

1992 – A Year of Growth for the IGS

by

Professor R. Kerry Rowe
President of the IGS

Looking at the statistics alone, 1992 was certainly a good year with growth in individual membership (by about 11 percent) and corporate membership (23 percent) and chapters (33 percent). However, the advances were far more than implied by the statistics alone. One of the key objectives of IGS is to encourage advances in the scientific and engineering development of geotextiles, geomembranes, and related products and associated technologies. One of the best ways of doing this is by the organization of conferences, seminars and other forums for information exchange. 1992 was a very good year in this respect as summarized in the following paragraphs.

Third Chinese Conference

1992 was an important year for growth of the IGS in Asia and Southeast Asia. As indicated by Dr. Bathurst in the last issue of IGS News, the Third Chinese Conference on Geosynthetics was held in Yizheng, China in November and I was delighted to have this opportunity to meet with the Chinese Chapter of the IGS. This chapter is very active in promoting the use of geosynthetics and, in addition to organizing the Third Chinese Conference, it has been very active in the organization of short courses dealing with the use of geosynthetics, in the development of a book of Chinese case histories relating to successful applications of geosynthetics, and in the development of a design manual. In discussions concerning membership, I was informed that the Chinese Chapter expects to see continued growth in the number of IGS members in the coming year.

Meeting in Japan

The Chinese conference was followed by the IGS Officers and Council Meeting and the International Symposium on Earth Reinforcement Practice (IS Kyushu'92) held in Fukuoka, Japan followed by a symposium held in

Tokyo at which many of the IGS Council members had an opportunity to meet with the Japanese Chapter. The Japanese Chapter is one of the largest IGS chapters with by far the largest number of corporate members and student members. One cannot help but be impressed by the level of activity which includes a well documented newsletter (in Japanese), regular meetings and seminars, and work toward developing test standards and design methodologies. Of special note is the number of Japanese Corporate Members who are construction companies. Their membership clearly signals the advantages that are perceived by these companies of being aware of the latest trends and developments in the area of geosynthetics.

Indonesian Chapter Inaugurated

It was my privilege to attend the inauguration of IGS-INA, the Indonesian Chapter of the IGS, and to attend the International Symposium on the Applications of Geosynthetic Technology held in Jakarta Indonesia, 23-24 November 1992 (see article p.3). The Inauguration of IGS-INA was attended by the Indonesian Minister for Public Works, Mr. Radinal Mochtar who, both in his speech and in the subsequent private discussions, emphasized the very important role that geosynthetics can play in solving many geotechnical challenges associated with development in Indonesia. IGS-INA President Soekrisno Rammelan, IGS-INA Secretary, Mr. K. Oetomo and the other members of the executive of IGS-INA are to be congratulated on the excellent work they have done in launching the chapter. There would appear to be marvelous opportunities for substantial growth in the use of geosynthetics in Indonesia and for the development of the Indonesian Chapter.

SEAC on the Move

Following my visit to Indonesia I took the opportunity

to visit both Singapore and Malaysia to meet with IGS members, to make a number of technical presentations and to become personally familiar with the preparation for the 5th International Conference to be held in Singapore 5–9 September 1994 (see article p.14). The level of interest in geotextiles and geomembranes was excellent and signalled the enormous potential for growth in the size of the Southeast Asian Chapter – particularly in Malaysia. During this visit I had the opportunity to inspect (and indeed stay at) the venue for the 5th International Conference. I am delighted to report that the facilities are absolutely outstanding. The hotel where the conference is to be held has a number of excellent lecture rooms and has a layout that will readily accommodate the needs of the exhibitors and attendees. There are also a number of excellent lower priced hotels quite close to the main conference hotel. Singapore is a remarkably organized, clean, safe and beautiful city. The organization for the conference is well under way and abstracts are beginning to pour in. If you have not already sent your abstract, please do so. The deadline is 31 July 1993. Based on my personal visit and my discussions with the organizing committee I believe that we can look forward to an outstanding conference in Singapore in 1994. Mark it into your calendars now.

