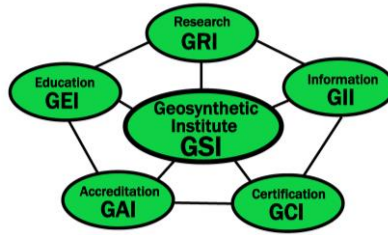


# The GSI Newsletter/Report



## Geosynthetic Institute

**Vol. 38, No. 3**

**September, 2024**

This quarterly newsletter, now in its 36<sup>th</sup> 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](http://www.geosynthetic-institute.org). It also serves as a quarterly report to its member organizations. Details are available by contacting George R. Koerner or Jamie Koerner at phone (610) 522-8440; or e-mail at [gsigeokoerner@gmail.com](mailto:gsigeokoerner@gmail.com) or [Jamie@geosynthetic-institute.org](mailto:Jamie@geosynthetic-institute.org)

### Activities of GSI's Officers and Board of Advisors (BOA)

#### 2024-2026 Board of Advisors

The following are the names of the current BOA members and their contact information. We thank them for their time and advice on matters concerning the Geosynthetic Institute.

#### Term Ends 2024

- Burrill (Bo) McCoy - Waste Management Inc. (Owners and Operators)  
e-mail: [bmccoy2@wm.com](mailto:bmccoy2@wm.com)
- Rene Laprade - Solmax Geosynthetics (Geotextiles and Geogrids)  
e-mail: [r.laprade@solmax.com](mailto:r.laprade@solmax.com)
- Sam Allen – TRI Environmental Inc. (Test Laboratories)  
e-mail: [Sallen@tri-env.com](mailto:Sallen@tri-env.com)

#### Term Ends 2025

- Henning Ehrenberg – NAUE GmbH & Co. KG (International-1)  
email: [hehnenberg@naue.com](mailto:hehnenberg@naue.com)
- Miranda Rine – C.P. Chemical (Resin and Additives Group)  
email: [Miranda.rine@cpchem.com](mailto:Miranda.rine@cpchem.com)
- David Carson – U.S. EPA (Agencies)  
email: [carson.david@epa.gov](mailto:carson.david@epa.gov)

#### Term Ends 2026

- Henry Mock – WSP (Consultants)  
email: [henry.mock@wsp.com](mailto:henry.mock@wsp.com)
- Anthony Johnson – Agru America Inc. (Barrier Group)  
email: [ajohnson2@AgruAmerica.com](mailto:ajohnson2@AgruAmerica.com)
- Jacek Kawalec – Tensar (International - 2)  
e-mail: [Jacek.Kawalec@vp.pl](mailto:Jacek.Kawalec@vp.pl)

GSI continues to have virtual quarterly meetings with the Board of Advisors via Zoom. The 3Q BOA meeting was held on September 30, 2024. Fellowship Awards were finalized, along with discussion about the transition plan for GSI. The 13-member Ad Hoc Committee will meet again on October 7 to discuss the six proposals received and decide which proposals will be selected for an oral presentation.

#### IN THIS ISSUE

- Activities of GSI's Officers and BOA
- Overview of GRI (Research) Projects
- Progress within GII (Information)
- Progress within GEI (Education)
- Activities within GAI (Accreditation)
- Activities within GCI (Certification)
- The GSI Affiliate Institutes
- GSI's Member Organizations

# Overview of GRI Projects (Research)

The following projects are all funded by GSI membership dues unless specifically noted. Most are long-term projects for which we are well positioned to accomplish. In an attempt not to repeat information in the quarterly newsletters, we will merely list the ongoing projects and new research details. Please contact George or Grace if you have advice or concerns.

George Koerner ([gsigeokoerner@gmail.com](mailto:gsigeokoerner@gmail.com))  
 Grace Hsuan ([hsuanyg@drexel.edu](mailto:hsuanyg@drexel.edu))

## 1. Durability of Geosynthetics (15 materials)

Durability of Exposed Geosynthetics (GM, GT, GG, HPTRM, Turf, WD & GCCM) GSI is using two outdoor exposure racks and six UV fluorescent devices to estimate the projected exposed lifetime of a litany of different geosynthetics. We currently have 15 geosynthetic materials under investigation. The goal of the study is to quantitatively illustrate the durability of these materials and to correlate outdoor exposure to accelerated weathering. In addition, we are tasked with conducting lifetime prediction of many geosynthetics using time temperature superposition via Arrhenius modeling.



## 2. GRI GM 40, 41 and 42 “New HDPE Specification for Extreme Conditions

New HDPE Specification for Extreme Conditions (GRI GM-42). This specification is accompanied by two practices, (1) GRI GM-40 “Preparation of Film for Accelerated Oxidation Resistance Testing of Polyolefin Geomembranes.” This practice is intended for the preparation of thin film samples used for determining an accelerated assessment of product durability in order to reduce the time necessary to assure specification compliance. (2) GRI GM-41 “Accelerated Oxidation Resistance Testing of Polyolefin Geomembranes.” This practice is largely informed by the use of procedures found in ISO 13438. This practice employs a series of oxidation resistance experiments using a two-phase approach. Phase 1 involves a water leaching procedure (GRI GM-40) and then Phase 2 involves oven, QUVA or chlorine aging. This specification has been in the works since 2018. We finally feel that we are close to a finished practice.

## 3. Silt Fence Test Methods

New test methods for determining the Connection Strength of Silt Fences: Procedure “A” Compression (simulates forces from water loading) and Procedure “B” Tension (simulates forces from construction and wind). This is a very common application for geotextiles seen on most construction sites. The purpose of a silt fence is to retain the soil on disturbed land (Figure 1a & 1b), such as a construction site, until the activities disturbing the land are sufficiently completed to allow revegetation and permanent soil stabilization to begin.

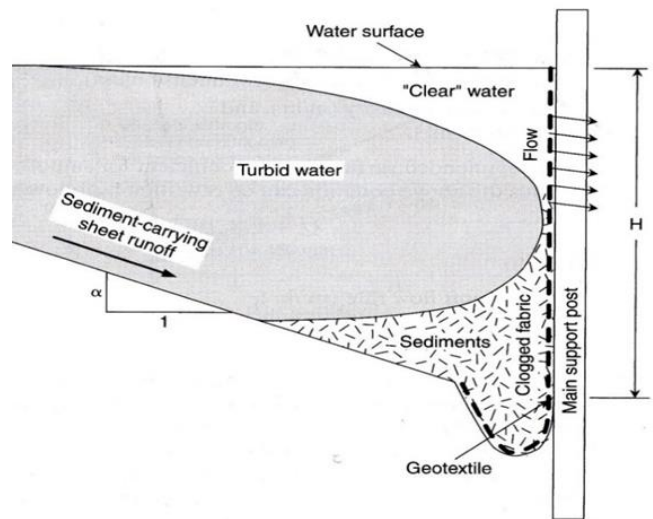


Figure 1a: Cross section of geotextile silt fence with the suggested manner in which system functions (ref. R. Bell USFS 1979)

