

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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President's Corner

The Strategic Goals of the IGS



Jorge Zornberg

Dear IGS member,

I am deeply honored and excited to be **your president** for the next four years. I take this opportunity to revisit with you my vision of the IGS for this period and outline the specific objectives that resulted from the fruitful meetings that our energetic, new IGS council held after the very successful 9th International Conference on Geosynthetics (9ICG). Throughout this issue of *IGS News* you will be able to read much of what happened during this landmark conference, held in Guarujá, Brazil. However, I will focus here on strategic goals, strategies, and measurable outcomes towards a healthy, continued growth of our Society.

My overall goal for the four-year period during which I will serve as IGS President is to capitalize on the existing success of our society while **improving communications**. As mentioned in previous occasions, I believe that a focused effort on communications will lead to a major expansion of the benefits derived from our Society's wealth of knowledge. In order to remain successful, the new generation of geosynthetic leaders needs to be both creative and bold in today's world of rapidly evolving technologies while holding firmly to those philosophies of the past that have led to the high stature of the IGS. As IGS President, my commitment to you, as an IGS member, involves strengthening the IGS by improving communications in three key areas. More specifically, my strategic goal for a **four-year planning horizon** could be articulated as follows:

To improve communication with our members, among those with

focused technical interests, and with sister international societies.

I would like to now elaborate on the three components of this strategic goal and on associated strategies that can be implemented to achieve improved communications in the various areas.

Improved communication with our own members, both individual and corporate, is perhaps the one effort through which we can have clear, immediate gains. In a sense, this is a relatively straightforward task (at least when compared with some other challenging tasks, see next). For example, when an individual IGS Member wonders what his/her member benefits actually are, all we need to do is to communicate to him/her the myriad of **existing** tools and experiences we already have in place to help individual members, chapters, corporate members and conference organizers. The task is then to implement more efficient ways to deliver these tools or to communicate experiences to our members, particularly through an effective interface with our chapters. This could also help increase the number of IGS individual members in areas like Africa where our representation could be improved. The good news is that technology is on our side (if used wisely, of course). The IGS Council is already working hard on the implementation of strategies to achieve this goal. For example, I trust you will be pleasantly surprised with the wealth of information and the functionality of our new, revamped website. I invite you to go to www.geosyntheticssociety.org and experience it by yourself (also, see the related article in page 15 this issue of *IGS News*). And this is just the beginning! Additional strategies involving continued website improvement, interaction with IGS Chapters, databases, webinars, discussion groups, on-line membership are in the making.

Improved communication among members interested in

specific technical issues is a strategic goal that I believe will lead to significant new benefits to our members. However, and unlike the previous strategic goal of general communication (e.g. of products that the IGS already has to offer), this second goal is more daunting. This is because it requires developing a new system to be added to the IGS structure. We are proud of the high level of technical excellence we have been witnessing in our conferences, presentations, short courses and technical journals. However, the **continuity** of ad hoc technical groups loosely formed in these venues has often been compromised by distance and time constraints. The IGS strategy is to foster these technical interest groups in the form of **IGS Technical Committees (TCs)**. Similar to the way that IGS members currently affiliate into geographically organized chapters, they can also affiliate into topically organized TCs. While this is a more difficult undertaking, we do have some good news for you: Under a task force lead by Council Member Neil Dixon the council has recently compiled a guidance document for the operation of TCs. With this new resource available, no time has been lost, and our first three TCs have been successfully created during our recent council meeting in Guarujá. Dedicated leaders of our geosynthetic industry are now engaged in the planning of the initial activities for the TCs on "Soil Reinforcement," "Barrier Systems," and "Filtration." Participation in these TCs is open to the IGS membership at large (see related article in page 6 of this issue of *IGS News* for contact information). These TCs are expected to gain synergism by interacting with organizers of upcoming conferences to lead technical sessions, with designers to produce technical documents, with academics to offer short courses, and with the inquisitive minds of young professionals to stimulate the use of geosynthetics among the new generation of engineers. If you are interested in offering your volunteer time in new, technically rewarding activities, I encourage you to consider joining one of

the new TCs of our Society.

Improved communication with the engineering community at large (outreach)

is a third strategic goal, which may result in significant opportunities for the IGS. It is practical not to expect that every potential user of geosynthetics will become an expert on geosynthetics engineering or a member of the IGS. However, **everyone within the engineering community** deserves to know that geosynthetics exist and that geosynthetics can provide suitable technical solutions to many of their civil, geotechnical, environmental, water resource, mining, materials, structural, erosion control, regulatory, transportation, maintenance, construction, military, sustainability, renewable energy, global warming, and ecological problems. It is our mission to ensure that these practitioners are aware of the technically superior, innovative, and cost-effective solutions that geosynthetics can offer. Experts in the various fields of engineering that come in contact with geosynthetics engineering have international societies of their own. Consequently, the opportunity exists for the IGS to foster relationships, agreements, and liaisons with sister societies whose members can benefit from the sound geosynthetic information. Yes, we are already working on strategies to enhance our interactions with the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE), the Federation of International Geotechnical Societies (FedIGS), and a number of other sister international societies. Outreach is a key effort about which you will see significant advances soon.

In order to organize and prioritize our efforts for the next four years, the IGS Council devoted significant time to **strategic planning** during our recent meeting in Guarujá (see related article in page 8 of this issue of *IGS News*). In this meeting, the council embraced the aforementioned strategic goals involving improved communications for a four-year planning horizon. However, the need for a long-term planning horizon was also developed. What is the core purpose describing the IGS very reason for being or existing?

Seeking answer this question led to discussions about the opportunities in which the IGS can capitalize, potential threats to our Society, and mega-issues that we expect will be core to the geosynthetics industry in the future. As an outcome of this rich discussion, the **Core Purpose** of the IGS was identified as:

Helping the world understand the value of and the appropriate use of geosynthetics technology.

This core purpose outlasts the four-year planning horizon, for which the aforementioned strategic goals had been established. Instead, and in order to meet this core purpose, the IGS Council identified a **Big, Audacious Goal** that stretches beyond the current 4-year strategic goals. Because it is "audacious" it represents a significant challenge and its achievement will require the IGS to move outside of its comfort zone. This long-term goal of the IGS was defined by the IGS Council as:

The IGS will make geosynthetics become indispensable to the point that they are regularly included in engineering curricula and relevant design standards.

This long-term goal is expected to be achieved in 10 to 15 years and is anticipated to set the direction for the succession of future 4-year strategic plans. So now the IGS has not only developed strategic goals and associated strategies for a 4-year planning horizon but also a long-term, audacious goal. However, the IGS Council moved even beyond the definition of goals and strategies, and chose to define **specific measurable outcomes** that we aim at achieving in the 4-year term of this council. These include: increasing the IGS Membership by 50 %, increasing traffic on our web site by 200 %, increasing the number of chapters in regions not represented by the IGS, achieving a better integration between the IGS Council and the IGS

Chapters, increasing the number of formal agreements with sister international societies, and making significant gains toward an increased geosynthetics education begin offered at the undergraduate level. These are not easy objectives to achieve in a single 4-year term! Even worse, since I have just made these self-imposed objectives public, you are now entitled to come back to this Council in four years and ask for an accounting of the measurable results.

While the bar has been set high, please rest assured that the members of our diligent IGS Council will work hard toward the overall goal of improved communications during the 4 year-term that began with the 2010 International Conference in Guarujá, Brazil. However, the competence and enthusiasm of our new IGS Council is important, but not enough to achieve these audacious goals. This is because we need **You, the IGS member**, as your engagement is crucial to achieve these important objectives. Indeed, the opportunities for you to provide input are multiple, as you can serve through our chapters, conferences, committees, and task forces to name a few options. It is ultimately your service that will make a difference towards an expanded, good use of geosynthetics worldwide. With your help and the help of the IGS Council, I am looking forward to our 2014 International Conference in Berlin, Germany, where I hope to report that our daring objectives not only have been met, but have been exceeded.



Jorge G. Zornberg, Ph.D., P.E.
IGS President

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The New IGS Officers and Council Members Term 2010 - 2014

The call for candidates for the IGS President, Vice-President, and Council members resulted in an overwhelming response: 2 candidates for president, 1 for vice-president and 23 candidates for the IGS Council. This was the highest number of candidates interested in serving the council in the history of the IGS, reflecting highly on the commitment of our members. The new IGS President, Vice-President, and Council members were announced at the General Assembly held at the 9ICG in Guarujá, Brazil, on May 26, 2010. The IGS Secretary and Treasurer were subsequently elected by the new IGS Council from amongst its members during the first council meeting, held on May 27, 2010. Please refer to the article on the IGS election procedure on page 5.

We congratulate the new members of the council and thank them for their willingness to serve the IGS.

The new Officers of the IGS are:



President:
Jorge G. Zornberg
(USA)



Vice-President:
Russell Jones
(UK)



Immediate Past-President:
Fumio Tatsuoka
(Japan)



Secretary:
Elizabeth Peggs
(USA)



Treasurer:
John Cowland
(Hong Kong, China)

The new Council members of the IGS are:



Pedro Abad
(co-opted, Spain)



Sam Allen
(re-elected, USA)



Eric Blond
(Canada)



Neil Dixon
(re-elected, United Kingdom)



Peter Legg
(South Africa)



Jun Otani
(re-elected, Japan)



Karpurapu Rajagopal
(co-opted, India)



Nathalie Touze-Foltz
(France)



Chungsik Yoo
(co-opted, Korea)



Xiao-Wu Tang
(co-opted, China)



German Vivar
(co-opted, Peru)

The new IGS Council members join the council members that were elected and co-opted in 2008 for the period 2008 - 2012. In addition, Gerhard Bräu continues as the Editor of IGS News and in that position has a permanent invitation to participate in the council meeting.

*Reported by
Jorge G. Zornberg, IGS President*

IGS Elections – Information on the General Procedure



**Secretary:
Elizabeth Peggs (USA)**

The 2010 IGS Elections were held as prescribed in the IGS Bylaws. They are explained here again to show the general procedure that lead to the above mentioned formation of IGS Officers and IGS Council.

The election was held over a 60 day period, beginning 1 February 2010 and concluding 31 March 2010. In this election the **IGS President** and **IGS Vice President** as well **8 Council Seats** were filled.

This election was particularly noteworthy because it generated the highest level of participation of any IGS Election to date; in fact this election had both the largest number of nominees and the highest percentage of membership voting. In total there were 23 candidates for 8 council seats, 1 candidate for the Vice Presidential seat and 2 Candidates for the Presidential seat. In total over 50% of our membership

cast a vote and although that may not seem high it is in fact as much as double the votes cast in either of the last two elections! The enthusiastic participation in this election is a very clear sign that our society is not passive but rather a thriving, growing and active body.

The IGS council's composition is unique and well thought out, the structure and election cycle is however not always clear to our members. Over the course of the election a number of members asked me to explain our system, as such I would like to take this opportunity to explain the IGS election process. The IGS has a two cycle election process:

Cycle 1:

Officers Elected by the General Membership:

President – elected by the general membership, by direct vote for a 4 year term; the President automatically becomes the Immediate Past President at the end of his term.

Vice President – elected by the general membership, by direct vote, for a 4 year term.

Immediate Past President – a role automatically inherited by the President at the conclusion of his term, and held for a 4 year term.

Council:

8 Council Elected Seats become available during this cycle. Council members are elected for a 4 year term by weighted vote of the general membership.

Officers Elected by the Council:

Treasurer & Secretary – are elected, from the existing council, by the existing council during the first meeting of the council after the General Membership election. These positions are held for a 4 year term.

Co-option:

Co-opted Members – are nominated and elected by the IGS Council, according to the IGS Bylaws the council may co-opt up to 5 members. Co-option of members is available to “ensure that the Council membership will be broadly representative of the different industrial, scientific, or national sectors of the Society;”

Cycle 2 (occurs 2 years after Cycle 1):

Council:

8 Council Elected Seats become available during this cycle. Council members are elected for a 4 year term by weighted vote of the general membership.

Co-option:

Co-opted Members – are nominated and elected by the IGS Council, according to the IGS By-laws the council may co-opt up to 5 members. Co-option of members is

available to “ensure that the Council membership will be broadly representative of the different industrial, scientific, or national sectors of the Society;”

*Reported by
Elizabeth Peggs, IGS Secretary*

Operating Units of the IGS Council



Jorge Zornberg

Considering the significance of improved communications (see the “President’s Corner” article in this issue of IGSNews), the IGS Council approved a new structure of operating units aimed at facilitating communications. Compared to the

structure of previous IGS councils, the new structure involves comparatively fewer Council Committees but it now includes a number of formal Task Forces. Under the new structure, the Council Committees, which typically meet before the IGS Council, will evaluate relevant issues and make recommendations for consideration by the council. On the other hand, Task Forces involve a small number of members who will typically meet after the council with the objective of implementing the new council decisions. In addition, a new track of Technical Committees was approved by the

IGS Council. Unlike the Council Committees and Council Task Forces, the schedule of the meetings of Technical Committees will not necessarily conform to that of the IGS Council.

Figure 1. shows the structure of the Council Committees, Council Task Forces and Technical Committees of the IGS Council. The chairpersons selected by the council to lead each one of these operating units are shown in parenthesis in the figure. The group of Committee Chairs will form an operating unit that will meet regularly in order to facilitate implementation of activities

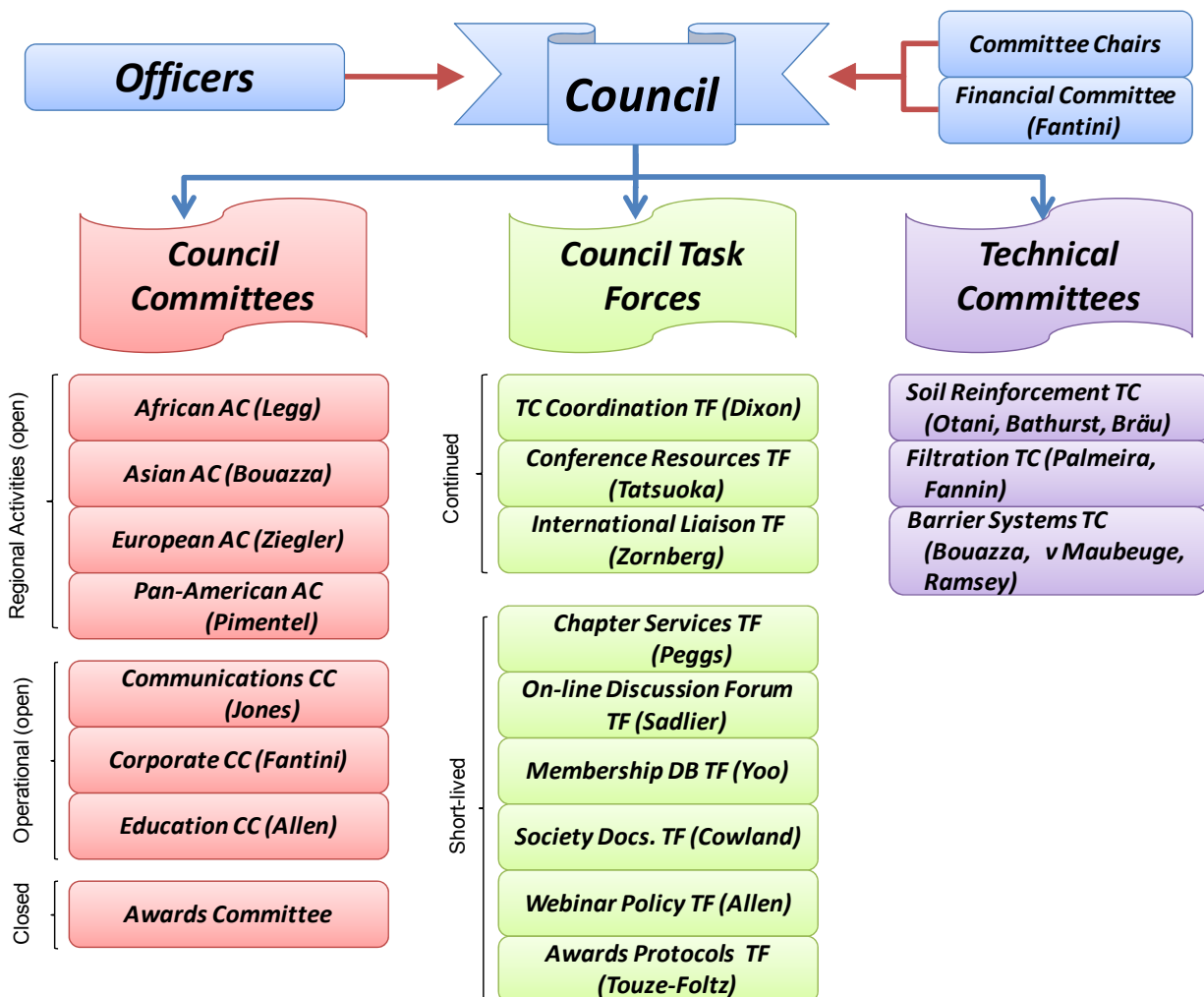


Figure 1: Structure of the Council Committees, Council Task Forces and Technical Committees of the IGS Council. Chairpersons of the various Operating Units are shown in parenthesis.

that bridge multiple committees. The Financial Committee, (the only committee required by the IGS by-law), will provide advice on financial matters to the IGS Council.

Included in the Council Committees of the IGS Council are the Regional Activities Committees, the charge of which includes: promoting the activities and presence of the IGS in a given region, assisting in the formation of new IGS Chapters, assisting in the organization of regional conferences of the IGS, and facilitating the distribution in the region of material to promote technical and educational events that will benefit the geosynthetics discipline. I would like to emphasize that these are **open committees**, so representatives of the IGS chapters are encouraged to participate in the meetings and activities of these committees. Another group of committees are the Operational Committees of the IGS Council, which are also open to participation by any IGS member. These include the Communications Committee, which is tasked among other activities to compile this issue of *IGSNews*, the Corporate Committee, which serves the needs of the corporate membership of our Society, and the Education Committee, which has generated a wealth of educational documents at multiple levels and in multiple languages

over the years. Finally, the Awards Committee is a closed committee serving the IGS Council in identifying and recognizing the most deserving technical contributors to our industry.

While individual members of the IGS Council have diligently worked to accomplish a myriad of important activities, recent experiences have indicated that tasks are often implemented more effectively when the effort is organized under formal Task Forces of the IGS Council. Consequently, the new structure of the IGS Council now includes a number of Task Forces. A number of these Task Forces will conduct continued operations. This includes the TC Coordination Task Force, which aims at organizing the new Technical Committees of the IGS, the Conference Resources Task Force, focused on consolidating the rich experience gained so far in IGS conferences, and the International Liaison Task Force, which focuses on the interaction with our sister learned societies. In addition, a number of additional Task Forces are short-lived, with an expected completion of their activities in approximately one year. These include the Task Forces on Chapter Services, On-line Discussion Forum, Membership Database, Society Documents, Webinar Policy,

and Awards Protocols Task Forces. These Operating Units have been assigned well-defined tasks, which are expected to be completed and delivered to the Council by the time of the next meeting of the IGS Council.

The brand new additions to the structure of Operating Units of the IGS Council are the Technical Committees (TCs) of the IGS. We are pleased to report that the IGS already has three operational TCs: Soil Reinforcement, Filtration, and Barrier Systems. The leaders of these new TCs initiated their operation after having compiled proposals that were approved by the IGS council and outlined the possible activities of these TCs. These possible activities include interacting with conference organizers to lead technical sessions at upcoming conferences, with designers to produce technical documents, with academics to offer short courses, and with special emphasis on young professionals who are expected to stimulate the use of geosynthetics among the new generation of engineers.

I encourage you to contact the chairs of any of the operating units in order to clarify any questions that you, as an IGS member, may have. You can obtain the contact information of the chairpersons by visiting

Table 1: Relevant contact information for some of the Operating Units of the IGS Council

If you are interested in...	Please contact:	E-mail address:
... representing a chapter in Africa	Peter Legg, Chair, African Activities Committee	peterlegg@telkomsa.net
... representing a chapter in Asia or Australasia	Malek Bouazza, Chair, Asian Activities Committee	malek.bouazza@eng.monash.edu.au
... representing a chapter in Europe	Martin Ziegler, Chair, European Activities Committee	ziegler@geotechnik.rwth-aachen.de
... representing a chapter in the Americas	Victor Pimentel, Chair, Pan-American Activities Committee	victor_pimentel@uol.com.br
... organizing a new Technical Committee	Neil Dixon, Chair, TC Coordination Task Force	n.dixon@lboro.ac.uk
... contributing to the planning of technical activities about Soil Reinforcement	Jun Otani, Richard Bathurst, or Gerhard Bräu, Co-chairs, Reinforcement Technical Committee	junotani@kumamoto-u.ac.jp , bathurst-r@rmc.ca , Gerhard.Braeu@bv.tu-muenchen.de
... contributing to the planning of technical activities about Barrier Systems	Malek Bouazza, Kent von Maubeuge, or Boyd Ramsey, Co-chairs, Barrier Systems Technical Committee	malek.bouazza@eng.monash.edu.au , kvmaubeuge@naue.com , boydramsey@comcast.net
... contributing to the planning of technical activities about Filtration	Ennio Palmeira or Jonathan Fannin, Co-chairs, Filtration Technical Committee	palmeira@unb.br , jonathan.fannin@ubc.ca

the membership directory in the IGS website. In particular, please stay tuned for upcoming information about joining the Technical Committees of the IGS. In the meantime, and for your convenience, I list in Table 1 the contact information of

the chairpersons of both the Regional Activities Committees and the Technical Committees, as I expect that these are the operating units in which IGS members may be particularly interested in participating. We are counting on your par-

ticipation and direct involvement in the activities of the IGS Council.

*Reported by
Jorge G. Zornberg, IGS President*

Report about the IGS Council Meetings May 2010, Guarujá, Brazil



**Secretary:
Elizabeth
Peggs (USA)**

At the 9th ICG in Guarujá there were in fact two sets of council meetings. Prior to the conference were the final meetings of the Officers and Council whose term concluded in 2010. After the conference we held the inaugural meetings of the newly elected council. It was a very busy and very productive week for IGS business.

23 May 2010 – Final Session of the 2006 - 2010 Council

The majority of the business conducted in this plenary meeting related to the wrap-up and transfer of various projects to be passed to the new council. Key items included on the agenda were:

Discussion regarding the previously approved Guidelines for Technical Committees/Technical Working Groups the council agreed to adopt the more current version of the document prepared by Neil Dixon and Jun Otani. In addition, the Council voted and agreed to adopt the name "Technical Committee" eliminating the nomenclature "Technical Working Groups".

The IGS Corporate Committee had previously begun an effort to create an IGS Corporate Recognition Award, the details of which are currently being established. It was agreed during this meeting that the award, when established, will be named in honour of Bernard Myles. This is intended to be a recognition of his long-standing contribution to

the IGS and specifically its corporate membership.

The review of the established process and procedure relating to the RFP (Request for Proposals) for the IGS Secretariat's Office was given by Sam Allen, Task Force Chairman.

A nomination of founding member and long standing IGS Council Member and Secretary Peter E. Stevenson for the IGS Honorary Membership award was made. A unanimous vote in favor of this award was made by the council.

A nomination of IGS Secretariat Rosemary Stevenson for the IGS Plaque was made. It was recognized that before becoming a paid full-time employee of the IGS Rosemary volunteered as administrative assistant and bookkeeper to the IGS. As such Rosemary contributed to the foundation of the IGS. A unanimous vote in favor of this award was made by the council.

Member Alan Bamforth put forth (in writing) a request for IGS participation in TARIC (Integrated Tariff of the European Communities) code dealings, this request was moved to the purview of the European Activities Committee.

Each of the four Regional Activities and Council Committees prepared a report and presented it to the group commenting on status of projects and identifying the need for work to be done by the newly elected council. If you would like to read a detailed report of these minutes or of the committee minutes please contact the Secretariat's Office (IGSsec@geosyntheticsociety.org) for complete copies of the minutes.

Council Meetings

27 May 2010 17:00-19:30 – Initial Plenary Meeting of the New

Council

The council discussed the need to co-opt members - council member co-option is available to "ensure that the Council membership will be broadly representative of the different industrial, scientific, or national sectors of the Society;" 5 nominations for co-option were made and by vote of the council co-opted. Those members are: P. Abad (Spain), G. Vivar (Peru), K. Rajagopal (India), X. Tang (China), C. Yoo (Korea).

The officers nominated, and the council elected, member E. Peggs as Secretary.

The officers nominated, and the council elected, member J. Cowland as Treasurer.

Via a presentation by Sam Allen, Chairman of the Secretariat RFP Task Force, the council was updated on the status of the RFP project, its associated deadlines and processes.

President Zornberg led a discussion addressing the organization of committees, task forces and the newly developing technical committees. The council worked together to hone the proposed format of these groups and established a working plan to move forward during the next two days of meetings and throughout the year. Please refer to article on page 6 in this issue of the IGS News for detailed explanation of this revised structure.