Advances in Europe

1992 saw the formation of the Dutch Chapter of the IGS which is an excellent outgrowth of the very successful 4th International Conference held in The Hague in 1990. The officers of the Dutch Chapter and in particular IGS Secretary, Mr. W. Voskamp are to be congratulated on their hard work in the development of this new chapter. 1992 was also an excellent year as we worked towards a number of new chapters with the development of an agreement for the formation of an Italian Chapter of the IGS which became effective on 1 January 1993 and with very active work towards the development of French, German and Belgian chapters of the IGS. In this regard the hard work of Mr. Daniele Cazzuffi (IGS Council Member from Italy), Mr. Francois Goussé (IGS Council Member from France), Prof. Dr. Rudolf Floss (IGS Vice-President and Chairman of the Committee for the Development of Chapters, from Germany) and Prof. Dr. Jean-Marie Rigo (IGS Council Member from Belgium) are to be congratulated for their very hard work in promoting the development of these new chapters. The next IGS Council Meeting will be held in Milan, Italy just prior to the Italian Conference on Geosynthetics.

There was considerable amount of technically oriented activity in Europe in 1992. For example, one of our oldest chapters – the UK Chapter of the IGS – was also very active in 1992 and it was a very great pleasure to be able to attend the Symposium on Geotextiles in Filtration and Drainage organized by the UK Chapter in September 1992. The UK Chapter continues to have an excellent program of lectures and activities and we look forward to seeing continued growth in the size of the UK Chapter in the coming year.

North America – Not to be Forgotten

1992 was very much a year of consolidation for the North American Chapter of the IGS (NAGS) and a lot of

hard work in preparation for Geosynthetics'93 which is to be held in Vancouver, Canada in March–April 1993. NAGS has instituted a thorough and vigorous paper review process and I think we can look forward to an outstanding selection of papers to be presented at Geosynthetics'93. Look forward to reading more about this in the next issue of IGS News if you are not lucky enough to be able to attend.

The IGS has also invited NAGS to prepare a detailed proposal for the hosting of the 6th International Conference to be held in 1998.

Changes to the Electoral Procedure at the IGS Ordinary General Assembly

Those of you who attended the IGS General Assembly in The Hague and endured the four hours that it took to complete the voting will fully understand the need to make some changes to our electoral procedure. At the recent IGS Council Meeting, held in Fukuoka, Japan, a decision was made to recommend to the membership that the voting procedure be changed. Briefly, we are recommending that votes for Council Members be cast (by written ballot) prior to the Ordinary General Assembly. Thus at the General Assembly there will only be a public election for the position of President and Vice-President. Once the outcome of this election is known, the names of the other members elected to the new IGS Council will be announced at the General Assembly. In this way, we believe we can maintain the democratic principle, provide those attending the Ordinary General Assembly with an opportunity to hear presentations of the presidential candidates and to cast their ballots without the need for enduring a four hour marathon session. Since the implementation of these changes requires a change to the by-laws of the IGS and since we would like to avoid a four hour marathon session in Singapore, we will be sending all IGS members a postal ballot later this year so they will have the opportunity to vote for this change to the IGS by-laws (see article p.4).

IGS Awards

The next IGS Awards will be presented at the 5th International Conference in Singapore (the first IGS Awards were presented at the 4th International Conference). The IGS Awards Rules have been changed to allow consideration of contributions over a five year period prior to the award. This is an increase from the previous limit of two years. A formal call for submissions and nominations will be published later this year. The Awards Committee will be established at the next IGS Council Meeting to be held in Milan in October. The rules have been relaxed to make it easier for individuals or groups to make a submission or to be nominated by a third party.

Name of the Society

As you are no doubt aware, there has been an ongoing debate concerning the appropriate name for our society since the last General Assembly held in The Hague in 1990. After giving careful consideration to all the input (including the opinions expressed by the various chapters) the Council has decided to have a postal ballot of all the membership concerning the name of the society. This ballot will be held in conjunction with the election of new Council Members to be held just prior to the 5th International Conference in Singapore. The results of the ballot

will be announced at the Ordinary General Assembly in Singapore. The membership will be given a choice between (a) retaining the current name "IGS - The International Geotextile Society" with the subtitle: "Dedicated to the Scientific and Engineering Development of Geotextiles, Geomembranes, Related Products and Associated Technologies" or (b) a new name "IGS - The

International Geosynthetics Society" with the same subtitle: "Dedicated to the Scientific and Engineering Development of Geotextiles, Geomembranes, Related Products and Associated Technologies". The IGS Council is recommending to the membership that they vote in favour of the change of the name to option (b). Readers should refer to the article by Dr. J-P. Giroud on p. 5 of this issue.