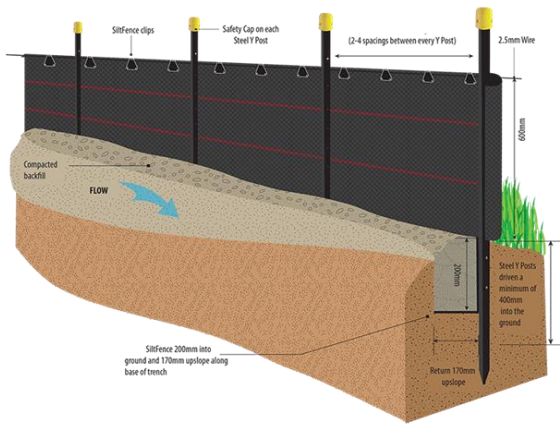


Figure 1b: Isometric view of geotextile silt fence showing proper installation

Silt fences work by using the force of gravity to slow down the flow of runoff. As the turbid water flows through the geotextile of the silt fence, it clogs the geotextile and builds a progressive dam. Hence the silt fence is designed base on the geotextile strength and the strength of the connections to the main support posts.

There are two existing test method for silt fences within ASTM. They are ASTM D5141 Standard Test Method for Determining Filtering Efficiency and Flow Rate of the Filtration Component of a Sediment Retention Device and ASTM D7351 Standard Test Method for Determination of Sediment Retention Device (SRD) Effectiveness in Sheet Flow Applications. However, neither of these methods specifically address the connection strength of the geotextile to the main support post.

Connection Strength of Silt Fences: Procedure "A" Compression. This procedure challenges the silt fence system in a performance configuration and simulates forces from water loading. As seen in Figure 2, one uses a full width 36" specimen configured on a CRE equipped with rigid grip attachments of a pair of 3" diameter PVC tubes. There is no grip separation and the speed for the test is 1"/min. Results for this procedure are shown in Figure 3.



Figure 2: Compression Test

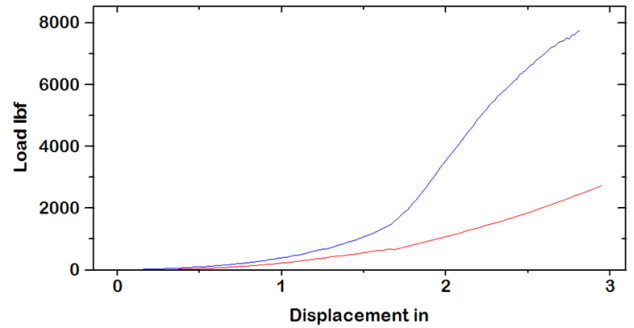


Figure 3: Results of Compression Test

Connection Strength of Silt Fences: Procedure "B" Tension. This procedure simulates forces from construction and wind. As seen in Figure 4, once again a full width 36" specimen configured on a CRE equipped with a pair of grip attachments. The grip separation is generally one foot and the speed for the test is 1"/min.

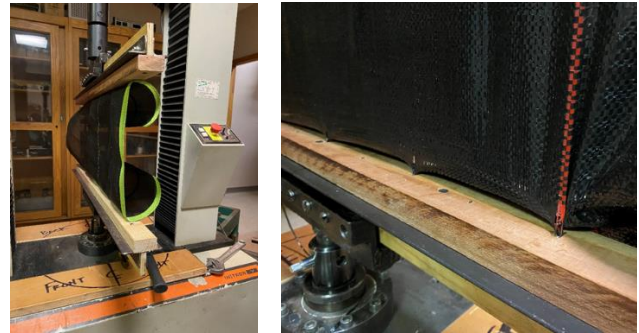


Figure 4: Tension Test

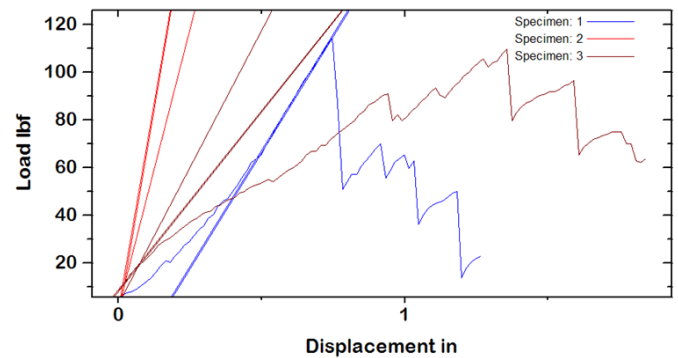


Figure 5: Results of Tension Test

This procedure challenges the wood (or metal)-staple (hog ring)-fabric connection. It again uses a CRE device equipped with a pair of very wide (3') grips. Not that the upper grip has a universal on the top 36-inch-wide grip which removes eccentricities and distributes the load. The type and number of staples are per manufactures recommendations. The grip separation 12 inches and the test are run on CRE at Speed = 1"/min.

#### 4. GeoMat Specification

The Geosynthetic Institute (GSI) has a long history of creating industry wide generic specifications for geosynthetics. At present, we have twenty-three promulgated and three others under development. Like all engineered materials, geosynthetics need general requirements/thresholds to incorporate into plans and specifications. GSI has a new GeoMat specification entitled GRI-GS35 Standard Specification for "Test Methods, Required Properties and Testing Frequency for Geomats Drainage Composites". This specification covers open three-dimensional mats and composite structures. Geomats are constructed of continuous polymeric fibers that are fused where they intersect. They can be used in a multitude of applications from drainage, erosion control and reinforcement applications. Both polypropylene and polyamide GeoMats are covered in the specification. These cores can be married to a geotextile filter on one or both sides to form a drainage geocomposite. Such materials combine drainage, protection and filtration all in one product. The specification addresses the use of GeoMat's in drainage applications. Our next effort will address the use of GeoMat's in erosion control applications.



