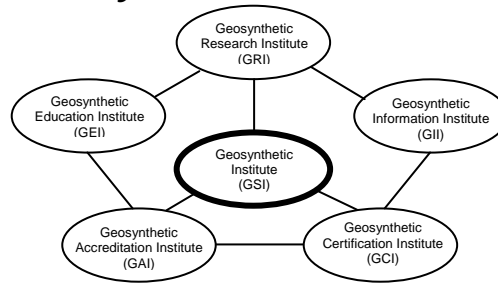


The GSI Newsletter/Report

Geosynthetic Institute



Vol. 23, No. 3

September 2009

This quarterly newsletter, now in its 21th year, presents the activities of GSI and its related institutes to all who are interested. It is available on the institute's home page at www.geosynthetic-institute.org. It also serves as a quarterly report to its member organizations. Details are available by contacting Robert M. Koerner or Marilyn Ashley at phone (610) 522-8440; fax (610) 522-8441 or e-mail at robert.koerner@coe.drexel.edu or mvashley@verizon.net.

Activities of GSI's Director and Board of Directors

NOTICE: Due to the increasing cost of printing, shipping and handling, this Newsletter/Report will be made available on our Home Page at www.geosynthetic-institute.org. It is in the open section under the heading "Newsletter/Report". Please share it with your friends and colleagues.

1. The GSI Fellowship program has been finalized for this our second academic year of the activity. Four new awardees have been notified as well as four of the first year recipients for a second year. Information is in the Education section of this newsletter/report.
2. Our initial GSI Webinar to be hosted by ASCE is set for March 2, 2010. The topic is "An Overview of Geosynthetics and Their Major Applications". If successful, a series of more advanced topics will follow. The time is around the noon-hour, so do plan for an in-house activity of your newer personnel.
3. All of the technical hurdles of our new Website have been cleared and Marilyn Ashley is now loading the appropriate information. We will notify you when it is launched.
4. GSI's next big event is coincident with ASTM in San Antonio on January 27-29, 2010. We are in the planning stage for focus group meetings. Also our Annual Meeting will be on the evening of January 28, 2010 after the ASTM task group meetings ends. The BoD meeting will be on January 29, 2010 after the conclusion of the Durability Workshop.
5. The ASTM/GRI Durability Workshop set for January 29, 2010 is soliciting extended abstracts presently. There is no formal paper required. Contact Sam Allen or George Koerner (or ASTM) for information and details.
6. The New York Federation of Solid Waste will hold its annual meeting at Sagamore, New York (a wonderful event) on May 17-19, 2010. This year it

- will have sessions on (i) solar panels on exposed geomembranes and (ii) new horizons in geosynthetic materials, among many others.
7. GeoFrontiers II is set for Dallas, Texas March 13-16, 2011 and we will have our GRI-23 conference embedded within it. Our theme will be "Enhanced Sustainability Using Geosynthetics". It's a "big-picture" topic and we are hoping for a nice set of GSI member papers and presentations.
8. Your Board of Directors is as follows. Do contact any of these with regard to GSI matters.

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- Items of Interest
- Continuing Education and PDH's
- Upcoming Events
- GSI's Member Organizations

Term Ends 2009

Tony Eith (Chairman) - Waste Management Inc. (Owners and Operators)

e-mail: aeith@wm.com

Boyd Ramsey - GSE Lining Technology, Inc. (Geotextiles and Geogrids)

e-mail: bramsey@gseworld.com

Sam Allen - TRI/Environmental, Inc. (At-Large)

e-mail: Sallen@tri-env.com

Term Ends 2010

David Jaros - Corps of Engineers (Government Agencies)

e-mail: dave.l.jaros@usace.army.mil

Paul Oliveira - Firestone bp Inc. (Resin Producers)

e-mail: oliveirapaul@firestonebp.com

Kent von Maubeuge - NAUE GmbH & Co. KG (International-1)

e-mail: kvmaubeuge@naue.com

Term Ends 2011

Dick Stulgis - GeoTesting Express (Consultants and Testing Laboratories) - Re-elected this year –

e-mail: rstulgis@geocomp.com

Gary Kolbasuk - Raven (Geomembranes and GCLs) - Re-elected this year

e-mail: gary.kolbasuk@ravenind.com

Wayne Hsieh - GSI-Taiwan (International-2) - Newly-elected this year

e-mail: cwh@mail.npust.edu.tw

Overview of GRI Projects (Research)

Each issue of our Newsletter/Report provides a brief glimpse and update of current GRI research projects. It will be noted that most projects are of a very long duration. (Note that short projects are usually given to design firms or testing laboratories which are GSI Members). Details and full briefings are available to member organizations at their request. Dr. Grace Hsuan, Associate Director of GRI can be contacted for additional information as can the other project managers listed in the following write-ups. **Projects marked with an asterisk have been written up as either short "in-progress" papers or complete papers.** Grace can be reached by phone at (610) 522-8440 or e-mail at <grace.hsuan@coe.drexel.edu>.