LETTERS TO THE EDITOR

Re: "Terms and Definitions: A French Perspective"

We refer to the above mentioned article on geosynthetic terminology, which appeared in IGS News, Vol. 8 No. 3 November 1992. We note (with lifted eyebrows) that the proposed French definition for Geomembranes excludes "products thinner than 1mm". Our company, Aquatan (Pty) Ltd (formerly Gundle Linings (Pty) Ltd and the original founders of the company, now known internationally as Gundle Inc. of Houston) has been laying 0.75mm and thinner geomembranes since 1966. We have done this most satisfactorily, with many millions of square metres in service. Some of our 0.5mm LDPE geomembranes have now been in service, fully exposed to the

South African sun (at around 180kL p.a. solar radiation levels) for over 20 years. Naturally, within practical constraints, the thicker a geomembrane, the greater its mechanical and durability properties should be. However, particularly in developing countries short of cash, the cost consideration is very important. Based on our extremely successful history with geomembranes thinner than 1mm, we believe the French proposal needs reconsideration.

*P. Davies
IGS member*

Inauguration of the INA-IGS

The inauguration of the Indonesian Chapter of the IGS, called INA-IGS, took place on 23 November 1992. At the same time, the INA-IGS helped to organize an International Symposium on Applications of Geosynthetic Technology. This two day symposium was held in Jakarta and was attended by approximately 140 people of which 26 were from foreign countries. The symposium was opened by the Minister of Public Works of Indonesia, Dr. Radinal Mochtar. Dr. Mochtar, who is a professional civil engineer, showed a great deal of interest in the products exhibited at the symposium. During his opening address he stressed the importance of new materials such as geosynthetics on the further development of a country like Indonesia. At the inauguration of the Indonesian Chapter, Prof. R. Kerry Rowe, the President of the IGS, gave a speech that focussed on the importance of local chapters. Dr. Rowe remarked that: "Engineers can discuss together in their own country the opportunities for the use of geosynthetics and exchange experiences on installation and design. At the same time, they have through the IGS a connection to experts in other parts of the world who can exchange experiences with them."

Keynote papers at this International Symposium on Applications of Geosynthetic Technology were presented by:

Mr. A.R. Soehoed - Geosynthetics
Prof. R. Kerry Rowe - Reinforced Embankments on Soft Cohesive Deposits
Prof. Bengt B. Broms - Fabric Reinforced Retaining Walls
Prof. M. Fukuoka - New Geomembrane Technology

In total, 21 papers were presented by Indonesian engineers and a number of foreign speakers on the following subjects: Testing and Properties; General Applications;



The IGS President, Prof. R. Kerry Rowe welcomes the Minister of Public Works of Indonesia, Dr. Radinal Mochtar at the inaugural meeting of INA-IGS. Mr. Soekrisno Rammelan (President of INA-IGS) looks on.

Earth Reinforcement; Drainage and Filters.

The symposium was very successful and presented a good platform for the exchange of experiences by all attendees. The friendly atmosphere and hospitality in Indonesia were highly appreciated by the visitors.

*reported by W. Voskamp
Secretary of the IGS*

Proposed changes to IGS by-laws

by Richard Jewell, Chairman of the By-laws Committee

The last Council Meeting of IGS (Kyushu, November 1992) considered and has recommended the following changes to the IGS by-laws. These changes will be the subject of a Postal Ballot to be held during the summer of 1993.

The purpose of the proposed changes is to improve the wording and to bring the by-laws into line with the current operation of IGS, which has evolved as the Society has grown. Of greater significance are the proposed changes to the election procedure which have been suggested in the light of the elections at the last General Assembly in the Hague, May 1990.