Chairmen for each of the task forces, committees and technical committees were proposed and confirmed. Please refer to the IGS Web site *Directories>Committees* for a complete list of committees and members.

28 May 2010 – 08:00-10:00 am – Plenary Part II – Strategic Planning

Strategic Planning, this session was new to the IGS Council and very compelling. President Zornberg provided a framework for the council to review "the big picture". The goal of which was to help develop "a clear path forward, a roadmap to change"

Some of the topics and resulting ideas we addressed in this discussion session:

Discussion of Opportunities: First the council identified **opportunities** for long term growth and impact noted that we should refer to Global Change documents by the UN.

Concepts raised:

1. Sustainable Development
 - a. Carbon management
 - b. Food production
 - c. Water
2. Disaster Mitigation (Brandl) – We should begin an effort to create a resource that Regulators and NGO's know of IGS as Access point so that we may quickly and efficiently extend services and resources when a disaster occurs.
3. Climate Change
4. Energy
5. The use of Marginal Materials for construction
6. Expedited Communication
7. Information transfer to the Regulatory community
8. Recycled material use guideline in anticipation of the need developing.

Mega issues:

1. Mitigation
2. Global Changes (population, carbon, water)
3. Environmental Preservation
4. Disaster Response - Creating a Resource that Regulators and NGO's know of IGS as Access point before a disaster occurs we should develop Name Recognition of the IGS. Highest level issues can be addressed at the IGS. Good communication with the IGS chapters is a necessity it should be recognized that many chapters and related organizations have started these efforts.

The IGS core purpose: was discussed and the following purposes were identified by the council:

1. Promoting Innovative Technologies for geo-solutions
2. To advance the proper user of geosynthetics

The final summary purpose statement which the council agreed to further refine:

The IGS Core Purpose is to help the world to understand the value of and the appropriate use of geosynthetic technology.

Establishing IGS B.A.G.s (Big Audacious Goals): geosynthetics should become indispensable to the point that they are regularly included in engineering curricula and relevant design standards.

Benchmarks to identify the achievement of this goal should include:

1. We will see Geosynthetics Technology being taught in all undergraduate curriculum
2. All relevant design guides include appropriate geosynthetics references.

The Council Established clear 4 year goals:

1. Increase Membership by 50%
2. Increase traffic on the web site by 200%
3. Increase the chapters in regions not represented by the IGS (e.g. Africa, parts of Asia and Americas)
4. Integrate more completely with the Chapters
5. Increase the Connections to the National Geosynthetics Organizations
6. Begin our efforts to increase geosynthetic education at the undergrad level

Before breaking into Committee Meetings the final portion of this session was comprised of IGS Success Stories. These stories were presented with the hopes of sharing practical knowledge amongst the council members. The three presentations were:

1. **Successful Regional Conference Story - Lessons Learned from the EuroGeo4 Conference**
by Neil Dixon
2. **Successful IGS Education Story - IGS-Perú Short Course Series**
by German Vivar

3. **Successful IGS Communication Story - GIGSA Newsletter**
by Peter Legg

28 May 2010 – 10:30-18:30 pm – Committee Meetings

Immediately after this session and after lunch the IGS Committees met to discuss their business. Each of the committees was asked to work on establishing their own short term goals which would help the IGS meet the B.A.Gs as well as the 4 year goals of the IGS. Committees which met include: Corporate, Communications, Education, African Activities, Asian Activities, European Activities and the North/South American Activities Committee.

Committee Meeting minutes are available in their entirety from the IGS Secretariat's Office by request (IGSsec@geosyntheticssociety.org)

29 May 2010 – 08:00 – 12:30 Closing Plenary Session

Standard business of the council reporting was conducted including scheduling, membership numbers, IGS News updates and web site updates. At the time of the meeting the membership numbered 130 Corporate.

In order to encourage more participation from the IGS Membership the council will work to schedule additional committee meetings during the course of conferences. This is expected to include regional activities committees, the corporate committee etc.

All IGS Committees Reported to the Council, proposals for 2011 activities reviewed and budget requests were made.

The African Regional Activities Committee among other things is:

- Establishing new chapters throughout the continent focusing on: the South Africa Developing Countries, Egypt, Algeria and Ghana
- Implementing a geosynthetics track at the ISSMGE conference in Maputo
- Commence with training in Botswana, Namibia and other neighboring countries.

Pan-American Regional Activities Committee among other things is:

- Is focused on supporting the chapters within the region initially

Argentina and Chile. Specifically in their efforts to develop more technical education efforts in those countries.

- Will focus on developing and utilizing the new web based tools becoming available through the IGS
- Creating joint educational efforts with sister societies – specifically Council Member Blond is perusing a joint effort between the Canadian Geotechnical Society and NAGS.

Asian Activities Committee among other things is:

- Is working to create joint educational efforts with sister societies including: Singapore Water Week, GSI Taiwan and the International Tunneling Association
- Is working to have their next meeting 8th December. The committee has requested a budget to invite delegates from under represented countries including: Cambodia, Laos and others to the meeting.
- Discussed how the Technical Committees (TCs) from various Asian Chapters could interact with the TCs being formed under the IGS

European Activities Committee among other things is:

- Developed plans for the creation of Task Forces (TF) including: **TF EG5 Support:** Chair Ziegler with Dixon, Fantini and Bräu, **TF Growth of Activities:** to help initiate activities where there are areas with no chapters: Fantini, Bräu and IGS Member Hearten (Romania, Slovenia, etc.), **TF EuroCodes** are not accurately used and they will do a survey to evaluate the situation - no budget this year but potentially. Chair Bräu with IGS Member Moraci
- The committee plans to make contact with Finland as there has been reported local interest in starting a chapter
- Create a Liaison the International Road Congress
- Identified a series of events at which they should promote the IGS and the UK Chapter. These targets include: Nubian conference in Bratislava, Sardinian Conference promote IGS there, EG

Geotechnical Conference 2011, Mega Cities Conference in Russia, Baltic Sea Conference Geotechnics

The **Communication Committee** among other things is:

- A Task Force lead by Sadlier assisted by Peggs will target the development of 4 articles on geosynthetics over the course of the next year. Placement of these articles in Non-Geosynthetics Magazines will be the goal.
- Considering a web site discussion forum, Sadlier is heading this Task Force. The task force will evaluate and the process and procedures required for such a forum and develop an action plan related to getting a discussion forum functioning.
- Developing an International Press Release list to which the IGS can circulate information about events, awards, technical meetings etc.
- Developing a survey questionnaire asking chapters about how we may improve communication between the IGS and its Chapters.

The **Corporate Committee** among other things is:

- Setting a goal to increase by 20% Corporate membership over the next 4 years
- Working to establish an improved channel of communication with the Corporate Membership specifically looking to obtain, from Corporate Members, contacts for specific types of communication.
- Lead by Fantini, revising and finalizing the Bernard Myles Corporate Recognition Award guidelines
- Planning a Corporate Committee Meeting within the operational hours of the next conference at future meeting events
- Lead by Peggs evaluating and reporting on options for exhibition rules to standardized complimentary registrations for corporate members who are exhibiting at IGS events.

The **Education Committee** among other things is:

- Continuing on with the development of Educational Leaflets, identifying 3 new topic areas for leaflet development: Sustainable

technologies, Landscape and Mining. They will also begin work on Case history Leaflets.

- Beginning work on the development of webinars. The committee identified potential topics for webinars including: Application and design elements, Material measurement and specification and Installation.
- Formed a Task Force to establish instruction/format and criteria for the webinars. This TF will be led by Allen and supported by Peggs and Sadlier.
- Developing a video on the geosynthetic technologies which can be utilized for Sustainable Development. This video will be targeted at NGOs, Government, Regulators and Large Industry.
- Undertaking the translation of the **Mathematical Symbols and Terminology** document. The following committee members have agreed to have the document translated:
 - **Vivar** - Spanish & Portuguese
 - **Touze-Foltz** - French
 - **Tang** - Chinese

After concluding the reporting and discussion of topics brought by each council the general business of the IGS was addressed and the following discussions took place.

The council reviewed the Technical Committee documents and addressed modifications to be generated by Dixon.

Treasurer Cowland made a financial report including a 2011 budget proposal which was adopted by the council.

The council voted and formally selected the next meeting location for the IGS Council. The meetings will be held in conjunction with GeoFrontiers in Dallas Texas in March of 2011.

After a review of the Action Items the council meeting was concluded.

*Reported by
Elizabeth Peggs, IGS Secretary*

Meeting of IGS Chapter Presidents May 2010, Guarujá, Brazil

The 9th International Conference on Geosynthetics (9ICG) was also the venue of an important meeting, which gathered the Presidents of the IGS Chapters and the elected Officers of the new IGS Council. The meeting took place on May 27, 2010 in Guarujá, Brazil, and was attended by the president (or representative) of 25 of the IGS Chapters. This was a fantastic turnout! The meeting was an excellent opportunity to share opinions and suggestions regarding the activities that the IGS Presidents would like to see prioritized during the next 4-year term of the IGS Council. Indeed, this information provided valuable input to the strategic planning meeting that was subsequently held by the IGS Council.

The meeting of Chapter Presidents was hosted by the three elected IGS officers (President Zornberg, Vice-president Jones, Immediate Past-president Tatsuoka), as well as by Mauricio Ehrlich, the President of the IGS Brazilian Chapter. Important topics covered during this meeting included:

- Vision and objectives of the IGS for the next 4 years
- Plans of each chapter for the next several years
- New initiatives developed by the IGS to address perceived needs of the chapters
- Communications between IGS chapters and the IGS Council
- Opportunities for individual members to more formally participate in organized efforts of the IGS (regional committees, *IGSNews*,



IGS Chapter Presidents at 9ICG in Guarujá

- conferences, technical activities).
- Opportunities for continued interaction among IGS Chapter Presidents

The meeting was also valuable to identify what did work (and what didn't) in the various chapters. In this regard, discussions addressing on-line membership and strategies for increased membership were of particular common interest among the chapters. Some of the needs identified by the Chapter presidents during the meeting included:

- Clarifying the requirements for IGS auspices of conference
- Developing an On line reporting system for the annual report
- Facilitating communication about available sources of income
- Making available keynote lectures of ICG and other key references

- Studying aspects associated with currency fluctuations for membership fee
- Identifying ways to update contact information in the IGS database

Each of these needs will be presented by the elected IGS Officers to the appropriate IGS Committees and Task Forces, and are expected to be addressed in a comparatively short period of time. **Figure 1** includes a group picture of many of the participants in this meeting.. Based on the high level of productivity I am very hopeful that the meeting of Chapter Presidents becomes an IGS tradition.

*Reported by
Jorge G. Zornberg, IGS President*

Report about the 7th General Assembly of the IGS at 9ICG in Guarujá, Brazil, on Wednesday May 26 at 4 PM

The IGS 7th General Assembly was held on May 26, 2010 16:00 – 19:30 at the 9th ICG in Guarujá, Brazil, as many of the events of the assembly have been described elsewhere in this issue of the *IGS News* I will acknowledge them quickly but only to avoid redundancy.

The Master of Ceremony at the event was IGS Treasurer John Cow-

land; the welcome was given by President Tatsuoka after which the Chairman of the Awards Committee Daniele Cazzuffi led the Awards Ceremony.

Please refer to the IGS Awards article in this issue for details on the **IGS Award** winners and their projects (page 20).

In addition to the IGS Awards, as

Giroud Lecturer Heinz Brandl was recognized, **Carroll Heart** was recognized as having supported the IGS as a **20 year Benefactor Member** and **Masashi Kamon** received a **Council Service Recognition** for his 8 years of service on the IGS Council.



Pete and Rosemary Stevenson – in service of IGS since the beginning

It was with great respect and admiration that the council had an opportunity to honour a founding member of the IGS who has remained a constant part of the IGS Council since its inception. Peter Stevenson began his 26 years of service to the IGS as treasurer in 1984. He continued on as Treasurer until 1994, following which he served as IGS Secretary for 16 years from 1994 through the 7th IGS General Assembly! Pete has arguably given more time to the IGS than any other single member; it was with this in mind that the IGS Council unanimously elected to present **Peter E. Stevenson** its highest award of **Honorary Membership**, an award which has been bestowed only five times in the history of the IGS. In addition to the award and as a token of the great appreciation for all of the time Pete had given to the

IGS, he was also presented with a lovely Tourneau timepiece.

The heartfelt speech given by Peter in response to the award was outstanding and received a standing ovation.

Pete's contribution to the IGS has been magnanimous but clearly couldn't be recognized as a solo contribution! **Rosemary T. Stevenson** as most of us know has served the IGS with a cheery disposition and a happy heart, as the Secretariat Manager for a number of years. But, what many may not know is that in the beginning, when the IGS was just new, Rosemary too was a volunteer supporting the growth of the IGS through the donation of time. It was with this in mind that the IGS Council unanimously elected to present **Rosemary T. Stevenson** the **IGS Plaque**. In addition to the award and as a token of the great appreciation for all of the time Rosemary had given to the IGS, she was also presented with a lovely Tourneau timepiece.

Richard Bathurst and Kerry Rowe recognized each of the **best paper award recipients** from **Geosynthetic International** and **Geotextiles & Geomembranes** respectively.

Geotextiles and Geomembranes
– R.K. Rowe, Editor

Best papers 2008

- **A study on biological clogging of nonwoven geotextiles under leachate flow**
Ennio M. Palmeira, Aline F.N. Remigio, Maria L.G. Ramos, and Ricardo S. Bernardes,
Geotextiles and Geomembranes, 26(3): 205-219
- **Geomembrane strains from coarse gravel and wrinkles in a GM/GCL composite liner**
R.W.I. Brachman and S. Gudina,
Geotextiles and Geomembranes, 26(6): 488-49

Three papers were selected for Honourable Mention:

- **Long-term barrier performance of modified bentonite materials against sodium and calcium permeant solutions**
Takeshi Katsumi, Hiroyuki Ishimori, Masanobu Onikata and Ryoichi Fukagawa,
Geotextiles and Geomembranes, 26(1): 14-30
- **Analytical modelling of gas leakage rate through a geosynthetic clay liner/geomembrane composite liner due to a circular defect in the geomembrane**
Abdelmalek Bouazza, Thaveesak Vangpaisal, Hossam Abuel-Naga and Jayantha Kodikara,
Geotextiles and Geomembranes, 26(2): 122-129
- **Design of geosynthetic-reinforced platforms spanning localized sinkholes**
Laurent Briançon and Pascal Villard,
Geotextiles and Geomembranes, 26(5): 416-428

Geosynthetic International - R.J. Bathurst, Editor

Best Papers of 2007

- **Quantifying geomembrane wrinkles using aerial photography and digital image processing.**
Take, W. A., Chappel, M. J., Brachman, R. W. I. & Rowe, R. K. (2007).
Geosynthetic International, 14, No. 4, 219–227
- **A theoretical framework to analyse the behaviour of polymer geosynthetic reinforcement in temperature-accelerated creep tests.**
Kongkitkul, W. & Tatsuoka, F. (2007).



IGS Past Presidents honouring Pete and Rosemary Stevenson

(left to right: Daniele Cazzuffi, JP Giroud, Pete Stevenson, Rosemary Stevenson, Kerry Rowe, Richard Bathurst, Fumio Tatsuoka)

Geosynthetics International, 14, No. 1, 23–38

- **Creep rupture curve for simultaneous creep deformation and degradation of geosynthetic reinforcement.**

Kongkitkul, W., Tatsuoka, F. & Hirakawa, D. (2007).
Geosynthetics International, 14, No. 4, 189–200

Three papers were selected for Honourable Mention:

- **Metal retention in geosynthetic clay liners following permeation by different mining solutions.**

Lange, K., Rowe, R. K. & Jamieson, H. (2007).
Geosynthetics International, 14, No. 3, 178–187

- **Behaviour of geogrid-reinforced load transfer platforms for embankment on rammed aggregate piers.**

Abdullah, C. H. & Edil, T. B. (2007).
Geosynthetics International, 14, No. 3, 141–153

- **Axisymmetric numerical modeling of a unit cell in geosynthetic-reinforced, column-supported embankments.**

Smith, M. & Filz, G. (2007).
Geosynthetics International, 14, No. 1, 13–22

To conclude the Awards portion of the General Assembly Elizabeth Peggs presented each of the winning photographs from the **1st IGS Photo Contest**. Please refer to the article in this issue of the IGS News to find the details of this presentation (page 16).

After the fun of the awards, it was time to get to the serious business of the 7th General Assembly of the IGS. Secretary Stevenson presented the procedure and established a quorum, all members received voting cards and the meeting began.

In two separate votes the minutes of the 6th General Assembly were approved and the general assembly approved the **10th ICG in Berlin** as the location for the next **IGS Gen-**

eral Assembly.

President Tatsuoka made his **Society Activity Report** to the assembly, reviewing the growth in membership by type and regional representation, reviewing also the critical growth of the Society's activities in: conference management, educational materials production, newsletter growth and the new web site launch. There was an opportunity for questions regarding the report and an approval by **vote**, of the *Society Activity Report*.

In Memory of Bernard Myles, Peter E. Stevenson asked for a moment of silence and delivered an amazing memorial speech on the life and numerous contributions of Bernie to the IGS and the world at large (page 14).

IGS Finances

were reported on by both the **Treasurer of IGS Cowland** and the **Financial Committee Chair Fantini**. Both presenters welcomed questions and comments from the membership after which Treasurer Cowland asked for and received an **affirmative vote** on the acceptance of the **financial report** by the members. Likewise Treasurer Cowland **made a motion** to approve keeping the current **IGS membership subscription rates the same**, the motion was carried. Finally the General Assembly **voted** in favor of keeping the **incumbent Chair of the Financial Review Committee Pierpaolo Fantini**.

After which President Tatsuoka recommended that the year of the 11th ICG be 2018. President Tatsuoka made a motion to approve this suggestion and the motion was carried. **The 11th ICG is to be held in 2018.**

To conclude the business of the 7th General Assembly President Tatsuoka, with great pride and pleasure, announced the newly elected Officers of the IGS and formally passed his title of **IGS President** to **Dr. Jorge Zornberg (USA)** and introduced **Dr. Russell Jones (UK)** as **IGS Vice President**.

The first official act of office President Zornberg made a very entertaining and appreciative Thank you



IGS Immediate Past President Fumio Tatsuoka

speech honoring Immediate Past President Tatsuoka for his service to the IGS. President Zornberg, presented to the General Assembly an overview of the many technical and personal contributions of Tatsuoka. Recognizing that **“Prof. Tatsuoka's contributions to multiple areas of Geosynthetics and Geotechnical Engineering have been characterized by his ability to transfer sophisticated concepts often restricted to academic circles into the hands of the mainstream design engineer.”**

President Zornberg concluded by introducing the 2010 council (details of which can be found in the election article in this issue of the IGS News) and the 7th General Assembly of the IGS was concluded.

*Reported by
Elizabeth Peggs, IGS Secretary*

Change of Editorial Board for IGS News



IGS News Editorial Board up to May 2010 (left to right): Pete Stevenson, Rosemary Stevenson, Gerhard Bräu, Daniele Cazzuffi, Fumio Tatsuoka

As editor of IGS News I want to thank the departing editorial team that assisted me during the last three years and have to leave as the period of their official position has gone: Daniele Cazzuffi in his function as Chairman of the IGS

to forget to mention also Rosemary Stevenson who has all those points in mind and crosschecked them in IGS News, that are necessary to have an accurate and for most of the readers satisfying issue. It was a fruitful and successful work with

Communication Committee, Pete Stevenson, as IGS Secretary and Fumio Tatsuoka as IGS President. It was a great pleasure to work with all of them, I learned a lot of the wide spread connections within the community, they supported me with great ideas, useful information and very well formulated texts. Within this context I do not want

this team and it was more: it was friendship one can count on! I wish them all the best for the future inside and outside of the geosynthetics community and I hope that I can come back to them if necessary, although no longer officially involved in the IGS News Editorial Board.

Now I am looking forward to work with the new editorial team that is already very active since the IGS meetings at 9ICG: Jorge Zornberg as IGS President, Elizabeth Peggs as IGS Secretary and Russell Jones as Chairman of the IGS Communication Committee. As you can see from the thickness of this IGS News issue and the very interesting and informative articles - it will work!

*Reported by
Gerhard Bräu, Editor of IGS News*

In Memoriam Bernard Myles



Bernard Myles

Bernard Myles was my friend. We met in 1980 in New Orleans at an organizing meeting for the IFAI geotextile committee where he was the only sensible voice. During the next 30 years he became my friend and he remained a sensible voice. He was a teacher, a guide, a mentor and a critic. Bernard was a scientist, an engineer, a warrior and a superb friend. We shared so many adventures I cannot recount them all else this note would become a bore rather than a tribute. We worked together in the exhibit hall at the 2nd IGC in Las Vegas and of course that was when the IGS was conceived. I became a member of the IGS in Brussels the next year at Bernard's insistence and we worked together in industry and in the IGS until last

year when he became so ill.

Bernard Myles was a founding member of the IGS and attended the Paris Conference, the organizing meeting in Las Vegas and served on the first council. Bernard served 16 years on the council and attended so very many council meetings and conferences. His dedication to the IGS is unquestioned. He assumed the role of the guardian of the interests of the corporate membership which was a role he played both as a council member and also during the period he was not a council member. Bernard was a burr under the saddle, never allowing an issue to be avoided, always requiring that the right thing be done. The IGS is indebted to Bernard Myles.

Following our meeting in New Orleans a 30 year chronology must include geotubes in Venice and high strength geotextile runway extension following Allan Halliburton's lead at Washington National (now Reagan) both in 1982 -1983 which was followed by high

strength fabrics in USA, Finland and around the world. Over the following years we pursued engineering, manufacturing, high strength seams, and unique solutions which included continuous filament non woven geotextiles in Switzerland, soil nailing in the UK, California and Colorado, and polyester geogrids once again in the US. Along the way we were team members in the days of Burlington and ICI, and then he worked for me while at James River. We were partners in Acme STW and later I worked for him in Soil Nailing and then he worked for me at Xtex. Regardless of organization charts, in reality we were always partners. It was a rich and rewarding friendship, and one that I would wish for anyone.

Bernard Myles held strong views and expressed them often and with passion. He never ducked a fight and there were many occasions in which we did not fully agree and we had some lively debates. Our solution was to run and we ran together many times, in the Apennines, in

London, on the Washington mall, in Paris and Brussels and Milan and a host of places I omit and near our homes as we visited together innumerable times. Running was special because we had to concentrate to communicate, breathing being an impediment to excess wordiness. We did argue a great deal in restaurants, trains and cars, and cars had a unique effect. We could become so involved as to lose track of conditions and on several occasions one of us received a not so friendly instruction to pay more attention from

local law enforcement.

In between arguments on politics, technology, strategy and nonsense we wrote a business plan while snowbound in the Alps, lived on the economy in Singapore during the conference there, shot steel rods into the earth in Oregon and generally had a great time. Bernard was my best man. Bernard's children, Doris and Philip, spent time at my home and my son Michael spent a summer under Bernard's watchful eye in a testing lab in the UK. My youngest, Tara,

visited Sweden in the summer with Bernard's family.

We were three weeks different in age, I being eldest... I miss him now and I will miss him forever. I am so sorry to say goodbye, for me the world is a lesser place today. He was more than my friend, he was my brother.

*Reported by
Pete Stevenson
Wednesday April 28, 2010*



In Respect and Love



Bernard Myles

New IGS Web Site Launched!



**Secretary:
Elizabeth
Peggs (USA)**

In concert with the 9th ICG the new IGS Web site was launched! Our goal was to have a site which would meet the needs of site visitors rang-

ing from IGS Members to the interested geosynthetics newcomer. The site has two classes of resources those available to the **public** like the Educational Leaflets (in 7 languages) and those which are restricted to **members only** access like the IGS Journals, Lectures and the Membership Directory.

In order to access the **Members Only Resources** a site visitor must be logged in. If you are an IGS Member you should have

received an email from the Secretariat providing log-in instructions for your account. If you have not received your login information please contact the IGS Secretariat at

IGSsec@geosyntheticssociety.com for details.

The site has all of the traditional content as well as a variety of new features including:

- Photo Gallery
- A language translation tool (trans-



New look of IGS web site –please check!

- Direct access to *Geosynthetics International* – the journal web site no longer requires a password when accessed by a logged in member from the IGS Web site!
- Document management tools for council and committee members
- lating site text into 40+ languages)
- Dynamic Linking of member information in all segments
- Online membership payments

We have every intention to continue developing the site as a useful tool to promote the IGS and Serve the membership; as such comments and suggestions are always welcome! Please forward your comments to the Secretary's office EPeggs@geosyntheticssociety.org.

Also keep your eyes open for some coming features including a Case Histories segment and an Interactive Discussion Forum!

