

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: Anatomy of the 10ICG (Berlin 2014)



Jorge Zornberg

Dear Member of the IGS,

The 10th International Conference on Geosynthetics will take place in Berlin, Germany, from 21 to 25 September 2014 (www.10icg-berlin.com). The IGS German Chapter, the German Geotechnical Society (DGGT) and the IGS are extremely pleased to invite you to this celebration of geosynthetic technology. Every International Conference on Geosynthetics (ICG) has a myriad of activities, which I try to summarize below, that make this quadrennial event a special milestone in geosynthetics history. This will certainly be the case in Berlin, with the added important note that the event will be co-located with the 33rd Baugrundtagung (i.e. the German Soil Mechanics Conference) of the DGGT. As the biennial Baugrundtagung expects more than 1,200 participants, great synergy and interaction is anticipated between these events, especially in the co-organized, co-located exhibition. There will be opportunities for participants of the Baugrundtagung to join the 10ICG as well as to also participate Baugrundtagung presentations, which will be simultaneously translated to English. The special lectures from both events will include deliveries from key experts from both the geotechnical and geosynthetics professions. This is an opportunity to offer exposure to the geosynthetics industry to a very progressive group of engineers that may (or may not) have known (so far) about geosynthetics.

The conferences of the IGS have played a remarkable role in the development of geosynthetic products and their applications. Much of the information on material properties, testing methods, applications and design approaches that we use in geosynthetics engineering has been vetted through these conferences. Of particular importance are the International Conferences on Geosynthetics. This series has been a premier outlet of, and in many cases has indeed triggered, many of the advances in geosynthetics. Figure 1 illustrates the location of the various international conferences (see yellow stars, with the corresponding conference number). As illustrated in this figure, the international conferences of the IGS have been well distributed throughout the globe. The first ICG was held in Paris (France) in 1977, and was followed by the 1982 Las Vegas (USA) conference, the 1986 Vienna (Austria) conference, the 1990 The Hague (Netherlands) conference, the 1994 Singapore conference, the 1998 Atlanta (USA) ICG, the 2002 ICG in Nice (France), the 2006 ICG in Yokohama (Japan), and the most recent event (9ICG) held in Guarujá (Brazil) in 2010. The forthcoming Berlin conference will be the 10th Conference of the important series of ICG events.

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Figure 1. Location of the previous and upcoming International Conferences on Geosynthetics

Figure 2 shows the same information as in Figure 1, but in a more interesting way, as conceived by the organizers of the 10ICG. Inspection of this figure will reveal an interesting mixture of artistic, historic, and “geosynthetic” views of our field. You may discover the characteristic landscape of the various conference locations. Can you find the multiple geosynthetics uses in this figure?



Figure 2. Location of the previous and upcoming International Conferences on Geosynthetics (source: 10ICG Brochure).

The 10ICG will see a major display of technical and organizational activities of the IGS and the geosynthetics industry at large. This is where the next Giroud Lecture (to be delivered by Prof. Richard Bathurst) will be offered. Key activities and meetings of the IGS Technical Committees on Filtration, Reinforcement and Barriers will take place. The current (15th) IGS Council will finish its term and the new (16th) IGS Council will begin along with a new IGS President’s tenure. He/she will be the ninth IGS Council President in the Society’s history. Also of note, the IGS Awards will be granted, among many other activities, during 10ICG.

The highlight of the conference will certainly be its technical contributions. While the themes of the conference cut across the many areas of geosynthetics and their affiliated applications, the conference organizers have identified three timely areas of emphasis:

- Geosynthetics for mitigation of natural disasters
- Geosynthetics for implementation of energy-efficient solutions
- Cost benefits of geosynthetic solutions

Stay tuned for upcoming information on these specific aspects in the technical program of the 10ICG.

Some of the important deadlines regarding the submission of technical contributions to the conference are noted in the inset box. The deadline for receiving abstracts has recently passed and we are pleased to report that a record-high number of 480 abstract submissions have been received by the 10ICG Organizers. This is an early indicator of the great feast of geosynthetics technology that will take place in Berlin. The reviewing process will be conducted next, and early releases of the upcoming technical program will be issued to

For information on the technical contributions and submission of abstracts go to:
www.10icg-berlin.com

Important deadlines are:

- **31 July 2013: Deadline for receipt of abstracts (*)**
- **1 December 2013: Communication of Abstract Acceptance**
- **28 February 2014: Deadline for first draft of papers**
- **31 May 2014: Deadline for final version of papers**

(*) Abstracts receipt is already closed.

provide continued information on the upcoming technical activities. Some special workshops and training lectures are also being planned, which constitute additional opportunities for participation. If you have special ideas/wishes on such lectures or want to potentially offer a contribution, please contact the organizing team of the 10ICG.

The technical program will include a number of educational training lectures, where the most qualified experts on different aspects of geosynthetics and geosynthetic applications will deliver state-of-the-knowledge lectures. These training lectures are expected to be delivered to address the needs of both geosynthetic experts and novices. Key aspects of geosynthetics in transportation, mining applications, waste containment, hydraulic projects, energy-related systems, pavements, and disaster mitigation will be covered by the training lectures. The 10ICG will place special focus on the major contributions that the two official journals of the IGS, *Geotextiles & Geomembranes* and *Geosynthetics International*, have made throughout the years to the geosynthetics industry and to the engineering community at large.

Finally, 10ICG will offer unique social events, including those in a magnificent exhibit hall which, because of the particularly suitable layout of the conference venue, will be fully integrated with the multiple activities of the technical program. The main feature among the conference social activities will be the gala dinner at a "surprise location," which has been closely guarded by the conference organizers.

We look forward to your participation in the technical activities of the 10th International Conference on Geosynthetics in Berlin, September 2014.

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

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General Information for IGS Members

Summary of 2012 IGS Chapter Activities



Russell Jones

The use of the standard reporting form for chapter reports allows IGS to understand the activities being carried out at local, regional and international level. This summary report for the year 2012 again shows an impressive number of technical activities being undertaken around the world. Out of the 36 chapters asked to submit a report, 5 chapters did not submit a report by 16 June 2013.

Figure 1 summarises the total number of technical activities carried out in 2012 by IGS chapters. These include activities where the chapter acted either independently or as a collaborating organisation.

It can be seen from the figure that the IGS chapters were involved with:

- 25 technical conferences;
- 21 workshops;
- 26 short courses; and
- 12 main lectures

These technical activities were supported by 223 reported board/committee meetings (in-person and conference calls), which shows the effort being put in by the chapter officers and members.

An assessment of the most active IGS chapter has again been carried out and it should be noted that this is based on the number reported by the chapters. It is felt that this is a worthwhile exercise not only to identify chapters that are

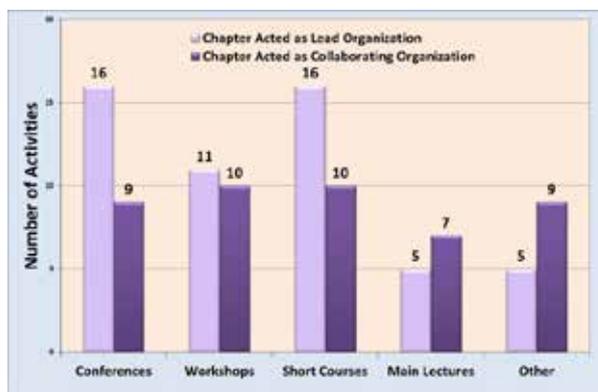


Figure 1: Number of activities carried out in 2012 reported by the chapters of IGS

worth recognition, but also to identify chapters that may benefit from more support and help in coordinating future activities.

Figure 2 shows a measure of the level of activities conducted by each of the IGS chapters in 2010. As detailed previously, the Activity Index was defined as a weighted average of the self-reported technical activities. The weighting methodology used allows, for example, that conferences are worth more than workshops, which in turn are worth more than main lectures. Also, activities conducted by chapters are worth more than those conducted by

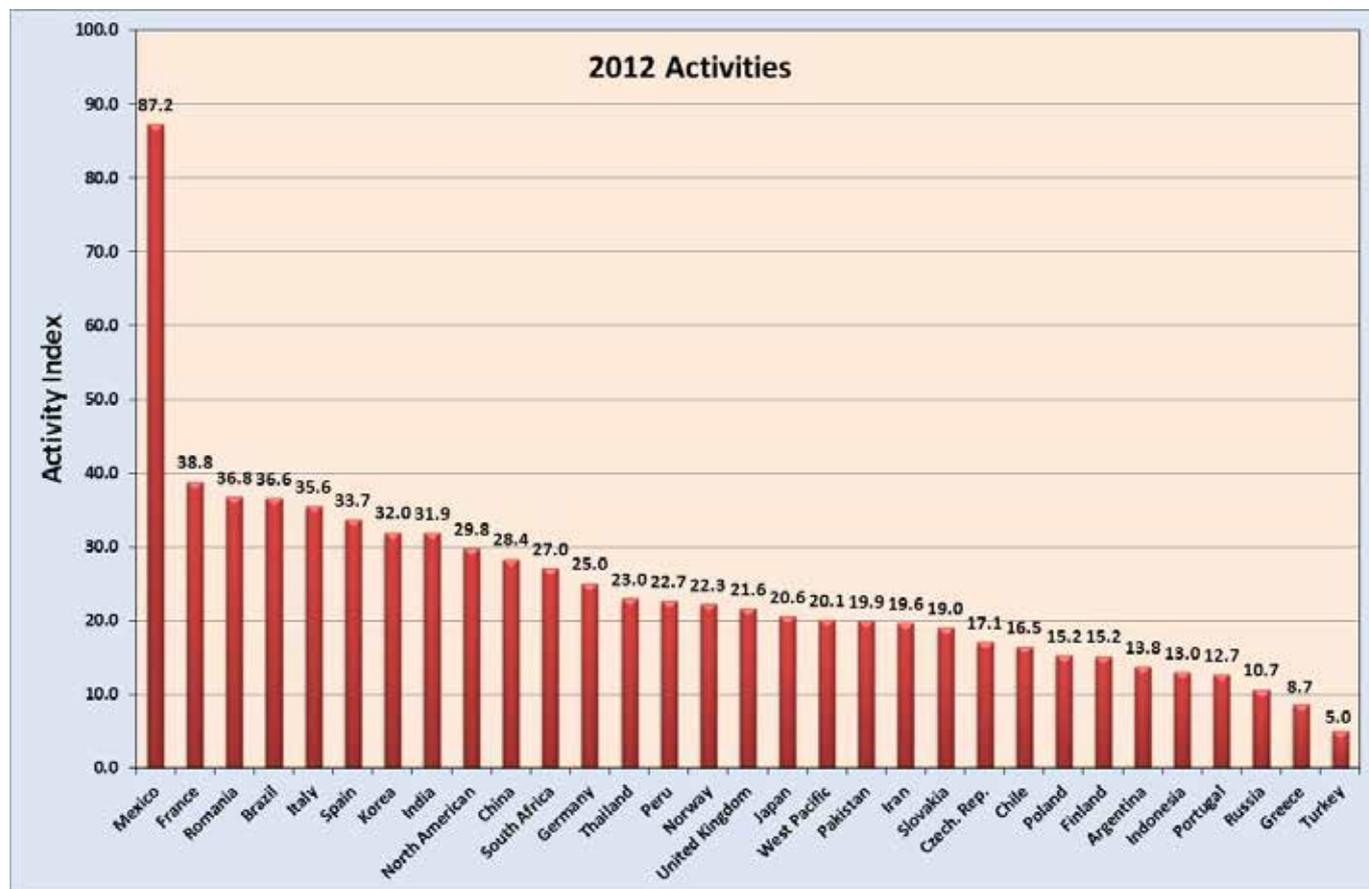


Figure 2: Activity Index for 2012 as reported by the chapters of IGS

chapters acting as a collaborating organisation. While the approach used to calculate the Activity Index is certainly subjective, the distribution within Figure 2 is expected to be insensitive to the weighting approach.

