



Geosynthetic Institute

PROSPECTUS

of the

GEOSYNTHETIC INSTITUTE (GSI)

and its

INTERRELATED INSTITUTES

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GEOSYNTHETIC INSTITUTE (GSI)

TARGETED POSITIONS WITH RESPECT TO ORGANIZATIONS INVOLVED WITH GEOSYNTHETICS

The following graphic illustrates how the Geosynthetic Institute (GSI) and its interrelated institutes are positioned to maintain a balance of activities between the three major groups involved with geosynthetic materials, applications, and related issues.



Clearly, those organizations dealing with the public interest and having long-term liability for systems which include geosynthetics have both the reason and need to be involved with GSI. Thus, Federal and State agencies and private owners form one part of the triangle. These organizations usually regulate or initiate a project and by so doing, involve many others.

In utilizing geosynthetic materials, both the manufacturers and their raw material producers have an obvious direct involvement. They form a second part of the triangle. The raw materials involved are polymer resins and the accompanying carbon blacks, additives, stabilizers and anti-oxidants. Contractors and installation companies also play a critical role in this group.

The third part of the triangle consists of the group which interfaces directly with the other two groups. They are the design consultants, testing laboratories and associated monitoring organizations who develop site specific plans, specifications and quality assurance documents.

All of these organizations are essential components of GSI and its affiliated institutes for the proper use and understanding of geosynthetic materials and their myriad applications.

GEOSYNTHETIC INSTITUTE (GSI)

Background

- GSI is the umbrella organization for the following interrelated institutes;
 1. Geosynthetic Research Institute (GRI)
 2. Geosynthetic Information Institute (GII)
 3. Geosynthetic Education Institute (GEI),
 4. Geosynthetic Accreditation Institute (GAI)
 5. Geosynthetic Certification Institute (GCI)
- GSI was incorporated in the State of Delaware on December 16, 1991.
- GSI is an independent, not-for-profit 501(c) (3) organization as of July 21, 1994.
- GSI is established through Institute Bylaws approved on December 11, 1994.
- GSI is advised by a 9-person, member elected board of advisors.
- GSI is supported by annual membership subscription, income from its interrelated institutes, and research contracts/grants/awards.
- The location of GSI is about 3 miles (4 km) from the Philadelphia International Airport.

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The Mission of GSI

GSI constitutes a diverse assembly of agencies, corporations, companies, partnerships, and groups who actively engage in the manufacturing, design and use of geosynthetics as engineering materials. The GSI mission is to develop and transfer knowledge, assess and critique geosynthetics, and provide service to the member organizations.

Geosynthetics consist of the following polymeric materials used in environmental, geotechnical, transportation, hydraulic engineering, and private development applications:

- geotextiles – porous textiles
- geomembranes – impermeable liners
- geogrids – reinforcement grids
- geonets and geopacers – drainage composites
- geosynthetic clay liners –bentonite layers in/on other geosynthetics
- geopipe – buried plastic pipe
- geofoam – lightweight fill
- geocomposites – various assemblages of geosynthetic and sometimes soil materials

The Goals and Objectives of GSI

The goals and objectives of GSI are to develop, investigate and implement the various facets of geosynthetics, recognizing them as engineering materials. This includes, but is not limited to, the following specific tasks:

1. Conduct applied research on the engineering aspects of geosynthetics.
2. Conduct basic research on resins, additives, stabilizers, antioxidants, fillers and modifiers used to manufacture geosynthetics.
3. Develop test methods, standards of practice, standard guides, and product specifications for manufacturing, design and installation.
4. Provide and implement geosynthetic certification and accreditation procedures.
5. Provide training and tutorial services to member organizations and their employees.
6. Develop and provide courses, conferences, symposia, workshops, webinars and training sessions.
7. Provide geosynthetics information retrieval services.
8. Provide publications in the form of newsletters, books, manuals, reports, journals, papers, articles, notes, and memos.
9. Provide forensic services on both field successes and failures.
10. Provide conflict resolution services between and/or on behalf of member organizations

Within the above specific tasks it is the goal and objective of GSI to be the conscience of the industry and to provide an ongoing and sustainable center of excellence for all types of geosynthetics.