*Reported by
Elizabeth Peggs, IGS Secretary*

Result of the 1st IGS Photo Contest

The 1st IGS Photo Contest was a fantastic success *thank you* to each and every contributor. The photos were of outstanding quality technically and esthetically! Our panel of judges certainly had a difficult time

but each reported enjoying the job thoroughly. Thank you also to Malek Bouazza, Han-Yong Jeon, Peter Legg, Michelle Maugeri and Ennio Palmeira for all of the time they took to review and score the 140+ photographs!

The IGS Photo Contest was created by the Web site redesign task force in order to collect compelling photos for use on the site and in other graphic efforts representing the IGS. We really wanted some impactful visual statements which would demonstrate geosynthetics technology at

its best. The winning photos represent well the outstanding works of our membership. It is our intention in future contests to refine the process, possibly creating categories specific to material function. Also a number of requests have been made regarding the details of the projects demonstrated in the winning photos. As such we are in pursuit of informative case history information associated with the winning photos – please keeps your eye on the *IGS News* for information regarding the release of these case histories.

If you would like to view all of the submissions you may go to www.geosyntheticssociety.org scroll to the bottom of any page and click on the *Flickr* gallery. To view the winning photos and descriptions you may go to the *>Resources* segment of the site and click on *>Photos* or just continue reading. Each of the following descriptions was provided with the photo in the application process.



Reinforcement

NENT Landfill Extension, Increase volume by a reinforced embankment using Tenax uniaxial geogrid, in Sha Tau Kok area, the city of Hong Kong, the Peoples Republic of China.



Erosion Control

ELCOROCK® coastal erosion protection system being used to construct a near shore breakwater and reduce erosive impact on the shoreline (refer www.elcorock.com and www.geofabrics.com.au). The system allowed the use of indigenous labour on the island in remote Australia.



Containment

Job site: Water pond (for artificial snow guns). Geotextile as protection layer for "solid ground" for a long term protection application. The protection geotextile "Drefon" was produced with extrem high puncture resistance (cone drop : 0 mm) made of high tenacity fibres. The Drefon protection geotextiles is a pure needle punched nonwoven. Behind you can see the mountain "Matterhorn" in Swiss !



Containment

The El Mochito mine has a tailings lagoon with a rock filled dam that contains large volumes of contaminated mine tailings slurry. Above the tailings lagoon is a large unstable area that has the potential to develop into an active landslide. To solve this, we constructed two Geotube® dams (2 - 1 and 3 - 2 - 1 pyramid structures of 10 m, 12 m, and 14 m circumference GT1000M Geotube® units) in the 10 meter deep, HDPE lined raceway above the tailings lagoon. Strips of high friction angle textured HDPE liner were welded to the existing HDPE raceway liner to provide a higher friction angle between the liner and the Geotube® container surface at the location of the two structures. It was also necessary to install 4 - 0.6m cir. HDPE corrugated drainage pipe bedded in gravel at the base of the structure to drain any accumulation of water. Next, the bottom layer of GT1000M Geotube® units were placed and filled multiple times with a locally available mixture of coarse and fine mine tailings until the top of each dewatered Geotube® unit reached 2.0 meters.



Reinforcement

Mindland Quarry, U.K., This photo clearly shows the division between the two different fill materials that were used. A former waste product of mixed foundry sand was used within the reinforced soil block and a site won cohesive fill (lime stabilised where required) was used for the backfill behind the reinforced soil block.



Reinforcement

NENT Landfill Extension, Increase volume by a reinforced embankment using Tenax uniaxial geogrid, in Sha Tau Kok area, the city of Hong Kong, the Peoples Republic of China.



Containment

Engineered Rock Placement Area for Pyrite on Pennsylvania Department of Transportation, I-99. 25 acre cell consisting of GCL/60mil HDPE/Geocomposite. Constructed by CETCO Contracting Services Company



Reinforcement

2010 World Cup Stadium, South Africa. Tensar TriAx was used to stabilise the haul roads on site. Tensar TriAx was also used to control settlement between concrete slabs and block paving as well as under precast stair blocks to mitigate cracking, should settlement occur



Containment

Anaerobic Digester is lined and capped with Firestone EPDM Geomembrane.

*Reported by
Elizabeth Peggs,
IGS Secretary and IGS Web Site Task Force Chair*



Containment

Double Lined Tank Base with HDPE & Chemoline G4 Rubber. Leak detection between liners which were mechanically fixed at centre and walls

IGS Highlighted in Recent Article Published in the Bulletin of ISSMGE

Good evidence of the continued, excellent relationship between the IGS and the International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) is the fact that the IGS history and activities were the highlight of the recent Bulletin of ISSMGE ("Message to ISSMGE from the President and Immediate Past-President of the IGS," ISSMGE Bulletin, Vol. 4, no. 2, pp. 1-11).

The 11-page article, written by Jorge G. Zornberg and Fumio Tatsuoka, offers to ISSMGE members some important milestones on the history of the IGS, provides a brief

overview of geosynthetics and geosynthetics engineering, illustrates the common knowledge base of geotechnical and geosynthetics engineering, and elaborates on possible collaborative efforts between the IGS and ISSMGE. The article concludes by pointing out the important aspects discussed by the IGS Officers in a recent meeting with ISSMGE President Jean-Louis Briaud. Specifically, collaboration between the IGS and ISSMGE is expected to continue through the support of relevant technical events (e.g. technical conferences). In addition, activities to be jointly conducted by our respective Technical

Committees were identified as new, promising venues which will help reach our common goals including: education, technical excellence, and service to the members at large.

The article can be downloaded from the ISSMGE web site:

<http://www.issmge.org/web/page.aspx?pageid=190758>

*Reported by
Jorge G. Zornberg, IGS President
and Fumio Tatsuoka, IGS Immediate Past-President*

Italian Leaflets Available



Ennio Palmeira

The IGS leaflets are brief descriptions of applications and characteristics of geosynthetics and their several applications.

The leaflets can be downloaded by anyone free of charge from the IGS website

<http://www.geosyntheticssociety.org/Resources.aspx>

Leaflets in English, Spanish, Chinese, Portuguese, French and Japanese have been available for a while **and new versions are now published in Italian.**

In view of the importance of these leaflets to promote the use of geosynthetics, the IGS Education Committee encourages your chapter to undertake the translation of the leaflets to your native language (if currently unavailable). To see a list of available languages please reference the IGS Web site **Resources>Education** section. German and Korean translations are currently underway. If you decide to do so, the IGS Education Committee will make the source files (in MS Word) available to the person in charge of the translation, which will help considerably his/her work. It is very important that the translated version, if not made by an expert on geosynthetics, be reviewed by one before it is sent for upload in the IGS website or publication.

The IGS Education Committee believes that the translated version of the leaflets will be very beneficial to the geosynthetics discipline and industry in your country or region.

The IGS Education Committee also takes the opportunity to encourage your chapter to produce CD's with the leaflets for distribution among university libraries in your country.

List of IGS Educational Leaflets

The following leaflets are actually available:

• Geosynthetics in Agricultural Applications

There is a wide variety of applications ranging from covered and uncovered ditch linings and ponds to protection of the groundwater and surface waters that are being polluted by animal waste.

• Geosynthetics Functions

Geosynthetics include a variety of synthetic polymer materials that are specially fabricated to be used in geotechnical, geoenvironmental, hydraulic and transportation engineering applications. It is convenient to identify the primary function of a geosynthetic as being one of: separation, filtration, drainage, reinforcement, fluid/gas containment, or erosion control.

• Geosynthetics Classification

Geosynthetics can be broadly classified into categories based on method of manufacture.

• Geosynthetics in Drainage and Filtration

Geosynthetics can be effectively used as drains and filters in civil and environmental works in addition to or in substitution to traditional granular materials. Geosynthetics are easy to install in the field and often cost-effective.

• Geosynthetics in Embankments on Soft Soils

Construction of embankments on soft soils can be a challenging task. The use of geosynthetics to improve embankment stability is one of the most effective and well-tried forms of the soil reinforcement technique.

• Geosynthetics in Erosion Control

Erosion is a natural process caused by the forces of water and wind. It is influenced by a number of factors, such as soil type, vegetation and landscape, and it can be accelerated by various activities that occur on a specific field installation. Uncontrolled erosion processes can cause major damages to existing structures and to the environment. Geosynthetics can be properly specified to minimize or avoid such damages.

• Geosynthetics in Hydraulics Projects

Hydraulic structures comprise the geosynthetics market segment with arguably the largest growth



L'utilizzo dei geosintetici nei pendii su terreni di fondazione stabili

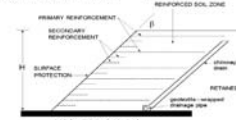
Testo di R. J. Bathurst - Tradotto da M. Mangani

Livelli di rinforzo con geosintetici sono utilizzati per stabilizzare pendii nei confronti di meccanismi di collasso. Il rinforzo può essere applicato nella sistemazione dei pendii o nel rinforzo delle scarpate dei rilevati.

I livelli di rinforzo consentono di realizzare pendii con fronti più ripidi di quelli non rinforzati. In alcuni casi può essere necessario stabilizzare la facciata del pendio (soprattutto durante i riempimenti e la compattazione) utilizzando rinforzi secondari più corti e con minore spaziatura e/o rivoltando il rinforzo in facciata. In molti casi la facciata del pendio deve essere protetta nei confronti dell'erosione. Ciò può richiedere materiali geosintetici, che possono comprendere le geocelle, riempite di terreno, o particolari geotesti, spesso utilizzati per il fissaggio temporaneo della vegetazione. La figura sottostante mostra un dreno utilizzato per ridurre gli effetti delle pressioni interstiziali nella zona rinforzata.



Esempio di stabilizzazione di un pendio mediante rinforzo



Pendio rinforzato con geosintetico su terreno di fondazione stabile

La posizione, il numero, la lunghezza e la resistenza dei rinforzi primari, richiesti per il raggiungimento di un adeguato fattore di sicurezza nei confronti della rottura del pendio, sono determinati utilizzando i metodi convenzionali di analisi dell'equilibrio limite o analisi modificata per tenere conto delle forze stabilizzanti disponibili per mezzo dei rinforzi. Il progettista può utilizzare il "metodo dei concetti" assumendo una superficie di rottura circolare o composta, composta da due o più cunei. Nell'analisi si assume che il rinforzo fornisca una forza agente nel punto di intersezione tra i geosintetici e la potenziale superficie di rottura analizzata. Per il calcolo del fattore di sicurezza FS può utilizzarsi il metodo di Bishop che fornisce la seguente espressione:

Italian version of an IGS Educational Leaflet

opportunities. The term "hydraulic structures" includes dams and canals.

• Geosynthetics in Landfills

Geosynthetics are extensively used in the design of both base and cover liner systems of landfill facilities.

• Geosynthetics in Railroads

Geosynthetics may perform the following functions in new track construction or rehabilitation: separation of materials with different particle size distributions, filtration, drainage and soil reinforcement.

• Geosynthetics in Road Engineering

Roads and highway are of utmost importance to the development of any country. Due to systematic traffic of heavy vehicles, climate conditions and mechanical properties of the materials used in their constructions, highway pavements may last considerably less than expected. Geosynthetics can significantly increase the performance and durability of roads.

• Geosynthetics in Slopes over Stable Foundations

Layers of geosynthetic reinforcement are used to stabilize slopes against potential deep-seated failure using horizontal layers of primary reinforcement. The rein-

forced slope may be part of slope reinstatement and (or) to strengthen the sides of earth fill embankments

• **Geosynthetics in Unpaved Roads**

Geosynthetics can be effectively used to reinforce unpaved roads and working platforms on soft soils.

• **Geosynthetics in Walls**

Horizontal layers of geosynthetic reinforcement can be included with retaining wall backfills to pro-

vide a reinforced soil mass that acts as a gravity structure to resist the earth forces developed behind the reinforced zone.

• **Geosynthetics in Waste Water Treatment**

Geosynthetics are used in various applications in waste water facilities. The most common use is in lagoons operating with anaerobic and aerobic processes. Other applications include enhanced evaporation of wastewater and sludge dewatering by permeable

geotextile geotubes.

You can find all leaflets at:

<http://www.geosyntheticssociety.org/Resources.aspx>

*Reported by
Ennio Palmeira,
previous Chairman of IGS Education Committee*

IGS Award Winners 2010

Report of the IGS Award Committee Awards Period 2006 - 2010



Daniele Cazzuffi

As reported in the March issue of IGS News, the IGS Awards Committee met in West Palm Beach on 20 February 2010.

Attendees were the Chairman Daniele Cazzuffi (Italy), the members Malek Bouazza (Algeria-Australia), Benedito de Souza Bueno (Brasil), Jean-Pierre Giroud (France-USA), and Mike Sadlier (Australia) and the Secretary Peter Stevenson (USA).

After a constructive discussion, the IGS Awards were unanimously assigned as following:

IGS Young Award:

one to Saman Zarnani (Iran-Canada)

IGS Awards:

four respectively to: the team composed of R. Bathurst (Canada), T. Allen (USA), Y. Miyata (Japan), & A. Nernheim (Germany), Chungsik Yoo (Korea), Huesker (Germany) and Tensar (UK-USA).

The presentation of IGS awards was held at the 9th ICG in Guaruja in conjunction with the IGS General

Assembly in the following order:

- Zarnani by Benedito de Souza Bueno
- Huesker by Jean Pierre Giroud
- Tensar by Mike Sadlier
- Yoo by Daniele Cazzuffi
- Bathurst et al by Malek Bouazza

The citations were as following:

Saman Zarnani:

“This IGS Young Award is given to Saman Zarnani for his experimental and simulation work on EPS geof foam to reduce horizontal loads on earth reinforced structures. Both dynamic and static loading were tested. The results showed that the dynamic loading attenuation was increased by 40% as compared with a wall with no geosynthetic buffers. A numerical simulation was also used and agreed very well with the experimental results. The results from the studies can guide engineers to the selection of buffer stiffness values to be used in the field”.

Huesker:

“This IGS award is given to Huesker Synthetic GmbH for the development and applications of high-performance geosynthetics made from innovative polymers. The validity of using these geosynthetics to support soil layers and liner systems over cavities, and embankments on pile foundations has been demonstrated in the field; and the

properties, applications and performance of these geosynthetics have been presented in high-quality papers”.

Tensar:

“This IGS Award is given to Tensar for the development and implementation of a triangular geogrid intended to display properties not achievable with conventional square or rectangular geogrids. The triangular geogrid has the capacity to develop more isotropic stiffness and this is expected to provide potential benefits across many applications”.

Yoo:

“This IGS Award is given to Professor Chungsik Yoo (Korea) who developed various methods for prediction and control of long term deformation of geosynthetic-reinforced soil structures under sustained and repeated loads. In addition he conducted a number of field investigations on case histories and provided relevant data to the Korean community to further improve design and construction practice in geosynthetics-reinforced earth structures”.

Bathurst et al.:

“This IGS Award is given to the team composed of R. Bathurst (Canada), T. Allen (USA), Y. Miyata (Japan), and A. Nernheim (Germany), for the development of the k-stiffness method. This method represents the basis of the next

generation of empirical-based reinforced soil wall design methods with demonstrated significant improvement of the prediction of reinforcement loads and their distribution”.

Finally, it was the opinion of the IGS Awards Committee that the recent practice of conducting an awards program every two years (with presentations at both Regional and International conferences) results in the dilution of the quality of the program through compression of the identification, preparation and submittal process. The Awards Committee has recognized that the current system has resulted in confusion with the several other awards programs and reduction of the number of meritorious submissions.

The IGS Awards Committee recommended that the IGS Awards program be conducted every four years with award presentations limited to the IGS International Conferences; for example 9th ICG in 2010 and 10th ICG in 2014.

Further, all awards programs related to chapter and regional activities (i.e. IGS Achievement Awards and IGS Student Awards) be conducted every four years, in concert with the several regional IGS conferences, that are nominally limited to be held in the intervening two



IGS Awards 2010 (left to right): Malek Bouazza, Benedito Bueno, Tim Oliver (Tensar), Mike Sadlier, Chris Jenner (Tensar), JP Giroud, Dimiter Alexiew (Huesker), Richard Bathurst, Daniele Cazzuffi, Chungsik Yoo, Pete Stevenson, Yoshihisa Miyata

year window; for example 2012 and 2016.

The IGS Awards Committee also recommended that the number of awards be expanded in terms of the maximum awards that can be given. Currently the maximum number is 6 consisting of 5 IGS Awards and 1 Young IGS Award. The recommended increase is to a maximum number of 7 consisting of 5 IGS Awards and 2 Young Awards. **Note** the total awards granted is not

mandated and can fall below the maximum.

All of these recommendations by the IGS Awards Committee were accepted by the IGS Council.

*Reported by
Daniele Cazzuffi, Chairman of IGS
Awards Committee and IGS Past
President*

Tensar International Setting Performance Standards – The Challenge for Geogrid Research

The highly significant 25th Jubilee Geogrid Symposium, held in September 2009 at the Institute of Civil Engineers, London, UK, identified some major opportunities for polymer geogrid research.

In his concluding remarks, keynote speaker Chris Jenner FICE stated: “Polymer geogrid reinforcement can be successfully used for an even wider range of soil structures than at present. Further research is required into the fundamental interactions between soil and grid. We have identified several opportunities where better understanding of performance will lead to further advances and improved breadth and depth of application.”

These comments are particularly applicable with respect to the use of

geogrids for pavements (optimizing layer thicknesses and/or extending service life) and for pavement foundation improvement. In pavement applications, subtle changes in geogrid structure and properties, as well as variations in fill soil type and quality, prompt significant changes in actual performance. As such, for research and testing to be meaningful, we must shift our focus from studying the geogrid and soil as separate entities. Instead we must study the result of combining these two materials, and this composite presents many new challenges.

The geogrid industry has to respond to this challenge, or risks stalling the rate of progress. And we must advance to make the most of the wider opportunities to

exploit the environmental and economic benefits that geogrid technology has to offer the civil engineering industry.

To achieve this, we must research and establish in-ground or composite performance to provide rigorously verifiable data from ‘standardized’ testing that the wider civil engineering industry can accept and use in its design and specification process. What the geogrid actually does is the most important subject for study, design and specification, not just what the geogrid is.

The real challenge is achieving this from right across the geogrid industry, not as the result of efforts from a few sources. Focusing on what geogrids do, and not what they are, provides a platform for all current,

and more importantly, future product types to be evaluated and utilized based on their in-ground performance, or in other words, the value they deliver to a project.

Tensar has been researching and developing geogrids for 30 years, ever since the company's founder invented the technology. Research for Tensar has been carried out by major internationally recognized and independent research and test facilities, including the US Army Corps of Engineers (UACE), the UK's Traffic Research Laboratory (TRL) and Building Research Establishment (BRE), CROW in the Netherlands and leading academic institutions around the world.

In addition to on-going work in Tensar's in-house research and development facilities, current Tensar-supported third party research in both the USA and the UK includes topics such as paved roads (optimizing the pavement structure and/or extending service life), pavement foundation improvement, and many other TriAx™ applications, all focusing on quantifying and understanding performance delivered. For example, the objectives set for a

research study completed by the UACE in February 2010 included: 'obtaining pavement response data..... quantifying the benefits of geogrid reinforcementvalidation of performance models'. At the University of Kansas, a study was conducted for the: ' ... calibration and validation of the Giroud-Han [design] methods... for determining the minimum aggregate thickness required to support wheel loads on the surface and prevent bearing failure and/or excessive deformation of the subgrade'.

A recent paper on trials undertaken at BRE has as its objective: 'Static plate load tests to evaluate the bearing capacity.... Develop data for use in construction platform and other designs'.

A paper from the geotechnical Engineering Research Laboratory of the Department of Civil and Environmental Engineering at the University of Massachusetts examines: 'The suitability of Tactile Sensor Technology to demonstrate the difference in performance between three types of geosynthetic [including TriAx geogrid] and an unreinforced control.'

As a result of its continuing investment in product and applications research and development, Tensar's developments and applications knowledge remain at the forefront of the industry, for example in developing the TriAx™ geogrid. For the industry to progress and create better comprehension of geogrid technology, research and development investment is required from a much wider range of commercial and academic stakeholders than at present, to create a general pool of information.

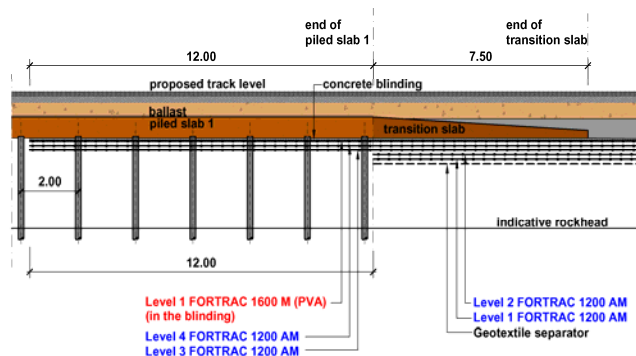
With more research investment, and the development of standardized methods for quantifying in-ground performance for geogrid applications, civil engineering's technical awareness of the benefits of geogrid technology will be enhanced. This will ensure a much wider mainstream engineering acceptance of geogrids, to the benefit of all manufacturers

*Reported by
Joseph Cavanaugh, P.E., Vice
President - Global Technology
Tensar International*

Huesker Synthetic GmbH Geosynthetic Reinforcement Using Innovative Polymers

During the 9th ICG in Guarujá, Brasil in May 2010 HUESKER Synthetic GmbH from Gescher, Germany received the 2010 IGS Award for the development and application of high-performance geosynthetics made from innovative polymers. The unanimous decision was taken by the IGS Award Committee based on the proven ability of using these geosynthetics to support soil layers over cavities, for reinforced piled embankments and numerous other geotechnical solutions. Demonstrations in the field by a significant number of constructed projects also validated these solutions and their use of geosynthetics. The IGS Committee also noted that the properties, applications and performance of these geosynthetic reinforcements have been presented in many high-quality technical papers. The development, production and

engineering applications of these products were on the one hand initiated as a response to the increasing requirements on reinforcements due to more and more sophisticated, demanding and critical georeinforced systems; but on the other hand, they opened the door to a number of even more elaborate and seminal engineering solutions. Thus, it was and still is a process of interaction of engineering design, product development and application resulting in mostly pioneering work in this area.



Example of an optimized mixed Aramid/PVA solution for a ScotRail project at Dolphingstone

Typically, high-strength low-strain low-creep reinforcement helps to solve problems with bridging sinkholes, heavily loaded or sensitive piled embankments and similarly geostructures sensitive to deformations, such as some landfills or heavy embankments on very soft soils.

HUESKER Synthetic were the first manufacturer (in 1993) to develop, test and apply the use anywhere in the world of extremely high-strength low-strain low-creep geogrids from an Aramid polymer (AR). This was used for bridging a sinkhole in a case of reactivation on the German Federal Road B 180 near Eisleben with an ultimate tensile strength (UTS) of 1200 kN/m at less than 3% strain (*Fortrac®* 1200/50-10A). HUESKER adopted this pioneering solution using Aramid because even the strongest reinforcement from Polyester (PET) was not able to meet the specific requirements resulting from the design analyses. In fact the sinkhole reactivated in 2001, the geogrids and system proved to be appropriate and successful in saving human life. The experience gained with the production of the Aramid geogrids for this first project was later on used to establish an entire HUESKER geogrid "family". The geosynthetic applications were then extended; e.g. in 1997 to geogrid-reinforced piled embank-

see above) but this time for a high-speed railroad, (300 km/h), at Gröbers in Germany.

For these selected projects mentioned a significant amount of pioneering work was done for the first time anywhere in the world. Geogrids from Aramid (AR) were developed and produced, their application for bridging sinkholes was tested and approved by "real life" monitored projects; applications for piled embankments for high-speed-trains and bridging sinkholes under a high-speed railroad and AR-reinforcements in landfills also followed.

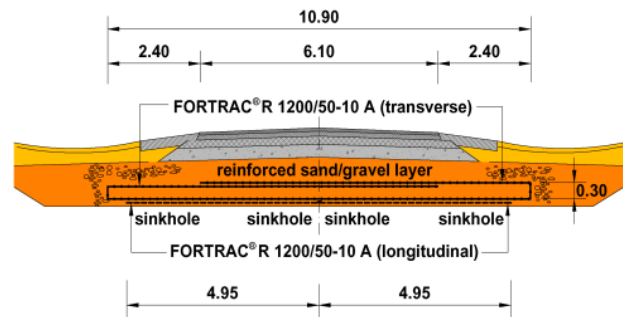
Around the end of the nineties HUESKER developed and started production of high-strength Polyvinylalcohol (PVA) geogrids and later on wovens for these now typical high-strength low-strain applications for bridging sinkholes, piled embankments and similar applications cited above for Aramid reinforcements.

Over the years the product "families" of PVA geogrids *Fortrac®* "M" and PVA wovens *Robutec®* were developed, tested, established and applied in the high-strength range of up to 1600 kN/m UTS.