The chapters have also reported a healthy number of technical activities planned for 2013. Figure 3 summarises the number of conferences, workshops, short courses and main lectures planned. Based on this information, the level of activities is expected to continue to be significant, which is very encouraging.

In summary, the overall level of activity is very high as clearly illustrated by a total of 98 technical events reported by the chapters for 2012. This is slightly less than the record 102 technical events reported for 2011. With 120 technical events planned for 2013, it certainly looks like the activities show no sign of slowing down.

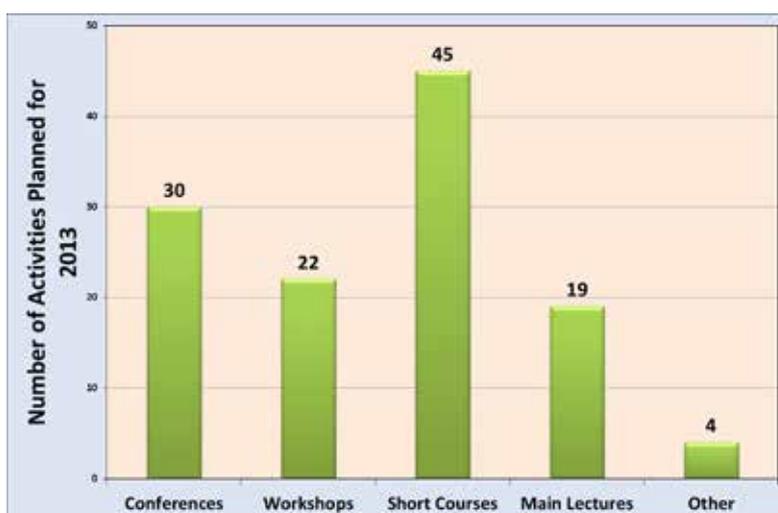


Figure 3: Number of activities planned for 2013 by the chapters of IGS

*Reported by
Russell Jones, IGS Vice President*

Conference Repository Service available online for IGS Members



**K.
Rajagopal**

The IGS is pleased to announce the launch of the Conference Repository Service to the members. The papers from different geosynthetic conferences are scanned and placed on the web site www.geosyntheticssociety.org.

IGS members may get access to different proceedings using the link "Proceedings Library" under the Member Tools on the main page of the web site. Some helpful instructions on how to use the resources are given on the main page itself.

The members of the TC-Soil Reinforcement have obtained the copyright permissions from the original publishers for launching the papers on our web site.

As the conference proceedings become available to IGS, they are being uploaded.

Currently, the following proceedings are available on the repository.

- Proc. of the 1st International Conference on the use of fabrics in Geotechnics (1977), Paris, France
- Proc. of the 2nd International Conference on Geosynthetics (1982), Las Vegas, USA
- Proc. of the 3rd International Conference on Geotextiles (1986), Vienna, Austria
- Proc. of the 7th International Conference on Geosynthetics (2002), Nice, France
- Proc. of the 9th International Conference on Geosynthetics (2010), Guarujá, Brazil
- Proc. of Earth Reinforcement Conference (1992) IS Kyushu, Japan
- Proc. of Earth Reinforcement Conference (1996) IS Kyushu, Japan
- Proc. of Earth Reinforcement Conference (2001) IS Kyushu, Japan
- Proc. of EuroGeo-I (1996), Maastricht, The Netherlands

The papers from many other conferences are being uploaded currently. They will become available to members as soon as they are uploaded.

The papers are uploaded under different volumes of the conferences. Title of each paper is the name used to list the papers on the site for ease of identification. Each paper is tagged with different keywords like author names, conference name, conference place, session name, publisher and the year. The papers are searchable under the different keywords. The key word search will enable finding all relevant papers in the entire conference repository.

All papers on the site may be protected by copyright regulations. Members and non-members of IGS must adhere to all copyright rules and regulations as they pertain to all the documents provided on the website.

Reported by

K. Rajagopal, IGS Council Member and Chair of IGS Conference Proceedings Task Force

Important Meeting of Presidents (WRA, IGS) Mexico City, 31 May 2013

A meeting took place on July 31 in Mexico City between the **presidents of the WRA (World Road Association), Ing. Oscar De Buen Richkarday, and of the IGS, Dr. Jorge Zornberg**. The meeting aimed at formalizing the collaboration between the two organizations and, in particular, to encourage global and local interaction among their technical committees.

Multiple opportunities of collaboration were explored during this important meeting, such as a possible close interaction between the Pavements Technical Committee of the WRA and the Reinforcement Technical Committee of the IGS, as the most appropriate to start an interaction. It was envisioned, for example, that a joint effort between such committees could establish the base for an enhanced functional performance of roadways while, at the same time, for an overall decrease on the environmental impact created by the construction of major roadway systems. Overall, a joint technical effort between WRA and IGS could capitalize on the multiple benefits that the use of geosynthetics can bring global road network.

The World Road Association is the international agency that establishes the coordination among national highway agencies such as the FHWA (Federal Highway Administration) in the US and the AMIVTAC (Asociación Mexicana de Ingeniería de Vías Terrestres AC) in Mexico. The direct cooperation between the national transportation agencies and the IGS Chapters was also envisioned. Indeed, such cooperation is expected to initiate soon between AMIVTAC and the Mexican Chapter of the IGS, or SIGMSC (Sociedad Internacional de Geosintéticos, Mexico SC).

The agreed activities that resulted from this meeting include the following:

- Both organizations will review their internal structure and operating units to identify the items to be included in a collaborative framework such as a memorandum of understanding.
- The communication established with this meeting will continue through direct communication between the presidents of the two international societies as well as through the officers of the national societies or chapters.
- In particular, the initial activities of this interaction will develop between the Pavements Technical Committee of AMIVTAC and the Reinforcement Technical Committee of the Mexican Chapter of the IGS, in order to develop a pilot effort at the national level that could subsequently evolve into an international collaboration.
- Dr. Hector Bonilla Cuevas of the WRA and Ing. Ignacio Narezo Larios of the IGS Mexican Chapter were appointed to initiate the effort at the national (Mexican) level.



Participants of the meeting between WRA and IGS. From left to right: Dr. Hector Bonilla Cuevas, Ing. Ignacio Narezo Larios, Ing. Oscar De Buen Richkarday (WRA President), Dr. Jorge G. Zornberg (IGS President), Ing. Guillermo Lopez Mellado and Ing. Guillermo Jesus Lopez (not in the picture).

The meeting was attended by Ing. Oscar De Buen Richkarday and Dr. Hector Bonilla Cuevas on behalf of the WRA and by IGS Dr. Jorge Zornberg, Ing. Ignacio Narezo Larios, Ing. Guillermo Lopez Mellado and Ing. Guillermo Jesus Lopez Noriega on behalf of the IGS.

*Reported by
Ignacio Narezo, IGS Mexican Chapter*

IGS Awards: Call for Nominations 2010 – 2013

Nominations due 31 January 2014

-- For Remembrance --



**Fumio
Tatsuoka**

IGS Awards will be granted in 2014 to individuals or groups of individuals who have made an outstanding contribution to the development and use of geotextiles, geomembranes, related products, or associated technologies through their scientific and technological achievements. For example, an award can be given for design and construction of a structure; publication of a technical document (paper, book, article, manual); completion of a research program; development of new products and techniques.

The Awards recognize the achievements completed and/or the validity of which have been demonstrated during the four-year period preceding the year of the Award (i.e., 2010 through 2013 inclusive).

The winning entries will be publicized in IGS News, in a special press release on the IGS web site and in other IGS publications.

Timeline and Deadlines

Nominations must be received by the IGS Secretary (see address on page 38 of this IGS News) no later than **31 January 2014**.

The deadline for receipt of award candidate presentation packages is **31 March 2014**.

Presentation packages will be forwarded by the Secretariat to the Award Committee by **15 April 2014** for the Committee to review and to finalize their decisions, draft citations and report.

Awards will be presented at 10ICG, in Berlin, Germany, on 21 to 25 September 2014.

There are Two IGS Awards

- **The Young IGS Member Achievement Award**
This Award is for IGS Members who are less than 36 years of age on **31 December 2013**.
- **The IGS Award**

The awards will consist of a specially commissioned medal and a diploma.

If a group submission is made for the Young IGS Member Achievement Award, all members of the group should satisfy the age requirement for this. If this requirement is not satisfied, the entire group will be not eligible for the Young IGS Member Achievement Award. If a candidate, individual or group, satisfies the age requirement for the Young IGS Member Achievement Award, the entry submitted by this candidate will be considered for both awards (unless requested otherwise by the candidate). However, a candidate may only receive one award.

Additional Information

For further information please refer to IGS News Issue 1, 2013.

The full text of the IGS Awards rules can be obtained from the IGS Secretary, Elizabeth Peggs, and the IGS webpage section "[Handbook, Part 4 Benefits and Awards](#)" in the "Membership only" section.

Reported by

Fumio Tatsuoka, Chair of IGS Awards Committee

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.

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.

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 Renewable 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

Exhibition

The 5000 m² technical exhibition space is directly connected to the conference rooms, being located half-way between the hotel and lecture rooms and accessed without having to leave the centre. The exhibition space will be used both by 10ICG and the Baugrundtagung event. The **reservation period for the exhibition** is open through the webpage since **July 2013**.

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)

Dr. Kirsten Laackmann (service@dggt.de)

Announcements of Regional Conferences of IGS

2nd African Regional Conference on Geosynthetics GeoAfrica 2013

Accra, Ghana, 18 - 20 November 2013



The 2nd African Regional Geosynthetic Congress, GEOAFRICA 2013, will take place in Accra, the Capital City of Ghana, from 18 to 20 November 2013. Ghana offers a warm and friendly people and a high degree of personal safety for this IGS - African Regional Conference.

As a new oil exporting country, infrastructural development is key on the agenda. In Ghana, and Africa in general, it is certain that geosynthetic use will rise in the coming years. It is therefore critical that we provide a technical venue to support geosynthetic education, communication and networking. As such, we invite geosynthetic manufacturers and practitioners to make an early foothold in the country.

Due to the existence of major projects in Mining, Transportation and Environmental sectors Africa presents numerous, exciting opportunities for the application of geosynthetic solutions.