- 1. Stress Cracking of Geomembranes and Geopipe*** - In addition to Grace Hsuan's ongoing evaluations of HDPE geomembranes, she is presently focusing on HDPE drainage and duct pipe mainly for the Florida DOT. The goal for both geomembranes and geopipe is to include technically viable test methods and limiting values for inclusion in generic specifications.
- 2. Durability of Polypropylene Geotextile Fibers** - Incubation at temperatures of 75, 65 and 55°C in high oxygen pressure containers is ongoing using PP-woven geotextile fibers. This study periodically measures changes in density,

dimensions, mass, morphology, strength, elongation, modulus, melt index, OIT and carbonyl content. Dr. Hsuan is in charge of the project.

- 3. In-Situ Temperature Monitoring of Liner and Cover Geomembranes in Dry and Wet Landfills*** - George Koerner is measuring the in-situ temperature behavior of liner and cover geomembranes and has installed 60± thermocouples for long term measurements in both wet and dry municipal solid waste landfills in Pennsylvania. The project has been extended into its 14th-year and has resulted in an extremely authoritative set of real-life data.
- 4. Bioreactor (aka, Wet) Landfill Behavior and Properties*** - One of the landfill cells mentioned in Item 3 is at field capacity, hence it is a true anaerobic bioreactor. Dr. George Koerner is in charge of considerable monitoring at this cell which includes the following
 - waste moisture content
 - waste temperature
 - leachate chemical analysis
 - waste gas analysis
 - perched leachate within the waste

Data is being collected on a monthly basis. The timeline of the project calls for monitoring for 5 to 10 years. This activity has been extended to an adjacent landfill to see how reproducible the data is with a slightly different waste mass.

- 5. Flow Behavior of Fully Degraded Waste*** - A field project under sponsorship of GSI and Waste Management investigates the drainage of highly degraded MSW placed directly on leachate collection systems. The leachate collection systems consist of both natural soils and geosynthetic drains. The project is now in its third year and is at a landfill in the Philadelphia area.
- 6. Hydrostatic Creep Puncture of Geomembranes*** - This ten-year creep puncture project has just been dismantled and an analysis of the findings has been concluded. A short version is available as GSI White Paper #14 on our website and a complete paper has been submitted to the Journal of Geotextiles and Geomembranes for review and possible publication. Contact us if you are interested in the draft paper.
- 7. UV Exposure of Geomembranes*** - GSI is using UV-fluorescent devices to evaluate the projected exposed lifetime of many different types of geomembranes. Presently being incubated are HDPE, LLDPE, 5 fPPs, PVC, EPDM, PE-R and LLDPE-R. Exposure times of 40,000 light hours are now realized at 70°C and a replicate set of samples are now being incubated at 60°C. These will take at least

60,000 light hours (> 8-years). The third sequence will be at 80°C. Ongoing data is being reported to manufacturers and resin producers.

8. **UV Exposure of Geogrids** - The UV-fluorescent exposure of four different biaxial geogrids which are used at the exposed surfaces of welded wire mesh retaining walls is ongoing. The geogrids are now up to 25,000 light hours and data is being generated and sent to the respective manufacturers. As with the geomembranes, replicate samples will now be incubated at 60°C for eventual use in Arrhenius Modeling and lifetime prediction. The last set will be at 80°C.
9. **UV Exposure of TRM Fibers** - We are also using UV-fluorescent exposure of several turf reinforcement mat fibers to assess their lifetime capabilities. Contact Bob Koerner if you have materials for inclusion into this effort.
10. **UV Exposure of Repair Tape** - We have found that a particular type of polyethylene repair tape has been successfully used to repair an exposed geomembrane at a Delaware landfill. After five-years it appears very durable. Original samples are being evaluated in one of our fluorescent tube weatherometers per ASTM D7238 at 70°C.
11. **Generic Specifications** - A major effort is ongoing with respect to the development and maintenance of generic geosynthetic specifications. The current status of these specifications is as follows:

Completed and Regularly Updated

GM13 – HDPE Geomembranes
GM17 – LLDPE Geomembranes
GM21 – EPDM Geomembranes
GM22 – Exposed Temporary Covers
GM19 – Geomembrane Seams
GT10 – Geotextile Tubes
GT12 – Geotextile Cushions
GT13 – Geotextile Separators
GCL3 – Geosynthetic Clay Liners

Working Within Focus Groups

GCXX – TRMs for Erosion Control
GTXX – High Strength Reinforcement Geotextiles
GMXX – LLDPE-R Geomembranes

Delayed or Off in the Distance

GGXX – Bidirectional Geogrids
GGXX – Unidirectional Geogrids
GNXX – Geonet Drainage Composites
GCXX – Drainage Geocomposites

The complete specifications are available to everyone (members and nonmembers) on the open section of our Home Page. Please download and use them accordingly. Also note that this is where the latest modification will

always be available. Copies of draft specification tables are available to members and associate members.