(Geogrids from PVA started in Japan in the beginning of the nineties. The development was strongly influenced by Professor Tatsuoka for a new system of retaining walls because of the very advantageous mechanical behavior (low strain, low creep) and chemical (high resistance) behavior. However, the strength was limited to typically ca. 100 kN/m

UTS and the application was only to walls).

The first significant HUESKER high-

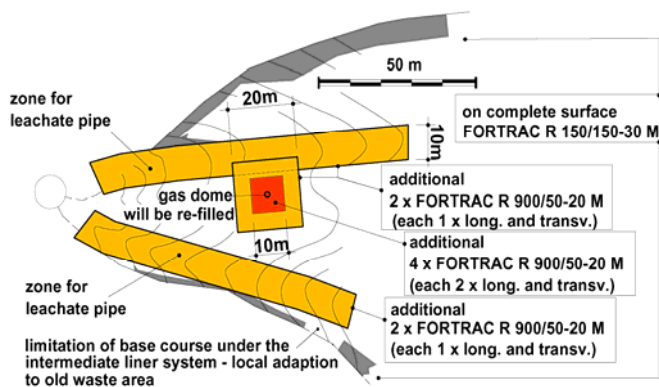


Cross section of the sinkhole bridging using Aramid geogrids on the Federal road B180 near Eisleben

strength-PVA-project was the landfill Einöd near Stuttgart, Germany in 1998. It had to be increased by up to 70 m to enlarge the capacity. The intermediate sealing layer on top of the old waste had to be reinforced to minimize deformation and to bridge an old gas dome. Only high strength geogrids from PVA were able to meet both the stringent stress-strain and chemical resistance requirements. HUESKER proposed an optimized engineering solution, then developed and produced the biaxial PVA geogrids (UTS 150 kN/m in MD & CD at < 5 % strain, *Fortrac®* 150/150-30 M) and uniaxial PVA geogrids (UTS 900 kN/m at < 5 % strain, *Fortrac®* 900/50-20 M) for this project.

These product developments and applications were then expanded to an even higher range of strengths for both uniaxial and biaxial geogrids and for other georeinforced systems. For example, in 2002 for the piled highway embankment for the A63 Selby Bypass project in the UK the optimal solution demanded extremely high-strength low-strain geogrids because of the large pile to pile clear span distances and the lateral spreading forces involved. Based on a cost-benefit analyses HUESKER developed and produced PVA geogrids with UTS of 1600 kN/m at < 5 % strain to ensure bearing capacity and to control deformations.

In 2003 for a very flat piled embankment railroad project Büchen at the main rail link Berlin - Hamburg, Germany, a high-strength low strain



Use of high-strength uni- and biaxial PVA geogrids in the landfill Einöd near Stuttgart

ments for high-speed trains (300 km/h) at Rathenow (Körgraben) in Germany because of the stringent deformation limitations (UTS 800 kN/m at < 3% strain, *Fortrac®* 800/100-20 A).

The applications were also extended to ensure local and global stability against sliding on landfill slopes (Landfill Böschtobel, Austria) providing reinforcements with very high tensile forces at low strains (UTS 550 kN/m & 1200 kN/m).

The application field was enlarged still further on in 2000 – 2001 using Aramid geogrids again for bridging sinkholes like in the first application in 1993 (Highway B 180 at Eisleben,

geogrid in combination with a high alkaline resistance was required. The optimal solution was a PVA geogrid *Fortrac*[®] 400/30-30 M with a UTS of 400 kN/m at < 5% strain. At approximately the same time for the piled embankment railroad project Paulinenaue at the same link Berlin – Hamburg, the (sophisticated) optimised solution required a biaxial low-strain geogrid. The biaxial geogrid *Fortrac*[®] 200/200-30 M was developed and produced, (UTS of 200 kN/m in both MD and CD at < 5% strain), to meet the requirements.

A further step ahead was the combined use of reinforcements from different polymers resulting into an optimized system solution. E. g. both PVA and Polyester were successfully used together for the Selby Bypass, UK or PVA and Aramid were used together at Dolphingstone, UK.

The development and applications

of high-strength PVA reinforcement continued further on; to ensure brevity we will focus on only one additional (recent) case:

In 2008 – 2009 a raw material stockyard for a steel plant of Thyssen Krupp (TKCSA) had to be constructed in soft soil lowlands near Sepetiba in Brazil. As an optimal solution for solving the crucial bearing capacity and deformation problems the intensive use of high-strength low-strain geosynthetic reinforcements was adopted. The best choice was found to be the application of customized PVA geogrids and PVA wovens. To meet the different requirements in different areas of the stockyard these PVA geogrids, (in the UTS range of 500 kN/m to 1600 kN/m and PVA wovens in the UTS range of 1000 kN/m to 1600 kN/m), were produced and installed.

The total quantity of PVA geogrids (*Fortrac*[®] M) and PVA wovens

(*Robutec*[®]), amounts to more than 600,000 m². The total installed geosynthetic strength (installed UTS x area) amounts to more than 630.10⁶ kN/m x m². It is the first application of PVA geogrids and wovens in such a high-strength range in such a quantity. On a final note it is believed to be the largest geotechnical/geosynthetic engineering project in terms of total installed reinforcement strength.

HUESKER intends to continue with the tradition of innovation combining also in the future the integral process of interaction of engineering design and optimization, research, product development and applications.

*Reported by
Dimiter Alexiew, HUESKER Synthetic GmbH*

Richard J. Bathurst (Canada), T.M. Allen (USA), Yoshi Miyata (Japan) and A. Nernheim (Germany) New Geosynthetic Reinforcement Design Method

The IGS Award presented to the international research team of Bathurst, Allen, Miyata and Nernheim recognizes their contributions to the development of the empirical-based K-stiffness Method to predict geosynthetic reinforcement loads for walls under operational conditions. The award identifies the following four papers published in peer-reviewed journals and the proceedings of the *8th International Conference on Geosynthetics*.

- Allen, T.M. and Bathurst, R.J. 2006. Design and performance of an 11-m high block-faced geogrid wall. Proceedings of the *8th International Conference on Geosynthetics*, Yokohama, Japan, September 2006, pp. 953-956.
- Miyata, Y. and Bathurst, R.J. 2007a. Evaluation of K-stiffness Method for vertical geosynthetic reinforced granular soil walls in Japan. *Soils and Foundations*, Vol. 47, No. 2, 319-335.
- Miyata, Y. and Bathurst, R.J. 2007b. Development of K-stiffness Method for geosynthetic

reinforced soil walls constructed with c-φ soils. *Canadian Geotechnical Journal*, Vol. 44, No. 12, 1391-1416.

- Bathurst, R.J., Miyata, Y., Nernheim, A. and Allen, T.M. 2008. Refinement of K-stiffness Method for geosynthetic reinforced soil walls. *Geosynthetics International*, Vol. 15, No. 4, 269-295.

The award team compiled a database of instrumented full-scale case studies from around the world including cases from unpublished Japanese sources. The database was used to examine the accuracy of the current AASHTO Simplified Method (tie-back wedge method) for the computation of reinforcement loads in reinforced soil walls under operational conditions. This quantitative evaluation has shown that for frictional backfill soils the predicted loads are well in excess of measured values and that the coefficient of variation (COV) of the ratio of measured to predicted loads is so high that there is no statistically significant relationship be-

tween measured and predicted loads. The accuracy of the AASHTO method is even poorer for backfill soils with significant fines content even though it can be argued that the majority of backfill soils for reinforced soil walls from a worldwide perspective have a cohesive shear strength component. The poor performance of the AASHTO Simplified Method has led to the development of the empirical-based K-stiffness Method for the calculation of reinforcement loads under operational conditions.

In the first paper (2006) the first version of the K-stiffness Method developed by Allen and Bathurst in previous years was used to design an 11-m high wall for the Washington State Department of Transportation. The wall was instrumented and surveyed and the accuracy of the K-stiffness Method confirmed. In the second paper (2007a) the authors first showed that the data for Japanese walls is consistent with performance data reported for walls largely constructed in North America. Next (2007b) they extended the

K-stiffness Method to the case of c - ϕ soils using data obtained from a total of nine new case studies – six

from Japan and three from the USA (this paper won the R.M. Quigley Award for the best paper published in the *Canadian Geotechnical Journal* in 2007). The fourth paper represents the most current version of the K-stiffness Method with additional wall data from eight more case studies and re-calibration to improve the accuracy of load predictions. This body of work is important because:

a) an extensive and detailed database of wall case studies is available to investigate the accuracy of reinforcement load predictions for walls under operational condition using current or future proposed design and analysis methods;

b) the K-stiffness Method has been identified in the latest FHWA guidance document as an alternative design method to the current Simplified Method. The load prediction method is used as part of an alternative reinforced soil wall design methodology in the current Washington State Department of Transportation GEO-TECHNICAL DESIGN MANUAL (2010) which is available online. At the time of writing the K-stiffness Method is under review for possible inclusion in the upcoming Canadian Highway Bridge Design Code;

c) the K-stiffness Method provides the only available rational framework for rigorous reliability-based load and resistance factor design (LRFD) calibration for the internal stability design of reinforced soil walls. The use of the current Simplified Method or other conventional limit equilibrium-based methods to predict operational loads for reinforced soil walls leads to non-sensible load and resistance factors for LRFD;

d) these papers are a collaborative initiative by researchers from four different countries (Japan, Canada, Germany and USA);

e) the K-stiffness Method has been demonstrated quantitatively to be accurate using measurements from a 11-m high production wall constructed in Washington State in the USA.

In conclusion, the new K-stiffness Method represents the basis of the next generation of empirical-based reinforced soil wall design methods with demonstrated significant improvement of the prediction of reinforcement loads and their distribution under end-of-construction (operational) conditions. For more information on the research recognized by this award please contact Professor Bathurst at email: bathurst-r@rnc.ca.

Reference

Washington State Department of Transportation (WSDOT), 2010, Geotechnical Design Manual, No. M46-03.02, Olympia, WA, USA

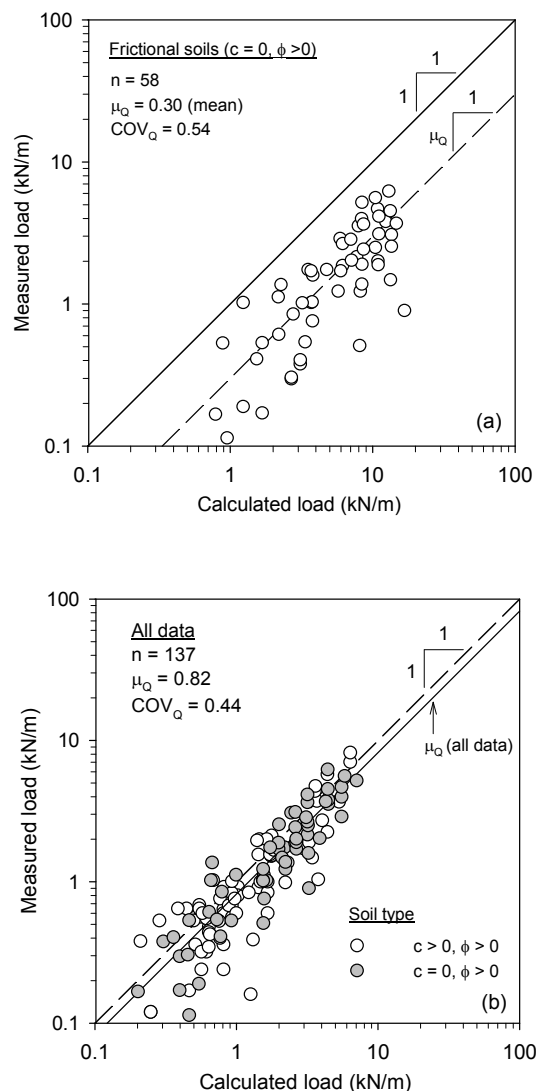


Figure 1. Measured reinforcement load versus calculated load using (a) AASHTO Simplified Method, (b) K-stiffness Method (after Bathurst et al. 2008)

During the past decade, the occurrence of locally concentrated heavy rainfall is increasing due to climate change. For example, Korean Meteorological Administration (KMA) reported that the annual precipitation during last 10 years has increased from 1200 mm to 1,300 mm on average with a continually increasing trend. Such a trend has brought concerns to geotechnical engineers over the effect of severe

rainfall on the stability of geotechnical structures, including reinforced earth wall. From the point of GRS wall stability, the issue of heavy rainfall is even more becoming important since the use on-site, marginal soil with high percentage of fines as backfill is increasing even if the soil does not meet the criteria set by the current widely accepted design approaches, i.e., NCMA (Collin 1997) and FHWA (Elias &

Christopher 1997) design guidelines.

The geotechnical group at Sungkyunkwan University led by Prof. Chungsik Yoo has put a considerable effort in developing a numerical modeling technique for GRS walls and rainfall interaction. The effort includes the stress-pore pressure coupled finite-element modeling of GRS wall (Yoo and Jung 2007) and rainfall interaction and

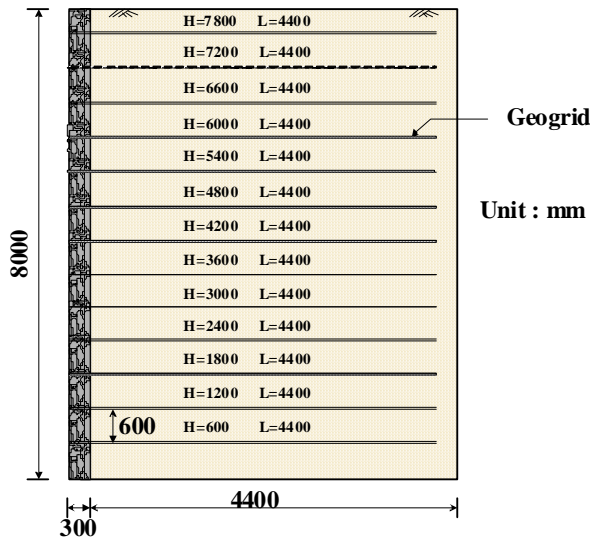


Figure 1. Geometry and reinforcement layout of wall considered

the limit-equilibrium based stability analysis within the framework of unsaturated shear strength, coupled with transient infiltration analysis. Due to space constraint, the research outcome on the effect of rainfall on the stability of GRS walls is presented.

A 7.9 m high GRS wall was conducted. The wall is reinforced with 0.7H long geogrid having a long-term design strength of 20 kN/m, installed at vertical spacing of 0.6 m as shown in Figure 1. The wall is assumed to be backfilled with a completely decomposed granitic (CDG) soil in nature, classified as SM according to the Unified Soil Classification System (ASTM D2487-90 1992). The backfill soil has shear strength parameters $c' = 13 \text{ kPa}$, $\phi' = 22^\circ$ with a saturated hydraulic conductivity of $k_x = 5.0 \times 10^{-7} \text{ m/s}$

The effect of rainfall on the wall stability was examined using a two-

step analysis. First, an infiltration analysis was performed to obtain the pore water pressures in the backfill. The pore water pressure obtained from the infiltration analysis were then used in the limit-equilibrium slope stability analysis to obtain the factor of safety FOS, taking into consideration of unsaturated shear strength. Subsequent sections describe detailed of the two-step analysis.

1) Transient infiltration analysis

The transient infiltration analysis was conducted using a commercial finite-element program SEEP/W (GeoStudio 2004). In SEEP/W, the saturated and unsaturated flows under steady-state and transient conditions are modeled using the governing equation given in Eq. (1).

$$\frac{\partial}{\partial x} \left(k_w \frac{\partial h_w}{\partial x} \right) + \frac{\partial}{\partial y} \left(k_w \frac{\partial h_w}{\partial y} \right) = m_2^w \rho_w g \frac{\partial h_w}{\partial t} \quad (1)$$

where k_w and h_w represent, respectively, the permeability of soil and the hydraulic head available for flow, m_2^w is the slope of soil water

characteristics curve (SWCC) representing the retention characteristics of a soil, ρ_w is the density of water, and g is the acceleration of gravity. Although not shown, the SWCC and the hydraulic conductivity function for the backfill were used in the analysis.

Figure 2 illustrates the finite element model adopted in the analysis, comprising approximately over 500 four-node plane strain elements. Actual rainfall records measured during a three month period, i.e., July, August, and September, in 2007 were applied on the surface boundaries AF and CB. According to the record, the total rainfall volume and maximum rainfall intensity were 1038 mm and 1445.5 mm/day, respectively.

2) slope stability analysis

In the limit equilibrium-based global

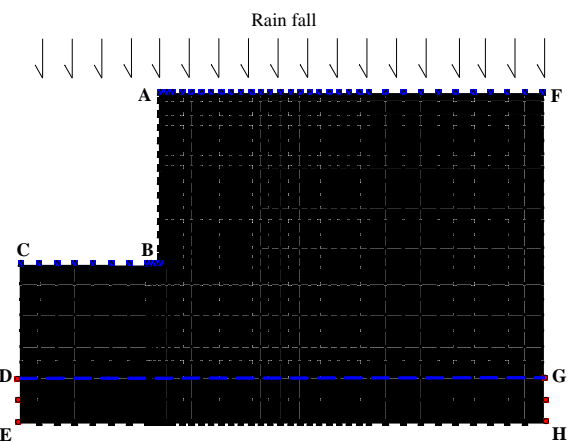


Figure 2. Finite element model used in infiltration analysis

slope stability analyses using SLOPE/W (Geostudio 2004), the pore water pressures in the reinforced and retained zones at different rainfall stages obtained from the transient infiltration analyses were fully considered by taking advantage of the SLOPE/W and SEEP/W interface. For example, SLOPE/W has an ability to incorporate negative pore pressures in the unsaturated zone above the water table in a slope stability analysis, making use of the modified Mohr Coulomb failure criterion [Eq. (2)] proposed by Fredlund et al. (1978) for unsaturated soils to determine the factor of safety:

$$\tau_f = c' + (\sigma - u_a) \tan \phi' + (u_a - u_w) \tan \phi^b \quad (2)$$

in which τ_f = shear strength, σ =

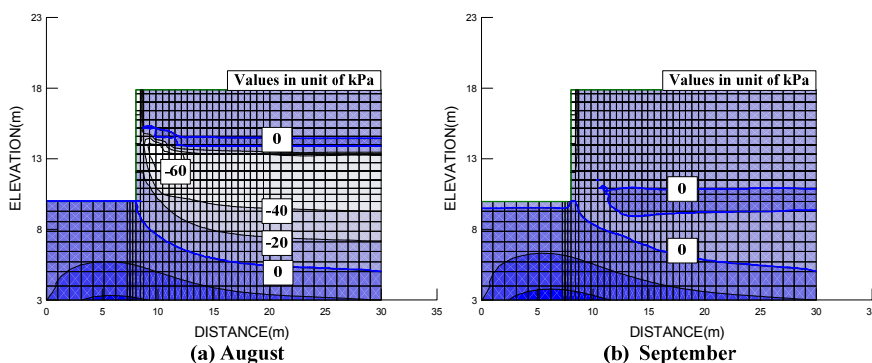


Figure 3. Pore water pressure contour plots at different time steps

total stress on the failure plane, $(\sigma - u_a)$ = net normal stress on the failure plane, and ϕ^b = angle indicating the rate of increase in shear strength relative to the matric suction. The factor of safety was obtained using the Bishop's simplified method. The angle indicating rate of increase in shear strength relative to matric suction, $\phi^b = 10^\circ$ is adopted

3) Results

Figure 3 shows pore water pressure contour plots at the end July, August, and September rainfalls. As seen in Figure 3(a), the rainfall in July causes pore water pressures in the upper 2 m zone to decrease, as much as 60 kPa, resulting in almost no matric suction in that zone. The rainwater infiltration caused by the subsequent August rainfall brings the matric suctions in the upper half of the reinforced zone further down to almost zero, as illustrated in Figure 3(b). The reinforced zone then becomes completely saturated by the end of September rainfall as shown in Figure 3(c). Such a reduction in matric suction in the reinforced zone has a significant implication on the wall stability as the shear strength of the backfill also decreases with decrease in the matric suction, thereby decreasing the factor of safety of the reinforced

wall as will be shown later. The implication of the trends observed in these figures is that the initially unsaturated backfill zone in a wall, either conventional or reinforced, can become completely saturated when subject to the rainfalls considered in this study.

The effect of rainfall is further illustrated in terms of the factor of safety in Figure 4. In Figure 4(a) the evolution of pore water pressures at the locations 2 m, 5 m, and 8 m below the top of the wall and 3 m off the wall facing is shown for the prescribed rainfalls. As shown in Figure 4(b), a decrease in the factor of safety is evident. For example, the initial factor of safety of 1.5 decreases to a minimum value of FS=1.1 over the 90 day period of rainfall, resulting in a 27% decrease, due to the reduction in shear strength caused by the decrease in matric suction in the backfill. Such a considerable decrease in the factor of safety in essence implies that the stability of walls with a marginal factor of safety can be significantly affected when subject to rainfalls considered in this study.

The results indicate that the factor of safety of a GRS wall can significantly decrease due to decrease in shear strength of the backfill soil caused by the reduction in matric suction in the backfill soil for the

rainfall condition considered. It is demonstrated that for walls with marginal factor of safety the stability of the wall may be of great concern depending on the rainfall characteristics. A further study is underway to incorporate the effect of rainfall in design of GRS walls.

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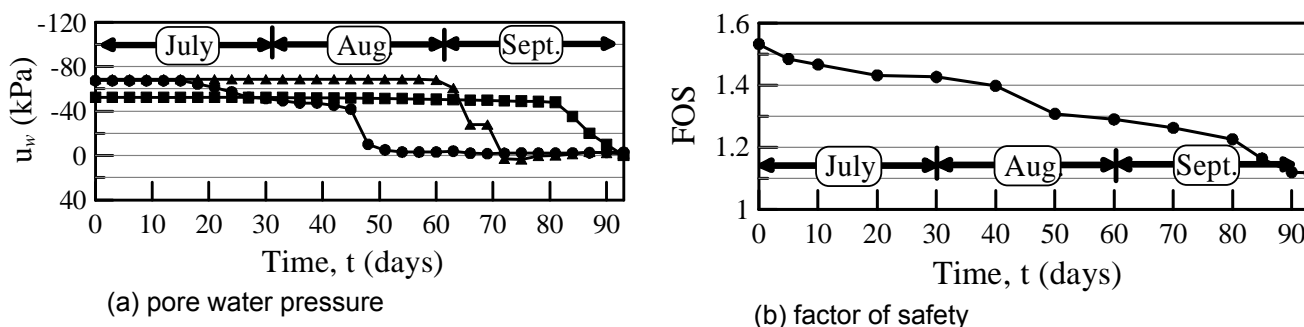


Figure 4. Variations of pore water pressures and factor of safety

IGS Young Award Winners 2010

Saman Zarnani Experimental and Numerical Investigation of Geofom Seismic Buffers

I am honoured to be selected as the recipient of the 2010 Young IGS Award for my research on the application of geofom material as a

seismic buffer for rigid retaining walls. The concept of reducing the magnitude of earth pressures against rigid wall structures by plac-

ing a compressible vertical inclusion between the rigid wall and the retained soil has been proposed by a number of researchers for the case

of static load conditions. Today, the compressible vertical inclusion material of choice is block-molded low-density expanded polystyrene (EPS), called geofoam in modern geosynthetics terminology. A logical extension of the use of geofoam inclusions to reduce earth loads on rigid earth retaining structures under static loading is the use of the same materials to reduce potentially much larger seismic-induced lateral earth pressures.