Ghana in particular is busy with major oil and gas, as well as mining and infrastructure developments. GeoAfrica2013 will bring together academics, designers, manufacturers and installers from the global geosynthetics industry presenting an opportunity for exchange of views and update on geosynthetic technological developments; as well it will provide an excellent forum for business networking. Global and Africa-specific perspectives and experiences will be featured in the technical programme.

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Important Dates

- Final submission of papers by **15 September 2013**

For more Information

Lesley Ferreira, GeoAfrica 2013 - Secretariat

2nd African Regional Conference on Geosynthetics

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lesley@cebisaconferences.co.za

www.cebisaconferences.co.za

Announcements of Conferences under the Auspices of IGS

International Symposium on Design and Practice of Geosynthetic-Reinforced Soil Structures and Joint Sessions with 26th Italian National Conference on Geosynthetics Bologna, Italy, 14 - 16 October 2013

This symposium is held to honor the research achievement of Prof. Dov Leshchinsky. He is a world-renowned researcher and educator on reinforced soils and has been a professor of geotechnical engineering at the University of Delaware for more than 30 years.

The symposium will be held under the auspices of:

- The International Geosynthetics Society
- The Italian Geotechnical Association
- TC 101 & TC 305 of the International Society of Soil Mechanics and Geotechnical Engineering
- American Society of Civil Engineers (ASCE) Geo-Institute
- Department of Civil, Environmental and Materials Engineering (DICAM)
- University of Bologna
- Japanese research institutes (Public Works Research Institute, Railway Technical Research Institute and National Institute for Rural Engineering).

Symposium topics

A total of 68 papers have been accepted for publication and presentation in the symposium. The papers cover a wide range of topics, and a full list is available online (see link at the bottom of this article).

- Geosynthetic-reinforced soil retaining walls
- Geosynthetic-reinforced soil slopes
- Construction of reinforced embankments over soft soil
- Geotextile tubes
- Geosynthetic-reinforced soil structures for railways and highways
- Properties of backfill soils, geosynthetics, and soil-geosynthetic interaction

Special and keynote lectures

- Leshchinsky, D. (USA): Design approaches to geosynthetic-reinforced walls and slopes
- Cazzuffi, D. (Italy): Geosynthetics engineering
- DiMaggio, J.D. (USA): Geosynthetic-reinforced soil walls and slopes: Best practices in design and construction and reality: Why they differ
- Koseki, J. (Japan) & Shibuya, S. (Japan): Mitigation of disasters by earthquakes and rains/floods by means of geosynthetic-reinforced soil retaining walls
- Nicola Moraci (Italy): Soil-geosynthetic interaction: Design parameters from experimental and theoretical analysis
- Tatsuoka, F. (Japan): Laboratory stress-strain tests for developments in geotechnical engineering research and practice (Bishop Lecture revised for Geosynthetics Engineering)

Registration

The symposium is now open for registration. There is a cap of about 100 participants.

Organizing Committee

- Fumio Tatsuoka, Tokyo University of Science, Japan
- Guido Gottardi, University of Bologna, Italy
- Hoe I. Ling, Columbia University, USA
- Jie Han, University of Kansas, USA
- Daniele Cazzuffi, CESI SpA, Italy

Symposium Website <http://www.columbia.edu/cu/civileng/bologna2013/>

Report of the Biennial FS-KGeo 2013

Munich, 7 March 2013

On 7th March 2013, like every two years, the national Geosynthetics Conference FS-KGeo 2013 took place in Munich, organized by the DGGT (German Geosynthetics Society), the German IGS Chapter and the Zentrum Geotechnik of the Technical University Munich. It was the 13th FS-KGEO being a one day information and lecture presentation about geosynthetics in geotechnics with associated exhibition.

There is still a great field of application for the products in hydraulic engineering, preliminary in the range of erosion control and scouring protection they find increasing appliance. An important article for this purpose was provided by an extra presentation of the Mercer-Lecture by Dr. Heibaum: „Geokunststoffe im Wasserbau und Hochwasserschutz –Interaktion Wasser – Boden“ held in German.

A further important issue was the sealing function concerning the application and the durability of geomembranes as well as their extended use in tailings for uranium ore mining.

In the presentation of the E.A.G.M.-study (European Association of Geotextile Manufacturers) was shown, that geosynthetics provide advantages compared to the conventional construction technique due to energy saving, polluting emissions and resource protection. These should be used to make the positive effects of the use of geosynthetics accessible to the responsible persons and the deciders of construction projects.

The active participation and lively discussions of the more than 150 attendees have contributed essential to the success of this event.

The proceedings will be available for ordering in September 2013 through the webpage of the FS-KGEO: www.gb.bv.tum.de/FSKgeo or the DGGT: www.dggt.de

Playing with Reinforced Soil Workshop IGS-Netherlands 19 March 2013

On 19 March 2013 the Dutch chapter of the IGS (NGO) organized a workshop on the topic geosynthetic reinforced retaining walls. The theme of this workshop was “Playing with Reinforced Soil”. As the theme suggests this was a workshop with plenty of room for creativeness and out of the box thinking.

Creative with sand

Seven teams were challenged to construct a small scale reinforced wall. Each team consisted of at least a client, a designer, a contractor and a supplier. However, one team accidentally consisted of three geotechnical advisors only.

Each team received two bags of sand, each of a different quality, some toilet paper kitchen paper and a pile of A3 paper sheets. Each team had to construct a 0.3 m high wall in a wooden mould. Three types of moulds were available, with an inclination (batter) varying from 0 to 10 degrees from the vertical. After construction, the front panel of the mould was removed and the scale model was tested for stability by three volunteers.

The teams were really creative. The construction materials we supplied were identical for each team, but the work resulted in seven unique constructions. Every single detail was different: the construction time, the height of the sand layers between the reinforcement layers, the length of the reinforcement and back folding (wrapping around) of the reinforcement at the front or not. One team even constructed an overhanging construction by turning their mould upside down after filling! Others had been inspired by the Japanese construction method, and crammed the bags of sand into the mould. Another model was constructed as lasagne: thin layers of sand and reinforcement without back folding. In the resulting model, the reinforcement was invisible: vandal proof and relatively cheap.

The winning team with the three geotechnical advisors first strolled around the work shop area to look for better construction material. They found some chicken wire-netting and some straw. The team constructed a well thought through design, with chicken wire-netting, paper, and the better quality construction sand at the front.



Photo 1 Test loading of the winning scale model

They added the straw to give the model a green appearance. Photo 1 shows how this model was tested playfully. This team, consisting of Marijn Brugman of Arthe Civil & Structure, Rens Servais of Strukton and Dirk Goeman of Crux Engineering, was awarded with the IGS-Dutch-Chapter-Challenge-Cup!

Creative with reinforcement

The day had started with two introductions. Wim Voskamp had told about the history and recent applications of soil reinforcement. Theo Huybrechts had explained design principles of reinforced retaining walls and slopes. Then, Piet van Duijnen challenged the participants to answer three questions:

How can we improve existing constructions?

Which new applications of reinforced soil are possible?

Which problem needs a solution with reinforced soil?

Most ideas that were generated in groups had been discussed earlier in tender practice. Some of them had been rejected because the technique had not been proved yet. Others have been realized. Others seem promising but need more development. We summarize some of the ideas.

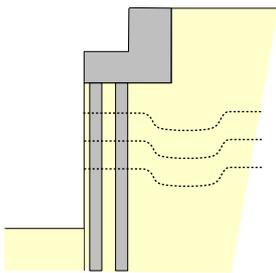


Figure 1 Improving the anchorage of the reinforcement with a pit

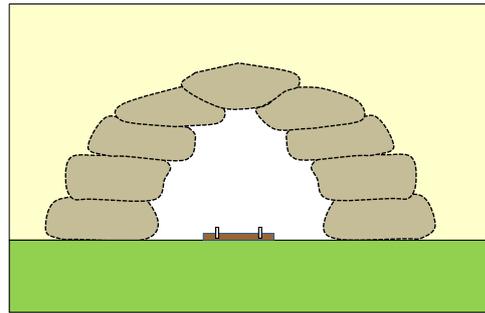


Figure 2 Ecoduct of geotubes

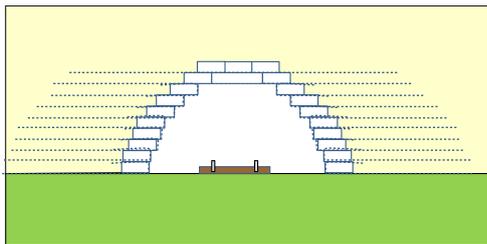


Figure 3 EPS and geosynthetic reinforcement in a viaduct

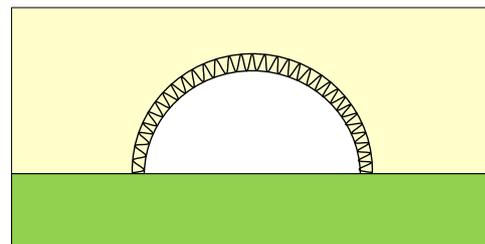


Figure 4 Variation on the walls-roof method

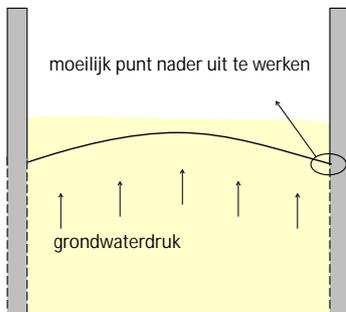


Figure 5 Excavation: Alternative for under water concrete

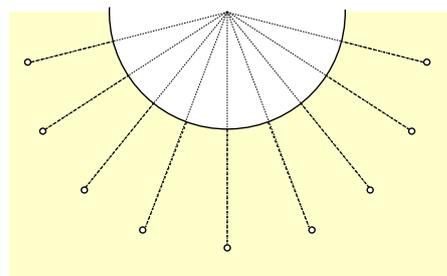


Figure 6 Excavation: water tight geotextile reinforcement + sealing

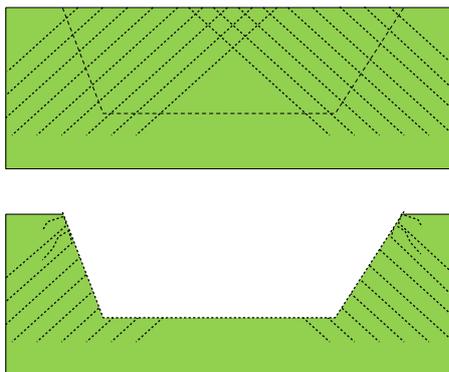


Figure 7 Excavation in reinforced and drained soil

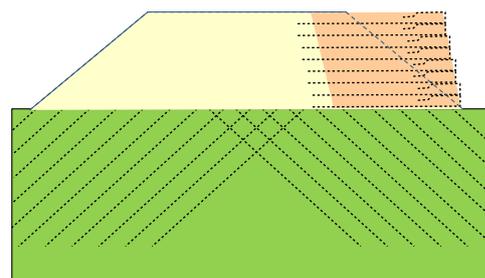


Figure 8 Diagonal drains: reinforcement sub grade and acceleration of drainage

Anchoring

The reinforcement in a retaining wall can easily be pre-stressed by installing the reinforcement across a pit, and then forcing it into the pit, see Figure 1. Practical applications did not yet lead to a spectacular improvement, although finite element calculations show a large improvement.