Activities within GII (Information)

Our GSI Home Page and is accessed as follows:

<<<http://www.geosynthetic-institute.org>>>

It has been maintained through the fine efforts of Marilyn Ashley. Everyone (members and nonmembers) can access the open part, which has the following menu:

- Introduction to GSI
- Prospectus
- Associate Membership (Agencies)
- Members by Focus Groups
- GSI Publications
- GRI Specs, Guides, White Papers
- CPReS
- CPHYs
- Laboratory Accreditation
- Product Certification
- Newsletter/Reports
- Internet Courses
- Geosynthetics Links
- GSI Member Meetings
- Courses at GSI
- CQA Insp. Cert.

To go further one needs a members-only password. Your contact person (see the last section of this Newsletter/Report if you do not know who it is) must get a password from Marilyn Ashley. Marilyn can be reached by e-mail at mvashley@verizon.net. When you get into this section, the following information is presented. This includes:

- GRI Test Methods
- GRI Reports (Summaries)
- GRI Technical Papers (Citations)
- Notes of GSI Meetings
- Links to the GSs World
- Keyword Search for Literature
- Example Problems
- Frequently Asked Questions (FAQs)

The keywords section contains about 25,000 citations of all of the geosynthetics literature published in English. It's quite easy to use provided that you have a specific topic, or area, in mind. This is the section of the website that we (and others we are told) use the most in our various activities. The GSI website is presently being modified and updated and its "launch" will be quite soon. We will e-mail everyone in this regard.

In addition to the information provided in our home page as just mentioned, Jamie Koerner (Special Projects Coordinator) is performing various surveys of pertinent topics in geosynthetics. To date she has focused on the following; all of which are available.

- State adoption of AASHTO M288 geotextile specification (GRI Report #31)
- State liner and cover regulations for solid waste disposal (GRI Report #32)
- International liner and cover regulations for solid waste disposal (GRI Report #34)
- Allowable leachate head in landfill sumps

(White Paper #13)

- Allowable leakage rates for waste ponds (White Paper #15)
- Professional development hours (PDH's) required by the various states for continued licensure. (See later description in this Newsletter/Report)

\$325/person thereafter
 \$175/person – GSI Members

Contact: Marilyn Ashley (mvashley@verizon.net)

Progress within GEI (Education)

Free CD

We sent a broadcast e-mail to everyone on February 25, 2008 stating that many power point presentations were available and would be sent upon request. About 20 persons replied asking for all of them. Therefore, we put all 63 presentations on a CD which was sent to all GSI contact persons. That said, we have many copies still available so do ask and we will mail it to you immediately. Topic areas are all types of geosynthetics, plus walls/slopes, landfills, specifications, and miscellaneous.

GRI Reports

To date, we have 37 GRI Reports available to members and associate members. These reports vary in length from 30 to 200 pages and beginning with Report #25 they are on the password protected section of our home page. Prior to that date only the abstract is available online. All of them, however, are available in hard copy. The most recent reports are as follows:

- #36 – Inadequate Performance of Geotextile Filters Under Different and Challenging Field Conditions
- #37 – Geosynthetic Supported Base Reinforcement Over Deep Foundations

Courses

We have scheduled the following sequence of courses:

- Monday, December 7, 2009 and Monday, March 22, 2010
Geosynthetics Design in Waste Containment Systems
- Tuesday December 8, 2009 and Tuesday, March 23, 2010
Quality Control/Quality Assurance of Geosynthetics

The above will be held at:

Geosynthetic Institute
 475 Kedron Avenue
 Folsom, PA 19033
 (approx. 4.5 miles from Phila. International Airport)

Course Registration and Fee:
 \$275/person for each one-day course (up to one month prior to course)

GSI Fellowships

We are pleased to announce the second class of GSI Fellows for the academic year 2009-2010. The basic criteria are as follows:

1. Student must have completed his/her doctoral candidacy examinations.
2. Student must be researching an innovative topic involving geosynthetics.
3. Student must express an interest and desire to teach and/or research in the geosynthetic field.

Four of the proposals contained excellent projects which have been awarded. These four plus four second year students (continuing their research projects) have been sent stipend checks accordingly.