In order to examine quantitatively the concept of geofoam compressible inclusions to reduce the magnitude of earthquake-induced dynamic forces against rigid earth retaining wall structures, a series of tests were conducted at the Royal Military College of Canada (RMC). The tests were carried out using 1-m-high models mounted on a large shaking table (Figure 1). The experimental design and test methodology using a shaking table showed

ground shaking (e.g. earthquake). The experimental design, detailed results of all shaking table tests and interpretation are published by Bathurst et al. (2007) and Zarnani & Bathurst (2007).

force and buffer compression predictions using the computer model were compared with the experimental results. The constitutive models used for the component materials in the simulations (i.e. soil and EPS

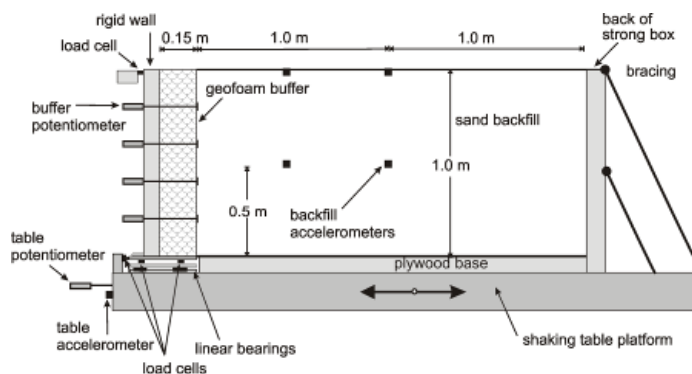


Figure 1. Example shaking table test configuration and instrumentation (Bathurst et al. 2007)

The next stage in this research program was to develop a computer model that could simulate the RMC experimental shaking table test

geofoam) were kept purposely simple as a first attempt to simulate the physical test results. The model performed very well when the dynamic wall forces generated during base excitation were compared to the corresponding values computed from the physical test results (Figure 3). Details of the numerical model development and the results of comparisons are published by Zarnani & Bathurst (2008). Since this numerical model was verified against unique experimental test results it provided us with a powerful tool to perform more extensive parametric studies to investigate the effect of different parameters that were not studied in the experimental program. The effects of different material constitutive models on numerical prediction for the component materials were also investi-

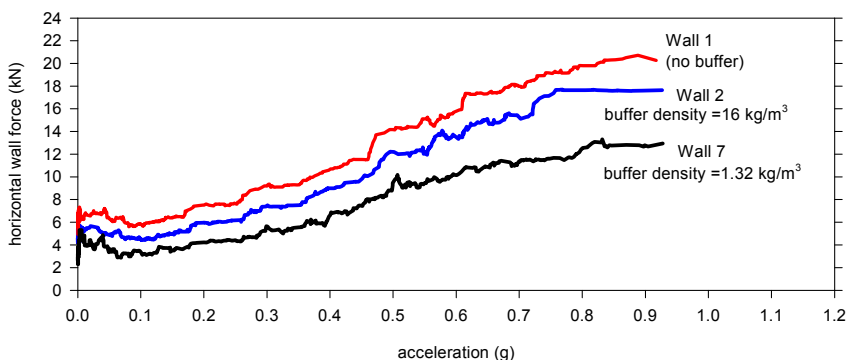


Figure 2. Peak horizontal total wall forces for three tests (Zarnani and Bathurst 2007)

that large detectable differences in dynamic force reduction occurred between rigid walls with and without a geofoam seismic buffer. Six shaking table tests using reduced-scale model walls were constructed with expanded polystyrene (EPS) panels with different properties to reduce dynamic earth loads due to base shaking. The test results show that dynamic load attenuation increased with decreasing geofoam stiffness. The test with the highest buffer stiffness resulted in a 15% reduction in dynamic load and the test with lowest stiffness resulted in a 40% reduction in dynamic load compared to the control wall (Figure 2). The results of these experiments provide proof of concept that EPS panels placed against rigid walls can act as a seismic buffer to attenuate dynamic loads due to

results. For this purpose a finite difference based computer program (FLAC) was used. The total wall

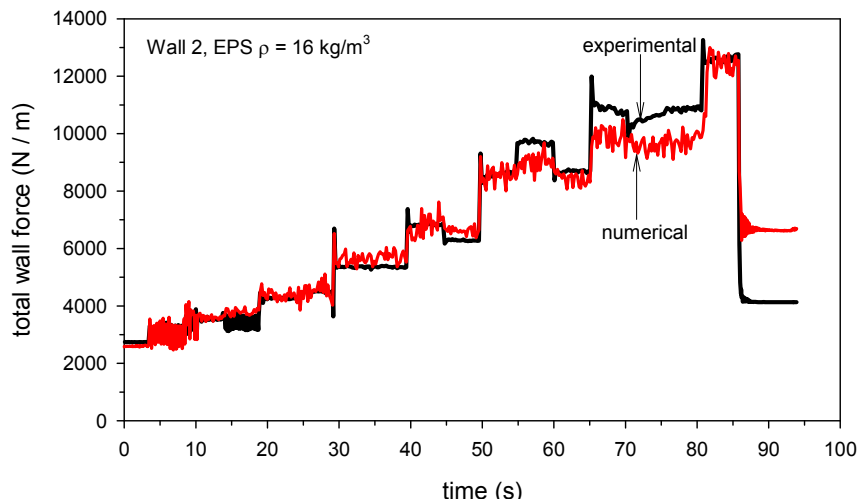


Figure 3. An example of numerical prediction compared to experimental results for model verification (Zarnani and Bathurst 2008)

gated in a separate study (Zarnani & Bathurst 2009a). In the original FLAC simulations a simple linear elastic perfectly plastic model with Mohr-Coulomb failure criterion (MC) for the geofoam and sand backfill was used. In the second approach, the equivalent-linear method (ELM) was adopted to model non-linear cyclic and hysteresis damping behaviour of the EPS geofoam and sand backfill. The two models were used to predict the results of some of the RMC experiments. For the more advanced ELM model the shear modulus decreases as the dynamic shear strain increases while damping increases with increasing dynamic shear strain. Both methods captured the qualitative trends in the measured load-time

the systems under investigation.

Next, the verified FLAC numerical model with MC constitutive model for component materials was used to perform a large numerical parametric study. The parameters that were investigated were: EPS geofoam type, EPS thickness and stiffness, wall height, frequency and type of excitation record. The significant conclusions gained from this parametric study included: The lower the EPS geofoam modulus, the greater the seismic load attenuation when all other conditions are the same; the total wall force typically increases (and the load reduction due to seismic buffer decreases) as the input excitation frequency approaches the funda-

the important outcomes of this numerical research was that the practical quantity of interest to attenuate dynamic loads using a seismic buffer is the buffer stiffness defined as $K = E/t$. A set of design charts was developed based on the parameters investigated in this numerical parametric study that can provide insight for design engineers to select a combination of EPS type and thickness for seismic buffers in rigid retaining wall application (**Figure 4**). For the range of parameters investigated in this study, $K \leq 50 \text{ MN/m}^3$ was observed to be the practical range for the design of these systems to attenuate earthquake loads. This is a useful and practical outcome for design engineers seeking to reduce the potentially damaging effects of earthquake loads on rigid retaining walls such as bridge abutments, basement walls, etc. Details of this numerical parametric study are published by Zarnani & Bathurst (2009b).

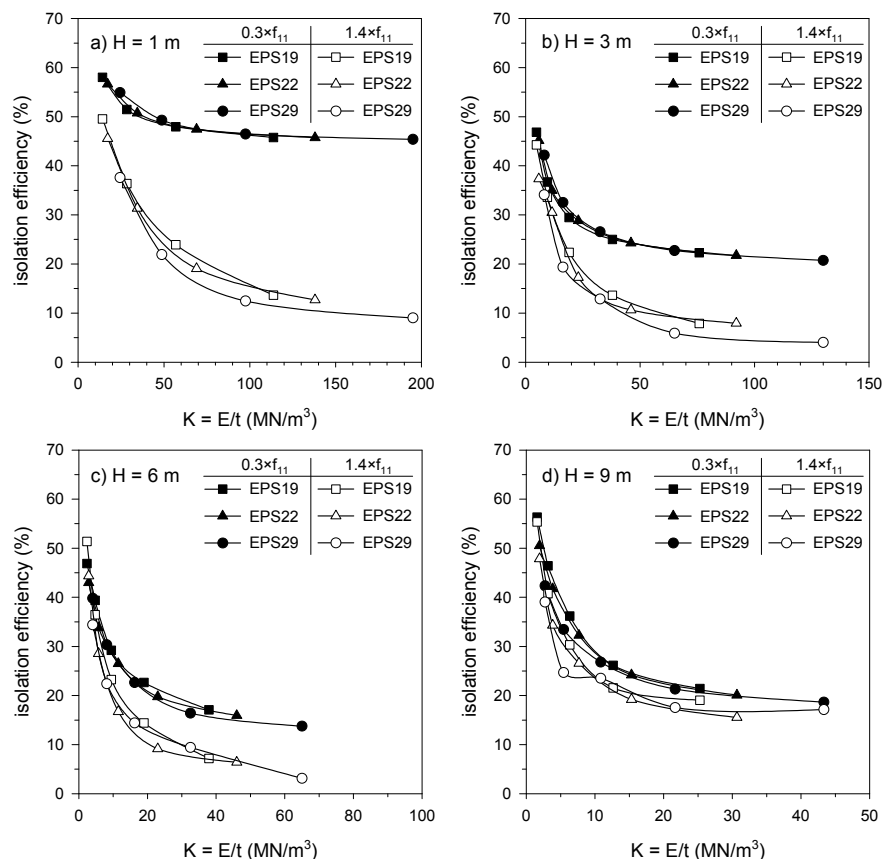


Figure 4. Design charts for selection of EPS seismic buffers for the investigated parameters (Zarnani and Bathurst 2009b)

history of the walls and in many instances were in good quantitative agreement with measured data. Although the ELM model gave better predictions at some stages of shaking, the more simplistic MC model was judged to be sufficiently accurate to predict the load-time histories despite the complexity of

mental (natural) frequency of the buffer-soil system. This decrease in efficiency of a seismic buffer is more pronounced for thin buffers; the combined influence of wall height, buffer thickness and proximity of the input excitation frequency to natural frequency of the system is clearly complex. One of

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Conference Reports

Symposium Geosynthetics, Present Time and Perspectives on Mexico Mexico City, Mexico, 11 and 12 March 2010



Speakers, attendees and committee organizers of Symposium geosynthetics, present time and perspectives on Mexico

Symposium Geosynthetics, present time and perspectives on Mexico was held on 11 to 12 March 2010 at the Civil Engineers College of Mexico in Mexico City and was jointly organized by the Mexican chapters of IGS and GMA and the Mexican Society of Soils Mechanics and Geotechnical Engineering, SMIG.

Specific sessions were dedicated to four broad geosynthetic application themes: mining applications, pavements & roads, reinforced soil walls and environmental engineering. Additionally, a technical session addressing other applications was presented. The symposium brought together more than 30 attendees and a total of 22 papers were pre-

sented by researchers, designers, consultants and students. A key lecture was presented by the IGS President Jorge Zornberg focused on "Design of Geosynthetic reinforced walls: Recent advances"

This symposium considered current and future perspectives for the use of Geosynthetics in Mexico. Further, this event represents the beginning of a series of efforts which will promote knowledge transfer, research and appropriate use of geosynthetics in the country.

On the 10th of March, one day before the conference a training course was held with an audience of 20 people. This course provided essential background information on geosynthetics and their use in civil engineering works. In addition, a successful technical exhibition was held during the symposium with 10 different companies presenting the latest geosynthetic products. The event concluded with a discussion on different fruitful and interesting topics.

*Reported by
Alexandra Ossa
Member of IGS-Mexico*

New Techniques for Design and Construction in Soft Clays Guarujá/SP, Brazil, 22 and 23 May 2010

The Symposium on New Techniques for Design and Construction in Soft Clays was held in Guarujá/SP, Brazil, between 22 and 23 May 2010. The conference was organized by the Federal University of Rio de Janeiro, the Brazilian Society of Soil Mechanics and the Brazilian Society of Geosynthetics,

under the auspices of the International Society for Soil Mechanics and Geotechnical Engineering and the International Geosynthetics Society. The event had 230 participants, including students, professionals and teachers from many countries.

A number of techniques available

for site investigation, design and construction in soft clays were presented. The range of the different techniques is quite wide and varies from country to country. These techniques were discussed with experiences and opinions of specialists from different countries.

The first section was about site investigation, vertical drains and surcharge, with a keynote lecture from Dr. Kerry Rowe concerning the interaction between drains and reinforcement and effect on performance of embankments on soft

full-scale experiments, deep-vibro techniques and consolidation settlements are included.

The third section was on the subject of monitoring and performance, with a keynote lecture from Dr. Márcio Almeida showing an overview of

lished contractors, with renowned experience in soft soil improvement techniques, shared their experiences and new approaches on this matter.

In that way, the accumulated knowledge of professionals and



Plenary and Discussion Podium of Symposium on New Techniques for Design and Construction in Soft Clays

ground. Lectures on preloading design, vacuum consolidation, test embankment and in situ testing were also presented.

The second section presented piled embankments, granular piles and deep mixing, with a keynote lecture from Dr. George Filz on deep mixing to improve the stability of embankments, levees, and floodwalls constructed on soft clay. Lectures also about numerical simulations,

Brazilian practice of construction over soft soils and other from Dr. Buddhima Indraratna about Soft soils improved by prefabricated vertical drains: performance and prediction. Lectures regarding the Brazilian experience in trial and pilot embankments, as well as in instrumented constructions were also presented.

The fourth section was about construction techniques where estab-

lished contractors, with renowned experience in soft soil improvement techniques, shared their experiences and new approaches on this matter. researchers from 13 different countries were compiled on a volume named "New Techniques on Soft Soils" providing an essential tool for designers and practitioners involved in soft soil design and construction.

*Reported by
Márcio Almeida, Chairman of the
Soft Clay conference and IGS-
member*

9th International Conference on Geosynthetics – 9ICG Guarujá, Brazil, 23 - 27 May 2010



The 9th International Conference on Geosynthetics (9th ICG) was a great success in all aspects. More than 2 years ago, a team of committed individuals has joined together, established important partnerships among associations and institutions, and looked for a good location in terms of comfort and infrastructure, in a city that undoubtedly is up to par and meets the visitors' goals.

Taking into account the response from the geosynthetic community so far, we strongly believe that every single objective was achieved. Our main priority was to offer everybody attending the 9ICG a delightful time and a very fruitful conference.



The 9ICG was held in Guarujá, Brazil from 23 to 27 May in 2010. The city of Guarujá, located on the island of Santos Amaro on the state

of São Paulo, is known as a beautiful seaside resort called 'The Pearl of the Atlantic'. The 9th ICG was held at the Convention Center of the Sofitel Jequitimar Hotel, a five stars hotel, which is one of the best convention centers on the coast line of Brazil, very modern and comfortable, prepared to host conventions for more than 1.000 people.

As the primary international geosynthetics event, ICG is held every four years. The 9th ICG was held for the first time in the Southern Hemisphere and organized by the Brazilian Association of Geosynthetics (IGS Brasil) and the Brazilian Association of Soil Mechanics and Geotechnical Engineering (ABMS), under the auspices of the International Geosynthetics Society (IGS), in association with the International Society for Soil Mechanics and Geotechnical Engineering (ISS-MGE) and with the support of the

Brazilian Association of Nonwoven and Technical Textiles (ABINT).



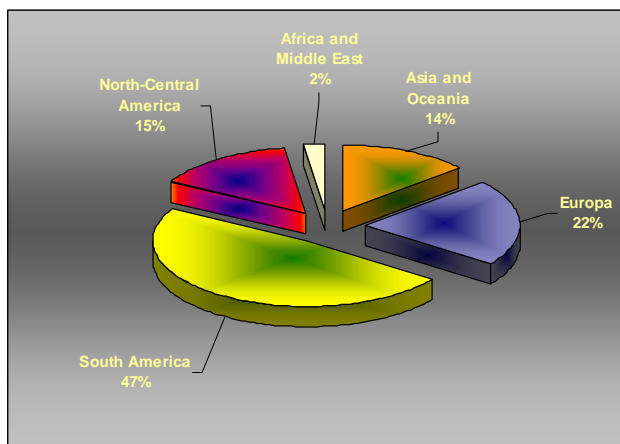
9ICG – Main Auditorium



Prof. Jarbas Milititsky (ABMS President) during the Opening Ceremony.



Closing Ceremony – from left to right: Prof. Maurício Ehrlich (Chair of the Organizing Committee and IGS Brasil President), Prof. Arsenio Negro (ABMS Vice-President), Prof. Jorge Zornberg (IGS President)



9ICG – Distribution of Attendance by Continent

Pictures of the event are already available on “Files for Download” (<http://www.9icg-brazil2010.info/ingles/arquivos.html>)

The pictures may be downloaded from the webpage.

Reported by
André Estêvão Silva, Treasurer

Participation

The conference attracted 837 geotechnical engineering academics and practitioners from 50 countries, in addition to 36 accompanying persons. This number comprises full registrations, day registrations, exhibitors and visitors. The largest participation came from Brazil (337 attendees), host country, as a result of the ICG being held at the Southern Hemisphere for the first time. United States (82) and Japan (37) were the second and third countries in number of participants, respectively.

Reported by
Delma Vidal, General Secretary

Technical program

The technical programme of the 9ICG provided a variety of options to the conference delegates, which included: keynote lectures, special lectures, training lectures, discussion sessions, meeting the industry sessions,

besides the traditional technical sessions. Three Keynote Lectures and four Special Lectures were delivered during the 9ICG by distinguished professionals of the geosynthetics discipline. The 9ICG lecturers were **S.S. Sandroni** (Brazil), **H. Brandl** (Austria), **J.P. Giroud**

(USA), **R.D. Holtz** (USA), **D. Cazzuffi** (Italy), **S. Perkins** (USA) and **A. Fourie** (Australia). The lecturers covered recent findings and applications of geosynthetic in problems related to barriers, filters, soil reinforcement, pavements, mining and natural disasters.

List of Special and Keynote Lectures:

Welcome Lecture

Brazilian research and practice with geosynthetics

S.S. Sandroni, L.G. de Mello, R.C. Gomes, O.M. Vilar



S.S. Sandroni

Prestigious Lecture 1

Development of criteria for geotextile and granular filters

J.P. Giroud



Prestigious Lecture 2

The 2010 Terzaghi Lecture – Geosynthetic Reinforced Soil: From Experimental to Familiar

Robert D. Holtz



Giroud Lecture

Geosynthetics application for the mitigation of natural disasters

H. Brandl



Keynote Lecture 1

Geosynthetics in barrier systems for dams

D. Cazzuffi, J.P. Giroud, A. Scuero, G. Vaschetti



D. Cazzuffi

Keynote Lecture 2

Geosynthetics in pavement reinforcement applications

S.W. Perkins, B.R. Christopher, N. Thom, G. Montestruque, L. Korkiala-Tanttu, A. Watn



S.W. Perkins

Twelve Discussions Sessions

were held during the conference. The speakers and discussion session leaders were: Richard J. Bathurst (Canada), Dennes T. Bergado (Thailand), Maria E. Boscov (Brazil), Malek Bouazza (Australia), Gerhard Bräu (Germany), Benedito

Keynote Lecture 3

Improving the performance of mining infrastructure through the judicious use of geosynthetics

A.B. Fourie, A. Bouazza, J. Lupo, P. Abrão



A.B. Fourie

S. Bueno (Brazil), Barry Christopher (USA), Steve Corbet (UK), Neil Dixon (UK), Mauricio Ehrlich (Brazil), Georg Heerten (Germany), R. Jonathan Fannin (Canada), Maria G. Gardoni (Brazil), Jean-Pierre Gourc (France), Michael Heibaum (Germany), Garth M. James (South Africa), Chris Jenner (UK), H. Jeon (Korea), Colin Jones (UK), Takeshi Katsumi (Japan), Chris Lawson (Malaysia), Maria L. Lopes (Portugal), Flávio Montez (Brazil), Nicola Moraci (Italy), Jochen Müller-Rochholz (Germany), Anna Laura Nunes (Brazil), Maurício Ossa (Chile), Jun Otani (Japan), Sérgio Reyes (Argentina), R. Kerry Rowe (Canada), Eun C. Shin (Korea), Fumio Tatsuoka (Japan), Nathalie Touze-Foltz (France), Delma Vidal (Brazil), German Vivar (Peru), Arnstein Watn (Norway), Chungsik Yoo (Korea) and Jorge G. Zornberg (USA). A wide variety of subjects were addressed during the discussion sessions with lively participation from the audience, which provided a unique opportunity of exchange of knowledge and experiences among professionals from different parts of the world.

List of Discussion Sessions

- Geosynthetics in Mining Engineering
- Retaining Walls Design and Performance
- Geosynthetics in Landfills
- Geosynthetics in Agriculture and Aquaculture
- New Techniques for Soft Soil Stabilisation Using Geosynthetics
- Geotextile Filter Clogging

- Soil-Geosynthetic Interaction
- Long-Term Performance of Geosynthetics
- Performance of Geosynthetics in Environmental and Hydraulic Applications
- Geosynthetics in Geocontainers
- Geosynthetics in Pavements
- Code of Practice for Reinforced Soil

The **Training Lectures** (11 in total) were also an important part of the technical programme of the 9ICG. The lecture attendees had the opportunity to learn and get updated information from leading experts on several aspects of the use of geosynthetics in geotechnical and geoenvironmental works. The following speakers delivered the 9ICG Training Lectures: Sam Allen (USA), Sean Currie (USA), Neil Dixon (UK), J.P. Giroud (USA), Russell Jones (UK), Jiro Kuwano (Japan), Chris Lawson (Malaysia), Michele Maugeri (Italy), Jun Otani (Japan), Ian Peggs (USA) and Richard Thiel (USA).

List of Training Lectures:

- Reinforced soil structures under seismic loading
- Slope stability for lined containment systems
- Applications of geocontainers
- Leak detection systems
- Measurement and interpretation of interface shear strength
- Design of unpaved roads and subgrade stabilization with geosynthetic reinforcement
- Testing and specification of geosynthetic erosion control products
- Quality control for geomembrane installation
- Geomembrane welding techniques
- Seismic stability of reinforced soil wall with segmental facing panels
- Reinforced embankments on soft soils and soft soil stabilization

Approximately **200 papers** were orally presented during the 9ICG in up to 6 parallel sessions over 4 days. Experiences from professionals and researchers from different parts of the world were presented and discussed. The other papers were invited for publishing in the Poster Session. The *Meeting the Industry* sessions, with 9 lectures delivered by technicians from the sponsor companies, was also an important activity which was part of

the technical program.



9ICG - Poster Session



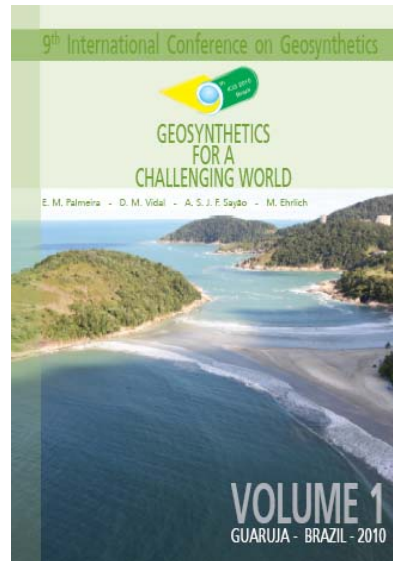
9ICG – Technical Session

List of Technical Sessions Themes

- Geosynthetics Testing and Properties
- Soil-Geosynthetic Interaction
- Geosynthetic Durability and Long-Term Performance
- Geosynthetics in Environmental Applications
- Geosynthetics in Mining Applications
- Drainage and Filtration
- Geosynthetics in Hydraulic Applications
- Innovative Geosynthetic Products and Applications
- Geosynthetics in Highways and Railways
- Reinforced Walls and Steep Slopes
- Embankments on Soft Soils
- Piled Embankments
- Other Applications of Geosynthetics in Soil Reinforcement
- Best Papers Published in IGS Geosynthetics Journals (G&G and GI – Co-organised by the journals' editors)

The printed version of the proceedings of the conference consists of a 4-volume publication, with over 2000 pages, which includes 317 peer reviewed technical papers by authors from 42 countries, 23 Discussion Session papers and 6 keynote lectures, including the tradi-

tional Giroud Lecture. The CD version of the proceedings has the same content.



Proceedings of 9ICG still available

There are still printed proceedings available for purchasing. In case of interest, contact secretariat@9icg-brazil2010.info.

Reported by Ennio Palmeira, Technical Committee Coordinator

9ICG Short Courses

Four 3-hour Short Courses were delivered on Sunday May 23. Some of the most recognized specialists on each subject presented their experiences and relevant concepts on important applications related to geosynthetics. The following courses were delivered: Geosynthetics in Dams (Rafael Jabu, Leandro P. Padula and Joaquim Pimenta), Geosynthetic Reinforced Walls (Robert D. Holtz & R. Jonathan Fannin), Geosynthetics in Mining (Richard Thiel), Geosynthetics in Landfills (Sam Allen & Patrick Pierson). The short courses attracted a great audience, with an average of 40 attendees per course.

- Geosynthetics in Dams
- Geosynthetic Reinforced Walls
- Geosynthetics in Mining
- Geosynthetics in Landfills



9ICG – Short Course

Reported by Maria das Graças Gardoni Education Committee Coordinator

Technical Visits

Several technical visits were offered by the Organizing Committee. One of them was attended by fourteen participants. The technical visit was a work of environmental and hydraulic engineering in Rio de Janeiro. The work consists of dredging of the channel known as Canal do Fundão aiming to revitalize the region where parts of the dredged sludge with heavy metals is being treated with geotextile tubes.

Reported by Denise Urashima Executive Secretary

Technical Exhibition

The traditional Technical Exhibition, the largest geosynthetics related exhibition in the world, occurred parallel to the conference and took place at the Jequitimar Exhibition Hall connected to the Jequitimar Convention Center, with a modern and a complete infrastructure. The exhibition hall covers an area of 1,400m², sufficient the proposed activities related to the exhibition and developed by the exhibitors. Over the 4 days of exhibition (24 - 27 May 2010), institutions and companies were able to present their products, services and solutions, exchange information, make contacts and promote small meetings and presentations, in a space and environment specially designed for this purpose.