Fig 1—Polypropylene Geomat with geotextile

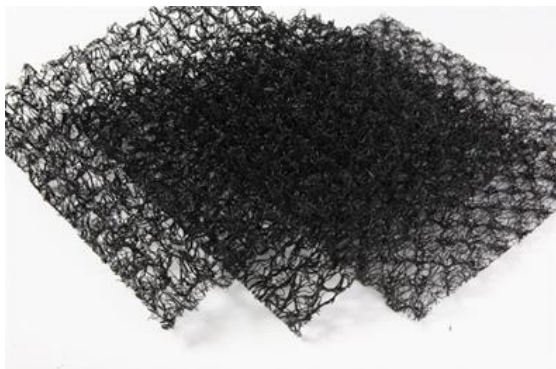
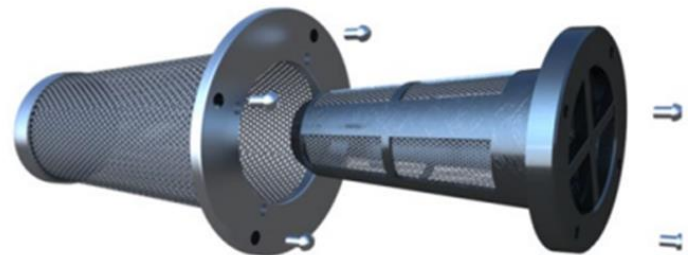


Fig 2—Polyamide Geomat with egg carton shape core

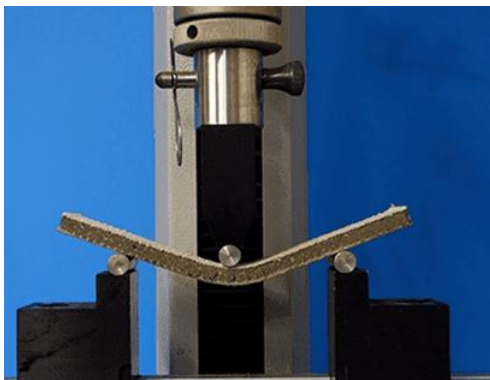
#### 5. JET Filter Test Method and Specification

Earth retaining structures, such as seawalls, bulkheads, bridge abutments and retaining walls, require proper drainage. Inevitably, hydrostatic water pressure builds up behind such walls over time. Without proper drainage, the wall will subsequently become distressed and possibly experience failure. Maintainable weep hole filters will extend the life of any new or existing structure. JET Filters have proven to be a maintainable weep hole system for both new construction and retrofits of old infrastructure. They consist of a cage and a removable geotextile cartridge for easy operations and maintenance. GSI is writing a new test method to evaluate these products over time. The long-term flow test is a bit tricky because it deals with partially saturated flow rather than our conventional Darcian flow. However, this is how the product works in the field. After the long-term flow test method has been promulgated, we will start work on a specification for this innovative product there after.



## 6. Arrhenius Modeling and Freeze-Thaw Cycling of GCCM's

We are now doing freeze thaw durability testing of Geosynthetic Concrete Composite Materials (GCCM's). Freeze-thaw testing, also known as freeze-thaw stability testing, is a process that subjects materials to repeated cycles of freezing and thawing to evaluate their stability and durability. This method is used in a variety of industries, including geosynthetics. Freeze-thaw weathering occurs when porosity within the GCCM allows water to infiltrate into it. Water enters cracks in the GCCM, when temperatures drop, the water freezes and expands causing cracking and weakening of the material. We are testing four different materials and monitor the flexural performance (ASTM D8058) of each GCCM over time by comparing the retained flexural strength.



## 7. Stress Cracking versus Strain Hardening Modulus

Traditionally, high-density polyethylene (HDPE) geomembranes are checked for stress crack resistance using the ASTM D5397 single point-notched constant tensile load (SP-NCTL). This test uses notched specimens, surfactant, and elevated temperatures to accelerate the behavior and force a brittle failure in HDPE geomembranes. With today's high stress crack resistant HDPE resins, the SP-NCTL test can now take thousands of hours. In short, this is too long for efficient manufacturer quality control. What is needed is an extremely fast method for determining the stress crack susceptibility of HDPE geomembranes.

Strain hardening modulus (SHM) testing procedures provide hope for the future in this regard. Test methods GRI GM-33, ISO 18488 and EN 17096 all generate a modulus between yield and break. The steeper the slope of the tail end of the stress strain curve (i.e., SHM) the more resistance the HDPE geomembrane to stress cracking. We are currently developing relationships between SHM and conventional stress crack testing. Work is proceeding nicely and we should have findings by the end of the year.

As a side note, it appears that CEN has arrived a replacement surfactant for the stress crack test by way of an extensive international round robin. Dr. Jan Retzlaff and his team has identified ROKAnol IT 10 manufactured by BASF as a substitute surfactant to IGEPOL CO-630. You may recall that the current surfactant (IGEPOL CO-630) for ASTM D5397 is no longer REACH compliant. REACH is a regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals. This is great news for all of us and the environment.

## Progress within GII (Information)

The bylaws are available to anyone upon request.

As you can see by the listing below, we are still disseminating a lot of new information at the institute.

- GRI Methods, Specifications, Guides & Practices
- Quarterly Newsletters
- White papers
- GSI Website
- Bimonthly GMA Techline
- Bimonthly GSI News Column in Geosynthetics Magazine
- Conference Papers
- GRI Reports

## IGS Geosynthetic Handbook

George R. Koerner, editor of the IGS handbook, has submitted the Second draft of the handbook. It is now being reviewed by the IGS handbook committee. This handbook will be a living document that will continue to evolve over time, updating as new information and technologies develop. This practical text is intended to serve as a general reference document in the field of geosynthetics. Polymeric construction materials used in civil applications are now commonly accepted as solutions to geotechnical and environmental engineering challenges. This handbook offers a comprehensive overview of geosynthetics and their

various applications. The chapter breakdown is as follows

- I **Introduction to Geosynthetics**
- II **Geosynthetics in Roads and Pavements**
- III **Geosynthetics in Subsurface Drainage/Water Storage**
- IV **Geosynthetics in Erosion and Sediment Control**
- V **Geosynthetics in Reinforced Soil Systems**
- VI **Geosynthetics in Seepage Control Systems**
- VII **Geosynthetics in Environmental Protection**
- VIII **Geosynthetics Support Systems**
- IX **References / Links**

We will keep you updated on the progress of the handbook, which is targeted for release by the end of 2024.

#### **Geosynthetic Institute's upcoming Activities:**

- Ad Hoc Committee Meeting – October 7
- ACIGS webinar – Oct 8
- BTRA Mumbai India - Oct 14
- Audits in Thailand and Taiwan - Nov 11-15
- Geostructures Conference Pittsburg -Nov 19
- U of Chicago webinar presentation – Dec 5
- Cooley Audit in Canada
- ICCGE Geotechnical Meeting Dec 11-12



Nathalia Castro and Bryon Hamilton visit GSI

#### **Members Only Section on Website**

Accessible with a members-only password. Your contact person/persons (names listed beneath member company) must obtain a password from Jamie Koernerto access the members-only section of the Geosynthetic Institute website. Jamie can be reached by e-mail at [Jamie@geosynthetic-institute.org](mailto:Jamie@geosynthetic-institute.org). When you get into

this members-only section, the following information is then available.