Shape stability of the facing of a retaining wall

The shape of fill material in a wrapped retaining wall has to remain as stable as possible. We do not want the 'burrito effect'. It is common practice to apply a fill material with sufficient fine grains for this purpose. It was proposed to apply granular material 0/20 instead of the more common 0/31.5 mm. In practice, this has been tried, as well as 2/20 mm.

Tunnels

Several solutions for tunnels were presented. Figure 2 shows a geotubes-ecoduct. Figure 3 shows a combination of EPS and geosynthetic reinforcement. The EPS has a stable shape, and can bear tensile- as well as compaction forces. Finally, an idea was presented to apply cell reinforcement in a variation on the wall-roof method, see Figure 4. One of the challenges of the last two solutions is the fire resistance.

Excavations

Figure 5 and Figure 6 give geosynthetic solutions for excavations. The traditional under-water concrete was replaced by geosynthetics. The installation and connections of a geosynthetic to a sheet pile wall needs some further development. It will be necessary to cover the membrane with a sufficiently thick fill.

The excavation wall can be constructed as a soldier pile wall by combining vertical precast piles and a vertical membrane. Photo 2 shows an example of the membrane wall that is currently under construction in Leeuwarden, Netherlands.

Drainage – geogrid strips as reinforcement

Figure 7 and Figure 8 show diagonal drainage that acts as reinforcement. The drainage is installed perpendicular on the expected shear planes (Bishop) and therefore reinforces the construction. The folding of the reinforcement during compaction needs attention. When excavating, the excavated strips can be installed again to give an extra nailing.

Wave overtopping

Geosynthetics can improve the erosion resistance of the inner slope of levees considerably. The result is that wave overtopping is less harmful. When the inner slope is protected properly, it should be possible to reduce the levee height.

Geosynthetics in levees

In several countries, such as the United States, geosynthetics are applied to improve the stability of the slopes of levees or even dams. In the Netherlands, however, this rarely occurs. Engineers tend to believe that this is due to conservatism of the clients. But it is important to realise that the risk (risk · result) of a levee is much higher than of an average retaining wall. Therefore, an investigation on the application of geosynthetics in levees could save millions. A welcome contribution in surviving the crisis!

Thanks to:

Han de Jong of Mobilis for supplying the nine moulds, the materials and the IGS-Dutch-Chapter-Challenge-Cup! Also thanks to the unknown person who left the chicken wire and straw lying around in the workshop area.

Reported by:

Suzanne J.M. van Eekelen (Deltares, Technical University Delft), Piet G. van Duijnen (Huesker, formerly Mobilis), Wim Voskamp (Voskamp Business Consultancy), Theo Huybregts (Geologics)



Photo 2 Installation of a membrane wall in Leeuwarden, Netherlands.

Source: Combination Grutte Fier (Mobilis, De Vries, Van Gelder and Oosterhof Holman).

Report of the North American Geosynthetics Society (NAGS) - Biennial Meeting

Long Beach, California, 2 April 2013

The meeting was called to order at 6:30 pm by outgoing President Dean Sandri. There were 20 in attendance.

A brief overview of NAGS was given. NAGS is a chapter of the International Geosynthetics Society made up of individual members whose mission is: "To provide leadership in advancing the education, and research of geosynthetics." The management structure of NAGS includes an elected Board of Directors and a paid Executive Director.

The 2011-2013 Board of Directors includes:

- President: Dean Sandri – Anchor Wall
- President-elect: Robert Mackey – S2Li
- Treasurer: Corey Bobba - FHWA
- Immediate Past President: David Elton – Auburn University
- Vice Presidents:
 - Marolo Alfaro – University of Manitoba
 - Richard Brachman – Queens University
 - John Henderson - TenCate
 - Jay McKelvey – Earth Engineering, Inc.
 - Dhani Narejo – GSE
- Executive Director – Dave Suits

Outgoing President Sandri reviewed his two years as President. Geo-Frontiers 2011 was a very successful event for NAGS. This was due to the efforts of the past Board of Directors. Over the past two years significant accomplishments in the following areas have been made:

- Bi-monthly Board meetings
- Resurrection of regional short courses in conjunction with the Geosynthetics Materials Association
- The establishment of NAGS as a registered provider of professional development hours
- Initiated the thought process of an appropriate name change
- Bid on and was granted the hosting of the Geo-Americas 2016 Conference.

Following these remarks Dean introduced incoming President Robert Mackey, and turned the President's gavel over. Dean wished Bob well and offered to listen, guide, and support his efforts. Bob assumes this role following this biennial meeting.

The 2013-2015 Board of Directors was introduced:

- President: Robert Mackey – S2Li
- President–elect: John Henderson – TenCate
- Treasurer: Corey Bobba
- Immediate Past President: Dean Sandri – Anchor Wall
- Vice Presidents:
 - Michael Bernardi – TenCate – Newly elected member
 - Richard Brachman – Queens University
 - Jay McKelvey – Earth Engineering, Inc.
 - Dhani Narejo – GSE
- Executive Director – Dave Suits
- Co-opt Members to be determined by the Board. Up to 2 co-opted members may be added.

Following the introduction of the new Board, incoming President Mackey reviewed his goals for the next two years. Bob opened his remarks with the question, "Who or what is NAGS?" He shared these thoughts regarding the question:

1) NAGS is a Society of dedicated and active members who help carrying out the basic mission of the Society of promoting education in the area of geosynthetics. They also belong to a number of other professional organizations that provide the opportunity for interaction with those who may not be familiar with these materials

2) There are a number of other geosynthetics related organizations in North America that NAGS interacts with routinely. These include: The Industrial Fabrics Association International and its Geosynthetics Materials Association division; The Geosynthetics Institute; The Geo-Institute of the American Society of Civil Engineers; The International Association of Geosynthetic Installers; The Fabricated Geomembrane Institute; and The Canadian Geotechnical Society and its geosynthetics committee.

Bob stated the following as his basic goals for the coming two years:

- Strengthen the bridges with above organizations, and build new ones with others
- Expand our definition of education

- Improve communications using our new web site and Facebook page
- Bring the By-Laws up to date
- In one to two years develop a long range strategic plan.

Following these remarks Bob recognized the outgoing officers of the Society:

- Dean Sandri as outgoing President
- Marolo Alfaro as an outgoing Vice President
- David Elton as outgoing Past President.

The meeting was adjourned at 8:00 pm.

Reported by

L. David Suits, Executive Director

Rencontres Géosynthétiques 2013 9th French Speaking Conference on Geotextiles, Geomembranes and Related Products Dijon, 9 to 11 April 2013

Organised by the French Chapter of IGS every two years since 1993, The Rencontres Géosynthétiques are the reference French speaking event for geotextiles, geomembranes and related products. They cover the whole range of applications of these materials in civil engineering and environmental protection. From the 9 to 11 April in Dijon this conference welcomes experts, engineers and technicians coming from all over Europe but also Northern Africa and Canada.

The ninth edition of the Rencontres Géosynthétiques was an occasion to make a state of the art on recommendations of use and installation and standards, through the presentation of practical cases of use. In a dedicated session emphasis was placed on the durability of geomembranes, with various feedbacks from the field on EPDM and bituminous geomembranes.

The Rencontres Géosynthétiques are a unique opportunity for practitioners to meet and exchange. On the first day, as usual, some short courses were given to those attendees less familiar with geosynthetics on what geosynthetics are, their basic properties and main uses in civil engineering and environmental protection.

On the second day the first keynote lecture dealt with the use of biodegradable geosynthetics for erosion control, and the second one with the specificities of French landfills for low level radioactive waste. Then various papers were presented on hydraulic works, transportation and landfills. Also posters were presented in the late afternoon, when some time was dedicated in parallel to visit the exhibition with 30 exhibitors.



Exhibition area at Rencontres Géosynthétiques 2013



Before gala dinner in Clos Vougeot

The gala dinner took place as usual in a marvellous wine-producing area, the Clos Vougeot, where the attendees could enjoy not only local music and songs but also 8 different very famous local wines and fantastic food.

On the third day, the Keynote lecture dealt with life cycle analysis of geosynthetics solutions, compared to more traditional solutions.

The use of geosynthetics for environmental protection was then discussed through a series of papers. The biggest session of all was dedicated to durability with numerous feedbacks from the field. Finally, we dealt with the topic of foundations.

The 9th Rencontres Géosynthétiques was, once again, a very successful event with about 400 attendees. The proceedings will soon be, as the previous ones, available for free download on the CFG website : www.cfg.asso.fr

*Reported by
Nathalie Touze-Foltz, French IGS-Chapter Correspondent*

News from GIGSA, the IGS South African Chapter



The Geosynthetic Interest Group of South Africa (GIGSA) held elections in October 2012, with the new committee taking office on the 6 November, at GIGSA's Annual General Meeting. The previous committee's term of office was productive, with a number of educational events having taken place, significant progress on national specifications for geosynthetics, doubling of GIGSA benefactor membership, revising and re-launching www.gigsa.org, and other achievements. Several stalwarts of the GIGSA committee have retired; Peter Davies, Garth James and

Mike Wittman were thanked for their dedicated service to the group over many years.

The current GIGSA committee members are Riva Nortjé (President), Edoardo Zannoni (Vice President & Specifications), Anton Bain (Past President), Irene Nyirenda (Secretary), Paul Pratt (Treasurer), Peter Legg (IGS representative), Joanne Smit (Newsletter & Website), Martin Schäffner (Events), Gareth Harper (Education), Morné Breytenbach (Membership and Marketing: Individuals), Colin de Bruyn (Membership and Marketing: Benefactors), Darryn Meisel (Landfill 2013 Treasurer), Melchior Briers (Western Cape Representative) and Rod Claus (KwaZulu Natal Representative).

Also in November 2012, GIGSA hosted a series of short courses by Professor R. Jonathan Fannin of the University of British Columbia, Canada on geosynthetic reinforced soil & geotextile filtration of soil in Pretoria, Durban and Cape Town. His thoughtful, balanced approach to geosynthetics use, polished presentation skills and wry sense of humour were all on display. Prof Fannin was also the guest speaker at GIGSA's AGM on Tuesday 6 November 2012, and gave a very interesting lecture on 'Critical filters in dams and dam applications: granular and geosynthetic'.

GIGSA has kicked off a new evening lecture series, with an excellent lecture on 'Drainage Geocomposites in Landfill Containment' given by Mr Alan Bamforth of ABG Geosynthetics on the 10 April 2013. Mr Bamforth's design expertise, extensive experience, practical know-how and recommendations for addressing stability made this a really worthwhile event. Further lectures are planned for 2013.