In total, 75 booths comprised of 50 different companies and institutions related to geosynthetics and geotechnical activities exhibited. It was a great success. Most of the booths were decorated very carefully and

with a great creativity. Some of the activities, like the Happy Hour, occurred on the Exhibition Hall.

In addition to exhibitors and conference attendees, the exhibition was visited by invited people by the exhibitors. It is estimated that more than 1000 people passed through the Exhibition Hall.



9ICG Exhibition Hall Entrance



IGS Booth at the 9ICG Exhibition

*Reported by
Lavoisier Machado
Exhibition Committee Coordinator*

Social events

As part of the social agenda of the conference, several "Brazilian Soul" activities took place. This included the **Welcome Reception**, held during the first day of the conference, which provided a very good environment for meeting new and old friends. The Welcome Reception was offered by the Brazilian Association of Geosynthetics Manufacturers (ABINT).

On Monday 24th May, to mark the opening of the exhibition hall, a **Happy-Hour** was offered. This event was a great success, as it facilitated the integration of exhibitors with all conference attendees by exchanging experiences and presenting their company's most recent technologies.

Immediately after the Happy-Hour, the IGS corporate members, IGS Officers, Council members and the

Conference organizers gathered for the **IGS Corporate Reception** at Il Faro Restaurant, located on the Enseada Beach in Guarujá. The guests enjoyed local food, drinks and high quality live Brazilian Music while meeting old friends.



Happy-hour at the Exhibition Hall



IGS Corporate Members Dinner

Additional social events included the **"Beach" Soccer Match and the Conference Dinner at the late Clube of Santos (in Guarujá)**. Please refer to the description of these two events are described in specific sessions of this newsletter.

Finally, on Friday May 28, the IGS Brazilian Chapter invited the IGS Council members and Officers the **Council Dinner**. Delicious Brazilian seafood dishes were served accompanied by exotic "*Caipirinhas*," which provided the final touch to an extremely successful series of social events at the 9ICG.

The social program included, along the event's period, music and folkloric presentations as a small sample of the rich Brazilian traditional culture.



Capoeira presentation on the 9ICG

*Reported by
Victor Pimentel, Vice-chair*

9ICG Conference Dinner

On May 26th, delegates at the 9ICG were treated to a memorable evening at the very pleasant site of the late Clube of Santos (in Guarujá), under the precise organization of Mrs Claudia Montez. After an excellent experience on Brazilian cuisine, all participants (350 people) had the opportunity to listen to the farewell words from past president Tatsuoka and to an informal speech from the incoming president Zornberg. Then, energetic Brazilian music and delicious cachaça caipirinhas did not allow anyone to stay quiet. A lively dance went on till the very last replay from the samba band, late at night. The conference dinner and dance was intensively documented and all participants may like (or not) to find their own pictures posted in the Photo Gallery at the 9 ICG website.





*Reported by
Alberto Sayão, Vice-Chair*

9ICG Soccer Game

The traditional football game took place on May 25, Tuesday evening. The idea was, as in previous years, to promote a challenge between Hispanics/Brazilians and Anglo-Saxons. But, the great numbers of players lead to a new situation... for the first time on the ICG history there was a real tournament, with three teams: Brazil, Hispanics, and Anglo-Saxons-Asians.

And, another innovation... this time it was a Beach Soccer tournament, held on the charming Enseada Beach of Guarujá.

After a three matches tournament, organized like all against the others, the Brazilian team finished unabated and the champion of the 9ICG soccer event.

The 9ICG soccer game involved more than 50 players and other more than 100 spectators. After the game there was a friendly and nice gathering of the participants at the same place, on a deck on the Enseada Beach.



9ICG – Beach Soccer



Brazilian Team – champion of the Soccer Game tournament

*Reported by
Vinícius Benjamin
Local Support Coordinator*

9ICG Communication Activities

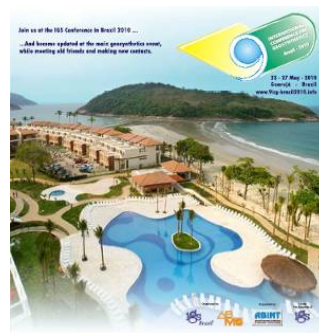
The first announcement of the 9ICG in Brazil occurred in September 2006 by the occasion of the 8th ICG in Japan. But the first massive action on the 9ICG promotion was in March 2008 during the GeoAmericas in Cancun. During the two years before the Conference several releases were published including short news about the event in Brazilian technical magazines, international associations and other entities, newsletters. Two months before the conference the advertising through those vehicles was intensified, mainly in Brazilian Geotechnical Magazines. Along the preparation period about thirty newsletters and mail blasts were sent to a more than 5.000 person mailing list (including students and professionals members of several associations, IGS, ISSMGE, ABMS, ABGE, among others) highlighting the main Conference subjects. The mascot of the 9ICG took place in most of the communication vehicles.

The 9ICG was also promoted in all International Conferences and Seminars related to Geosynthetics from 2008 to 2010, and in this way, the International Promotion Committee played an important role. The Organizing Committee could also count on the support of all the IGS

Chapters and other partners on the promotion of the 9ICG. Another important action from the organizing associations, IGS Brasil and ABMS, was the organization of regional technical events along two years aiming to promote the 9ICG.

The 9ICG website was published prior to the 8th ICG, and from that time on it was constantly updated and was, for sure, the main tool used by the organizing Committee to communicate important news about the conference. It was also the primary resource for participants to get relevant information and also to register for the event.

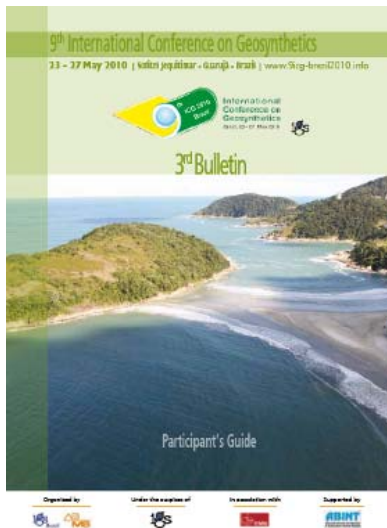
Three Bulletins were printed, the first in February 2008, the second in February 2009 and the third in May 2010 (which also served as the conference guide) With the collection of the three bulletins, one may keep all the history of the 9ICG.



9ICG 1st Bulletin



9ICG 2nd Bulletin



9ICG 3rd Bulletin

The Communication and Promotion Committees thank all the community for helping on the promotion of the event, what was an important part of the success of the 9ICG.

*Reported by,
Indiara Vidal, Communication
Committee Coordinator
Flávio Montez, International Promo-
tion Committee Co-Chair*

Professional Meetings throughout the 9ICG

Among the activities of the broad programme of the 9ICG, a significant number of meetings and receptions were held, with addressed the needs of various groups within the IGS and other related organizations such as ISO working groups.

Before the beginning of the conference, on Saturday May 21 and Sunday May 22, respectively, the former IGS officers and IGS council met for the last time. Their term formally ended at the General Assembly held on Wednesday May 26, which marked the beginning of a new council term.

The **7th IGS General Assembly** took place on May 26, and represented a major landmark as it was attended by a significant number of IGS individual and corporate members, which participated in important decisions of our Society. This included the address and report of the President of IGS, report of the Secretary of IGS, report by the Treasurer of IGS, presentation of awards by the IGS council, and selection of the date of the next International Conference.

Officers and council members elected to serve for the 2010-2014 term were announced and officially took office during this General Assembly. The elected officers are: Dr. Jorge G. Zornberg - President, Dr. Russell Jones – Vice President and Prof. Fumio Tatsuoka Immediate Past President. Please refer to the article on the New IGS Council in this issue of IGSNews for additional details.

The **traditional IGS Awards Ceremony** was marked by moving speeches that announced the award winners, carefully selected by the IGS awards committee among high quality candidates from all over the world. The IGS award winners of 2010 are: Dr. Richard J. Bathurst, Mr. Tetsuro Miyata, Mr. Tony M. Allen and Prof. Chungsik Yoo. Please refer to the article on IGS Awards in this issue of IGS-News for additional details.

Council member Elizabeth Peggs announced the winners of the 1st IGS photo contest, a very successful initiative that resulted in the submission of hundreds of high quality photos. While the evaluation process of the many excellent submissions was quite a difficult task, the winning photos were selected and announced. (please see <http://www.geosyntheticssociety.org/default.aspx?Page=2>).

The highlights of the ceremony included the IGS Honorary Member

and the IGS Plaque, respectively, granted to Mr. Pete E. Stevenson and Mrs. Rosemary T. Stevenson to recognize the significance of their dedication to the IGS, as well as a the vote of thanks of outgoing President Fumio Tatsuoka for his significant contributions to the continued growth of the IGS. Please refer to the articles in this issue of *IGS News* for additional details.

Several important meetings of the IGS took place throughout the conference. This included the meeting of the recently elected officers with the presidents of the many chapters of the IGS. This meeting was particularly informative, as it was attended by the presidents or their representatives of 25 of the chapters of the IGS.

Another series of important meetings were those held in preparation of the formation of the new Technical Committees of the IGS. Specifically, meetings were held by working groups that prepared successful proposals for the creation by the council of the new Technical Committees on Filtration, Barrier Systems, and Soil Reinforcement.

After the closing ceremony of the 9ICG and for the next two days, the new council, officers and committees met to initiate the 2010-2014 term of the IGS. As per the IGS by-laws the new council elected a Treasurer and Secretary from amongst the council membership. John Cowland, the incumbent Treasurer was reappointed by the council to serve as the IGS Treasurer. Elizabeth Peggs, a 6 year member of the Council was appointed to the position of IGS Secretary. In addition, the IGS Council co-opted members in order to better represent the diversity of the IGS membership within the council. Gerhard Bräu continues as the Editor of IGS News and in that position has a permanent invitation to participate in council meetings.



Session of the IGS Council meeting (from left to right: Zornberg, Tatsuoka, Cazzuffi, Cowland, Allen, Dixon, Pimentel, Otani, Fantini, Maugieri, Legg, Jeon, Peggs, Jones, Sadlier, Bouazza, Palmeira, Braeu, Bergado, R. Stevenson, P. Stevenson)



President-elect Jorge G. Zornberg and the presidents (or their representatives) of 25 of the IGS Chapters during their meeting on the occasion of the 9ICG in Guarujá.

The **ISO working groups** met during lunch-times throughout the conference. Fully equipped rooms were made available for these distinguished partners of the IGS so they can conduct the most productive meetings.

*Reported by
Jorge Zornberg, International Promotion Committee Co-Chair*

Thanks and Future

Thanks for the financial support of the Brazilian funding agencies,

CNPq, CAPES and FAPESP. We specially thank our sponsors, Bidim, Cipatex, Engepol, Huesker, Macafferri, Santa Fé, Ober, Tencate. The technical activities were a great success, thanks all the speakers and audience for that.

I personally thank the group from the Organizing Committee. They did a great job. As volunteers, they sacrificed personally for the success of 9ICG. We also give thank for the support of the members of the international committee. We hope to have also fulfilled the expectations of all participants. We did our best for that. Thanks to all of the participants for coming.

Best wishes for a great success for the 10th ICG Organizing Committee. See you and all participants in Berlin 2014.

*Reported by
Maurício Ehrlich, Chairman of the Organizing Committee*



From left to right: Bruno Pedroni, Delma Vidal, Denise urashima, Ennio Palmeira, Indiará Vidal, Vinícius Benjamin, Lavoisier Machado, Maria das Graças Gardoni, Benedito Bueno, Maurício Ehrlich, André Estêvão Silva

Special thanks to: Carolina Carvalho, Eduardo Buitron, Emy Tominaga and Rafaela



Flávio Montez



Alberto Sayão



Victor Pimentel



Jorge Zornberg



Daniele Cazuffi



Richard Bathurst

XIVth Danube-European Conference on Geotechnical Engineering

2 - 4 June 2010, Bratislava, Slovak Republic

The 14th Danube-European Conference on Geotechnical Engineering (DECGE) was held from 2 - 4 June 2010 in Bratislava. The Conference was organized by the Department of Geotechnics of the Faculty of Civil Engineering, Slovak University of Technology (STU) under the auspices of the International Society for Soil Mechanics and Geotechnical Engineering



Opening address by ISSMGE President Briaud

(ISSMGE).

The main theme of the conference was "From Research to Design in European Practice". The conference theme, session topics and venue attracted around 250 participants from 40 countries, 9 sponsors and 16 exhibitors.

After the opening ceremony four keynote lectures were presented in a special session: "Energy piles and other thermo-active ground-source systems" by Heinz Brandl (Chairman of the next DECGE), "The pressuremeter – some contributions to foundation engineering" by Jean-Louis Briaud (ISSMGE President), "Development of geotechnics in Slovakia" by Peter Turček (Chairman of the Organising Committee) and "Why do we need standards?" by Bernd Schuppener (BAW). The keynote lectures have

then been followed by a session dealing with ground characterisation and new developments in soil mechanics.

A Welcome Reception was given on the evening of the first day in the theatre of the Slovak Radio Building. It consisted of nicely composed pieces of classical music played by the STU-Orchestra followed by an impressive show of traditional slovak dancing. At the end of the show Jana Frankovská (Chairperson of Czech and Slovak Committee of ISSMGE) presented a song composed especially for geotechnics, giving geotechnical engineers their own hymn:

Bridges, buildings, constructions, built on our foundations, geotechnics saves it all, without us the world would fall.

On the second and third day papers were presented in two parallel sessions focussing on the following topics:

- Case studies using Eurocode 7
- Specific problems for environmental consideration
- Design methods for geotechnical

structures

- Monitoring and supervision of geotechnical structures
- Numerical and physical models in geotechnical design
- Interactive design and other problems in geotechnical design

During the geotechnical conference, geosynthetics were omnipresent as six out of nine sponsors and half of the exhibitors came from the geosynthetic industry. Presentations dealing with geosynthetics were given in all of the sessions, mostly focussing on the behaviour and design of geogrid reinforced soil.

A printed version of the proceedings contains the abstracts of the 150 accepted papers as well as the full versions of the main lectures. The full versions of all papers comprise 1700 pages and are included on a CD ROM, which can be obtained from the organizers (martin.ondrasik@stuba.sk).

The next DECGE Conference will be held in Vienna in 2014, exactly 50 years after the 1st Danube European Conference which was held in Vienna in 1964.

*Reported by
Axel Ruiken, IGS member*



Traditional slovak dancing at the Welcome Reception

Announcements of Conferences of IGS

10th International Conference on Geosynthetics – 10ICG Berlin, Germany, 21 – 25 September 2014



The German Geotechnical Society (DGGT) and the International Geosynthetics Society (IGS) German Chapter, as a special group within the DGGT, cordially invite you to participate in the 10th International Conference on Geosynthetics (10ICG) in 2014 in Berlin, Germany. The conference will be held from 21 to 25 September 2014 in direct connection with the 33rd Baugrundtagung (German Soil Mechanics Conference) of DGGT (23 to 26 September 2014).

As the Baugrundtagung expects 1200 participants, great synergy and interaction is expected between these events, especially in the co-organized, co-located exhibition.

The overlapping of lectures from both events will also attract many additional experts from the geotechnique and geosynthetics professions.

Venue

The 10ICG will be held in the south-eastern part of Berlin at the ESTREL convention centre, just 15 minutes from the new international airport Berlin-Schönefeld.

ESTREL offers about 50 rooms for lectures and meetings in different sizes, integrated exhibition halls (approx. 5000 m²) and a 4-star hotel (1125 rooms).

Travelling time from there to the centre of Berlin is about 20 minutes.

Language

The official language of 10ICG will be English.

Exhibition

The 5000 m² technical exhibition space is directly connected to the conference rooms and is half-way between the hotel and the lecture rooms inside the centre.

The exhibition space will be used both by 10ICG and the Baugrundtagung event.

Berlin

Berlin is the capital city of Germany and offers a tremendous number of interesting cultural events, museums and sightseeing attractions directly in the city and its surrounding area.

Berlin is the "gateway" to the eastern part of Europe. The city is easily reachable and the site of many significant political milestones not only in the history of Germany but of Europe and the world.

More than 6.5 million visitors per year experience Berlin. The 10ICG programme for accompanying persons will cover guided city tours, visits to museums and galleries - such as the Museumsinsel (a "World Cultural Heritage" site of UNESCO since 1999) and the Brandenburg Gate) – as well as special offers for individual trips and visits to the surrounding area (e.g., Spreewald, Potsdam, Mecklenburg Lakes).

10ICG Conference Themes

- Green Engineering, Sustainability and Durability with Geosynthetics
- Use of Geosynthetics for Renew-

able Energy

- Mining, Waste Management, Contaminated Sites and Environmental Protection
- Roads, Railways and Other Transportation Applications
- Reinforcement in Walls, Slopes, Embankments and Base Courses
- Flood Control, Levee and Canals, Dams, Reservoirs and Other Hydraulic Applications
- Drainage and Filtration Properties of Geosynthetics
- Geomembrane and Geosynthetic Clay Liner Barrier Systems
- Case Histories and Innovative Uses of Geosynthetics
- Quality Control, Quality Assurance and Accreditation
- On-site Installation Technologies and Monitoring Programs
- Soil-Geosynthetic Interaction and Large-Scale Performance Testing
- Design Approaches
- Regulations and Recommendations
- Looking to the Future with New Geosynthetic Products

For more information

Please visit the website that will be updated in due time:

www.10icg-berlin.com

For further information please contact:

Gerhard Bräu,

Gerhard.Braeu@bv.tum.de

or Dr. Kirsten Laackmann

service@dggt.de

Announcements of Regional Conferences of IGS

GEOAMERICAS 2012

II Pan-American Congress on Geosynthetics

Lima, Perú, 6 - 9 May 2012



The II Pan-American congress will take place from May 6th – 9th 2012, and will bring together researchers, consultants, environmental engineers, contractors, geosynthetic courses and exhibitors. It will be held at the modern Swissôtel in Lima, Peru. Lima is the capital city of Peru, which is the fifth-most populous and the third-largest country in South America. Geoamericas 2012 will be organized by the IGS Perú under the auspices of the IGS.

Technical Program

The congress will highlight the main topics in the geosynthetics industry

and application. Keynote lectures and selected papers will be presented on the main themes:

- Geosynthetics in Environmental Applications
- Geosynthetics in Dynamic Applications
- Geosynthetics in Hydraulic Applications
- Geosynthetics in Mining Applications
- Geosynthetics in Highways Applications
- Geosynthetics in Sanitary Applications
- Case Histories
- New Geosynthetics Products

Exhibition

During the Geoamericas 2012 an exhibition will be available to all interested companies and organizations that are willing to present lat-

est technologies, innovations and services to delegates and visitors. The conference venue offers exhibition facilities with 1340 m². of available space for consultants, contractors, suppliers, installers, agencies, project offices, and all organizations interested in the geosynthetic community.

Language

English will be the official language of the congress. However there will be simultaneous translation from English to Spanish.

For more information

More information will be available after August 2010 in the congress web site may be found in www.igsperu.org

5th European Geosynthetics Conference

Valencia, Spain, 16 - 19 September 2012



The next European Geosynthetics Conference “EuroGeo 5” will be held on 16 – 19 September, 2012 at the Convention & Exhibition Center (Centro de Eventos) in Valencia, Spain under the auspices of the IGS.

The event will be organized by the Spanish IGS Chapter in cooperation with European and national associations of producers and with scientific and engineering organizations.

The main objective is that the experts, manufactures, applicators and end users can exchange their experiences related to Geosynthet-

ics.

A group of experts will be present in the event and will describe the most recent developments in these fields. The aim of the discussions is to establish an open dialogue which will enable to enhance the participants' knowledge.

The EuroGe05 will appeal to all participants in the field of Geosynthetics whether in a practical or scientific sense: project authorities, designers, technicians, manufacturers, applicators, inspectors, researchers, regulators, experts, users, consultants, laboratories and other persons who, due to their professional activities, are interested in this field of technology.

Main Subjects of the Conference

The conference will provide an

overall look at the multiple applications of

- Transport (roads, railways, tunnels, airports)
- Hydraulic structures (dams, reservoirs, canals)
- Erosion control and coastal works
- Waste landfills
- Soil improvement and reinforcement
- Mining
- Environmental applications
- Agriculture and aquaculture
- Building construction
- Remediation technologies

All aspects of the use of Geosynthetics will be dealt with, drawing on experience gained from case histories as well as research and development into new products and uses:

- Testing and properties

- Specifications and certifications
- Long term experiences and durability
- Design concepts and calculation methods
- Installation and pathology.

Technical Exhibition

Exhibitors will present the latest technological innovations and associated services to the conference delegates and visitors.

The technical exhibition is open to all interested companies and organizations. Information and a registration file will be available on the conference website.

Languages

The official languages will be English and Spanish. Simultaneous translation will be provided. All written communications will be presented in English and/or Spanish.

Call for Abstracts

Authors interested in presenting a paper at the Conference must provide an abstract before 30 September 2011, addressed to the Conference Secretariat, through the Conference website. Abstracts received by fax or mail will not be considered.

The abstracts must be written in English or Spanish.

Important Dates

- Opening date for abstracts: submission: 30 June 2011
- Deadline for submission of abstracts: 30 September 2011
- Deadline for submission of final papers: 31 March 2012

Further instructions to submit abstracts are available in the Conference website www.eurogeo5.org

For more information please contact the Conference Secretariat:

E-mail info@eurogeo5.org

Geosynthetics Asia 2012

5th Asian Regional Conference on Geosynthetics Bangkok, Thailand, 10 - 14 December 2012



The International Geosynthetics Society-Thailand Chapter (IGS-Thailand), under the auspices of International Geosynthetics Society (IGS), organizes the Fifth Asian Regional Conference on Geosynthetics or Geosynthetics Asia 2012, which is scheduled from 10 to 14 December 2012 at Grand Centara Convention Hotel, Bangkok, Thailand. GA2012 will be hosted by the Asian Center for Soil Improvement and Geosynthetics (ACSIG) in the Geotechnical and Geoenvironmental Engineering Program (GGE) under the School of Engineering and Technology (SET) at the Asian Institute of Technology (AIT). The theme of this Conference is "Geosynthetics for Sustainable Adaptation to Climate Change".

The effect of climate change including global warming is not only limited in causing landslide disasters but also in increasing the frequency of occurrence of a variety of natural disasters. The intergovernmental panel on climate change (IPCC) reported that residences of many more millions of people are projected to be flooded every year through the 2080s because of rising

sea level. Among at risk are lowlying and densely populated areas. Moreover, recent news items have identified that insurance companies are blaming bad weather slashing down their profit forecasts by millions of dollars. Consequently, the insurance companies have been forced to raise the insurance premium to recoup their losses.

The objective of GA2012 is to bring together geosynthetic researchers, consultants, owners, manufacturers, distributors, project regulators, contractors, and academics in order to share their knowledge, update information, create advance technologies, and discuss recent developments.

Keynote and theme lectures will be presented by world famous authorities in geosynthetics. Invited lectures will be delivered by IGS Chapters and IGS Council Members. Technical visits to major geotechnical/geosynthetics projects will be organized.

Call for Abstracts

Abstracts on the following themes are particularly welcome:

- Geosynthetics for Climate Change Due to Global Warming
- Sustainable Infrastructure Including Limited Life Geosynthetics (LLGS)
- Geosynthetics for Human Security

- Geosynthetics for Food and Agriculture
- Geosynthetics for Water Conservation
- Geosynthetics for Leisure Activities
- Geosynthetics for Futuristic Innovations
- Geosynthetics for Waste Disposal
- Geosynthetics for Coastal and Riverbank Erosions
- Case Histories from IGS Chapters
- Other Themes Related to Geosynthetics Engineering

Language

The official language of this conference will be English

Important Dates

- Deadline for Abstract Submission: 31 May 2011
- Deadline for Paper Submission: 30 September 2011
- Deadline for Author Registration: 30 Jun 2012
- Deadline for Early Bird Registration: 30 Jun 2012

More information may be found in www.set.ait.ac.th/acsig/conference

Contact E-mail: bergado@ait.ac.th or acsig@ait.ac.th

Announcements of Conferences under the Auspices of IGS

3rd International Symposium on Geosynthetic Clay Liners 15 - 16 September 2010, Würzburg, Germany

GBR-C 2k10

The 3rd International Symposium on Geosynthetic Clay Liners will be held at the Fortress Marienberg in Würzburg, Germany from 15 till 16 September 2010.

Würzburg is honoured to host GBR-C 2k10, which is held every eight years in Germany – an outstanding forum for designers, geotechnical and geoenvironmental engineers, manufacturers, researchers and environmental agencies around the world to meet, to present and to discuss highly technical and scientific issues about GCLs through a total of seven sessions.