- **GRI Test Methods (all)**
- **GRI Reports**
- **GRI Technical Papers (419 Citations)**
- **Notes of GSI Meetings**
- **Links to the GSs World**
- **Keyword Search for Generic Papers**
- **Example Problems**
- **Frequently Asked Questions (FAQs)**

#### **GRI Reports**

To date, we have 48 GRI Reports available to members and associate members. Access to these reports are in the password protected section of the GSI website at [www.geosynthetic-institute.org/member/reports.html](http://www.geosynthetic-institute.org/member/reports.html). Non-members can purchase the reports from the online GSI bookstore. There are 45 Whitepapers which are free to everyone.

### **Progress within GEI (Education)**

#### **Robert and Mitchell Landreth “Steward of the Environment” Award**



Dr. Fady Badran Abdelaal

We are pleased to announce that the Geosynthetic Institute's Board of Advisors (BOA) have chosen Dr. Fady Badran Abdelaal as the 2024 Landreth Award recipient. Dr. Abdelaal is an assistant professor with the Department of Civil Engineering (Smith Engineering) at Queen's University, located in Kingston Ontario, Canada. Dr. Abdelaal is currently teaching and doing research that is geoenvironmental related. Congratulations to Dr. Abdelaal!

#### **GSI Fellowships - 2024**

For the 2024-2025 academic year, the Geosynthetic Institute received 30 proposals for fellowships related to various topics involving geosynthetics. We thank all University professors and students who submitted proposals for their time and effort.

The BOA reviewed and graded all proposals on a scale of 1 (poor) to 10 (Excellent). There were 17 proposals with a score of 5 or higher, which met the funding criteria. This year, a total of \$85,000 was given to support research related to geosynthetics. The 17 graduate students listed below have been chosen to receive this year's GSI \$5000 Fellowship Award.

### 2024-2025 Fellowship Recipients

STUDENT	RESEARCH TOPIC	PROFESSOR	UNIVERSITY
G. Tavakoli Mehrjardi	Probability and rate of microplastics	Wichtmann	Ruhr U, Germany
Asad Ahmad	GG-reinforced MSE wall with horizontal obstructions	Bodet	Purdue U
Hanzi Zhao	Effect of Hydration Conditions on Shear Strength of HDPE GM and GCL interface	Tian	George Mason U
Ashray Saxena	GS reinforcement reducing asphalt overlay thickness	Zornberg	U of Texas at Austin
Wei Sun	Smart GT for Real Time soil monitoring through AI	Zhang	U of Mass Amherst
Sufal Biswas	Evaluation of GG reinforced soil at bridge abutment with pile foundation	Sasanakul	U of South Carolina
Shanmukha S.A. Gonnabathula	Performance Eval. Of Wicking Geotextile in Enhancing Unpaved Pavements	Puppala	Texas A&M
Leonardo V. Paixao Daciolo	Effect of PFAS solution on GM service life	Rowe	Queen's U, Canada
Jose Wilson Batista da Silva	Effect of the welding quality and GM thickness on long-term performance of HDPE fusion seams	Rowe	Queen's U, Canada
Abdalla Abouyoussef	Effect of Homogenization and Dissection approaches on the Standard OIT of Multilayered GM	Abdelaal	Queen's U, Canada
Kasra Salemi Kouchesfahani	Physical Modelling of GS waste Covers under Differential Settlement	Brachman	Queen's U, Canada
Candas Oner	Modeling based design & optimization of Spider-web inspired GG in composite Geomaterials systems	Frost	Georgia Institute of Technology
Emre Duman	A novel multi-functional experimental setup to assess GG and aggregate interaction etc.	Frost	Georgia Institute of Technology
Mozaher Ul Kabir	Moisture Reduction in Unsaturated Soils with High Fines Contents using Wicking GT	Han	U of Kansas
Andrea Maria Pereira Vieira	Mechanism Evaluation of GS Encased Column-Supported Embankments with Basal Reinforcement etc.	Portelinha	UFSC, Brazil
Karolina Maria dos Santos	Milling aspects of GS reinforced pavements and the influence of G-RAP on recycled asphalt mixtures	Correia	UFSC, Brazil
Fatih Polat	Influence of Anion Type, Cation Exchange, & Temp. on Membrane Behavior and Diffusion in GCL	Lord	Villanova U

Congratulations to all Geosynthetic Institute 2024-2025 Fellowship Recipients!

## Webinars – Prerecorded

The following prerecorded webinars are available to purchase on our website. The GSI webinars (1 ½ hours in duration) cover a large variety of topics related to geosynthetics.

[www.geosynthetic-institute.org/webinar.htm](http://www.geosynthetic-institute.org/webinar.htm)

GSI 1	"A Data Base and Analysis of 320 Failed MSE Walls With Geosynthetic Reinforcement"
GSI 2	"MSE Wall Back Drainage Design"
GSI 3	"MSE Wall Remediation and Monitoring"
GSI 4	"MSE Wall Inspection"
GSI 5	"Geosynthetics in Hydraulic Applications"
GSI 6	"Geosynthetic Applications Used in Heap Leach Mining"
GSI 7	"Geosynthetics in Agriculture and Aquaculture"
GSI 8	"Geosynthetics Applications in the Private Sector"
GSI 9	"Behavior and Analysis of Twenty Solid Waste (Landfill) Failures"
GSI 10	"Wet (Bioreactor) Landfills for Rapid Degradation of MSW Organics"
GSI 11	"Lateral and Vertical Expansions Over Old and Existing Landfills"
GSI 12	"Landfill Covers: Past, Present, Emerging"
GSI 13	"Beneficial Uses of Abandoned and/or Closed Landfills"
GSI 14	"Lifetime Predictions of Covered and Exposed Geosynthetics"
GSI 15	"In-Situ Stabilization of Soil Slopes Using Nailed (or Anchored) Geosynthetics"
GSI 16	"Sand Drains-to-Wick Drains-to-Sand Columns (Including a Major Failure Case History)"
GSI 17	"Geosynthetics in Erosion Control"
GSI 18	"Pond Liner Design and Performance"
GSI 19	"Wave (or Wrinkle) Management [For Proper Deployment of GM]"
GSI 20	"Geosynthetic Drainage Materials: Applications, Design, Installation and Performance"
GSI 21	"A Brief Overview of Geosynthetics and Their Major Applications"
GSI 22	"Geosynthetic Reinforced MSE Walls; Overview, Failures and Items for Improvement"
GSI 23	"Geosynthetic Filters: Concerns and Issues"
GSI 24	"Disposal of Coal Combustion Residuals"
GSI 25	"Soil Consolidation by Wick Drains, aka PVDs"
GSI 26	"Applications and Design of Geotextile Tubes"
GSI 27	"Stability Design of Landfill Cover Soils"
GSI 28	"Geomembrane Puncture"
GSI 29	"QA/QC of Geosynthetics"
GSI 30	"Lifetime Durability of Geosynthetics"
GSI 31	"Laboratory Testing of Geosynthetics"
GSI 32	"Sustainability with Geosynthetics"
GSI 33	"Ultraviolet Resistance of Geosynthetics"
GSI 34	"Geosynthetics in Roadways"
GSI 35	"Geosynthetics used in Canal Linings"
GSI 36	"Geosynthetics as Hydraulic Barriers"

Each webinar provides 1.5 Professional Development Hours available upon completion of a short quiz

GSI Members Cost - \$200  
(unlimited number of attendees for GSI Members)  
Nonmembers Cost - \$250

## Courses

The following pre-recorded courses are available through our online bookstore to both members and non-members.