Class 1 - Continued funding for 2nd year

Number	Student	Advisor	University	Topic
1-08	Michael McGuire	George Filz	Virginia Tech	Geosynthetic reinforced pile supported embankments
2-08	Connie Wong	Grace Hsuan	Drexel Univ.	Durability specification development for HDPE transmission and drainage pipes
3-08	Axel Ruiken	Martin Ziegler	RWTH Aachen	Geogrid behavior used in walls and slopes
4-08	Eleni Kapogianni	Michael Sakellairou	U. of Athens	Geosynthetic reinforcement of soil slopes under seismic conditions

Class 1 - New funding this year

Number	Student	Advisor	University	Topic
1-09	Anil Bhandari	Jie Han	U. of Kansas	Geogrids in pavements under dynamic loading
2-09	Brent Robinson	Mo Gabr	N. C. State	GT/GG behavior in lime stabilized subgrade soils
3-09	Ioanna Tzavara	Yiannis Tsompanakis	U. of Crete	Seismic design for geogrid reinforced walls
4-09	Majid Khabbazian	Victor Kaliakin	U. of Delaware	Geosynthetic Reinforced stone columns and embankment stabilization

Activities within (Accreditation)

The Geosynthetic Accreditation Institute's (GAI) current mission is focused on a Laboratory Accreditation Program (LAP) for geosynthetic test methods. George Koerner is in charge of the program. The GAI-LAP was developed for accrediting geosynthetic testing laboratories on a test-by-test basis. GAI-LAP suggests that laboratories use ISO 17025 as their quality system model. In addition, the program uses the GSI lab as the reference test lab and operates as an ISO 17011 enterprise. In short, this means that the GSI lab does not conduct outside conformance testing.

It should also be made clear that GAI-LAP does not profess to offer ISO certification, nor does it "certify" laboratory results. GAI-LAP provides accreditation to laboratories showing compliance with equipment and documentation for specific standard test methods, usually ASTM or ISO standards. In addition, GAI-LAP verifies that an effective quality system exists at accredited laboratories by way of proficiency testing.

There have been significant additions to the number of GAI-LAP tests. Presently, there are 184 GAI-LAP methods available for accreditation. Please consult our home page for a current listing.

As of September, 2009, the following laboratories are accredited by the GAI-LAP for the number of test methods listed in parenthesis. Contact personnel and telephone numbers are also listed.

- 1^A - TRI/Environmental Inc. (118 tests)
Sam Allen -- (512) 263-2101
- 3^A - Golder Associates (44 tests)
Jonathan Evingson -- (770) 492-8280
- 4^C - Geosynthetic Institute (116 tests)
George Koerner -- (610) 522-8440
- 8^B - Propex, Ringgold (19 tests)
Todd Nichols -- (800) 258-3121
- 9^B - Lumite (10 tests)
Rebecca Page -- (770) 869-1700
- 11^A - STS Consultants Ltd. (13 tests)
Bill Quinn -- (847) 279-2500
- 13^A - Precision Laboratories, CA (95 tests)
Ron Belanger -- (714) 520-9631
- 14^A - Geotechnics (61 tests)
J. P. Kline -- (412) 823-7600
- 19^A - HTS Inc. (42 tests)
Larry McMichael -- (713) 692-8373
- 20^A - GeoTesting Express, MA (46 tests)
Gary Torosian -- (978) 635-0424
- 22^B - CETCO Hoffman Estates (13 tests)
Jim Olsa -- (847) 392-5800
- 23^B - CETCO Cartersville (10 tests)
Sid Weiser -- (706) 337-5316
- 24^B - CETCO Lovell (10 tests)
Roger Wilkerson -- (307) 548-6521
- 25^B - en Cate, Pendergrass (11 tests)
Beth Wilbanks -- (706) 693-2226
- 26^B - Agru America Inc. (17 tests)
Grant Palmer -- (843) 546-0600

- 31^D - NYS Dept. of Transportation (9 tests)
John Remmers -- (518) 457-4104
- 32^A - Vector Engineering (6 tests)
Ken Criley -- (530) 272-2448
- 34^B - GSE Richey Road (28 tests)
Jane Allen -- (281) 230-6726
- 37^B - GSE Chile (21 tests)
Mauricio Ossa -- 56-2 6010153
- 38^C - Sageos/CTT Group (82 tests)
Eric Blond -- (450) 771-4608
- 40^B - GSE Lining Technology Inc. (17 tests)
Vicki Parrott -- (843) 382-4603
- 41^A - SGI Testing Service, LLC (19 tests)
Zehong Yuan -- (770) 931-8222
- 42^C - NPUST (GSI-Taiwan) (56 tests)
Chiwan Wayne Hsieh -- 011-886-8-7740468
- 43^A - Ardaman & Associates (18 tests)
George DeStafano -- (407) 855-3860
- 44^B - BBA Fiber Web, Inc. (9 tests)
Ken McLain -- (615) 847-7575
- 45^B - Ten Cate Malaysia SDN Bhd. (23 tests)
C. P. Ng -- (603) 519 28568
- 46^B - Bentofix Technologies (13 tests)
Colin Murphy -- (705) 725-1938
- 47^A - Precision Laboratories, TX (13 tests)
Mike Bishop -- (866) 522-0843
- 48^B - Tenax Corporation (9 tests)
Andrew Barker -- (410) 522-7000
- 49^B - Engepol Geossinteticos (20 tests)
Carolina Polomino -- (55) 11-4166 3001
- 50^B - ADS, Inc. Hamilton (7 tests)
Terry McElfresh -- (513) 896-2065
- 51^B - Solmax International Inc. (17 tests)
Simon Gilbert St. Pierre -- (450) 929-1234
- 53^B - Polytex Inquique (13 tests)
Cristian Valdebenito -- 011 56 57 42 90 00
- 54^B - ADS, Inc. Finley (9 tests)
David Gonso -- (419) 424-8377
- 55^B - Atarfil Geomembranes (20 tests)
Iganacio Garcia Arroyo -- 34 958 439 278
- 56^B - Polytex Santiago (11 Tests)
Jamie Morales -- 56-2-627-2054
- 57^B - Ten Cate Cornelia (15 Tests)
Melissa Medlin -- (706) 778-9794
- 58^B - Propex Nashville (9 Tests)
Tim Smith -- (229) 686-5511
- 59^B - Firestone (9 Tests)
Janie Simpson -- (864) 439-5641
- 60^B - Polytex Lima (11 tests)
Elias Jurufe -- 51 16169393
- 61^B - Raven Industries (17 tests)
Justin Norberg -- (605) 335-0288
- 62^B - Solmax International Asia (14 tests)
Marie Andre Fortin -- (450) 929-1234