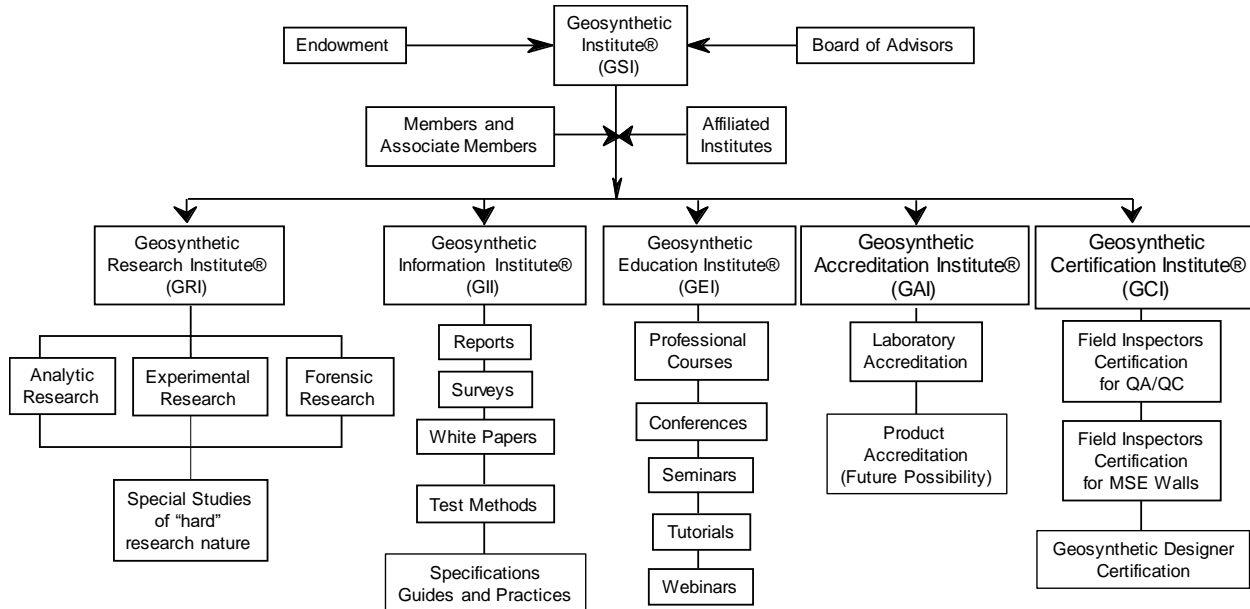
Affiliated Organizations

In order to provide geosynthetics-related global outreach, a number of associations called “affiliated organizations” have been implemented, e.g., GSI-Korea, GSI-Taiwan and GSI-India. Their mandate is to provide for technology transfer from GSI to their respective countries in their native language and to develop research and development focused on their particular situations.

Centers of Excellence

In specific application areas where the use of geosynthetics is underutilized, centers of excellence can be initiated accordingly. Such centers are typically with universities where such expertise exists. Examples are geosynthetics in reinforcement applications, hydraulic engineering applications, etc.

The Structure of the Geosynthetic Institute (GSI) Along with Its Interrelated Institutes



Geosynthetic Institute's Interrelated Institutes

1. Geosynthetic Research Institute (GRI)

- Incorporated in the State of Delaware on August 12, 1986 as Geosynthetic Research Incorporated.
- Name amended to Geosynthetic Research Institute on March 3, 1989.
- Permanent staff are assisted by technicians and graduate students.
- Approximately 10 research projects are presently ongoing.
- Included in these research projects are environmental related applications, transportation/geotechnical related applications and hydraulic related applications.
- Most projects are long-term in their duration (generally, short-term projects are referred to the member organizations; mainly consultants and testing laboratories).
- Major projects on lifetime prediction of HDPE, LLDPE, fPP and EPDM geomembranes, PP and PET geotextiles, HDPE and PET geogrids, and HDPE geopipes are ongoing.
- Evaluation of the behavior of antioxidants in geosynthetic formulations is an ongoing study.
- Creep behavior of geomembrane seams and puncture as well as midplane creep shear of hydrated GCL's are also being evaluated.
- Life cycle benefits of geotextile separators in extending highway pavement performance is also a priority research project.