GIGSA and the Institute of Waste Management of Southern Africa (IWMSA) are co-hosting the conference "Landfill 2013" to be held on 16 - 17 October 2013. The venue is Misty Hills in Muldersdrift, which borders on the Cradle of Humankind, to the west of Johannesburg. Dr George Koerner of the Geosynthetics Institute (GSI) will give the keynote address at the conference on "Geosynthetics in Containment: Past, Present and Future". The theme of the conference is "Effective environmental protection from the residues of modern civilization", and includes general waste, hazardous waste, industrial waste, coal ash and mining residues. A number of interesting papers will be presented in line with the theme, focusing on barrier design, case studies, policy and planning, and leachate, effluent and gas management. A one day course on "Geosynthetic Barriers" by Dr George Koerner of the Geosynthetics Institute will be held at the same venue on the 18 October 2013. For more information, please see <http://www.iwmsa.co.za/site-content/landfill-2013-2.html>.

Edoardo Zannoni, Peter Legg and Irene Nyirenda, GIGSA committee members currently serving the IGS, as well as Garth James are assisting with GeoAfrica 2013. This, the Second Regional African IGS Conference, is to be held in Accra, Ghana from 18 to 20 November 2013. GIGSA is pleased that a number of South African papers have been submitted, and looks forward to being a part of this regional event.

*Reported by
Riva Nortjé, President of South African IGS-Chapter*

38th Meeting of CEN/TC 189 "Geosynthetics" London, 14 - 16 May 2013

The European technical standardization committee on Geosynthetics (CEN/TC 189) organised its annual meeting this year in London, at the BSI headquarters, on kind invitation of the British geosynthetics industry.

The plenary session was chaired by Dr Daniele Cazzuffi (IT), in his second year as chairman. The plenary meeting on 16 May was attended by 47 delegates from 14 CEN countries and several observers from other CEN and ISO committees and branch organisations, while the various WG's meetings in the previous days were attended by

around one hundred experts.

The plenary session was in fact preceded by meetings of all the working groups, including the project group on surface erosion and – for the first time in several years – the working group on terminology (WG 2).

Although the two sets of product standards for geotextiles and geosynthetic barriers had been revised recently, there was a consensus that these revisions were not final and further improvements should be made to the standards and to the test method standards, which support them.

Highlights from the meetings of the working groups were:

- WG 1, product requirements for geotextiles (convenor Ph. Delmas, FR), completed its package of 10 application-related standards, which are now – after some rework – ready for the formal vote. These standards are already adapted to the new European legislation (CPR), but further improvements are planned.
- The project group "surface erosion control" (convenor H. Zanzinger, DE) is working on a list of relevant requirements for these products. All the requirements will have to be linked to suitable test methods.
- WG 2, terminology and identification parameters, met for the first time under its new convenor, Dr. Erol Güler, from Turkey. Although most of the work of this WG is done under the ISO umbrella, a few standards will remain under control of CEN. The WG decided to revise a test standard for geosynthetic clay liners.
- WG 3, mechanical testing, met also for the first time under its new convenor, Mr James Hollands Wilkins from UK. The WG had an ISO meeting in the morning and a CEN meeting in the afternoon to deal with specific European standards. The revision of several standards was started or continued.
- WG 4, hydraulic testing (convenor N. Touze-Foltz, FR) also had a double CEN-ISO meeting. The standard on permeability of clay liners was finalized and revision work on several other standards was decided.
- WG 5, durability testing (convenor J. Retzlaff, DE), continued its work in support of WG 1 and WG 6 with regard to long-term durability up to 100 years. The current state of this work has been implemented in the WG 1 and WG 6 standards, but a revision will start very soon.
- WG 6, product requirements for geosynthetic barriers (convenor K. von Maubeuge, DE) completed the revision of a package of six standards for a variety of applications. These standards were approved and will be published soon. Nevertheless it was already decided to start their revision, in order to align them with the new European legislation.

The next meeting will be held in Geneva on 8 - 10 April 2014, in conjunction with Index '14, and will be hosted by SNV and EDANA.

CEN/TC 189 kept up its good tradition to organise a delegates' dinner on the evening before the plenary session. This time the British geosynthetics industry invited all experts to a river boat cruise with barbecue. It became a very enjoyable evening, appreciated by all attendees.



London CEN/TC 189 meeting - participants

*Reported by
Fred Foubert, Secretary of CEN/TC 189 and IGS member*

Educate the Educators on Geosynthetics in Argentina

27 – 28 May 2013



The first course of the Educating the Educator (on Geosynthetics) took place in the Villa Carlos Paz City in Córdoba, Argentina, from Monday May 27th to Tuesday May 28th. The event was organized by the Argentinian chapter of the IGS under the auspice of the International Geosynthetic Society and in cooperation with the Argentinian Society of Geotechnical Engineering. The event brought together over 40 professors from 18 different Argentinian universities representing 19 different cities of the country.

The event was sponsored by four companies (CORIPA SA, GSE Environmental, Mexichem Bidim and Maccaferri) and thanks to their economic support and the support given by IGS the course represented no cost for each one of the attendees.



Prof Emilio Redolfi welcoming the participants

The attendees were chosen from a previous list of 70 professors interested in the course. The selection criteria was based in the age of the professors, the experience, the maximum academic degree reached and the geographic diversity, in that way, middle age professors with a MSc or a PhD degree were preferred, and in order to guarantee the geographical spread of the course, at least one professor from every university represented among the interested was selected. In that way, among the attendees, there were 15 full professors, 16 associate professors and 6 assistant professors, the average age of the attendees was 47 years and they have an average time expertise in teaching of around 15 years.

The main goal of the program was to show to the attendees the minimum academic topics on geosynthetics engineering that it was considered

that could be incorporated in undergrad classes of either soil mechanics or applied geotechnical engineering classes in order to guarantee that every civil engineering student from every civil engineering program of Argentina have at least one hour of classes about geosynthetics topics.

The course was composed of several lectures given by three experts in geosynthetics engineering: Prof. Jorge Zornberg, Prof. Ennio Palmeira and Eng. Victor Pimentel. The lectures covered different topics related to different applications of geosynthetics in geotechnical, transportation, hydraulic and environmental problems. The discussion was around how to implement the different topics in the current civil engineering curricula of the different universities and how deep it is convenient to introduce each topic. Every attendant was provided with a power point presentation of an example class and a wide catalog of geosynthetic samples provided by the sponsors to use as a sample material in their future classes.



Victor Pimentel and Jorge Zornberg introducing IGS and the aims of this innovative program

At the end of the event, the Argentinian chapter of IGS took the compromise to conduct two different surveys. One in the next few months to collect the opinions of the attendees about the organization of the course, they suggestion for the organization of futures courses and their perspectives on how are they going to implement this topics in their classes and how they will spread their experience with their colleagues of the same university. The other survey will be conducted in about one year to have feedback from the professors after having the experience in teaching these topics in their classes.



Group picture, instructors and attendees of the Education the Educators on Geosynthetics course in Carlos Paz – Argentina

*Reported by
Marcos Montoro, Argentinian Chapter of IGS*

International Symposium on COUPLED PHENOMENA IN ENVIRONMENTAL GEOTECHNICS

Torino, 1 - 3 July 2013

The International Symposium on “Coupled Phenomena in Environmental Geotechnics (CPEG): from theoretical to experimental research to practical applications” was held in Torino (Italy) from the 1st to the 3rd of July 2013. The Symposium, organized by the Italian Geotechnical Society (AGI: Associazione Geotecnica Italiana), under the auspices of IGS and ISSMGE, was part of the activities of Technical Committee TC 215 of the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) “Environmental Geotechnics” for the term 2009 - 2013 and was hosted by Politecnico di Torino.



Opening session of CPEG 2013 in the auditorium of Politecnico di Torino



IGS Past President Daniele Cazzuffi at CPEG in Torino 2013

from left to right: Mario Manassero (Chairman of TC 215 of ISSMGE), Laura Montanaro (Pro-Rector of Politecnico Torino), Roger Frank (ISSMGE Board), Stefano Aversa (AGI President), Daniele Cazzuffi (AGI-IGS President and IGS Past President), Claudio Scavia (Director of DISEG Politecnico Torino)

Environmental Geotechnics deals with a wide variety of applications, such as the characterization of polluted sites and landfill waste, the design of containment systems including Geosynthetics for subsoil pollutant control, radioactive waste disposals, geo-energy exploitation and bacteria-driven soil modification, among others. In order to obtain reliable and effective predictions of the actual behavior and performance of these very complex systems, theoretical and experimental research and advanced design procedures need to be taken into account, coupled with hy

dro-bio-chemo-mechanical phenomena occurring at very different scales.

Further progresses in the scientific state of the art and substantial advancements in the standard practice are then closely related to the development of a shared knowledge among different disciplines. The extension and refinement of theoretical modeling and experimentation capabilities stimulated by geo-environmental applications provide more in general the framework for substantial advancements in the fields of soil & rock mechanics and of geosynthetics engineering.

The conference was conceived as an opportunity for discussion and sharing of knowledge, skills and front edge research activities in the field. By including contributions coming not only from the geotechnical community, but also from related and complementary disciplines, the conference gathered new experimental evidence, contributions to theoretical developments and innovative applications. Kerry Rowe, Antonio Gens and Majid Hassanizadeh presented outstanding keynote lectures. The conference was then organized in 9 sessions devoted to specific topics of Geotechnical Engineering. Four sessions of the symposium dealt with landfills: waste characterization, stability problems, lining and capping systems. Three sessions were devoted to polluted sites and their interaction with aquifers both in terms of characterization and remediation strategies. The remaining two sessions focused on the emerging topics of energy issues and bio-chemical processes. Each session included a general report, a specific lecture and a session report, as well as a lively floor discussion on the contributed papers animated by a discussion leader.

The proceedings, published by CRC Press, collect 21 invited papers and 61 contributed papers, covering a wide range of fundamental and applied research on the topics of geo-environmental engineering.

All the participants should be thanked for their invaluable contribution and for their enthusiasm, which was undoubtedly the key element for the success of the event.

Reported by

Mario Manassero & Andrea Dominijanni, IGS members, and by Sebastiano Foti & Guido Musso, local organizing committee



IGS Past President Kerry Rowe presenting his keynote lecture

18th International Conference on Soil Mechanics and Engineering Paris 2 to 6 September 2013



The French chapter of IGS offers a half-day dedicated to geosynthetics on September 5, at 09:00 AM at the Paris International Conference Centre (Palais des Congrès)

The Comité Français des Géosynthétiques (CFG), French chapter of the International Society (IGS) offers a half day dedicated to geosynthetics, in collaboration with the IGS during the 18th International Conference on Soil Mechanics and Geotechnical Engineering (ISSMGE).

The main theme of the Conference, organised by the French Society for Soil Mechanics and Geotechnical Engineering (CFMS) is "**Challenges and Innovations in Geotechnics**".

Plan this event on your agenda on September 5, 2013 from 9:00 AM to 12:30 PM!

As part of his missions to inform and make aware professionals of geosynthetics the CFG invited a panel of international experts which lectures will be presented in English during two consecutive sessions.

Session1 Chair : Jean-Pierre Magnan, Ifsttar, president of CFG

9h00 AM : Introduction by Jean-Pierre Magnan, Président of the Comité Français des Géosynthétiques (CFG), who will give an insight in the missions and actions of the CFG.