1. Quality Assurance/Quality Control of Geosynthetic in Waste Containment Facilities  
(Recordings are available)
2. Construction Inspection of Mechanically Stabilized Earth (MSE) Walls, Berms and Slopes  
(Recordings are available)

The third and newest of GSI courses is an On-Line "Designing with Geosynthetics (DwG)" course. Please go to [www.geosynthetic-institute.org/courses.htm](http://www.geosynthetic-institute.org/courses.htm) and scroll down to Course #3. Here you will see the requisite details. The course itself is completely synchronized with the 6<sup>th</sup> Edition of the DwG textbook. It consists of 1540 slides with ~ 18 hours of voice over; about one minute for each slide.

Contact Jamie Koerner at [jamie@geosynthetic-institute.org](mailto:jamie@geosynthetic-institute.org) if you want additional information.

## Activities within GAI (Accreditation)

The GAI-LAP program continues to grow steadily with much interest internationally and with the proficiency test program (PTP)

- Began in 1995 w/ISO 17025 as model.
- GSI operates under 17011.
- 123 labs, 24 different countries, 265 possible tests

There are nine (9) laboratories currently going through the process of becoming a GAI-LAP accredited lab. Audits have either just been completed or will be taking place before end of 2024. Cooley Group (USA and Canada) have 4 labs, Huikwang Corporation-Huitex (Taiwan), Sinopec Research Institute (China), Ober S.A. Industria E Comercio (Brazil), Sintepol Servicios E Laboratorio (Brazil) and APEC Industries Composite Polymeric Materials (UAE).



Yafang Zhuang (Sinopec) and George Koerner

On August 28, George Koerner traveled to Beijing China to audit the laboratory of the Sinopec Research Institute of Chemical Industry Co. Ltd., located in Beijing, China. Sinopec is one of the labs currently seeking accreditation with GAI-LAP.

The following laboratories are accredited by the GAI-LAP for the number of test methods listed in parenthesis.