Under the proposed changes, election to Council could be completed by a Postal Ballot before the date of the General Assembly. The election results would be kept confidential until their announcement at the Assembly after the election of the President and the Vice-President. In this case, only the election of the President and Vice-President would take place during the General Assembly. The benefit would be to allow all IGS members to participate in the election of members of Council, and to expedite the business of the General Assembly.

Proposed changes to the by-laws related to election procedure and other issues are listed below:

art. 4.01.01: (current)

Application for membership shall be submitted in writing to the Secretary or to any Officer who will forward it to the Secretary.

art. 4.01.01: (revised)

Application for membership shall be submitted in writing to the Secretary or to any officer who will forward it to the Secretary. If the applicant is joining a Chapter as well as the Society, the application will be submitted to the Chapter and the Chapter will submit a master membership list to the Secretary.

art. 4.01.03: (current)

All applications will be considered for approval by the Council.

art. 4.01.03: (revised)

All applications will be considered for approval by the Council or its delegate.

art. 4.02.01: (current)

Any member may resign at any time by written notice delivered to the Chairman or the Secretary."

art. 4.02.01: (revised)

Any member may resign at any time by written notice delivered to the President, the Secretary or the Treasurer.

art. 5.02.02: (current)

Subscription fees paid by members joining during the second half of any year shall be levied at half the annual rate.

art. 5.02.02: (deleted)

art. 7.02.01: (current first paragraph)

The business of an Ordinary Assembly will include the debate on and approval of reports by the Chairman and Treasurer on the Council and Society's activities, the appointment of Auditors, the approval of the Society's accounts, the approval of the subscription fees, and the election of the President, the Vice-President and Council members, each time the present by-laws call for such an election.

art. 7.02.01: (revised first paragraph)

The business of an Ordinary Assembly will include the debate on and approval of reports by the President and the Treasurer on the Council and Society's activities, the appointment of auditors, the approval of the Society's accounts, the approval of the subscription fees, and the election of the President and the Vice-President, each time the by-laws call for such an election.

art 8.02.01: (current first paragraph)

The Council shall consist of at least 10 and no more than 16 persons elected from the membership, half of which should be elected at each Ordinary General Assembly meeting held concurrently with an International Conference, the other half to be elected at the mid-way point between those General Assemblies, either at a General Assembly or by postal ballot.

art 8.02.01: (revised first paragraph)

The Council shall consist of at least 10 and no more than 16 persons elected from the membership, half of which should be elected in conjunction with the Ordinary General Assembly meeting held concurrently with an International Conference, the other half to be elected at the mid-way point between those General Assemblies, either at a General Assembly or by postal ballot.

art. 8.02.03: (add last sentence)

Co-opted members shall retire or stand for election at the second ballot after the date of co-option.

art. 8.03.02: (current)

The Council requires a quorum to validly meet. This quorum shall comprise, at minimum, the President or the Vice-President, and the Secretary of the Society and four other Council members present or represented.

art. 8.03.02: (revised)

The Council requires a quorum to hold a valid meeting. This quorum shall be at minimum, the President or the Vice-President, and the Secretary or the Treasurer of the Society, and four other Council members present.

The Council hopes that members of IGS will approve these proposed changes in the forthcoming Postal Ballot. Any discussion of the proposed changes may be addressed to the Secretary (Wim Voskamp) or to the Chairman of the By-laws Committee (Richard Jewell).

TOWARD A DECISION FOR THE NAME OF THE SOCIETY

by

Dr. J–P. Giroud, Past–President of the IGS

“Toward a Solution for the Name of the Society” was the title of my last article on the subject in IGS News (Vol. 8, No. 1, March 1992). Comparing the two titles above shows that decisive progress has been made.

Through numerous articles in IGS News, the IGS membership has been closely and democratically involved at each step of the decision—making process regarding the name of the society. In keeping with this spirit, I would like to describe the last steps. In June 1992, the IGS officers met in Louisville, USA, and decided to ask the IGS chapters to give their opinion of the following three proposals:

- (1) International Geotextile Society, i.e., the present name unchanged.
- (2) International Society for Geosynthetics, Related Products and Associated Technologies.
- (3) International Society for Geotextiles, Geomembranes, Geosynthetics and Related Technologies.