^AThird Party Independent ^CInstitute
^BManufacturers QC ^DGovernment

If you are interested in this program and would like a copy of the GAI-LAP directory, please advise accordingly. A directory is published annually in December, and is also kept current on GRI's Home page at <http://www.geosynthetic-institute.org>. For additional information on the GAI-LAP program contact:

George R. Koerner, Ph.D., P.E., CQA
Geosynthetic Institute
475 Kedron Avenue
Folsom, PA 19033-1208
Telephone: (610) 522-8440
Fax: (610) 522-8441
E-mail: gkoerner@dca.net

The annual GAI-LAP meeting was held in Vancouver BC, Canada in conjunction with ASTM D35 on June 18, 2009. Ten people attended representing 10 of 43 GAI-LAP labs (31%). A photograph of the group can be seen below.



Left-to-right: Sam Allen (TRI Environmental), Jim Olsta (CETCO), Gary Kolbasuk (Raven), George Koerner (GSI), Brittany Garner (Propex Inc.), Jan Wildman (Ardaman Associates Inc.), Tim Bauters (Golder Associates), James Brown (Thrace/Linq Inc.), Eric Blond (Sageos CTT Group) Jimmy Youngblood (GSE Inc.)

The results of the meeting were as follows.

1. A brief introduction and background of the GAI-LAP program was discussed.
 - (a) Program started in 1995
 - (b) Accredited only geosynthetic labs
 - (c) ISO 17025 is our model
 - (d) On-site audits (Years 1, 5, 10 etc...)
 - (e) Proficiency tests every year
 - (f) Our Goal is to get Cv < 5

The newest members are:

- Raven Industries, Sioux Falls, SD USA
- Solmax International Asia, Kuala Lumpur, Malaysia

2. The Demographics of the current GAI-LAP organizations are summarized as follows:

15	independent labs
25	manufacturer QC labs
<u>3</u>	centers (research or government)
43	total

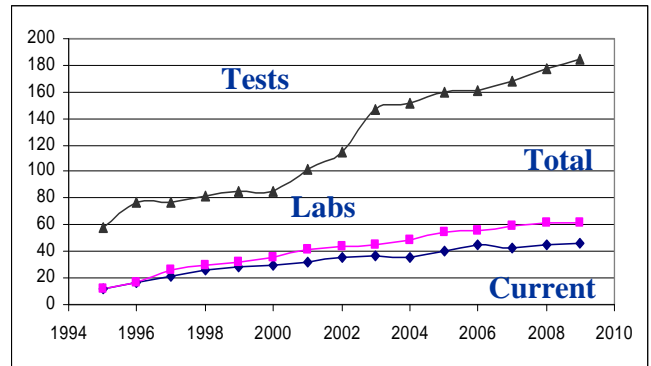
Also:

32 are GSI members
 11 nonmember labs
 (16 international labs)

There are 184 possible tests for accreditation (141 ASTM, 1 FTM, 8 GRI, 34 ISO). The number of accredited tests per lab are as follows;

5 min., 30 ave. 122 max.

The graph below shows the trends for both the number of possible accredited tests and the number of laboratories participating in the program.



The graph clearly shows that there has been a rapid rise of new test methods, with a near tripling of methods covered in a ten year period. The number of labs enrolled shows a steady increase in both overall labs and labs currently participating in the program.

3. Proficiency testing is still the hallmark of the GAI-LAP. Of the 1478 proficiency test results submitted this year, 16 first submittals were outliers representing 1.1% of the total. All outliers were resolved. Results of the proficiency tests were shared at the meeting. Electronic and hardcopy of the 2009 proficiency test results is available upon request.

The GAI-LAP proficiency test program would not function without samples to test. The GAI-LAP would like to thank the following organizations for their generous contribution of geosynthetics to this cause.