- |   |  |
|---|--|
| <p>1<sup>A</sup> - TRI/Environmental Inc. (158 tests)<br/>Jarrett Nelson -- (512) 263-2101<br/><a href="mailto:jnelson@tri-env.com">jnelson@tri-env.com</a></p> <p>3<sup>A</sup> - WSP (43 tests)<br/>Henry Mock -- (770) 492-1893<br/><a href="mailto:Henry.Mock@wsp.com">Henry.Mock@wsp.com</a></p> <p>4<sup>C</sup> - Geosynthetic Institute (108 tests)<br/>George Koerner -- (610) 522-8440<br/><a href="mailto:gsigeokoerner@gmail.com">gsigeokoerner@gmail.com</a></p> | <p>8<sup>B</sup> - Solmax Geosynthetics (Propex) - Ringgold (18 tests)<br/>Todd Nichols -- 438-553-3757<br/><a href="mailto:tnichols@solmax.com">tnichols@solmax.com</a></p> <p>9<sup>B</sup> - Lumite (17 tests)<br/>Rebecca Kurek -- (770) 869-1787<br/><a href="mailto:rkurek@lumiteco.com">rkurek@lumiteco.com</a></p> <p>13<sup>A</sup> - Precision Geosynthetic Labs (TRI Env.) (77 tests)<br/>Chad Blackwell -- (714) 520-9631<br/><a href="mailto:cblackwell@tri-env.com">cblackwell@tri-env.com</a></p> <p>14<sup>A</sup> - Geotechnics (55 tests)<br/>J. P. Kline -- (412) 823-7600<br/><a href="mailto:JPkline@geotechnics.net">JPkline@geotechnics.net</a></p> <p>20<sup>A</sup> - GeoTesting Express, MA (63 tests)<br/>David Norton - (978) 635-0424<br/><a href="mailto:dnorton@geotesting.com">dnorton@geotesting.com</a></p> <p>22<sup>B</sup> - CETCO Hoffman Estates (11 tests)<br/>Minerals Technologies Inc.<br/>Dennis Wind -- (847) 851-1904<br/><a href="mailto:Dennis.wind@mineralstech.com">Dennis.wind@mineralstech.com</a></p> <p>24<sup>B</sup> - CETCO Lovell (12 tests)<br/>Minerals Technologies Inc.<br/>Ryan Nicholls -- (307) 548-6521<br/><a href="mailto:Ryan.Nicholls@mineralstech.com">Ryan.Nicholls@mineralstech.com</a></p> <p>25<sup>B</sup> - Solmax (TenCate), Pendergrass (13 tests)<br/>Randy Johnson-- (706) 693-2226<br/><a href="mailto:rjohnson@solmax.com">rjohnson@solmax.com</a></p> <p>26<sup>B</sup> - Agru America Inc. (27 tests)<br/>Vicky Bryant-- (843) 546-0600<br/><a href="mailto:Vbryant@AgruAmerica.com">Vbryant@AgruAmerica.com</a></p> <p>29<sup>E</sup> - FITI Testing and Research Institute (80 tests)<br/>Hang Won-Cho -- 82-2-3299-8071<br/><a href="mailto:hwcho@fitiglobal.com">hwcho@fitiglobal.com</a></p> <p>31<sup>D</sup> - NYS Dept. of Transportation (8 tests)<br/>Jim Simonds -- (518) 485-5707<br/><a href="mailto:Jim.Simonds@dot.ny.gov">Jim.Simonds@dot.ny.gov</a></p> <p>34<sup>B</sup> - Solmax (GSE) - Houston, TX USA (24 tests)<br/>Sai Prasad Namburi<br/><a href="mailto:sprasad@solmax.com">sprasad@solmax.com</a></p> <p>38<sup>C</sup> - CTT Group SAGEOS (125 tests)<br/>Oliver Vermeersch -- (450) 771-4608<br/><a href="mailto:overmeersch@gcttg.com">overmeersch@gcttg.com</a></p> <p>40<sup>B</sup> - Solmax (GSE) - Kingstree, SC USA (14 tests)<br/>Bruce Pressley -- (843) 382-4603<br/><a href="mailto:bpressley@solmax.com">bpressley@solmax.com</a></p> <p>41<sup>A</sup> - SGI Testing Service, LLC (19 tests)<br/>Zehong Yuan -- (770) 931-8222<br/><a href="mailto:ZYuan@sgilab.com">ZYuan@sgilab.com</a></p> <p>45<sup>B</sup> - Solmax (TenCate) Malaysia SDN Bhd. (29 tests)<br/>Boon Kean Tan -- (603) 519 28576<br/><a href="mailto:bktan@solmax.com">bktan@solmax.com</a></p> <p>46<sup>B</sup> - TAG Environmental Inc. (13 tests)<br/>Manpreet Saini-- (705) 725-1938<br/><a href="mailto:manpreet.Saini@tagenv.com">manpreet.Saini@tagenv.com</a></p> <p>49<sup>B</sup> - Engepol Geossintéticos (16 tests)<br/>Patricia Natali -- (55) 51 3303-3901<br/><a href="mailto:patricia@engepol.com">patricia@engepol.com</a></p> <p>50<sup>B</sup> - ADS, Inc. Hamilton (8 tests)<br/>Justin Elder -- (513) 896-2065<br/><a href="mailto:justin.elder@ads-pipe.com">justin.elder@ads-pipe.com</a></p> <p>51<sup>B</sup> - SOLMAX - Canada (20 tests)<br/>Claude Cormier -- (450) 929-1234<br/><a href="mailto:ccormier@solmax.com">ccormier@solmax.com</a></p> <p>53<sup>B</sup> - Polytex Autofagasta (19 tests)<br/>Mario Contreras Cardenas -- 011 55-288-3308<br/><a href="mailto:mcontreras@polytex.cl">mcontreras@polytex.cl</a></p> <p>55<sup>B</sup> - Atarfil Geomembranes (21 tests)<br/>Gabriel Martin Sevilla -- 34 958 439 200<br/><a href="mailto:gmartin@atarfil.com">gmartin@atarfil.com</a></p> <p>56<sup>B</sup> - Polytex Santiago (15 tests)<br/>Sebastian Iturrita Monroe-- 011 56-2-677-1000<br/><a href="mailto:Siturrita@polytex.cl">Siturrita@polytex.cl</a></p> <p>57<sup>B</sup> - Solmax (TenCate) - Cornelia (26 tests)<br/>Taylor Kolesnick-- (706) 778-9794<br/><a href="mailto:kolesnick@solmax.com">kolesnick@solmax.com</a></p> |
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- 58<sup>B</sup> - Propex Furnishing Solutions - Hazlehurst (10 tests)  
Lee Branch -- (912) 375-6180  
[Lee.Branch@propexglobal.com](mailto:Lee.Branch@propexglobal.com)
- 59<sup>B</sup> - Holcim Solutions & Products (9 Tests)  
Janie Simpson -- (864) 439-5641  
[Janie.Simpson@holcim.com](mailto:Janie.Simpson@holcim.com)
- 60<sup>B</sup> - TDM Geosintéticos S.A. (21 tests)  
Henry De La Cruz -- 051-1-6300330  
[Hdelacruz@tdmgeosinteticos.com.pe](mailto:Hdelacruz@tdmgeosinteticos.com.pe)
- 61<sup>B</sup> - Vialflex (24 tests)  
Clint Boerhave -- (605) 335-0288  
[Clint.Boerhave@vialflex.com](mailto:Clint.Boerhave@vialflex.com)
- 62<sup>B</sup> - SOLMAX - Selangor - Malaysia (18 tests)  
Pei Ching Teoh -- (450) 929-1234  
[pcteoh@solmax.com](mailto:pcteoh@solmax.com)
- 63<sup>A</sup> - TRI-SC Labs (20 tests)  
Jay Sprague -- (864) 346-3107  
[Jesprague@tri-env.com](mailto:Jesprague@tri-env.com)
- 64<sup>B</sup> - Agru America (NV) (14 tests)  
Ryan Steele -- (775) 835-8282  
[RSteele@AgruAmerica.com](mailto:RSteele@AgruAmerica.com)
- 65<sup>C</sup> - Bombay Textile Research Assoc. (BTRA) (25 tests)  
PK Panda (0) 022-25003651  
[geotech@btraintia.com](mailto:geotech@btraintia.com)
- 66<sup>B</sup> - Rowad International Geosynthetics Co. Ltd (15 tests)  
Mohammad Ishad Hussain-- +966-3-812-1360  
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- 69<sup>B</sup> - Solmax - Rayong - Thailand (18 tests)  
Siriporn Chayaporenler -- 66-386-36758  
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- 70<sup>A</sup> - RSA Geo Lab LLC (49 tests)  
Rasheed Ahmed -- (908) 964-0786  
[geolab13@yahoo.com](mailto:geolab13@yahoo.com)
- 71<sup>B</sup> - Plásticos Agrícolas y Geomembranas S.A.C. (25 tests)  
Manuel Constantino Olivares Espinoza --  
073-511814-511829  
[calidad@pqapag.com](mailto:calidad@pqapag.com)
- 72<sup>B</sup> - Tensar Corp. GA (5 tests)  
Lynn Cassidy-Potts (770) 968-3255  
[lcassidy@tensarcorp.com](mailto:lcassidy@tensarcorp.com)
- 73<sup>B</sup> - Gai Loi JSE (10 tests)  
Paul Wong 84-650-362-5825  