- In-situ monitoring of landfills insofar as liner and cover temperatures, waste degradation over time, and behavior of leachate collection systems.
- Filtration and drainage of tailings and residual materials

Information on GRI can be obtained from:

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2. Geosynthetic Information Institute (GII)

The GII provides specific technical information to all GSI member organizations in the "Member Access" section of the website. A password is needed to access this information which includes test methods, proprietary reports, technical papers, annual meeting recaps, a key word search of the geosynthetic literature (approx. 30,000 citations), example problems, and frequently asked questions and answers.

- GII information is presented in hard copy by means of a quarterly Newsletter/Report. Each of the institutes are highlighted and their respective programs are reviewed and updated.
- Information is also daylighted on the Internet via our website which is accessed via www.geosynthetic-institute.org. Information available to anyone who visits our website includes the following:
 - Links to most of the geosynthetics community and an updated list of laboratories with their accredited test methods.
 - Specific, project related, information is interactively obtained by member organizations via the website.
 - General geosynthetic information is available on-line (free to anyone) in the form of answers and questions at GMATechline@ifai.com.
 - GII develops geosynthetic product specifications. As such, the specific test methods, minimum (or maximum) property values and recommended frequency of testing are prescribed.
 - GII also develops geosynthetic test methods, guides, and practices. These items are intended to function until other groups, such as ASTM or ISO, develop standards of their own.
 - GSI standards are available through our Bookstore as a published set and currently comprise 66 separate documents.

Information on GII is available from:

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3. Geosynthetic Education Institute (GEI)

- The Geosynthetic Education Institute offers both courses and webinars on an ongoing basis. There are currently 27 GSI webinars, 21 ASCE webinars and 3 courses available. The topics are related to geosynthetics in the following applications:
 - waste containment
 - transport/geotech
 - hydraulics
 - walls and slopes
 - private development
 - QC and QA of geosynthetics
- Distance learning of the above courses can be described as interactive internet learning which is available at the time, location and discretion of the user/student.
- The sixth edition of “Designing with Geosynthetics” Volumes I and II (2012) is available in hardback, softback and e-book.
- “Geotextiles from Design to Applications”, edited by R.M. Koerner is available in hardback and e-book.
- Upon passing a quiz on the subject matter, continuing education credits, i.e., PDHs are available.
- Past conference themes have been on durability, seaming, resins/manufacturing, landfill closures, filtration/drainage, soft soil stabilization, infrastructure remediation, performance, etc. Full proceedings of all papers presented at the 25 conferences are available.
- Briefings and seminars are available to member organizations at their facilities on an annual basis. The topics are mutually decided upon and the sessions last from 2 to 4 hours.
- Tutorials (mainly for laboratory managers and technicians) are available to member organizations at GSI’s facilities.

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4. Geosynthetic Accreditation Institute (GAI)

- The major activity of GAI at the present time is the geosynthetic testing laboratory accreditation program, or “GAI-LAP”.
- This is a hybrid program which accredits individual tests involving geosynthetic materials.
- The program requires a quality manual modeled after ISO 9000.
- The laboratory protocol is modeled after ISO Guide 17025 and 17011
- Also required are standard operating procedures and test result reports of all tests to be accredited.
- An on-site audit is made and test results are compared to the GAI established database for acceptance/rejection.
- For the 2nd, 3rd and 4th years, continued accreditation is based on proficiency testing.
- Samples of various geosynthetic materials are sent to the respective laboratories, tested by them, and results compared to the GAI database. Results from the laboratories must be within $\pm 2\sigma$ of the mean value in order for the laboratory to remain accredited for the test method under consideration.
- The 5th year is another on-site audit and then the cycle repeats itself.
- The program has accredited 106 laboratories having 257 tests under accreditation.
- In addition to the ASTM tests, the program is now venturing into other tests, i.e., ISO tests, and into accrediting international laboratories.
- The program publishes a directory in December of each year.
- The up-to-date listing of laboratories and their accredited test methods is maintained on the institute’s website which is accessed by www.geosynthetic-institute.org.

