghai, China

17-19 November 2004

Contact: Flora Zu

E-mail: fzu@cna.org

www.chinanonwovens.com

15th South-East Asian Geotechnical Conference (SEAGC)

Bangkok, Thailand

22-26 November 2004

Contact: Dr. Wanchai Teparaksa

E-mail: seagc15@eng.chula.ac.th

www.eng.chula.ac.th/seagc15

International Conference on Geosynthetics and Geoenvironmental Engineering, ICGGE-2004

Mumbai, Maharashtra, India

8-10 December 2004

Contact: Dr. D. Choudhury

E-mail: icgge@civil.iitb.ac.in

www.civil.iitb.ac.in/~icgge/

GeoFrontiers 2005

Austin, Texas, USA

24-26 January 2005

Contact: Carol Bowers, Geo-Institute

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E-mail: cowers@asce.org

www.asce.org/conferences/geofrontiers05/

index.cfm

11th International Conference of IACMAG,

International Association of Computer

Methods and Advances in Geomechanics

Turin, Italy

19-24 June 2005

Contact: Organizing Secretariat

E-mail: iacmag@iacmag2005.it

www.iacmag2005.it

16th International Conference on Soil

Mechanics and Geotechnical Engineering

Osaka, Japan

12-16 September 2005

Contact: Prof. Masashi Kamon

E-mail: 16ICSMGE@jiban.or.jp

www.jiban.or.jp/

XIIIth Danube-European Conference on

Geotechnical Engineering

Ljubljana, Slovenia

7-9 June 2006

Contact: Dr. Janko Logar

E-mail: jlogar@fgg.uni-lj.si

8th International Conference on

Geosynthetics (8ICG)

Yokohama, Japan

18-22 September 2006

Contact: 8ICG Conference Secretary

E-mail: info@8icg-yokohama.org

www.8icg-yokohama.org

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- PRS Mediterranean Ltd.** *Israel (2003)*
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- Reinforced Earth Co., The** *USA (1989)*
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- Solmax International, Inc.** *Canada (1997)*
- SVG (Swiss Association of Geotextile Professionals)** *Switzerland (1984)*
- Taiyo Kogyo Co., Ltd. (Ocean)** *Japan (1996)*
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The International Geosynthetics Society



OBJECTIVES OF THE IGS

The International Geosynthetics Society was formed with the following objectives:

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

WHY BECOME A MEMBER OF THE IGS?

First, to contribute to the development of our profession.

By becoming an IGS Member you can:

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

Second, to enjoy the benefits.

The following benefits are now available to all IGS Members:

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

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, or not of, corporations who voluntarily contribute a minimum of US\$200 annually to the IGS, in excess of their membership dues, will be mentioned in the IGS Directory in a separate list as benefactors.

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