[paul905677@gmail.com](mailto:paul905677@gmail.com)
- 74<sup>B</sup> - Agru America Inc. (9 tests)  
Mark Locklear - (843) 221-4121  
[mlocklear@agruamerica.com](mailto:mlocklear@agruamerica.com)
- 75<sup>B</sup> - GeoMatrix S.A.S. (45 tests)  
Javier Diaz Cipagauta (571) 424-9999  
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- 76<sup>B</sup> - Tehmco (Chile) (18 tests)  
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[rcampoym41@gmail.com](mailto:rcampoym41@gmail.com)
- 78<sup>B</sup> - PAG Mexico (16 tests)  
Cesar Augusto Arcila (669) 954-8202  
[directorcalidad@pagv.mex](mailto:directorcalidad@pagv.mex)
- 79<sup>A</sup> - TRI Geosynthetic Testing and Services (32 tests)  
Mansukh Patel 86-512-6283-1396  
[Mpatel@tri-env.com](mailto:Mpatel@tri-env.com)
- 80<sup>B</sup> - Texel Technical Materials (Alkegen) (10 tests)  
Eric Trudel (418) 387-4801  
[Etrudel@alkegen.com](mailto:Etrudel@alkegen.com)
- 81<sup>B</sup> - Solmax (GSE) - Reclin - Germany (18 tests)  
Evelyn Kroeger 49-40-767420  
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- 83<sup>B</sup> - Solmax Geosynthetics S.A.E. (13 tests)  
Ahmed Abdel Tawab - 202-2-828-8888  
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- 85<sup>B</sup> - PAG Tacna (26 tests)  
Manuel Olivares Constantino Espinoza --  
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[calidad@pqapag.com](mailto:calidad@pqapag.com)
- 86<sup>B</sup> - BOSTD China (29 tests)  
Zheng Hong - 86-532-8780-6917  
[zhenghong@bostd.com](mailto:zhenghong@bostd.com)
- 87<sup>B</sup> - Willacoochee Industrial (19 tests)  
Miranda Adams - 912-534-5757  
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- 88<sup>B</sup> - Geosynthetic Testing Services Pvt. Ltd. (16 tests)  
Ravi Kant - 02717-250019  
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- 89<sup>B</sup> - Megaplast India Pvt. Ltd. (13 tests)  
Tatwadarsi Tripathy - 91-937404-4620  
[geo.sqc@megaplast.in](mailto:geo.sqc@megaplast.in)
- 90<sup>B</sup> - Techfab (India) Industries Ltd. - Daman (10 tests)  
Anant Kanoi - 91-22-2287-6224  
[anant@techfabindia.com](mailto:anant@techfabindia.com)
- 91<sup>B</sup> - Techfab (India) Industries Ltd. - Rakholi (3 tests)  
Rajendra Chavan - 91-982-593-9922  
[geogrid.qualitylab@techfabindia.com](mailto:geogrid.qualitylab@techfabindia.com)
- 92<sup>B</sup> - Techfab (India) Industries Ltd. - Khadoli (2 tests)  
Navir Kumar - 91-22-229-76224  
[woven.qualitylab@techfabindia.com](mailto:woven.qualitylab@techfabindia.com)
- 93<sup>B</sup> - Garware Technical Fibres (19 tests)  
Rajendra K. Ghadge - 0-932-601-8083  
[rghadge@garwarefibres.com](mailto:rghadge@garwarefibres.com)
- 95<sup>B</sup> - Mexichem Colombia (Pavco) (8 tests)  
Jenny Colmenares Chavez - 57-1-782-5100 (ext. 1534)  
[ijenny.colmenares@wavin.com](mailto:ijenny.colmenares@wavin.com)
- 96<sup>B</sup> - Tensar China (7 tests)  
Zhu Shaolian - 603-6148-3276  
[zsl@tensar.com.cn](mailto:zsl@tensar.com.cn)
- 97<sup>A</sup> - TUV SUD PSB Singapore (17 tests)  
CHA Ming Yang - 65-6885-1514  
[ming-yang.CHA@tuv-sud.psb.sg](mailto:ming-yang.CHA@tuv-sud.psb.sg)
- 99<sup>B</sup> - Atarfil Middle East (16 tests)  
Mohammad Hneine - 971-564-33-1271  
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- 100<sup>B</sup> - Atarfil Geomembranes USA (12 tests)  
Alejandro Carreras - 757-263-4057  
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- 101<sup>B</sup> - Solmax (GSE) - Spearfish, SD USA (7 tests)  
Chuck Taylor - 605-642-8531  
[ctaylor@solmax.com](mailto:ctaylor@solmax.com)
- 102<sup>B</sup> - SKAPS Industries (12 tests)  
Sadhvi Arora - 706-336-7000  
[sadhvi.Arora@skaps.com](mailto:sadhvi.Arora@skaps.com)
- 103<sup>B</sup> - STRATA Geosystems Pvt. Ltd. (30 tests)  
C. V. Kanade - 91-22-4063-5100  
[cv.kanade@strataindia.com](mailto:cv.kanade@strataindia.com)
- 104<sup>A</sup> - Advanced Terra Testing (32 tests)  
Kerry Repola - 303-232-8308  
[krepola@terratesting.com](mailto:krepola@terratesting.com)
- 105<sup>B</sup> - Pavco Wavin - Peru (8 tests)  
Nestor Sifuentes Boggio - 51 990 277 136  
[nestor.sifuentes@wavin.com](mailto:nestor.sifuentes@wavin.com)
- 107<sup>A</sup> - TRI Australasia PTY LTD (39 tests)  
Warren Hornsey - +617-5535 7227  
[Whornsey@tri-env.com.au](mailto:Whornsey@tri-env.com.au)
- 108<sup>B</sup> - Solmax Geosynthetic Co. Ltd. Suzhou (13 tests)  
Pei Ching Teoh - 86512-66667-6100  
[pcteoh@solmax.com](mailto:pcteoh@solmax.com)
- 109<sup>B</sup> - Hock Technology Co. Ltd. (17 tests)  
Song Binghong - 186-7873-9722  
[Binghong.Song@shhock.com](mailto:Binghong.Song@shhock.com)
- 110<sup>C</sup> - Geofabrics Australia Pty. Ltd. - GRID (53 tests)  
Ryan Hackney - 61-42-781-0392  
[r.hackney@geofabrics.com.au](mailto:r.hackney@geofabrics.com.au)
- 111<sup>B</sup> - Huesker Inc. - Shelby (9 tests)  
Callie Kesterson - 704-406-8308  
[ckesterson@huesker.com](mailto:ckesterson@huesker.com)
- 112<sup>C</sup> - Instituto Mauá Tecnologia Brazil (13 tests)  
Henrique Nelson Satkunus  
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- 113<sup>B</sup> - Azul Pack Filmes - Embalagens (11 tests)  
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- 114<sup>B</sup> - Lonax Industria Brasileira DeLonax Ltda. (13 tests)  
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- 115<sup>B</sup> Doha Waterproof Factory (21 tests)  
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- 116<sup>B</sup> Soleno Textile Techniques Inc. (6 tests)  
Kathie Fleury  
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- 117<sup>B</sup> Reinforced Earth India Pvt Ltd. (4 tests)  
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- 118<sup>B</sup> Layfield Canada (9 tests)  
Richard Langford  
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- 119<sup>B</sup> Mexichem Brasil (10 tests)  
Nathalia Miyahara  
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- 120<sup>B</sup> Gold-Joint Testing Technology. (26 tests)  
ACE Geosynthetics  
Amy Tang  
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- 121<sup>B</sup> Techfab (India) Karajgam (18 tests)  
Prabhu Tripathy  
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- 122<sup>B</sup> TDM Geosinteticos Brasil (6 tests)  
Wladimir Caressato  
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- 123<sup>B</sup> Tecelagem Roma Ltda (6 tests)  
Marcos Fernando Leme  
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- 124<sup>B</sup> Geo Source (7 tests)  
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<sup>A</sup>Third Party Independent    <sup>C</sup>Institute  
<sup>B</sup>Manufacturers QC            <sup>D</sup>Government