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5. Geosynthetic Certification Institute (GCI)

- GCI's Inspectors Certification Program (GCI-ICP) began in January, 2006 with the Construction Quality Assurance (CQA) for Geosynthetic Materials and Compacted Clay Liners.
- While landfills, surface impoundments, and waste/heap leach piles are the main applications, all types of geosynthetics installations are applicable.
- In 2012 the GCI Program was expanded to include the Inspectors Certification Program for MSE Walls, Berms and Slopes.
- Candidates requirements for certification:
 - recommendation by superior
 - minimum 6-mos. field experience
 - acceptable personal resume
 - successfully pass a proctored multiple-choice examination
- The most recent GCI program, **Geosynthetic Designer Certification Program** started in 2016. The requirements for certification are as follows:
 - Candidate must hold a degree from an accredited engineering university
 - Must be a professional engineer
 - Minimum 6 months of geosynthetics design experience.
 - Successfully pass a 45-question numeric examination that follows directly with the 6th Edition of Designing with Geosynthetics textbook.
- A steering committee gives oversight and updates the above examinations every five years.

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Membership Privileges

GSI provides for its members the privileges that are listed below:

1. Voting in all GSI matters
2. Eligibility for board of directors
3. Annual traveling in-house seminar
4. Training at GSI laboratories
5. Input as to research project selection
6. Guidance and critique of research projects

7. Proprietary reports on the results of research projects
8. Survey results on specific topics involving geosynthetics
9. Access to "Members Only" portion of the Home Page on the Internet
10. Keyword search on the geosynthetic literature on the GSI Website
11. Member information posted on the GSI Website
12. Direct linkage, i.e., "hot wiring" to individual member organizations Home Pages
13. Peer review of manuals, brochures, reports, concepts, and related information
14. Direct contact and relations with respect to litigious and insurance matters
15. Annual meeting attendance
16. Focus group participation
17. Briefings and tutorials at GSI
18. Discounts on webinars and on-line courses
19. Data from all affiliated institutes
20. Development of GRI standard test methods/practices/guides/specifications
21. Quarterly Newsletter Reports
22. Discounts on publications
23. Presentations at GRI conferences
24. Document/brochure/project guidance and advice on an as-required basis
25. Direct and immediate consultation with GSI personnel and staff at any time
26. Conflict resolution services between, or on behalf of, member organizations

Membership Fees

Time	Full Member	Associate*
First Year	\$10,000	\$1000
Subsequent Years	\$10,000	\$1000

*Only for State and Governmental Agencies

Summary

- The Geosynthetic Institute (GSI) is the umbrella organization which directs and guides its affiliated institutes. The interrelated institutes are GRI, GII, GEI, GAI and GCI as described in this prospectus.
- Membership in GSI automatically brings full membership to all of the interrelated institutes.
- An Associate Membership status (at the present reduced fee of \$1000 per year) is available for Federal, State and Governmental Agencies.
- Bylaws of GSI are available upon request.
- GSI functions through advice by its nine-person Board of Advisors.
- GSI operates via a Director, Associate Director and associated staff and colleagues.
- GSI and its interrelated institutes (such as GRI, GAI, etc.) are funded consortium fees from the member organizations, by contracts, and grants.
- Since GSI is a nonprofit organization under the IRS 501(c) (3) tax-free status, an Endowment Fund exists. It is in existence and is supervised by a Financial Oversight Committee.

- Funds are hereby solicited via special projects, honoraria, corporate gifts and personal gifts.
- Affiliated-Organizations are based within non-U.S. agencies and/or universities in which English is not the major language and are formed to provide geosynthetics outreach in an orderly and proactive manner.
- For additional information regarding this prospectus and/or questions on the activities described herein please contact:

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