GBR-C 2k10 will be organised by SKZ and will be held under the auspices of the IGS. The Scientific Committee is formed by Robert M. Koerner, P.E. (USA), Nathalie Touze-Foltz (France), Helmut Zanzinger (Germany)

Symposium Themes

The Symposium will deal with the following topics:

- Shear and mechanical behaviour of GCLs
- Chemical resistance of GCLs
- Testing of GCLs under unsaturated conditions
- Behaviour of GCLs in landfill covers (case studies)
- Regulations, new concepts and developments in the use of GCLs
- GCLs for hydraulic and construction applications

Keynote Lectures

- Role of GCLs in controlling leakage through composite liners R.K. Rowe (Canada)
- Hydraulic conductivity of exhumed geosynthetic clay liners from composite barriers C.H. Benson, J. Scalia (USA)
- Internal and interface shear

strengths of geosynthetic clay liners P. J. Fox (USA)

Technical exhibition

A technical exhibition held in conjunction with the symposium will favour further exchanges of information and making contact around the latest innovative products.

Language

English is the official language of the conference

Important Date

Early bird registration before:
01 August 2010

Registration

E-Mail: anmeldung@skz.de

For more information

www.gbr-c-wuerzburg.com

E-mail: gbr-c2k10@skz.de

6th International Congress on Environmental Geotechnics 8 - 12 November 2010, New Delhi, India



The Indian Geotechnical Society (IGS) will host the 6th International Congress on Environmental Geotechnics (6ICEG) at New Delhi during November 8-12, 2010 on behalf of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE). Over 400 delegates, including 250 from abroad, will gather to discuss latest developments.

The congress is being organized by an Organizing Committee guided by a Conference Advisory Committee

as well as TC5 (Technical Committee on Environmental Geotechnics) of ISSMGE and a National Advisory Committee of IGS. It will be held under the auspices of the IGS.

Topics

The theme of the congress is: Environmental Geotechnics for Sustainable Development.

The congress will deal with the following topics:

- MSW and Hazardous Waste Landfills
- Slurry Ponds
- Contaminated Land, Groundwater and Abandoned Landfills
- Geosynthetics and New Materials
- Sustainability, Professional Practice and Education

- Geohazards, Disaster Mitigation and Management
- Testing, Monitoring and Performance Evaluation
- Physical and Numerical Modelling

Plenary Lectures

The actual program shows the following keynote and plenary lectures with geosynthetic background:

- Malek Bouazza, Monash University, Australia
Geosynthetics in mining applications
- Kerry Rowe, Queen's University, Canada
Factors affecting the clogging of leachate collection systems in MSW landfills
- Jean-Pierre Gourc, Domaine Universitaire, France
The bio-hydro-mechanical behav-

ior of MSW (Municipal Solid Waste) and the improvement of landfill environmental sustainability

- Mario Manassero, Politecnico di Torino, Italy
Coupled Modelling of Swelling Properties and Electrolytes Transport through Geosynthetic Clay

Liners

Exhibition

An exhibition of new equipment, new instruments, new materials, geosynthetics, engineering software, technical books, designers, consultants, contractors, and re-

search organizations will be arranged at the congress venue.

For more information

Email: 6icegdelhi@gmail.com

International Symposium on Geotechnical and Geosynthetics Engineering: Challenges and Opportunities on Climate Change Bangkok, Thailand, 7 - 8 December 2010

The effect of climate change including global warming is not only limited in causing landslide disasters with increasing frequency but also increasing frequency of occurrence of variety of geo-disasters. Reports have been circulated regarding the flooding of residences of millions of people in densely populated and low-lying areas where adaptive capacity is insufficient owing to tropical storms, land subsidence, as well as the threat of sea level rise. Moreover, riverbank and coastal erosions are now common occurrence due to increasing intensity and frequency of strong typhoons and associated heavy rainfall.

This Symposium aims to gather academics, practitioners, partners, and stakeholders to discuss emergency and urgent issues related to climate change as well as the innovative mitigation measures in the context of geotechnical and geosynthetics engineering.

The Symposium will be organized by the IGS Thailand, the Asian Center for Soil Improvement and Geosynthetics, the Southeast Asian

Geotechnical Society and the Thailand Geotechnical Society. It will be held under the auspices of IGS.

Technical Themes

The Symposium will cover a wide range of topics including but not limited to:

- Geotechnical/Geosynthetics Engineering for Riverbank and Coastal Erosions
- Sustainable Methods including Limited Life Geosynthetics (LLGs)
- Geosynthetics for Mitigations of Geo-Disasters
- Case Histories on Slope Failures and Mitigations
- Other Topics on Geosynthetics Applications

Keynotes and invited Lectures

Several well-known academics and practitioners have agreed to present Keynote and Invited Lectures such as Prof. Chungsik Yoo and Prof. Rajagopal. Potential Lecturers are Prof. E.C. Shin, Prof. Jun Otani, Prof. Jiro Kuwano, Prof. Malek Bouazza, John Cowland, Mike Sad-

lier, and many others.

Short Course, Symposium, and Exhibition

In conjunction with the International Symposium, a whole-day short course and two days exhibition are also organized. The one-day short course is scheduled on 06 December 2010 while the exhibition will be held together with the symposium on 07 and 08 December 2010.

Important Dates

- Deadline for submission of abstracts: 01 August 2010
- Notification of abstract acceptance: 01 September 2010
- Full paper submission: 01 November 2010

For more information

For more information please contact

E-mail: climatechange@ait.ac.th
www.set.ait.ac.th/acsig/climatechange

GEO-FRONTIERS 2011 Dallas, Texas, USA, 13 -16 March 2011



The objective of Geo-Frontiers 2011 is to share new developments in geotechnical engineering technologies. Attendees will be exposed to the state of the art practices as applied to geotechnical engineering.

As an engineer, environmental specialist, water or transportation regulator, you will have an extensive menu of technical programs, workshops and short courses from which to select. You'll walk away with up to 32 Professional Development Hours and hundreds of new ideas - from design and engineering strategies to cost-saving

geotechnical solutions and new industry contacts.

The conference venue will be the Sheraton Dallas Hotel.

The conference will be organized by GI, IFAI, GMA and Nags under the auspices of IGS. It also hosts the annual GSI-Conference GRI 24 which is somewhat different in that it encompasses all types of geosynthetics and all types of applications,

each of which is viewed from the context of sustainability. Many of the papers contrast traditional solutions to geosynthetic solutions from both cost and carbon footprint perspectives.

Topics of the GRI-24

Session 1 – Transportation and Geotechnical Applications

- Gravity Walls vs. MSE Walls
- Aggregate vs. Geosynthetic Pavement Sections
- Asphalt vs. Geosynthetic Pavement Overlays
- Traditional vs. Plastic Pipe Comparisons

Session 2 – Environmental and Hydraulic

- Reducing Landfill Footprints
- Landfill Berms for Increased Air-space
- Waterproofing Dams and Other Hydraulic Structures
- Geofoam Gravel Drainage vs. Natural Aggregates
- Solar Panels on Exposed Landfill Covers
- The “Perpetual” Landfill

Session 3 – Private Development and Miscellaneous

- Geosynthetic-Related Green Roofs
- Contrasting Various Sedimentation/Retention Systems
- Geosynthetic vs. Natural Soil Installation Contrasts
- Pacific Region Perspectives on Sustainability
- Basic Principles in the Calculation of CO2 Emissions
- ISO Standards vis-à-vis Sustainability

Short Courses at Geo-Frontiers 2011

Full-day short courses are being offered on Sunday, March 13, 2011 with the following themes:

- Advanced Principles of Slope Stability Analysis
- Design and Construction of Bottom Liner and Cover Systems
- Geosynthetic Reinforced Soil
- Instrumentation, Monitoring, and Condition Assessment of Foundations & Geo-Structures
- Application of Geophysics to Geotechnical Problems

Trade Show

Geo-Frontiers 2011 offers an excellent opportunity for geotechnical manufacturers and service providers to present new technologies and innovations to regulators, contractors, engineers, specifiers and other geotechnical users from both hemispheres.

For more information please contact: searman@ifai.com

Important Dates

- Final papers / paper deposit: 01 September 2010
- Final paper acceptance: 15 October 2010
- Presentation files due: 15 February, 2011

For more information

More information may be found in www.geofrontiers11.com

E-mail: bjconnett@ifai.com or tmwalsh@ifai.com

News from the IGS Chapters and the Membership

Dr. J.P. Giroud Named a Member of the Order of the Légion d'Honneur 16 June 2010



Mrs. Nicole Hirsh presents the medal to Dr. Giroud

Since 1970, J.P. Giroud, Ph.D., has worked at the forefront of the geosynthetics field (including coining the terms “geotextile” and “geomembrane”, which paved the way for the ‘geo-terminology’). He has earned many accolades for his pioneering work. Dr. Giroud's many



Dr. Giroud delivering his acceptance speech

awards and key industry positions include: serving as president of the International Geosynthetics Society (IGS), being honored with the establishment of an IGS “Giroud Lecture” presented at the beginning of each International Conference on Geosynthetics, being granted ‘hero’ status by the Geo-Institute of the American Society of Civil Engineers (ASCE), being appointed Honorary Member of the IGS, being selected to deliver prestigious lectures (e.g. ASCE Terzaghi Lecture, Vienna Terzaghi Lecture, and Mercer Lecture), being appointed Doctor Honoris Causa of the Technical University of Bucharest, and being elected Member of the US National Academy of Engineering.

This year, on April 2, Dr. Giroud received another very impressive

distinction. He was named a member of the Order of the Légion d'Honneur by a decree signed by the French President Nicolas Sarkozy. Established in 1802, the Order of the Légion d'Honneur is the highest decoration in France. In fact Dr. Giroud has French/US dual citizenship.

The official ceremony took place in Paris, on June 16, in the presence of members of the French Parliament and dignitaries of the Order of the Legion d'Honneur. The Technical University of Bucharest, of which J.P. Giroud is Doctor Honoris Causa, was represented by its Prorector, Professor Anton Chirica. Also in attendance were the IGS President Jorge Zornberg, the IGS Past President Daniele Cazzuffi, and other French IGS pioneers such as Professor Jean-Pierre Gourc, Gerard Cazier and Jacques Perfetti, and some prominent IGS members such as Jacek Mlynarek from Canada and Herve Plusquellec from the United States. The French President was represented by Mrs. Nicole Hirsh, member of the Assembly representing French citizens living abroad. She delivered an eloquent speech that described Dr. Giroud's career and presented him with the medal. Then, Dr. Giroud delivered an acceptance speech in traditional French verses, an unusual and brilliant performance, to the delight of the attendees.

This recognition is well deserved. The design methods developed by Dr. Giroud have had a significant impact on numerous applications of geosynthetics, such as: filtration, drainage, liquid containment, leachate collection, leakage evaluation and detection, liner system stability, liner system resistance to wind action, reinforcement of liners and embankments overlying cavities, unpaved roads, etc. Also, he played a key role in the development of liner construction quality assurance, in the early 1980s, and in the development of the technique of exposed geomembrane covers for landfills and dams, in the past fifteen years.

His "firsts" in the field's applications are many, all of which have now



Jorge Zornberg (IGS President), Daniele Cazzuffi (IGS Past President), JP Giroud (IGS Past President), Jean-Pierre Gourc, Jacek Mlynarek

permeated throughout geosynthetic practice. For example: first non-woven geotextile filter, which was also the first geotextile in a dam (1970), first geotextile cushion for geomembrane (1971), first double liner with two geomembranes (1974), first entirely geosynthetic double liner system with two geomembranes and a geonet leakage detection system (1981). As a result, Dr. Giroud is considered the "father of geosynthetic liner systems" and his design methods and technological innovations are routinely used in waste storage landfills, liquid reservoirs, dams and tailing dams.

The document supporting J.P. Giroud's nomination to the Légion d'Honneur indicates that "through the methodologies he has developed, J.P. Giroud is probably one of the engineers who have had the most beneficial impact on the environmental protection of the ground." The document also notes that Dr. Giroud has devoted a considerable amount of time to non-profit activities for the dissemination of technical information such as writing almost 400 papers, lecturing, and teaching courses. Perhaps, the main features of J.P. Giroud's presentations and publications are the clarity of explanations and the sim-

plicity of conclusions. All design methods developed by him include simple equations that engineers can use readily and step by step recommendations that practitioners can follow easily. These features have greatly contributed to the fact that these methods are now widely used.

In addition to his technical activities, Dr. Giroud has had a major impact on our profession, being the driving force of the formation of the IGS, the co-founder of Geosyntec, a major consulting engineering firm, from which he retired with the title of Chairman Emeritus, and the co-founder and Editorial Board Chairman of two technical journals, *Geotextiles & Geomembranes* and *Geosynthetics International*.

It is in part through his great activity that geosynthetics have now become established in every segment of civil and environmental engineering.

We congratulate him on this wonderful recognition, which is also an honor for our entire discipline.

*Reported by
Daniele Cazzuffi, IGS Past President and Chris Kelsey, IGS member*

Prof. Ennio Palmeira Receives Highest Accolade to Brazilian Scientists 26 May 2010



Prof. Ennio Palmeira received the Presidential Order of Scientific Merit

If you attended the 9th *International Conference on Geosynthetics* (9ICG) in Guarujá, Brazil, you may have perhaps noticed that while the Technical Chair of the Conference Prof. Ennio M. Palmeira was all over the place during three of the conference days, he was indeed missing during one of them. Indeed, Prof. Palmeira was not in Guarujá, but in Brasilia on the third day of the 4 day long International Conference. This is because right in the middle of the conference towards which Prof. Palmeira had been working so hard, he was requested to visit with Brazilian President Luiz Inácio Lula da Silva. The reason was very justifiable, as Prof. Ennio M. Palmeira was scheduled to re-

ceive, directly from the President of Brazil, the Commendation for the “Presidential Order of Scientific Merit”, in the range of “Comendador” (or “knight”).

The Commendation ceremony of took place on May 26, 2009 in Brasilia, Brazil. In addition to the Brazilian President, the ceremony was attended by the Brazilian Ministers of Education and of Science and Technology, as well as other distinguished authorities. The ceremony involved the presentation of a Presidential insignia and a diploma. The Presidential Order of Scientific Merit is granted to individuals who, in addition to having excelled in their areas of expertise, have also contributed significantly to the scientific and technological development of Brazil as a nation. Indeed, Prof. Ennio Palmeira was one of the pioneers in the study and dissemination of geosynthetics for use in geotechnical and environmental engineering projects in Brazil. In addition, throughout his distinguished professional career, Prof. Palmeira has served diligently as adviser, consultant and member of committees of the Brazilian Ministries of Education and of Science and Technology. He has also been instrumental in the evaluation of postgraduate University programs, in the development of new undergraduate and postgraduate courses in Brazil, and in the review of scien-

tific and technologic programs in the country.

Prof. Palmeira graduated as Civil Engineer from the Federal University of Rio de Janeiro (Brazil), received his M.S. degree from the same University (COPPE program), and his Ph.D. from Oxford University (UK). He is a member of the Brazilian Academy of Sciences. Prof. Palmeira has served at multiple levels in the IGS, including his service as member of the IGS Council during 12 years, Chair of the Education and South American Activities Committees, President and founder of the Brazilian Chapter of the IGS, and Technical Chair of the GeoAmericas 2008 (Cancún) and 9ICG (Guarujá) Conferences. Prof. Palmeira was the Mercer Lecturer for the period 2007-2008. He has also contributed significantly to the development and training of engineers, doctors and educators, who have in turn served in universities, research institutes as well as in engineering practice within Brazil and worldwide.

Congratulations to Ennio for his invaluable contributions towards the advancement of geosynthetics! The IGS membership at large is proud of your achievements.

*Reported by
Jorge G. Zornberg, IGS President*

4rd Remediation Technologies Expo, RemTech 2010 21 - 23 September 2010, Ferrara, Italy



Ferrara will host the fourth edition of Remtech Expo - Remediation

Technologies and Requalification of the Territory Exhibition.

RemTech Expo 2010 will take place in Ferrara Exhibition and Conference Centre from 21 to 23 September 2010 under the auspices of different national and international societies, including AGI-IGS, the Italian Chapter of IGS.

In spite of the international economic crisis, RemTech Expo obtained, in the previous three edi-

tions in 2007, 2008 and 2009, a great success in terms of exhibitors and visitors, and became the most important Italian event entirely dedicated to remediation of contaminated sites, territory requalification and protection.

Its importance is based on a clear identity, a strong specialization in green economy, the idea of expo such as a meeting point for the professional community, a network

between companies, public bodies, universities and research centers, a place to create and develop business partnerships, to share information, experiences and good practices.

RemTech 2010 will include BtoB meetings, a renovated and expanded exhibition area with environmental remediation and protection societies, institutions and public bodies, universities and research centers, national and international conferences with a focus on industrial, private, real estate and public sectors.

The Edition 2010 will feature ten Official Conferences, coordinated by a Scientific and Advisory Committees, both chaired by Daniele Cazzuffi, IGS Past President. The Official Conferences will regard first of all environmental regulations, risk management, decontamination

systems, old landfills management and remediation, treatment of sediments, demolitions and management of excavated soil and rocks, instruments for planning, requalification, environmental communications.

Special Events will include a round table about environmental regulations, a forum about Health, Safety and Environment, a conference about remediation of tanks, a meeting with Real Estates, a focus on Coasts and Harbors, a forum with Civil Service about remediation, a conference about Insurances, an interregional conference about management and treatment of Asbestos.

Among the most important news there are risk prevention, environmental protection, the involvement of industrial sites, the reinforcement of relationships between estate

agencies and building contractors, a focus on coast and port management and a national forum of public bodies about remediation.

Other highlights of RemTech 2010 include foreign Delegations and international Buyers and also the second edition of the Degree Awards sponsored by Andis, Unione Petrolifera, ALA, Assoreca, CNC and Federambiente.

RemTech Expo 2010 will take place in Ferrara Fiere Congressi – Via della Fiera, 11 – 44124 Ferrara (Italy), well connected by train to Bologna, Venezia, Milano and Roma.

Contact

Ph. +39.0532.909495 or 900713

Fax +39.0532-976997

E-mail: info@remtechexpo.com

www.remtechexpo.com

6th China International Exhibition of Geosynthetics & Equipments 13 - 15 October 2010, Shanghai, China



At present, the Chinese government is making a great effort in expanding China's domestic demands, with investments in transportation as a top priority. In line with this policy, the State Council has approved a 2 billion RMB railway development scheme proposed by the Ministry of Railways. And, shortly after that, the State Council declared a program of 10 measures for expanding domestic demands, which costs 4 billion RMB. The majority of the investment will flow to infrastructure constructions. With the investment in capital construction accelerating, the demands of geosynthetics will continuously mount. Apart from the demands from the big cities and the priority projects, more geosynthetic materials are needed in the constructions in the medium-and-small-sized cities, even in the rural areas, projects including the renovation of satellite airports. Furthermore, the Ministry of Housing and Urban-Rural Development has explicitly required that the employment of geosynthetic materials should be expanded in future constructions of dams, expressways, railways and

housing projects.

The 6th China International Exhibition of Geosynthetics & Equipments is a gala of the industry under the background of government efforts in expanding the using of geosynthetic materials. This exhibition aims at providing a stage for the geosynthetic industry to exhibit and exchange their latest techniques and equipments, so that they jointly promote technological upgrade and technological innovation, and expand the uses of geosynthetic materials in China's capital construction, supporting the harmonious development of Chinese cities in a more advanced, more environment-friendly, and healthier way.

With authoritative hosts, experienced organizers, a lengthy list of activities, the support of the leaders and experts from the relevant industries and the participation of professionals from all over the world, the exhibitors will be provided with a precious chance to showcase their latest technologies, their latest equipments and products. They will also have the chance to exchange information and cooperate in the field of trade and capitalization. We hope and believe that this exhibition will be a great success.

Scope of Exhibition

- Geofabrics, geofilms, geosynthetics and relevant products
- Raw materials for producing geosynthetics
- Techniques and equipments for producing geosynthetics
- Instruments and equipments for testing geosynthetics
- Techniques and equipments for applying geosynthetics in construction
- Latest technologies and research results concerning geosynthetics
- Technological consulting, technological services concerning the employment of geosynthetics in
 - Reinforcement for Bridge abutment of railways
 - Isolation between highroad pavement and foundation soil
 - Dam surface under drainage layer of geotextile
 - Application in landfill

For more information

Chinese Technical Association on Geosynthetics

Tel : +86-21-6517-8355

Fax: +86-21 -6517-8355

E-mail: postmaster@ccigs.com.cn

Secretary: Miss Zhou Yingxian

www.intergeosyn.com

XXIII Italian National Conference on Geosynthetics

27 October 2010, Bologna, Italy

The Italian Chapter of the International Geosynthetics Society (AGI-IGS), together with the Association of Engineers and Architects of Bologna and with BolognaFiere-SAIE 2010, organizes the XXIII Italian National Conference on Geosynthetics, this year dedicated to "Sheltering and mitigation interventions against landslides".

The Conference will be held in Bologna on Wednesday 27 October 2010, i.e. the first day of the huge SAIE exhibition, the main important event in Italy in the field of constructions and civil engineering.

The morning session will be devoted to "Triggering of landslides and mitigation interventions", and it will be chaired by Stefano Aversa

(President of AGI, the Italian Geotechnical Society). After the keynote lecture by Michele Maugeri and the introduction by the Italian Authority on the subject, the other contributions will be devoted to intervention policies to hazard mitigation and to present some possible solutions to prevent possible trigger of a landslide.

The afternoon session will be devoted to "Evolution of fast landslides and protection measures", and it will be chaired by Daniele Cazzuffi (President of AGI-IGS, the Italian Chapter of IGS). After the keynote lecture by Claudio di Prisco, the introduction lecture will be given by Manuel Pastor (CEDEX, Madrid, Spain). Prof. Pastor will present

some techniques able to numerically reproduce the evolution of fast landslides, with some applications to real case studies. The other contributions will be focused on real case studies of protection and sheltering structures.

More information on the Conference programme and registration will be available in September by contacting the following email:

agiroma@iol.it

Reported by

Daniele Cazzuffi, President of AGI-IGS, and Claudio di Prisco, Member of AGI-IGS Board

31st Baugrundtagung with Exhibition „Geotechnik“ 60th Anniversary of DGGT 3 – 6 November 2010, Munich, Germany



The "Baugrundtagung" is the highlight in the life of DGGT, taking place every two years. This year we take the opportunity to celebrate the 60th Anniversary of the DGGT at this conference, which is characterized by an attractive and scientifically high-ranking lecture-programme as well as an interesting trade exhibition. The conference will be hosted at the ICM in Munich, one of the latest and most successful Congress Centres worldwide.

Conference-Themes

- Special Geotechnical Work
- Soil Mechanics
- Road and Railroad Engineering
- Geothermal Energy
- Geological Engineering
- Research, Development and Innovation
- International Projects

Trade Exhibition

The trade exhibition will take place in hall B0 in the International Congress Centre in Munich. It will be open on 4 - 5 November 2010.

Special Session for Young Geotechnical Engineers

On the first day (3 November 2010) of the Baugrundtagung a special

session will present about 25 lectures given by young researchers showing their actual research programme. The session will be chaired by Georg Heerten, Vice-Chairman of DGGT and of the German IGS chapter.

Language

The official conference language is German.

More Information

More information can be found in

www.baugrundtagung.com

Contact E-mail:

baugrundtagung@interplan.de

GEOSPERU 2010

4 - 6 November 2010, San Isidro, Lima, Perú



The IGS International Peruvian Chapter (IGS-PERU), is now organizing the 2nd National Congress of Geosynthetics, "GEOSPERU 2010", which will take place at the Swissôtel located in San Isidro, Lima -

Perú, the dates will be the 4, 5 and 6 of November.

The event will include national and international experts in themes related to the sectors of Transportation, Mining Industry, Agriculture,

Energy and Environment.

One of the distinguished speakers is the Dr. Giroud, precursor in the theme of geosynthetics, who has carried out investigations since 1969 and is the author of more than 350 publications. He coined the terms "Geotextile" and "Geomembrane" in 1977.

Dr. Braja Das is other of the distinguished speaker that will be at the 2nd National Congress. He is the

Dean of Sacramento California University; he is the author of great quantity of geotechnical books and papers of reference projects, which have been translated to all the languages.

The event will include time dedicated to 24th of the best geosynthetics proposed projects done by professionals. Besides there will be an exhibition fair at the same time of the conferences where the institu-

tions and companies of the geosynthetic sector will present their products, services and solutions.

For more information go to the website of the congress: www.igsperu.org/congreso/

*Reported by
Juan Carlos Rivera, Vice President
of IGS Peruvian Chapter*

4th Portuguese Seminar on Geosynthetics 22 - 23 November 2010, University of Aveiro, Portugal

The 4th Portuguese Seminar on Geosynthetics will be held in the University of Aveiro, Portugal, on 22 – 23 November 2011. This event is organised by the Portuguese Chapter of IGS (IGS-Portugal), the Portuguese Geotechnical Society (SPG) and the University of Aveiro (UA).