9h30:: Ingenuity in Geotechnical Design using Geosynthetics, presented by Jorge Zornberg , Professor, University of Texas at Austin, Texas, USA, President of the International geosynthetics Society (IGS).

Session 2 Chair : N. Touze-Foltz, Irstea, member of the councils of CFG and IGS

- 11h: The sustainability case for using geosynthetics: case studies, by Neil Dixon, Professor, Loughborough University, UK
- 11h30: Recent insight regarding the performance of GCLs in bottom liners and covers, by Kerry Rowe, Professor, Queen's University, Canada
- 12h : Encapsulation of contaminated soils in damn construction for roads, by Kent Von Maubeuge, Naue Fasertechnik, Chair of the technical committee on barriers of the IGS

More information

For more information visit www.paris2013-icsmge.org

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RemTech 2013 Remediation Technologies and Requalification of the Territory Exhibition (7th Edition) Ferrara, 18-20 September 2013



The seventh edition of RemTech Expo 2013 (www.remtechexpo.com), the most specialized event on remediation of contaminated sites and requalification of the territory, looks rich in appointments of very high technical and scientific profile, with remarkable references to very topical and urgent themes.

As always, also this year the event received the auspices of AGI-IGS, the Italian Chapter of IGS.

Moreover, both the Scientific and Advisory Committees of RemTech 2013 are under the coordination of Daniele Cazzuffi, AGI-IGS President and IGS Past President.

Among the key-words of the event, which will take place from September 18 to 20, in the pavilions of Ferrara Exhibition Centre, a major role is played by sustainability, at the core of the opening conference of September 18, "Sustainability, innovative technologies and economic impacts". Furthermore, on September 20, the first field study in Italy on remediation will emerge from the "SURF (SUstainable Remediation Forum) Day", containing the guidelines and sustainability indicators for remediation projects.

The novelties of the exhibition organized by Ferrara Fiere Congressi, in collaboration with Emilia-Romagna Region, concern the four "call for proposal" – "Call for proposals for pilot test", "Call for proposal from Exhibitor", "Call for Public Administration - Case Histories", "Call for University and Research" (Research Focal Point) –, which aim to highlight the most interesting innovations in the field of remediation, virtuous application cases, research works available in our country and abroad. Also the "RemTech Training School" is unprecedented, as well as the focus on the theme of health in relation to contaminants, which will be deepened in the conference "Environment and its impact on human health".

In this edition, RemTech confirms its vocation of event strongly oriented to training and privileged speaker to the industrial world. In addition to the "RemTech Training School", the training will be at the heart of the prestigious "Advanced training course on assessing environmental crimes in the remediation field". Instead, the involvement of industry, in general, and of the energy sector, in particular, will occur through a dedicated Focus and the conferences on "Nuclear Decommissioning", "Oil distribution site" and "Risk Analysis and Monitoring", with speakers from leading companies also in the oil and petroleum sectors.

As regards the topics of remediation and remediation technologies – the main themes of the event –, they will be treated in some meetings of great interest: "Sediments management and remediation", "Remediation of contaminated soils", "Public Administration and remediation plans" and "Remediation of contaminated ground waters", with the presentation of Italian and foreign case histories.

The target RemTech addresses – companies, public administrations, associations, institutions, professionals, universities, industry, including Geosynthetics manufacturers and distributors, oil sector, real estate and planning sector – will find, in addition, a highly qualified exhibition area, parallel events, technical meetings organized by the exhibiting companies, pilot tests and field demonstrations, foreign delegations representing the main buyers.

For the third consecutive year, the remediation community participating in RemTech will be the protagonist of the "Gala Dinner", a convivial occasion to share experiences related to remediation in a prestigious period location, in the heart of the old town center of Ferrara.

No less substantial is the scientific proposal of RemTech's special sections.

Coast Expo (www.coastexpo.com), the most specialized event in Italy in the field of coastal and sea management and protection, celebrates its fourth edition and represents a point of encounter and confrontation between public administration, research centers, university, engineering firms and consulting companies, professionals, associations, national and international operators.

This year, Coast's conference program involves new themes: Flood Directive, coastal development, sediment management, soft coastal defence measures, morphological and dynamic monitoring, Marine Strategy Directive, coastal emergencies, Green Coast Award (poster&case studies) and RITMARE Flagship Project.

In turn, Coast Expo will inaugurate Esonda (www.esondaexpo.com), the new focus dedicated to hydrogeological instability and hydraulic risk, in light of the increased frequency and intensity of calamitous meteorological and climatic events, and of future scenarios of climate change. Among the issues Esonda will face in relation to hydrographic basin, riverbeds and torrential courses, and to marine and coastal areas, a particular attention will be given to hydraulic risk monitoring, prevention and management, intervention measures against erosion and landslides, river navigation and tourism, protected areas, state and problems of implementation of the Flood Directive.

Last but not least is the second edition of Inertia (www.inertiaexpo.com), the more specialized event in Italy on inert wastes and natural, recycled and manufactured aggregates. Among the appointments planned it is worth mentioning the XVII Interforum Recycling, organized by ANPAR and FIR, and this year dedicated to the use of recycled and manufactured aggregates on roads; the workshops on the sustainable use of natural resources, the planning of mining activities and the new procedures for the recovery of excavated soils, the sustainability of buildings and the environmental product declarations; the Technical Forum.

For more details, it's possible to contact: Daniela Modonesi -Ferrara Fiere Congressi - Press Office and Communication (email: dmodonesi@ferrarafiere.it and phone: + 39 0532 909495 – 900713).

Reported by

Daniele Cazzuffi, Chairman of RemTech 2013 Scientific and Advisory Committees and IGS Past President

Geosintec Iberia 1

5 – 6 November 2013, Seville, Spain



From 5th to 6th November 2013, Seville (Spain) will host the Congress Geosintec Iberia1, organized by the Spanish Chapter of the International Geosynthetics Society (IGS) with the collaboration of both, public and private institutions.

The Spanish chapter of the International Geosynthetics Society is pleased to invite you to attend the Congress, which will be a biannual event that aims to be a reference forum on the latest developments in the field of geosynthetics. The Congress will count on the participation of **Dr. Jorge Zornberg** and **Dr. Jean Pierre Giroud**, who will give two **keynote lectures**, which together with the contributions of the rest of the speakers, will provide an appropriate framework for the exchange of knowledge on the latest advances in the field.

A trade exhibition will also take place, where manufacturers and suppliers will present their latest innovations in the field of Geosynthetics.

The Congress will be held in the Hotel Meliá Lebreros, with an excellent location in Seville, in the vicinity of the high-speed (AVE) train station. Seville, the fourth city of Spain in population, combines traditional and modern architecture and is characterized by an intense cultural and artistic activity and a very lively nightlife. National and international flights at its airport as well as its connection with Madrid by high-speed (AVE) train, facilitate the access to this city.

Important Dates

- | | |
|--|-------------------|
| - Deadline abstract submission | 30 June 2013 |
| - Notification of acceptance of Abstract | 15 July 2013 |
| - Deadline full papers submission | 15 September 2013 |
| - Notification of acceptance of papers | 30 September 2013 |

Topics

The Geosintec Iberia 1 will be the ideal occasion to take an overall look at the multiple applications of geosynthetics:

- Reinforcement and transport
- Port and hydraulic construction

- Building construction
- Environment
- Examples of construction in Spain and Portugal

Languages

Please be aware that the official languages will be the Spanish, Portuguese and English.

Contact

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Announcement for the Recipients of the 2013 - 2014 Academic Year GSI Fellowship Awards



The GSI Board of Directors has made their selections for this year's GSI Fellowship awards from a number of proposals from universities around the world. The program recognizes and supports outstanding graduate students studying geosynthetics. Requests for proposals (RFP's) for the upcoming seventh year of the program will be announced this winter. In order to be eligible, students must focus on a geosynthetic topic, have passed their candidacy examination, and be recommended by their advisor. The recipients for the 2013-'14 GSI Fellowship Awards are as follows:

Class 6(a) – 1st Year Funding at \$10,000 per Student

No.	Name	University	Advisor	Topic
1-13	Jongwan Eun	University of Wisconsin	Craig Benson	Transport Parameters in Co-extruded Geomembrane Containing Ethylene Vinyl-Alcohol
2-13	Yu Qian	University of Illinois	Erol Tutumluer	Geogrid-Ballast Interaction and Geogrid Application in Railroad Reinforcement using Image-aided Discrete Element Method

Class 5(b) – 2nd Year Funding at \$5,000 per Student

No.	Name	University	Advisor	Topic
2-12	Xunchang Fei	University of Michigan	Dimitrios Zekkos	Impact of Municipal Solid Waste Biodegradation on Separator Geotextile

Class 4(c) – 3rd Year Funding at \$5000 per Student

No.	Name	University	Advisor	Topic
3-11	Felix Jacobs	RWTH Aachen University	Martin Ziegler	Large Scale Biaxial Compression Testing of Geogrid Reinforced Soil

Please contact Jamie Koerner at jrkoerner@verizon.net for information on the students and their respective projects or go to www.geosynthetic-institute.org/gisfellows.htm for a complete history of the fellowship program.

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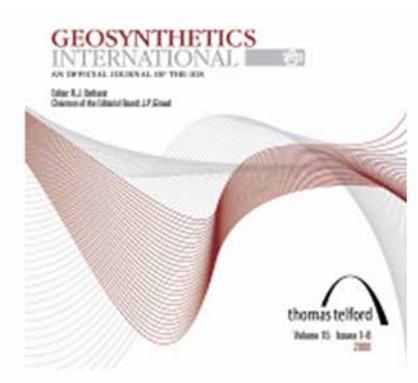
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Content of Volume: 20, Issue: 3 (June 2013)

Multiscale transmissivity study of drain-tube planar geocomposites: effect of experimental device on test representativeness, S. Bourguès-Gastaud; E. Blond; N. Touze-Foltz

A bearing capacity calculation method for soil reinforced with a geocell, J.O. Avesani Neto; B.S. Bueno; M.M. Futai
Pilot-scale load tests of a combined multilayered geocell and rubber-reinforced foundation, S.N. Moghaddas Tafreshi; O. Khalaj; A.R. Dawson

Experimental and DEM simulation of sandy soil reinforced with H–V inclusions in plane strain tests, Y.L. Lin; M.X. Zhang; A.A. Javadi; Y. Lu; S.L. Zhang

Role of strain magnitude on the deformation response of geosynthetic-reinforced soil layers, J.S. McCartney; B.R. Cox

Centrifuge study of anchored geosynthetic slopes, A. Rajabian; H. Ghiassian; B.V.S. Viswanadham

Behavior of nonwoven-geotextile-reinforced sand and mobilization of reinforcement strain under triaxial compression, M.D. Nguyen; K.H. Yang; S.H. Lee; C.S. Wu; M.H. Tsai

Performance comparison of conventional biplanar and low-cost alternative geocomposites for drainage, C.A. da Silva; E.M. Palmeira

Please find the download of the articles at:

<http://www.icevirtuallibrary.com/content/issue/gein/20/3>

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Content of Volume: 20, Issue: 4 (August 2013)