Some chapters presented more than one opinion, and, all things considered, the opinions expressed by the chapters were almost uniformly distributed between the three proposals. Also, some chapters and some individual IGS members indicated their preference for “International Geosynthetics Society”. Finally, a number of other names, generally complex, were proposed by IGS members.

My task was to present a concise summary to the Council, which was not easy because of the diversity of opinions. At the meeting held in Fukuoka, Japan, in November 1992, I indicated to the Council that those who wanted to keep the existing name could be put in two categories. The first category includes those who are afraid that non-synthetic geoproducts (e.g., those made from natural fibres) would be excluded. I indicated to the Council that, in my opinion, a subtitle such as the one we use now (“Dedicated to the scientific and engineering development of geotextiles, geomembranes and related products”) should alleviate their fears. The second category includes those who consider that it took time for the IGS to be known by a large number of people and think that a discontinuity in the name could be detrimental. I commented that, in my opinion, continuity was indeed very important, but that keeping the acronym IGS should be sufficient to indicate continuity.

I also told the Council that I could see two positive trends in the opinions collected: (i) there was a unanimous agreement to keep the acronym IGS; and (ii) a very large majority was of the opinion that the present name should be changed. The problem was to find a new name agreeable to most.

In order to find a solution, I presented the following comments:

- The rather complex names proposed in my article in the March 1992 issue of IGS News, or those equally complex proposed by the IGS officers to the IGS chapters, did not generate great enthusiasm. These complex names were meant to please a maximum number of people. Instead, they encouraged many to propose even more complex names. I concluded that the name should be simple.
- Reviewing the options presented in the March 1992 issue of IGS News, those presented to the IGS chapters, and comments by individual members, it appeared that two words were mentioned more than others: geotextile and geosynthetics. However, using both terms together is not logical since geosynthetics encompass geotextiles.
- Every attempt to craft a logical name for the society led to extremely complex wording because strictly logical names have to be consistent with the relationships between the various terms (geosynthetics, geotextiles, geomembranes, etc.). Such names do not meet the two requirements mentioned above: they are not simple and the acronym is not IGS.

In conclusion I told the Council that my recommendation was to ask the membership to choose between two simple names: the “International Geotextile Society” and the “International Geosynthetics Society”. I also recommended that, regardless of what name is selected, there be a subtitle explaining what is encompassed under the IGS name. After discussion, a large majority of the IGS Council voted (18 for, one abstention, none against) that the IGS membership be asked, in a postal ballot, to choose between the following two options:

- (a) the current name, “IGS – The International Geotextile Society” with the subtitle “Dedicated to the scientific and engineering development of geotextiles, geomembranes, related products and associated technologies”.
- (b) a new name, “IGS – The International Geosynthetics Society” with the same subtitle “Dedicated to the scientific and engineering development of geotextiles, geomembranes, related products and associated technologies”.

Also, the IGS Council voted with a large majority (15 for, 4 abstentions, none against) to recommend that option (b) be selected. As indicated by President Rowe (see p. 2), a postal ballot will be organized in 1994. If the membership follows the Council’s recommendation, the IGS will become the International Geosynthetics Society in September 1994, at the General Assembly to be held in Singapore.

Changing the name of our society is certainly a very important decision. It is very satisfactory to realize that all mechanisms of our society have functioned well during the decision-making process: information back and forth was collected and disseminated very effectively by IGS News; IGS members and chapters actively participated;

and the Council carefully reviewed options. The final step of this democratic process will be the decision made by the membership through the postal ballot.

To conclude on a historical note, I would like to say that when the IGS Council decided during its meeting in Fu-

kuoka to recommend a new name for our Society, it must have been well inspired: the Council's vote took place on 10 November 1992, that was exactly on the 9th anniversary of the IGS which was founded in Paris, France, on 10 November 1983 (see following article).

The IGS celebrates 9th Anniversary

The IGS became 9 years old on 10 November 1992. At that time, Council members and many other IGS members were in Fukuoka, Japan to attend the IGS Council Meeting and the IS Kyushu'92 conference.