- BBA, Inc. for geotextile
- NSC Inc. for geomembrane
- CETCO Inc. for GCL
- ADS Inc. for Pipe
- GSE Inc. for geonet and geocomposite

4. The GAI-LAP Customer Survey was again sent out to all program participants and the findings were reviewed at the meeting. The results are as follows;

- (a) 27% return; following are results (5 best to 1 poorest)
- (b) Information exchange = 3.5
- (c) Conflict resolution = 4.5
- (d) Proficiency Testing = 4.2
- (e) Directory and Internet = 3.5

- (f) Overall = 3.9
- (g) Overall results to date: 2008 (4.4), 2007 (3.9), 2006 (4.0), 2005 (4.0), 2004 (4.1), 2003 (4.1), 2002 (4.2)

We had a very good year in 2009 and showed improvement across all categories. Individual comments that we find very helpful are listed below;

- Increased cost by \$500/year understood but hard felt in this tough economy
- Some labs miss hardcopy directory
- Response time is slipping
- Getting picky at audits and we are not sure that overall quality was improved by cited deficiencies

Craig Calabria and David Moreno conducted the GSI/GAI audit on January 10, 2009. Thanks to both of them for their time and effort. Highlights of the audit included the following:

- GSI is operating its lab per ISO 17011 and conducting very little testing
- Observations
 - Added new tests
 - Document Control needed updating
 - Equipment Record Update needed
 - IRM File
 - Calibration
- GSI closed all of its findings by April 11, 2008

5. Discussion about conflict resolution activities dominated the remainder of the meeting. Conflict resolutions were conducted on the following six test methods over the course of the past year;

5.1 ASTM D638 versus ASTM D6693, GM Tensile

- Specimen
- Extensometer
- Analysis of results



5.2 ASTM D1004, 90 degree tear

- Specimen preparation
- Radius needs to be uniform at 0.5 inches
- 90 degree cut needs to be sharp



5.3 ASTM D4491, Permittivity

- Specimen preparation
- Temperature correction
- Number of specimens



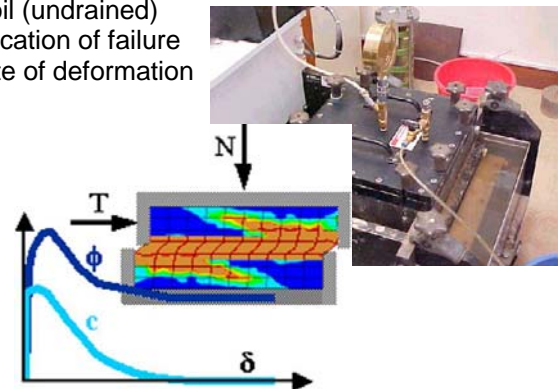
5.4 ASTM D4632, Grab tensile

- Slippage (grip wear & tear)
- Elongation (pressure)
- Analysis of data for rupture rather than break



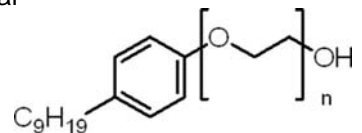
5.5 ASTM D5321, Direct Shear

- Soil (undrained)
- Location of failure
- rate of deformation



5.6 ASTM D5397, NCTL Stress Crack

- (Igepal CO 630) Nonoxynol-9, HLB 13
- Not all Igepals are equal
 - Reactivity
 - Shelf life
 - Corrosion
- Notching is still critical



6. The open discussion portion of the meeting was highlighted by the following housekeeping items:

- (a) The next GAI-LAP annual meeting will be held in June 2010 in conjunction with ASTM D-35.
- (b) GAI solicited manufacturers for geosynthetic materials for 2010 proficiency testing.
- (c) GSI requests a volunteer auditor for 2010.
- (d) Note that each lab can add up to seven tests per year.
- (e) Invoices need to be paid prior to sending results and the accreditation certificate.
- (f) The directory is kept current on our home page:

www.geosynthetic-institute.org

It is a pleasure working with you and thanks for participating in the GAI-LAP program. If you have questions, please contact accordingly.

George Koerner

Activities within GCI (Certification)

Due in part to the active interest by many GSI members and associate members we present a tabular summary of the Inspectors Certification Program as of November, 2008. The table following gives the pass/fail statistics by year as well as insight as to the impact of taking a course before the written examination. In looking at the data it appears as though we are not “teaching-the-exam”.

Inspector Certification Test Results
2006 – 2009

Year	Geosynthetic Materials		Compacted Clay Liners		Comment ary
	No. of people taking exam	No. of people failing exam	No. of people taking exam	No. of people failing exam	
2006	141	5 (3%)	128	12 (9%)	2 (1.5%)
2007	82	11 (13%)	73	12 (16%)	7 (8.5%)
2008	95	25 (25%)	89	20 (23%)	13 (14%)
2009	26	6 (23%)	24	2 (8%)	2 (8%)
TOTAL (to date)	344	47 (14%)	314	46 (15%)	24 (7%)

The GSI Affiliated Institutes

It has long been realized that the information generated within the GSI group should have a timely outlet to all countries, and in all languages. To this end, GSI has created affiliated institutes in two countries (Korea and Taiwan), and potentially others in the future. These affiliated institutes are full members of GSI and are empowered to translate and use all available information so as to create similar institutes and activities in their respective countries.