If anyone desires more information on the GAI-LAP program, its test methods, the associated laboratories, etc., please go to our website [www.geosynthetic-institute.org/gai/lab.htm](http://www.geosynthetic-institute.org/gai/lab.htm) or contact George Koerner.

## Activities within GCI (Certification)

GSI presently has three separate inspector certification programs. One (began in 2006) is focused on QA/QC of field inspection of waste containment geosynthetics and compacted clay liners. The second (began in 2011) is focused on MSE Wall, Berm and Slope field inspection. The third, on Geosynthetic Designer Certification began on September 1, 2016. See our website at [www.geosynthetic-institute.org](http://www.geosynthetic-institute.org) under “certification” for a description and information on all three of them.

Applications to sit for the GCI-ICP exams need to be submitted to the Geosynthetic Institute for approval prior to taking the exams. Applications and payment information for the exams can be found at: <https://geosynthetic-institute.org/applications.htm>

## Program #1 - Inspection of Liner Systems for Waste Containment Facilities

The next QA/QC course and exams are scheduled for October 29 - November 1. TRI Environmental will be presenting the Construction QA/QC courses as well as proctoring the GCI-ICP exams for inspector certification. More Information and registration can be found at : <https://tri-environmental.com/cqa-week-2024/>

The Geosynthetic Institute has a pre-recorded “QA/QC of geosynthetics in waste containment facilities” course that can be purchased by anyone wanting to take the course online (accommodates your schedule) in preparation for the GCI-ICP certification exams. More information can be found at: [www.geosynthetic-institute.org/courses.htm](http://www.geosynthetic-institute.org/courses.htm)

### Inspector Certification Test Results 2006-2024

Year	Geosynthetic Materials		Compacted Clay Liners	
	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%)
2007	82	11 (13%)	73	12 (16%)
2008	95	25 (26%)	89	20 (22%)
2009	36	7 (19%)	36	2 (5%)
2010	59	12 (20%)	54	7 (13%)
2011	54	6 (11%)	53	3 (6%)
2012	34	5 (15%)	28	3 (11%)
2013	32	4 (12%)	30	1 (3%)
2014	45	1 (3%)	42	3 (7%)
2015	56	6 (11%)	51	6 (12%)
2016	36	3 (10%)	35	5 (18%)
2017	78	5 (6%)	66	3 (4%)
2018	53	5 (10%)	51	1 (3%)
2019	114	20 (18%)	119	15 (13%)
2020	100	14 (14%)	92	10 (11%)
2021	70	14 (20%)	61	8 (13%)
2022	89	15 (17%)	80	13 (16%)
2023	81	18 (22%)	76	13 (17%)
2024	47	13 (27%)	40	7 (17%)
<b>Total</b>	<b>1302</b>	<b>189 (14%)</b>	<b>1213</b>	<b>142 (12%)</b>

## Program #2 - Inspection of MSE Berms and Slopes

While a field inspector cannot require proper design or direct a contractor how to build a wall, flaws can be identified for possible design modification or mitigation action. Furthermore, and at minimum, construction practices can be observed and corrected if inadequate or improper. The official launch of this inspection program was on December 1, 2011 with a course and the examination afterward. A somewhat revised course on November 29, 2012 was presented. Presently, the corresponding course for this certification program has been transferred into a series of six presentations that have been recorded and can be viewed at your leisure.

## Program #3 - Geosynthetic Designer Certification

Please see [www.geosynthetic-institute.org/gdcpintro.pdf](http://www.geosynthetic-institute.org/gdcpintro.pdf) for the requisite details. Included are introduction requirements, application, reference material, sample questions, proctor manual and proctor application. You must have six-months of geosynthetic designer experience to take the exam.

## 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. GSI has affiliated institutes in two countries (Korea and India), 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). **INHA University** is located in Incheon and the geosynthetics laboratory is led by Professor Han-Yong Jeon. Please note that the 3<sup>rd</sup> International ICGEE 2025 conference will be held in Seoul, South Korea from March 22-24, 2025. It will again be a nice opportunity to interact with old friends and new colleagues.

**GSI-India** under the direction of Dr. T.V. Sreekumar was formed in 2015. The hosting organization is the Bombay Textile Research Association (BTRA) which is a premier textile research institute providing testing, research, training and consultancy services. BTRA is located in Mumbai, India and is accredited as per ISO 17025. The Geosynthetic test lab is also GAI-LAP accredited. Testing at BTRA is performed as per the latest EDANA, ASTM, INDA, AATCC, ISO, EN and AASHTO international standards. BTRA is known for its excellence in textile R & D and is currently branching out into all forms of geosynthetics with a fantastic R & D laboratory.

## GSI Member Organizations

We Sincerely Thank all 63 (47 full and 16 associate) Members Organizations of the GSI family for their continued guidance and continued support, especially during this transition period. Without members, GSI could not exist. The current GSI member organizations and their contact members are listed to the right and on the following page.

### Solmax

Mark Harris/Jacques Cote/Simon Gilbert St-Pierre/  
Jimmy Youngblood/Guillaume Beaumier/

### U.S. Environmental Protection Agency

David A. Carson [BOA]

### Federal Highway Administration

Silas Nichols/Daniel Alzamora

### WSP Inc.

Frank Adams/Paul Whitty/Linda Grover/Henry Mock [BOA]

### Tensar International Corporation, Division of CMC

Mark H. Wayne/Joseph Cavanaugh/Jacek Kawalec [BOA]

### Solmax Geosynthetics

John Henderson/John Lostumbo/Rene Laprade [BOA]

### Minerals Technology/CETCO

Reza Gorakhki/Stacy Byrd/Michael Donovan/Hilary Walker

### Huesker, Inc.

Flavio Montez/Andreas Elsing/Leite Gembus

### NAUE GmbH & Co. KG

Alexander Naue/Henning Ehrenberg [BOA]

### Propex Operating Company LLC

Drew Loizeaux/Noah Nichols

### TRI Environmental Inc.

Sam R. Allen [BOA]/C. Joel Sprague

### U. S. Army Corps of Engineers

Richard DePasquale

### Chevron Phillips Chemical Co.

Ashish Sukhadia/Lawrence Szmuto/Miranda Rine [BOA]

### CARPI, Inc.

Alberto M. Scuro/Francois Tronel/John A. Wilkes

### Civil & Environmental Consultants, Inc.

Tony Eith/Steve Menoff

### AGRU America, Inc.

Gunther Niedermoser/Tom Nichols/Markus Haager/

Anthony Johnson [BOA]

### INHA (GSI-Korea)

H.-Y. Jeon

### Waste Management Inc.

Greg Cekander/Burrill (Bo) McCoy [BOA]

### GeoComp/GeoTesting Express

W. Allen Marr/Gary Torosian/Joe Tomei

### ATARFIL

Emilio Carreras Torres/Jorge Fernandez Lopez/

Gabriel Martin/Nacho Garcia Arroyo

### Republic Services Inc.

Joe Benco/ Mike Beaudoin/Dave Vladic

### InterGEO Services Co.

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