The 9th anniversary of the IGS was celebrated at a reception hosted by Professor and Mrs. Yamanouchi. The photograph, taken by Professor Yamanouchi himself, shows Professor M. Fukuoka, Honorary Member of the IGS and Chairman of the Japan Chapter of IGS, and Dr. J-P. Giroud, Past-President of the IGS. Both were indeed entitled to celebrate as they are the only two members of the present IGS Council who participated in the founding meeting in Paris, France, 10 November 1983, and who have attended all Council Meetings since then.

The reception hosted by Professor and Mrs. Yamanouchi took place in a very elegant setting and was an excellent opportunity for IGS Council Members and other distinguished guests to exchange memories of the past exciting nine years while enjoying the exquisite Japanese cuisine and hospitality.



Professor M. Fukuoka and Dr. J-P. Giroud, celebrate the 9th anniversary of the IGS in Fukuoka, Japan, 10 November 1992

*reported by R. J. Bathurst
Editor of IGS News*

The Belgian Committee for Geosynthetics – B.C.G. by J.M. RIGO Liege University, Liege, Belgium

As in many parts of the world, the geosynthetics market in Belgium has shown exponential growth over the last decade. Environmental protection, treatment of old landfills, and lining of new waste containment facilities are all applications where geosynthetics are playing a greater role. In order to promote the use of geosynthetics a "Belgian Committee for Geosynthetics" has been recently formed. It is comprised of individuals, manufacturing companies, consulting companies, research institutes and the Ministry of Public Works. The executive is:

President: P. SILENCE, Delft Geoconsult
Vice-President: Prof. J.M. RIGO, Liege University
Secretary: L.J. CANDRIES, Belgian Textiles Research Centre
Treasurer: Ch. LEGRAND, Belgian Building Research Centre

The objectives of the BCG are similar to those of the IGS but the committee will focus on standardization work related to CEN. A number of committees of the BCG have also been formed with the following Chairmen:

Standardization: Ph. HERREMANS (UCO)
Education: J.M. RIGO (Liege University)
Insurance: J.P. MILLER (TRACTEBEL) and
J.L. HILDE

Certification: M. SIMON, Ministry of Public Works
Promotion: P. SILENCE, Delft Geoconsult

A BCG newsletter will be circulated to the members. The BCG will encourage links between its local members and IGS. In fact, the BCG will cover the cost of membership dues to members who belong to both organizations. The formation of a Belgium chapter of the IGS will be discussed at a later date. The BCG gave its support to the conference on Reflective Cracking to be held in Liege on 10-12 March 1993.

The contact person for the BCG is:

Paul SILENCE
DELFT GEOCONSULT
Kersenbomenlaan, 47 1990 OVERIJSE (Belgium)
Tel: 32 - 2 - 657 24 23

GEOSYNTHETICS PLEASE – NOT GEOCONFUSION!

by

P. Rimoldi, Tenax Spa, Italy

D. Cazzuffi, ENEL/CRIS, Milano, Italy

A. Ionescu, Saiform Spa, Italy

N. Moraci, University of Padova, Italy

INTRODUCTION

The recent discussions on terminology for geosynthetics that have appeared in IGS News have identified an important issue and stimulated a general re-thinking of current definitions. The articles written by J.M. Rigo (IGS News, Vol 8 Nos 1&2, March/July 1992), W.A. Gevers et al. (IGS News, Vol. 8 No.2, July 1992), Ph. Delmas and Y. Matichard (IGS News, Vol. 8 No. 3, November 1992) have focussed attention on the diversity of opinions on terminology that exist in many countries. The discussion has also been stimulated in Europe by the activities of CEN/TC 189. The Italian Ad-Hoc Group for Terminology inside UNI (The Italian Standards Organization) recently met on several occasions to discuss the draft European standard prEN 30318. This standard is simply the old ISO/10318 standard "Geotextiles-Vocabulary". The Italian experts, rather than accepting the ISO document as is, investigated many different proposals for terminology related to geosynthetics (e.g. ISO, ASTM, Gevers et al., Delmas and Matichard). The Italian group concluded that there were deficiencies in all referenced documents related to consistency and all suffered from a mixture of different ideas that are likely the result of compromise amongst many parties with different points of view. Unfortunately, in the opinion of the writers, the result is that the non-specialist is left with an impression of "geoconfusion" rather than geosynthetic product definition! Therefore, we would like to present our proposal in an attempt to arrive at a more comprehensive treatment of geosynthetics terminology.