GSI-Korea was formed on February 9, 1998 as a collaborative effort between FITI Testing and Research Institute (a quasi-government organization) and INHA University (through its Geosynthetics Research Laboratory).

FITI is a 30-year old testing organization located in Seoul focusing on interlaboratory proficiency; environmental protection; safety and flammability; hazardous substances; in-house quality control; consumer protection; complaint analysis; quality marking; procurement; household and industrial applications; and materials approval. The geosynthetics testing group within FITI has twelve people (two with doctoral degrees) and 10 engineers. The geosynthetic laboratory is GAI-LAP accredited for 70 geosynthetic test methods. Dr. Jeonghyo Kim is the general manager within FITI's geosynthetics activities.

INHA University is located in Incheon and the geosynthetics laboratory is led by Professor Han-Yong Jeon. Dr. Jeon has 10-students working on geosynthetic-related projects and is extremely active both nationally and internationally.

GSI-Taiwan was formed on August 18, 2000 and is wholly contained within the National Pingtung University of Science and Technology in Nei Pu, Pingtung (southern Taiwan). It completely parallels GSI in that it has specific units for research, education, information, accreditation and certification. The Director is Dr. Chiwan Wayne Hsieh who is a Professor in the Department of Civil Engineering and Dean of the Computer Center. GSI-Taiwan has an Taiwanese consortium of geogrid/geotextile manufacturers who work toward producing quality products according to the draft GRI geogrid specifications and the associated test methods. As such, GSI-Taiwan is a GAI-LAP accredited laboratory for 32 geosynthetic test methods. Dr. Hsieh has 10-students working on geosynthetic-related projects and is extremely active nationally and internationally. GSI Taiwan has hosted two very successful conferences to date and has plans for another, followed by a broader conference for Southeast Asia.

Items of Interest

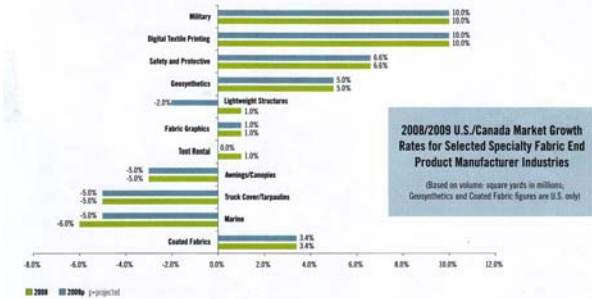
1. Engineering Salaries Continue to Rise Despite Recession

A salary survey released in June by ASCE in conjunction with the National Society of Professional Engineers (NSPE) and the American Society of Mechanical Engineers (ASME) reveals that, despite the precarious state of the nation's economy, the salaries of engineers continue to reflect a positive trend that began in 2005.

According to the 2009 report, the highest median income of full-time salaried engineers are earned by those working in petroleum engineering (\$127,500), corrosion engineering (\$119,500), minerals and metals engineering (\$118,250), cost management (\$116,000), materials engineering (\$115,000), nuclear engineering (\$114,000), and systems engineering (\$111,000). A number of disciplines have seen increases over the past year. Coastal engineers earned a surprising 24.2 percent more, geotechnical engineers earned 12.2 percent more, structural engineers 11.8 percent more, civil engineers 9 percent more, transportation engineers 7.5 percent more, and environmental engineers 7 percent more. Unfortunately, the report reveals that forensic engineers earned 8.9 percent less than in 2008. (ref. *Civil Engineering*, Aug. 2009)

2. Fabric Usage

A survey conducted in fall 2008 by IFAI with its U.S. end-product manufacturer members revealed some interesting results. Almost half (45 percent) of all manufacturer respondents reported favorable sales in the first half of 2008 compared to the first half of 2007. In the second half of 2008, as the economy slowed, only 39 percent of respondents reported favorable sales compared to the second half of 2007. In response to the economic developments over the past six months, the majority of respondents reported that they will maintain their current staff levels until they see the economy improve. (ref. *Review Magazine*, March, 2009)



3. A Water Warning

Peter Brabek-Letmathe, chairman of Nestlé, argues that water shortage is an even more urgent problem than climate change. Water withdrawals for agriculture continue to increase rapidly. In some of the most fertile regions of the world (e.g., America, southern Europe, northern India, north-eastern China) overuse of water, mainly for agriculture, is leading to sinking water tables. Groundwater is being withdrawn, no longer as a buffer over the year, but in a structural way, mainly because water is seen as a free good. He is convinced that, under present conditions and with the way water is being managed, we will run out of water long before we run out of fuel. (ref. *The Economist*, Aug. 2009)