The conference is aimed to be of great interest for geotechnical, environmental and civil engineers, project designers, contractors, consultants, manufacturers and installers, facility owners, researchers, professors and students.

Technical and Educational Program

The Seminar will start with a half-day course on "Filtration and drainage with geosynthetics" by Maria de Lurdes Lopes (FEUP) and Isabel Pinto (FCTUC).

The following periods include 4 Keynote lecturers and several oral presentations, on the following topics: coastal and hydraulic engineer-

ing, environmental engineering, soil reinforced structures and transportation engineering.

Keynote lectures

There will be four keynote lectures on the four main topics of the seminar. The invited speakers are:

- Coastal and hydraulic engineering - Adam Bezuijen
- Environmental engineering - Madalena Barroso
- Soil reinforced structures - Neil Dixon
- Transportation engineering - Jörg Klompmaker

Exhibition

A Technical Exhibition is going to take place. The two-day exhibition will be held November 22 - 23, 2011 at University of Aveiro. The seminar offers an excellent opportunity for geosynthetics' manufacturers and service providers to present new technologies and innovations to regulators, contractors, engineers, specifiers and other geosynthetics users.

Important dates

Submission of abstracts:
January 31, 2011

Acceptance of abstracts:
February 28, 2011

Submission of full papers:
June 30, 2011

Acceptance of papers:
July 31, 2011

Language

Portuguese is the official language of the Seminar.

Registration

Detailed information will be soon available in <http://4spgeo.web.ua.pt>

For more information

For more information, please contact: 4spgeo@ua.pt

*Reported by
Madalena Barroso, IGS News Correspondent from Portugal*

List of IGS Chapters Including the Year of Foundation and Their Chairpersons

Argentina

Argentinean Chapter (2009)
President: Prof. Sergio Reyes,
sreyes@reyesasoc.com.ar

Australia and New Zealand

Australasian Chapter (2002)
President: Mr. Mike Sadlier
sadlier@attglobal.net

Belgium

Belgian Chapter (2001),
Chairman: Frans De Meerleer,
frans.texion@skynet.be
www.belgian-geosynthetics.be

Brazil

Brazilian Chapter (1997)
President: Prof. Mauricio Ehrlich
igsbrasil@igsbrasil.org.br
www.igsbrasil.org.br

Chile

Chilean Chapter (2006),
President: Mr. Mauricio Ossa,
mossa@igs-chile.org
<http://igs-chile.org/index.html>

China

Chinese Chapter (1990)
Chairman: Li, Guangxin

postmaster@ccigs.com.cn
www.ccigs.com.cn

Czech Republic

Czech Chapter (2003)
Chairman: Mr. Petr Hubik
igs@igs.cz
www.igs.cz

France

French Chapter (1993)
President: Mr. Jean-Pierre Magnan
françois.caquel@developpement-durable-gouv.fr

Germany

German Chapter (1993)
Chairman: Prof. Dr.-Ing. Martin Ziegler
service@dggt.de
www.gb.bv.tum.de/fachsektion/index.htm

Greece

HGS, Greek Chapter (2005)
President: Mr. Dimitrios K. Atmatzidis
dac@upatras.gr

India

Indian Chapter (1988)
President: Prof. K. Rajagopal
cbip@cbip.org
www.cbip.org

Indonesia

INA-IGS, the Indonesian Chapter (1992)
President: Mr. Gouw Tjie Liong
ina_igs@binus.ac.id

Italy

AGI-IGS, the Italian Chapter (1992)
President: Dr. Ing. Daniele Cazzuffi
agiroma@iol.it
www.associazionegeotecnica.it/~agi/

Japan

Japanese Chapter (1985)
Chairman: Dr. Hiroshi Miki
secret@icigs.or.jp
www.soc.nii.ac.jp/icigs/

Korea

KC-IGS, The Korean Chapter (1993)
President: Prof. Eun-Chul Shin
kgss-adm@kgss.or.kr
www.kgss.or.kr

Mexico

Mexican Chapter (2006)
President: Giovanni Bellei
Giovanni.bellei@maccaferri.com.mx

The Netherlands

Netherlands Chapter (1992)
President: Dr. Ir. A. H. de Bondt
mail@ngo.nl

www.ngo.nl

North America

North American Geosynthetics Society (NAGS) (Canada, USA) (1986)
President: Dr. David Elton
NagsDirector@aol.com
www.nags-igs.org

Norway

Norwegian Chapter of IGS (2008)
Chairman: Arnstein Watn
Arnstein.watn@sintef.no

Peru

Peruvian Chapter (2001)
President: Miguel De La Torre
gerencia@geoserviceing.com
www.igsperu.org

Philippines

Philippine Chapter (2007)
President: Engr. Emil Morales
emmorales@gmail.com or
igs_philippines@yahoo.com
www.igsphilippines.com

Poland

Polish Chapter (2008)
Chairman: Prof. Adam Bolt
abolt@pg.gda.pl

Portugal

Portuguese Chapter (2003)
President: Maria de Lurdes Lopes
Lcosta@fe.up.pt
www.spgeotecnia.pt

Romania

Romanian Chapter (1996)
President: Dr. Valentin Feodorov
adiol@utcb.romailto

Russia

Russian chapter of IGS (RCIGS, 2008)
President: Prof. Andrey Ponomaryov
ofrikhter@mail.ru

South Africa

South African Chapter (1995)

President: Garth James
garth@kaytech.co.za or
joannes@englining.co.za
www.gigs.org

Spain

Spanish Chapter (1999)
President: Mr. Angel Leiro
pabad@cetco.es
www.igs-espana.com

Thailand

Thai Chapter (2002)
President: Prof. Dennes T. Bergado
bergado@ait.ac.th
www.set.ait.ac.th/acsig/igs-thailand

Turkey

Turkish Chapter (2001)
President: Dr. Orkun Akkol
orkunakkol@orientresearch.com

United Kingdom

U.K. Chapter (1987)
Chairman: Neil Dixon
n.dixon@lboro.ac.uk
www.igs-uk.org

West Pacific Regional Chapter

West Pacific Regional Chapter (1997)
President: Dr. Dave Ta-The Chang
tateh@cyu.edu.tw

Note:

- If you find your information is incorrect please contact your chapter secretary or if you are not affiliated with a chapter contact the IGS secretary. Please also advise the IGS News editor

Conferences

Symposia

Workshops

Calendar of Events



Short Courses

Expositions

Trade Shows

3rd International Symposium on Geosynthetic Clay Liners
Würzburg, Germany
15 -16 September 2010
E-mail: gbr-c2k10@skz.de

6th China International Exhibition of Geosynthetics & Equipments
Shanghai, China
13 - 15 October 2010
Email: postmaster@ccigs.com.cn
www.intergeosyn.com

31st Baugrundtagung with Exhibition „Geotechnik“
60th Anniversary of DGGT
Munich, Germany
3 – 6 November 2010
E-mail: a.enke@interplan.de
www.baugrundtagung.com

4rd Remediation Technologies Expo RemTech 2010
Ferrara, Italy
21 - 23 September 2010
Email: info@remtechexpo.com
www.remtechexpo.com

XXIII Italian Conference on Geosynthetics
Bologna, Italy
27 October 2010
E-mail: agiroma@iol.it

Bangladesh Geotechnical Conference 2010; Natural Hazards and Countermeasures in Geotechnical Engineering
Dhaka, Bangladesh
4 - 5 November 2010
E-mail: bsge.hgs@gmail.com
www.bsge-bd.org (under construction)

International Symposium on Geomechanics and Geotechnics: From Micro to Macro
Tongji University, Shanghai, China
10 - 12 October 2010
E-mail: mingjing.jiang@tongji.edu.cn
www.geotec.tongji.edu.cn/is-shanghai2010/

ISRM International Symposium 2010 and the 6th Asian Rock Mechanics Symposium
New Delhi, India
23 – 27 October 2010
E-mail: uday@cbip.org; cbip@cbip.org
www.arms2010.org

GeosPeru 2010
Lima, Peru
4 – 6 November 2010
<http://igsperu.org/congreso/>

Fifth International Conference on Scour and Erosion (ICSE-5)
San Francisco, California, United States
8 - 10 November 2010
E-mail: cavila@avilaassociates.com
www.icse-5.org

6th International Congress on Environmental Geotechnics
New Delhi, India
8 - 12 November 2010
E-mail: 6icegdelhi@gmail.com
www.6iceg.org

3rd International Conference
"Geosynthetics Middle East 2010"
Abu Dhabi, UAE
9 - 10 November 2010
E-mail: anmeldung@skz.de
www.skz.de/shop

4th Portuguese Seminar on Geosynthetics
University of Aveiro, Portugal
22 - 23 November 2010
Email: 4spgeo@ua.pt
<http://4spgeo.web.ua.pt>

Waterproof Membranes 2010
International business and technology conference on waterproofing in roofing and geomembrane liners
Cologne, Germany
30 November - 2 December 2010
www.amiplastics.com

International Symposium on Geotechnical and Geosynthetics Engineering: Challenges and Opportunities on Climate Change
Bangkok, Thailand
7 - 8 December 2010
E-mail: climatechange@ait.ac.th
www.set.ait.ac.th/acsig/climatechange

International Symposium on Forensic Geotechnics of Vibratory and Natural Hazards
Mumbai, Maharashtra, India
14 - 15 December 2010
E-mail: gls@civil.iisc.ernet.in
www.civil.iisc.ernet.in

5th International Conference on Geotechnical Earthquake Engineering (5-ICEGE)
Santiago de Chile, Chile
10 - 13 January 2011
E-mail: secretariat@5icege.cl
www.5icege.cl

Geo-Frontiers 2011
Dallas, Texas, USA
13 - 16 March 2011
E-mail: bjconnett@ifai.com

FS-KGEO 2011
Kunststoffe in der Geotechnik
Munich, Germany
3 March 2011
E-mail: fskgeo@bv.tum.de
<http://www.gb.bv.tum.de/fskgeo>

Index 11
Geneva, Switzerland
12 - 15 April 2011
E-mail: index11@geneva-palexpo.ch
www.index11.org

7th International Symposium on Geotechnical Aspects of Underground Construction in Soft Ground
Roma, Italy
16 - 18 May 2011
E-mail: info@tc28-roma.org
www.tc28-roma.org

The 3rd International Conference on Geotechnical Engineering for Disaster Mitigation and Rehabilitation 2011 (GEDMAR2011) combined with The 5th International Conference on Geotechnical and Highway Engineering Semarang, Central Java, Indonesia
18 - 20 May 2011
E-mail: hpi_jateng@yahoo.com,
geocofina@yahoo.com
www.reliability.geoengineer.org/GEDMAR2011/

XIV Asian Regional Conference Soil Mechanics and Geotechnical Engineering
Hong Kong, China
23 - 27 May 2011
E-mail: 14arc.2011@polyu.edu.hk
www.cse.polyu.edu.hk/14arc

3rd International Symposium on Geotechnical Safety and Risk (ISGSR2011)
Munich, Germany
2 - 3 June 2011
www.isgsr2011.de

XV African Regional Conference on Soil Mechanics and Geotechnical Engineering
Maputo, Mozambique
18 - 21 July 2011
E-mail: info@15arcsmg-maputo2011.com
www.15arcsmg-maputo2011.com

Fifth International Symposium on Deformation Characteristics of Geomaterials (IS-Seoul 2011)
Seoul, Korea
31 August - 3 September 2011
E-mail: is-seoul@kaist.ac.kr
www.isseoul2011.org

XV European Conference on Soil Mechanics and Geotechnical Engineering
Athens, Greece
12 - 15 September 2011
E-mail: athens2011ecsmge@hssmge.gr
www.athens2011ecsmge.org

XIV Panamerican Conference on Soil Mechanics and Geotechnical Engineering (October) & V PanAmerican Conference on Learning and Teaching of Geotechnical Engineering, & 64th Canadian Geotechnical Conference
Toronto, Ontario, Canada
2 - 6 October 2011

2nd World Landslide Forum
"Putting Science into Practice"

Roma, Italy
3 - 9 October 2011
E-mail: secretariat@wlf2.org
www.wlf2.org

GeoAmericas 2012
II. Pan-American Congress on Geosynthetics
Lima, Peru
6 - 9 May 2012
www.igsperu.org

12th Baltic Sea Geotechnical Conference
Rostock, Germany
31 May - 02 June 2012

11th Australia - New Zealand Conference on Geomechanics
Melbourne, Australia
15 - 18 July 2012
(dates still to be confirmed)

EUROGEO5 - 5th European Geosynthetics Conference
Valencia, Spain
16 - 19 September 2012
E-mail: info@eurogeo5.org
www.eurogeo5.org

32. Baugrundtagung with exhibition „Geotechnik“
Mainz, Germany
26 - 29 November 2012

GEOSYNTHETICS ASIA 2012 (GA2012)
5th Asian Regional Conference on Geosynthetics
Bangkok, Thailand
10 - 14 December 2012
www.set.ait.ac.th/acsig/igs-thailand

10th International Conference on Geosynthetics
Berlin, Germany
21 - 25 September 2014
E-mail: g.braeu@bv.tum.de
www.10icg-berlin.com

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Geosynthetics 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 is only published electronically starting Volume 10 (2003) by Thomas Tel-

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Content of Volume: 17, Issue: 2 (April 2010)

Analysis of geosynthetic reinforcement in pile-supported embankments. Part I: 3D plate model, pp. 59–67, Authors: B.M. Jones; R.H. Plaut; G.M. Filz

Analysis of geosynthetic reinforcement in pile-supported embankments. Part II: 3D cable-net model, pp. 68–76, Authors: K.A. Halvordson; R.H. Plaut; G.M. Filz

Analysis of geosynthetic reinforcement in pile-supported embank-

ments. Part III: Axisymmetric model, pp. 77–85, Authors: R.H. Plaut; G.M. Filz

Influence of geofibers on the flexural behavior of compacted soil beams, pp. 86–99, Authors: B.V.S. Viswanadham; B.K. Jha; S.N. Pawar

Shear strength of randomly distributed moist fibre-reinforced sand, pp. 100–106, Authors: J. Lovisa; S.K. Shukla; N. Sivakugan

Cyclic shear test of a geosynthetic clay liner for a secondary containment application, pp. 107–111, Authors: C. Athanassopoulos; P.J. Fox; J.D. Ross

Please find the download of the articles at:
<http://www.icevirtuallibrary.com/content/issue/gein/17/2>

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Permeability and internal erosion of a GCL beneath coarse gravel, pp. 112–123, Authors: S. Dickinson; R.W.I. Brachman

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Numerical study of the effect of geosynthetic encasement on the behav-

our of granular columns, pp. 132–143, Authors: M. Khabbazian; V.N. Kaliakin; C.L. Meehan

Wetting-drying behaviour of geogrid-reinforced clay under working load conditions, pp. 144–156, Authors: Y.P. Pathak; M.C. Alfaro

Anisotropy and directional shrink-

age of geosynthetic clay liners, pp. 157–170, Authors: L. Bostwick; R.K. Rowe; W.A. Take; R.W.I. Brachman

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Geotextiles & Geomembranes



Geotextiles and Geomembranes 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.

The Journal publishes technical papers, technical notes, discussions, and book reviews on all topics relating to geosynthetics, research, behaviour, performance analysis, testing, design, construction methods, case histories, and field experience.

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Please ensure the text is double spaced, there is an abstract with keywords included, and tables and figures are at the end following the text. Please check the Journal's instructions for authors for additional information regarding submissions. The Journal strives to provide the authors with quick, constructive reviews, and we appreciate the author's hard work in addressing these comments and quick return of revised papers.

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IS Kyushu 2007 Special Issue on New Horizons in Earth Reinforcement, 5th International Symposium on Earth Reinforcement

Fukuoka, Japan

Edited by Jun Otani and Yoshihisa Miyata

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under cyclic loading, Pages 251-261, Helmut Zanzinger, Hartmut Hangen, Dimiter Alexiew

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Deformation behavior of clay cap barriers of hazardous waste containment systems: Full-scale and centrifuge tests, Pages 281-291, J.P. Gourc, S. Camp, B.V.S.

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Multifaceted potentials of tire-derived three dimensional geosynthetics in geotechnical applications and their evaluation, Pages 303-315, Hemanta Hazarika, Kazuya Yasuhara, Yoshiaki Kikuchi, Ashoke K. Karmokar, Yoshio Mitarai

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Numerical simulation of geosynthetic-reinforced soil walls under seismic shaking, Pages 317-334, K.Z.Z. Lee, N.Y. Chang, H.Y. Ko

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Shrinkage characteristics of heat-tacked GCL seams, Pages 352-359,

R. Kerry Rowe, Laura Bostwick, Richard Thiel

A wave flume experiment for studying erosion mechanism of revetments using geotextiles, Pages 360-373, Yves-Henri Faure, Chia Chun Ho, Rong-Her Chen, Mattieu Le Lay, Jon Blaza

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Technical Notes

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Modeling of soil-woven geotextile interface behavior from direct shear test results, Pages 403-408, Anubhav, P.K. Basudhar

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Corporate Membership

Corporate Members Present Case Studies

The IGS Council approved a new initiative which provides the corporate membership the opportunity to present interesting case studies of geosynthetic applications in site works to the IGS and the general public audiences. Conceived as a powerful way to present the story of geosynthetics to a broad audience, the concept is to present a series of half page synopses, or abstracts, of case studies with each case study presented under the company logo and linked to the company web pages for further information and complete detail. The reader who finds a case history inviting can follow up immediately to harvest a full understanding with details and with a connection to the firm.

The editor of the IGS News will invite the corporate membership to present case histories with the most senior members having first priority followed by more recent member companies. For each issue the editor will issue 15 to 20 invitations to submit case histories. Up to 8 case histories will be published in each issue, which means that the entire membership will have the opportunity to tell a story every four years if not sooner. Of course, if a company misses a publication deadline, the editor will make every effort to include the tardy submission in one of the next issues.

Once published, the case history will live on in two forms. First, as the IGS website archives the IGS

News, a reader who peruses the archived issues will have the opportunity to pursue interesting case histories through the identification of and link to the corporate member. Further, the IGS is developing a new and more powerful web site that will include the opportunity for the half page abstract to be expanded to as much as two pages which will also feature links to the corporate member who authored the case history.

Corporate members are encouraged to create case histories that communicate with the broadest user audience, from the small contractor to the landscaper to the sophisticated designer.

GeoMega[®] system associated with new EcoStrap[™] reinforcements makes the winning combination for a concrete crushing company in the North of Paris area

When the concrete crushing company DLB, based in Gonesse, France, contacted Terre Armée S.A.S. (Reinforced Earth company in France), it was with the intention to get the best solution for their needs, while combining at the same time cost effectiveness, reduced environmental impacts, reliability and short construction time. Ge-

oMega system with EcoStrap reinforcements proved to be the best choice.

DLB is a company specialized in selecting, crushing and blending materials taken from deconstruction sites, mostly concrete but also to a lesser extent road waste. In conjunction with the construction of a new crusher, they needed an

access ramp to let the incoming trucks dump the selected materials into the crusher. The ramp needed to be retained by 7.5 m high vertical walls on two sides. The use of a classical Mechanically Stabilised Earth wall with segmental concrete panels was a logic choice, but under the condition that it be constructed with filling material available on site.



TERRE ARMÉE
SUSTAINABLE TECHNOLOGY

This material, made of 70% in weight of recycled concrete, is very adequate in terms of mechanical characteristics. But the high level of pH (about 12 when concrete is freshly crushed) imposed the combination of recent developments carried out by Terre Armée Internationale.

The GeoMega system makes it possible to connect segmental concrete panels to reinforcing geostrips without any intermediate structural element, which is a major advantage for durability in aggressive environments. EcoStrap reinforcements are made of polyvinyl alcohol (PVA-I) yarns sheathed with low density polyethylene. They are compatible with the level of pH exhibited by crushed concrete used for the walls in Gonesse. Construction was carried out in January 2009 and the performance of the structure fully complies with the expectations of

the client.

This first Reinforced Earth wall reinforced with EcoStrap strips is a new step towards an increasingly wide range of applications of the original Terre Armée concept: design and supply elements which enable the use of soil or other materials like demolition waste to build flexible, durable and cost-effective structures.



Terre Armée Internationale, 1 bis, rue du Petit Clamart, 78140 VELIZY-VILLACOUBLAY, FRANCE – tel : +33 1 46 01 84 84 – fax : +33 1 46 01 86 87

<http://www.terre-armee.com>

Contact: Mr Nicolas Freitag
(nicolas.freitag@terre-armee.com)

OJSC “494 UNR”

Installation of Geocells and Geomembranes



OJSC “494 UNR” is the Russian industrial building company with its history, which has been lasted for more than 40 years. The success of the company OJSC “494 UNR” in the production engineering of “PRUDON-494” and “Luron-494” has been known in Russia, the CIS, the Middle East and Africa for more than 20 years. The company is the first in Russia which opened up industrial manufacturing of the plastic geocells “PRUDON- 494” and polymer reinforcing geomembrane “Luron- 494” with the total volume of more than 5 million square meters per annum.

Since 90's years of the last century experiments and testing operations, hundreds of monitoring measures of finished constructions and construction projects have made it possible to get long-lasting and reliable constructions with the application of geocells “PRUDON-494”. The main application of “PRUDON-494” is as follows: the subgrade support and the base of road, slope paving, the cones of grade eliminations and

bridges.

The solutions which have been applied for more than twenty years are ready to be applied as generic solutions, and it makes it easy for engineering companies to choose and set the engineering solution in the road, gas-oil, oil and railway areas. Since 2003 OJSC “494 UNR” has been the first Russian Corporate Member of the IGS. The quality of output product meets the International technical requirements.

In March 2008 experiment laying of the geocells “PRUDON-494” was made in the base of multiple-well platform in the Nenets Autonomous District. The representatives of the OJSC “Tatneft”, OJSC “SoyusdorNII”, of the Institute “TatNIIneft”, of the OJSC “494 UNR” took part in the accomplishment of the project. “Methodology recommendations on the engineering and building of the base of boring rigs, sites and intra-site roads” were worked out and sent out to more than 300 engineering companies.



Contact:

www.prudon.ru, www.494unr.ru

e-mail: unrmarket@prudon.ru

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Australia

GEOFABRICS AUSTRALASIAN
PTY Ltd.
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Fontana International GMBH
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(2005)

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Maccaferri do Brasil Ltda
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China (P.R.)

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Co., Ltd.
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Shenzhen Sheng Yi Environmental
Co., Ltd.
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Tensar Geosynthetics (China) Ltd.
(2003)

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(2010)
Servicios de Ingenieria Geosintetica
S.A. (SIGSA)
(2008)

Croatia

Werkos
(1999)

Denmark

Fibertex A/S
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(1996)
Terre Armee International
(2002)
Texinov
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(2004)
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(1987)
NAUE GmbH & Co. KG
(1987)

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National Coir Research & Manage-
ment Institute (NCRMI)
(2009)
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(2008)
TechFab India Industries Ltd.
(2008)

Indonesia

PT Tetrasa Geosinindo
(2010)
Teknindo Geosistem Unggul, PT
(2009)

Iran

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(2008)
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Ireland

F.L.I. Environmental
(2002)

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(2010)
- Geosynthetic Materials Association
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(1988)
- I-CORP INTERNATIONAL
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- Propex
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- TenCate Geosynthetics North
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- Tensor International Corporation
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- Venezuela**
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- Tonb bozorg Water purification plant
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- **Oil, Gas, Petrochemical** projects by providing secondary containment, ground reinforcement, isolation, evaporation lagoons and other solutions.
- **Road and railroad construction, civil, hydraulic and geotechnical** projects by providing ground reinforcement and stabilization, tunnel waterproofing, reinforced walls, embankments, and sea coasts and slopes erosion control solutions.
- **Urban and Industrial waste management projects** by providing Landfills, Storage areas for treatment of contaminated soil and industrial sludge desiccation and many other solutions.
- **Agricultural, Irrigation projects and water treatment plants** by providing water lagoons and reservoirs, canal and pond lining solutions.
- **Telecommunication and Piping projects and various civil projects** by providing horizontal Directional drilling services for crossing the rivers with pipelines and utilities or other means.



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Hints for Easy Usage of This Document

To allow easy and most effective use of this IGS News we tried to incorporate as many links to further information on the internet as possible. This means that moving around with the mouse pointer in the PDF-file allows direct linkage to webpages of the conferences, documents of IGS, journals, email

addresses and many other things.

Further on you can click on the page numbers at the "Content" on the front page to jump directly to the article.

Another useful tool is the "bookmark" function within your PDF-Reader. This functionality shows

you on the left part of your screen the content with the headlines of the articles and on the right part the article itself.

If you have any further ideas to improve the usage of IGS News – please let us know!

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- 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.

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Please check whether there is a local IGS Chapter in your country (list at page 50)!
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