Discrete-element method simulation of a model test of an embankment reinforced with horizontal–vertical inclusions, M.X. Zhang; C.C. Qiu; A.A. Javadi; Y. Lu; S.L. Zhang

Performance of a geosynthetic-encased column (GEC) in soft ground: numerical and analytical studies, M.S.S. Almeida; I. Hosseinpour; M. Riccio

Effects of polypropylene fiber inclusion on the strength and volume change characteristics of cement-fly ash stabilized clay soil, M. Olgun

Behaviour of soft ground improved by conventional and geogrid-encased stone columns, based on FEM study, M.B.D. Elsayy

Small-strain properties of soft clay treated with fibre and cement, B. Fatahi; B. Fatahi; T.M. Le; H. Khabbaz

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Content of Volume 38 (June 2013)

Large scale field tests on geogrid-reinforced granular fill underlain by clay soil, Ahmet Demir, Mustafa Laman, Abdulazim Yildiz, Murat Ornek

Quantification of diffusion of phenolic compounds in virgin GCL and in GCL after contact with a synthetic leachate, M.J.A. Mendes, N. Touze-Foltz, M. Gardoni, M. Ahari, L. Mazeas

Bearing capacity of geosynthetic encased stone columns, Mahmoud Ghazavi, Javad Nazari Afshar

Bearing capacity of square footing supported by a geobelt-reinforced crushed stone cushion on soft soil, Xiao-Hong Bai, Xian-Zhi Huang, Wei Zhang

Prediction of pore size characteristics of woven slit-film geotextiles subjected to tensile strains, Xiao-Wu Tang, Lin Tang, Wei She, Bai-Song Gao

A case study on soil settlements induced by preloading and vertical drains, Ernesto Cascone, Giovanni Biondi

Finite element analysis experiments on landfill cover drainage with geosynthetic drainage layer, Dhani Narejo

Content of Volume 39 (August 2013)

Thermal conductivity of geosynthetics, Rao Martand Singh, Abdelmalek Bouazza

Behaviour of a geogrid reinforced wall built with recycled construction and demolition waste backfill on a collapsible foundation, Eder C.G. Santos, Ennio M. Palmeira, Richard J. Bathurst

The lateral displacement response of geogrid-reinforced ballast under cyclic loading, Buddhima Indraratna, Syed Khaja Karimullah Hussaini, J.S. Vinod

Performance evaluation of two silt fence geotextiles using a tilting test-bed with simulated rainfall, Ikiensinma Gogo-Abite, Manoj Chopra

Experimental and numerical investigation of the response of geocell-reinforced walls to horizontal localized impact, Maxime Soudé, Bastien Chevalier, Michel Grédiac, Aurélie Talon, Roland Gourvès

Numerical analysis of geocell-reinforced retaining structures, Rong-Her Chen, Chang-Ping Wu, Feng-Chi Huang, Che-Wei Shen

Please find the download of the articles at:

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Corporate Membership

Case studies – new approach for Corporate Members starts with great success

In the last issues of IGS News we published case studies submitted by IGS Corporate Members with a maximum length of a half page. For each issue about 20 corporate members were asked due to their seniority as members in IGS. This round is meanwhile finished. The experience was that it is hardly possible to show a case study within this very small place available. As we still think that case studies are the most useful information for the whole membership of IGS, we start a new round with some more room (that means 1 full page) for each case study. This should allow place for useful information as well as 1 or 2 pictures and a link to further information through the web.

All corporate members are invited to announce a case study at any time. For each issue 3 to 4 case studies are planned to be placed in. If there are more announcements we will place them on a list and will use them on a “first come, first serve” basis. A corporate member may have a second case study published if the list is finished with corporate members not been considered yet. As we know that some of our corporate members are very hard-working on such a type of publication, please be aware that the only possibility to prevent a publication series by one company is to send in your own case study!

With a distribution of more than 3000 samples/downloads of IGS News this is a good promotion of the geosynthetics technique and your company. We would be happy if this chance is used frequently.

Reported by

Gerhard Bräu, IGS News Editor

Wattle Park Reservoir Liner & Cover Replacement



Wattle Park Reservoir, a 27,000m² potable water storage essential to Adelaide city's water system was built approximately 80 years ago. The recent upgrade included removal and disposal of the failed CSPE liner and cover, remediation of concrete basin, design, supply, and installation of under-liner leak detection systems, and new liner and cover systems compatible with high dosing and desalinated water.

Crucial completion for operation during the upcoming peak period, challenges became abundant including a myriad of environmental, time, design, regulatory pressures, safety challenges, time constraint, and unforeseen complications resolved by innovative solutions designed and implemented in order to achieve a successful outcome.

Beginning with a 4.5 month site works commencement delay incurred by external factors, Fabtech prefabricated

materials into panels in-house during the delay period transporting them to site to expedite installation time.

The deep reservoir encompassed a flat, non-sloping floor hindering water draining to outlets. Excessive rain meant flooding of approximately 150ml in the basin resulting in difficulty removing the existing liner. Soaring temperatures beyond safe working conditions were remedied by night works. Steepness of the walls incurred 'working at heights' safety classification requiring all site crew undertaking training and harnessed for safety precaution at all times.

Following removal of electrical fencing and other redundant facilities, the failed liner and cover had to be cut and rolled in 40 parcels weighing 3 tonne each, then elevated out by crane. To ensure the new lining systems achieved required design life, the concrete basin undertook extensive remediation and a protective cushioned geotextile layer.

A leak detection system was designed and incorporated within the under liner system with a partial system of Flownet drainage channels connecting to a detection sump. MDPE was specified with high performance additive package as the liner material to provide the necessary chemical resistance and life with high elongation performance accommodating the sub-grade condition and balance of properties achieving chemical resistance, folding flexibility, stress cracking resistance, UV stability and mechanical strength. The liner was required to form around large above ground concrete inlet structures, and the design had to allow the loads caused by floor mounted mixing systems. To facilitate cleaning and maintenance during asset life, the cover design incorporated capability of inflation in addition to the inspection hatches and sampling ports.

The hatch for the mounted mixer was specifically designed to accommodate rising and falling water levels. Following cover installation, the first time water filled the reservoir, the cover ballooned as a result of too much air content in the water, and existing air vents were unable to handle the excess air in the water. Fabtech Engineers therefore invented a new venting system involving active vents which wind assisted in vacuuming air out of the cover, quickly dissipating the trapped air.

Commissioning included Fabtech in-house electronic LISA testing of the liner, hydrostatic testing of the complete system, and surface systems performance validation.

Fabtech successfully completed installation on time within budget. The reservoir has been back in service since February 2012, functioning as per the design and client expectations.



Cushion geotextile layer exposed during geomembrane installation



Removal of existing failed liner



Cover installation complete

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THE PROBLEM

In November 2009, the north west of England experienced widespread flooding. In the town of Workington, one road bridge collapsed and the other was deemed unsafe. The town was divided in two. The Royal Engineers were commissioned to build a temporary footbridge over the River Derwent. The Engineers required immediate design guidance on stabilisation and delivery of geogrids within 24 hours.

THE SOLUTION

The use of multiple layers of Tensar TriAx™ geogrid combined with locally sourced stone enabled Army Royal Engineers to begin construction of the bridge assembly, the launch platform and the bridge abutments less than 24 hours after the initial call for assistance from the local authorities.

PROJECT DESCRIPTION

In November 2009 the town of Workington in Cumbria experienced severe flooding. One bridge in the town collapsed and the other was deemed unsafe. This left locals with an 18km round trip to travel from the north to the south of the town. Army Royal Engineers were commissioned to build a temporary footbridge to connect the two sides of the town. The selection of the site and the soil testing were carried out immediately. Tensar International was given a brief to return design advice and to organise an express delivery of Tensar TriAx geogrid. An Application Suggestion was produced the same day, to illustrate the appropriate use of geogrids, and material was delivered the following morning. Base layer Tensar TriAx geogrid laid on the formation Bridge is cantilevered across the river- courtesy of jackthehat.co.uk The banks of the River Derwent consist of sandy clay soil with poor load bearing properties. By constructing the abutment bank seat supports, as well as the bridge assembly platform, using Tensar TriAx geogrid and locally sourced stone, the time and cost involved in any other stabilisation methods and support services were avoided. Referring to the bridge abutments, Captain Caroline Graham-Brown of the Royal Engineers commented "Normally the bridge would be built on existing abutments or temporary abutments on a river bank. In this case the saturated topsoil was stripped down to the sandy clay below and the platform was built up using the TriAx geogrid. A platform was built with multiple layers of TriAx geogrid and a minimum of 400mm of DOT Type 1 sub-base aggregate". Captain Graham-Brown went on to say that "the MOD has used Tensar geogrid solutions in the past for infrastructure projects with excellent results". Major Phillip Curtis confirmed that "Tensar responded magnificently to our requirements, both in contributing to the design(1) and specification and getting the geogrid to us within a day of our call". In recognition of the delivering of the solution, British Construction Industry awarded the project the „Thomas Telford Civil Engineering Award". The judge's comments read "What makes this project special is the extraordinary speed with which the solution was envisaged, the design developed, land acquired and project delivered"

BENEFITS TO CLIENT

Rapid response to carry out emergency works after a disastrous flood event.

References (1) Livesey, C. The Barker crossing: Royal Engineers reconnect Workington Proc Inst Civ Eng, Vol 164 May 2011



Aerial view of the temporary bridge span launching site



Bridge is cantilevered across the river courtesy of jackthehat.co.uk



Base layer Tensar TriAx geogrid laid on the formation

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Greener Dreams Come to Life: Gardens by the Bay



Singapore is one of the most densely populated places in the world. Green space on this tightly developed island comes at a premium, but it has become the mission of this Asian citystate to transform itself into a truly green, world city. The impressive Gardens by the Bay installation is the result: a 101ha spread of botanical gardens, forestry, walking trails and waterway views in the heart of Singapore. It's built on land reclaimed from the sea, and geosynthetics from NAUE have played a major role in bringing this garden vision to life.

Three major gardens are housed within the overall Gardens by the Bay development: Bay South Garden, Bay East Garden and Bay Central Garden. They form something of a ring around the bustling business district and its adjacent gambling meccas, providing a stunning refuge for the citizens. It's also flipped conventional urban planning on its head. Singapore is located only 1° of latitude from the equator; yet, showcase greenhouses – not something normally needed or sought at this latitude – are central to Gardens by the Bay. In fact, they've been designed to keep plants cooler, thus enabling multiple ecosystems, from arid to verdant, to be experienced in the city centre. It's a statement on climate change and understanding how all people and the ecosystems they live in are connected. But while an architect can conceive of transforming a "garden city" into a "city in a garden", it takes engineering to make the most innovative and defining dreams a reality.