Continuing Education and PDH's

Jamie Koerner has just completed a survey of individual states in the USA regarding their regulations for continuing Professional Engineering (P.E.) licensure. They include the obtaining of annual professional development hours, or PDH's. The following table presents the information. Incidentally, a one-hour Webinar counts for 1.0 PDH unit. the survey is as follows:

States requiring PHD's = 31 (62%)
 States not requiring PHD's = 19 (38%)

No. of States Requiring
 4 PDH's/year = 1 (3%)
 12 PDH's/year = 5 (15%)
 15 PDH's/year = 25 (81%)

Required Professional Development Hours (PDHs) by State

(for specific comments on each state contact Jamie at jrkoerner@verizon.net)

State	Requirements
Alabama	15 PDH/year
Alaska	24 PDH biennially
Arizona	none
Arkansas	15 PDH biennially (30 PDH in 2011)
California	none
Colorado	none
Connecticut	none
Delaware	none
Florida	8 PDH biennially
Georgia	30 PDH biennially
Hawaii	none
Idaho	none
Illinois	30 PDH biennially
Indiana	none
Iowa	group 1 – 30 PDH biennially group 2 – 10 PHD for independent study
Kansas	30 PDH biennially
Kentucky	none
Louisiana	30 PDH biennially
Maine	30 PDH biennially
Maryland	none
Massachusetts	none
Michigan	none
Minnesota	24 PDH biennially
Mississippi	15 PDH/year
Missouri	30 PDH biennially
Montana	30 PDH biennially
Nebraska	30 PDH biennially

Nevada	30 PDH biennially
New Hampshire	30 PDH biennially
New Jersey	none
New Mexico	30 PDH biennially
New York	36 PDH triennially
North Carolina	15 PDH/year
North Dakota	30 PDH biennially
Ohio	15 PDH/year
Oklahoma	30 PDH biennially
Oregon	30 PDH biennially
Pennsylvania	12 PDH biennially (24 PDH in 2012)
Rhode Island	none
South Carolina	30 PDH biennially
Tennessee	24 PDH biennially
Texas	15 PDH/year
Utah	24 PDH biennially
Vermont	none
Virginia	none (will be required 2010)
Washington	none
West Virginia	15 PDH/year
Wisconsin	none
Wyoming	30 PDH biennially

Upcoming Events

- November 2-4, 2009
ASCE Geotechnical Conference Hershey, PA
Contact: cbeenenga@gfnet.com
- November 10-11, 2009
Geosynthetics in the Middle East Dubai, UAE
Contact: www.geosyntheticssociety.org
- December 7-8, 2009
GSI Courses on Design and QA/QC
Folsom, PA
Contact: mvashley@verizon.net
- January 27-29, 2010 ASTM Committee D35
San Antonio, TX
Contact: csierk@astm.org
- January 28, 2009
GSI Annual Meeting
San Antonio, TX
Contact: mvashley@verizon.net
- January 29, 2009
GSI BoD Meeting
San Antonio, TX
Contact: mvashley@verizon.net
- February 3, 2010
AES Workshop
Los Angeles, CA
Contact: kkhilnani@aesciences.com
- February 19, 2010
CETCO Workshop
Chicago, IL
Contact: tim.rafter@cetco.com

- March 22-23, 2010
GSI Courses on Design and QA/QC
Folsom, PA
Contact: mvashley@verizon.net
- September 15-16, 2010
GCL Conference Wurzburg, Germany
Contact: robert.koerner@coe.drexel.edu
- May 17-19, 2010
N.Y. Federation Waste Conference
Sagamore, New York
Contact: www.nyfederation.org
- November 23-25, 2010
IGS Asia
Taiwan
Contact: cwh@mail.npust.edu.tw
- March 1-16, 2011
GeoFrontiers II
Dallas, TX
Contact: tvindemann@ifai.com

GSI's Member Organizations

We sincerely thank all of our sponsoring organizations. Without them, GSI simply could neither happen nor exist. The current GSI member organizations and their contact members are listed below. The newest member organizations are; Plasticos Agricolas y Geomembranes, S.A.C. of Peru with Marino Gomez Montoya as the contact person; Afitex-Textel with Pascal Saunier as contact person; and EVAL Americas (Kararay) with Robert Armstrong as contact person. The newest associate member organization is the Philadelphia Water Department with Vahe Hovsepian as the contact person. Thanks to all and welcome to GSI.

GSE Lining Technology, Inc.

Boyd Ramsey [BoD]

AECOM

Kevin McKeon/Ken Bergschultz/John Trast

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Vahe Hovsepian

IN THE NEXT ISSUE

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- Overview of GRI (Research) Projects
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- Progress within GEI (Education)
- Activities within GAI (Accreditation)
- Activities within GCI (Certification)
- The GSI Affiliate Institutes
- The GSI Centers-of-Excellence
- Items of Interest
- "Webinars: The Educational Vehicle of the Future???"
- GSI's Member Organizations