Reinforcing the vision

BBG Bauberatung Geokunststoffe GmbH & Co. KG was involved in the project in close cooperation with Green Cosmos Marketing Pte Ltd, NAUE's local partner in Singapore. BBG was asked to design retaining walls that could be both "green walls" and provide a high factor of safety and longterm support for retaining structures. These walls would be essential to enabling connections between the different levels of the garden and supporting the adjacent major pedestrian walkways. The engineering solution needed to match visual aesthetics of the garden. They proposed a series of geogrid-reinforced earth walls that would be constructed using a wrap-around facing. Temporary formworks would allow this construction to happen efficiently and safely within the space constraints posed by the local and planned elevation changes. This approach would also minimise the amount of land needing to be disturbed during construction as well as minimise the amount of heavy equipment needed on site for construction. The design was approved and the subsequent geogrid-reinforced structures were constructed with inclinations from 45° to a maximum 70° and at heights up to 7m. These were not typical geogrid-reinforced walls, however. True to the architectural and landscaping vision of the project, the construction and engineering had to incorporate a significant number of atypical details into the project "Green Walls". For example, gargoyles, cascades, balconies and viewing decks, and concrete footings for bridges and artistic "aerial roots" needed to be incorporated. In other parts of the garden, vertical geogrid-reinforced earth structures were constructed to function as "earth pressure absorbers" behind concrete retaining walls. This solution limited the horizontal pressure onto the concrete walls, thus improving their integrity and design life. The largest of the gardens (Bay South Garden) includes the geogrid-reinforced "Green Walls" that were opened to the public in late June 2012 after approximately 5 years of planning and construction. In total, Gardens by the Bay has used roughly 300,000m² of Secugrid® and Combigrid® reinforcement products with ultimate tensile strengths varying, depending on the reinforcement conditions and needs, from 80kN/m to 400kN/m.



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**Techgrid Geogrid Reinforced Soil Wall
 with Wire Mesh Facing**



The Project

The Noida Toll Bridge Company Ltd. (NTBCL) has been promoted by Infrastructure Leasing and Financial Services Ltd. (IL&FS) as a special purpose vehicle to develop, construct, operate and maintain the eight lane DND Flyway (including a bridge across the Yamuna river) connecting South Delhi to Noida on a Build Own Operate Transfer (BOOT) basis. The company's principal source of revenue is from the levy of tolls on commuters on this facility. NTBCL constructed a DNC-Mayur Vihar Link Road to attract the large population living in the Trans-Yamuna area of Mayur Vihar to use DND Flyway to increase its revenue.

This DND-Mayur Vihar Link Road required the construction of a flyover, whose approach embankments had a maximum height of 9.0m on the DND end and 15.0 m on the Mayur Vihar End. Since there was no constraint with respect to right-of-way, the approaches consisted of normal embankments. However, retaining walls were to be constructed as closure walls behind the abutment piers and 25m long return walls at both ends of the flyover.

TechGrid knitted and PVC coated polyester geogrids, manufactured by TechFab India, from select grades of high tenacity, high molecular weight polyester yarns using an advanced weft insertion warp knitting process and coated with a specially formulated PVC plastic. The high performance characteristics of these world class geogrids enabled the walls as high as 15 m, to be designed safely and economically.

The Solution

The facing comprised a geogrid wrapped face supported by L shaped galvanized welded wire mesh panels & ties at 500 mm spacing. A 350 mm thick random rubble was provided to enhance the rigidity of the facing and to protect the fill material. A nonwoven geotextile filter was used behind the rubble to contain the fill material, which was a fine sand. The overall inward batter of the facing was approximately 5°.

Ability to accommodate appreciable amounts of differential settlements was one of the major reasons for adopting

this type of facing. The design angle of shearing resistance of the compacted sand was 35°. The ground treatment was done by replacing clayey-silt with compacted sand reinforced with TechGrid TGB-90. Construction of the wall was carried out under the supervision of TechFab India Industries Ltd. The project was successfully completed in March 2009.



15 m high wall at Mayur Vihar End

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Notes:

- The corporate members are encouraged to check their entry there!
- Date is earliest year of continuous membership

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The International Geosynthetics Society was formed with the following objectives:

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

WHY BECOME A MEMBER OF THE IGS?

First, to contribute to the development of our profession.

By becoming an IGS Member you can:

- help support the aims of the IGS, especially the development of geotextiles, geomembranes, related products, and associated technologies;
- contribute to the advancement of the art and science of geotextiles, geomembranes, related products, and their applications;
- provide a forum for designers, manufacturers, and users, where new ideas can be exchanged and contacts improved; and
- become increasingly informed, involved, and influential in the field of geotextiles, geomembranes, related products, and associated technologies.

Second, to enjoy the benefits.

The following benefits are now available to all IGS Members:

- the online IGS Membership Directory, updated in real time;
- the newsletter, IGS News, published three times per year;
- free electronic issues of Geosynthetics International and Geotextiles & Geomembranes;
- 19 IGS Mini Lecture Series are available online;
- information on test methods and standards;
- discount rates on the purchase of any future documents published by the IGS and on the registration cost of all international, regional, or national conferences organized by or under IGS auspices;
- preferential treatment at conferences organized by or under the auspices of the IGS; and
- the possibility of being granted an IGS award.

Please check whether there is a local IGS Chapter in your country (list at page 24)!

Otherwise please use the online form at <http://www.geosyntheticssociety.org> or the following

IGS Membership Application

Membership of the Society is open to Individuals or Corporations "...engaged in, or associated with, the research, development, teaching, design, manufacture or use of geotextiles, geomembranes and related products or systems and their applications, or otherwise interested in such matters." The annual fee for membership is (US) \$45 for Individual Members and (US) \$1000 for Corporate Members. Individuals or Corporations who voluntarily contribute a minimum of (US) \$200 annually to the Society, in excess of

their membership dues, will be mentioned in the IGS Membership Directory in a separate list as benefactors.

Send this completed form to:

The International Geosynthetics Society, 1934 Commerce Lane, Suite #4, Jupiter, FL 33458, USA

TEL: +1.561.768.9489 FAX: +1.561.828.7618

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Attach your business card or fill in your address (print or type if possible), as you wish it to appear in the next IGS Membership Directory.

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Membership fee: Individual (US) \$ 45,
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Calendar of Events

Event	Location	Date	E-Mail, Website
Fifth International Young Geotechnical Engineers' Conference (5iYGEC'13)	Paris, France	31 Aug - 01 Sep 2013	yujun.cui@enpc.fr www.lepublicsystemepco.com/EN/events.php?IDManif=696&IDModule=21
18 th International Conference for Soil Mechanics and Geotechnical Engineering	Paris, France	2 - 6 Sep 2013	vgauthier@le-public-systeme.fr , vmetral@le-public-systeme.fr www.issmge2013.org
REMTECH EXPO 2013 Remediation Technologies and Requalification of the Territory Exhibition - 7th Edition	Ferrara, Italy	18 - 20 Sep 2013	info@remtechexpo.com www.remtechexpo.com
Geomontreal 2013	Montreal, Canada	29 Sep - 03 Oct 2013	eblond@gcttg.com www.geomontreal2013.ca
International Symposium on Design and Practice of Geosynthetic-Reinforced Soil Structures	Bologna, Italy	14 - 16 Oct 2013	ling@civil.columbia.edu http://www.civil.columbia.edu/bologna2013
LANDFILL 2013: Effective environmental protection from the residues of modern civilization	Misty Hills, Gauteng, South Africa	16 - 18 Oct 2013	nortje@jaws.co.za
Geosynthetics India '13	New Delhi, India	23 - 25 Oct 2013	uday@cbip.org
International Conference Geotechnics in Belarus: Science and Practice	Minsk, Belarus	23 - 25 Oct 2013	geotechnika2013@gmail.com , belgeotech@tut.by
Geosintec Iberia 1	Seville, Spain	5 - 6 Nov 2013	www.geosinteciberia.com
The 2nd African Regional Conference on Geosynthetics GeoAfrica2013	Accra, Ghana	18 - 20 Nov 2013	skampadu.coe@knust.edu.gh
The 19 th NZGS Symposium "Hanging by a Thread – Lifelines, Infrastructure and Natural Disasters"	Queenstown, New Zealand	20 - 23 Nov 2013	secretary@nzgs.org www.nzgs13.co.nz/
10 th International Symposium of Structures, Geotechnics and Construction Materials	Santa Clara, Villa Clara, Cuba	26 - 29 Nov 2013	ana@uclv.edu.cu , quevedo@uclv.edu.cu www.uclv.edu.cu
GEOTEC HANOI 2013 "Geotechnics for Sustainable Development"	Hanoi, Vietnam	28 - 29 Nov 2013	secretariat@geotechn2013.vn www.geotechn2013.vn
8 th International Conference on Physical Modelling in Geotechnics 2014 (ICPMG)	Perth, Western Australia, Australia	14 - 17 Jan 2014	icpmg2014@arinex.com.au http://icpmg2014.com.au/
GeoShanghai 2014	Shanghai, China	26 - 28 May 2014	xzhang11@alaska.edu www.geoshanghai2014.org
8 th European Conference on Numerical Methods in Geotechnical Engineering (NUMGE14)	Delft, Netherlands, The	18 - 20 Jun 2014	info@numge2014.org www.numge2014.org
Geohubei International Conference 2014	Hubei, China	20 - 22 Jul 2014	GEOHUBEI.ADM@GMAIL.COM http://geohubei2014.geoconf.org
TC204 ISSMGE International Symposium on "Geotechnical Aspects of Underground Construction in Soft Ground" - IS-Seoul 2014	Seoul, Korea	25 - 27 Aug 2014	cyyoo@skku.edu
International Symposium on Geomechanics from Micro to Macro (TC105)	Cambridge, United Kingdom	01 - 03 Sep 2014	ks207@cam.ac.uk
10th International Conference on Geosynthetics (10ICG)	Berlin, Germany	21 – 25 Sep 2014	g.braeu@bv.tum.de www.10icg-berlin.com
33rd Baugrundtagung with Exhibition „Geotechnik“	Berlin, Germany	23 – 26 Sep 2014	www.dggt.de

Event	Location	Date	E-Mail, Website
7 th International Congress on Environmental Geotechnics	Melbourne, Australia	10 – 14 Nov 2014	www.7iceg2014.com
ISFOG 2015	Oslo, Norway	10 - 12 Jun 2015	isfog2015@ngi.no www.isfog2015.no
XVI European Conference on Soil Mechanics and Geotechnical Engineering	Edinburgh, Scotland, United Kingdom	13 - 17 Sep 2015	derek_smith@coffey.com www.xvi-ecsmge-2015.org.uk
NGM 2016, The Nordic Geotechnical Meeting	Reykjavik, Iceland	25 - 28 May 2016	has@vegagerdin.is
3 rd PanAmerican Regional Conference on Geosynthetics	Miami South Beach, USA	April 2016	NAGSDirector05@gmail.com
EuroGeo 6 – European Regional Conference on Geosynthetics	Istanbul, Turkey	25 – 29 Sep 2016	eguler@boun.edu.tr
6 th Asian Regional Conference on Geosynthetics	New Delhi, India	Last week of November 2016	uday@cbip.org
11th International Conference on Geosynthetics (11ICG)	Seoul South Korea	16 - 20 Sep 2018	csyoo@skku.edu

Note:

The conference announcements are shown with different graphics due to their priority for IGS:

IGS Conference	Conference organized under the auspices of the IGS	Conference under the auspices or with the support of an IGS Chapter
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