"PHILOSOPHICAL" APPROACH

Let us briefly review the history of geosynthetics terminology. The names of the different families of products were initially selected on the basis of physical appearance: for example; "geotextiles", "geomembranes", "geonets", "geogrids" and so on. Then, as the number of products on the market grew, the families of products were extended in order to encompass the main function of the group. For instance: geonet was associated with drainage; geogrid with reinforcement; and so on. However, as a result of this evolution in terminology, some products may not fit into a family of products that was initially based on the physical appearance of the "pioneer" product of that family. For example: a cusped core (dimple product) is different from a geonet based on physical appearance but serves a similar drainage function. If product families are labelled based on physical appearance, then a new family name must be issued which is consistent with the physical ap-

pearance of the first product in the group. On the other hand, if product families are named according to function, the problem then arises to assign a "main function" or a "main working mechanism" to the different products in the group. However, some products can fulfil different functions. For these cases, should we include them with more than one family or, should we assign them to an arbitrarily chosen main family? It is our opinion that selecting family names by physical appearance is easier – it just requires that we periodically update our vocabulary of terms. In this approach, a geomat remains a geomat and may be used for drainage or for protection. The article by Gevers et al. (IGS News, July 1992) is very valuable, but it illustrates some of the confusion between classification by physical appearance or function. As an example: what is meant by a product in geotechnical and civil engineering applications whose name is "geospacer"? Does it serve a drainage or separation function? This is "geoconfusion"! Based on their physical appearance, geospacer products should be a "geomat" or a "geodimple". After having decided to classify products by their physical appearance, we have only to decide on the name of the family. Regardless of the final choice of family classification name, a product will always be related to one family. In this way, even products made of totally different materials, but similar in shape, can be unequivocally classified into the same family.

TASKS OF THE IGS

We believe that it is a specific task of IGS to produce reference documents for geosynthetics terms and graphics symbols. An important example is the draft graphics symbols proposed by Dr. J-P. Giroud in IGS News (Vol 7 No. 3 November 1991). The development of a standard geosynthetics terminology should be undertaken by IGS using a small working group of experts to prepare a proposal for discussion amongst the members. The forum for debate would be the IGS News. Once the terminology has been defined, IGS should vigorously promote its use with standards organizations (such as ISO, CEN, ASTM). Only in this manner can we arrive at a common internationally agreed vocabulary. While IGS should not and does not engage in a discussion of test methods, it is surely an obligation of the IGS and an IGS mission to define the language and graphics symbols set for the international geosynthetics community. Once a standard vocabulary and symbols set is established, the IGS should update the list every 4 years (corresponding to each International Conference) using a special edition of IGS News.

GENERAL CONSIDERATIONS FOR A STANDARD GEOSYNTHETICS TERMINOLOGY

In conclusion, we want to propose some general guidelines to play the geosynthetics terminology game.

- Each family of products must be distinguished by a unique physical characteristic that will allow us to place that product in a single family. As an example: geogrid can be defined as “a regular network of integrally connected elements”, while geonet can be “a regular network of integrally connected overlapping ribs”. On the other hand, geomat can be defined as “a non-regular network of fibres, yarns, filaments, tapes or other elements”.
- The definition of families of products must follow a consistent scheme so that the difference between various classes of products is clear. Therefore we propose to use the following scheme: name of the family; degree of permeability; type of raw material (natural and/or synthetic); structure of the product; production process and field of application.
- Each of the main geosynthetics families (e.g. geotextiles, geogrids, geomembranes) shall be divided into sub-families. Each sub-family must be distinguished by a particular production process. Hence, the “geotextile” family shall be divided into “woven”, “nonwoven” and “knitted”. The “geogrid” family into “extruded”, “woven” and “bonded”. The sub-families shall not include the prefix “geo”, rather, they shall be identified by the family to which they belong. Therefore we propose “woven geotextile” rather than “geowoven”. In this way, the family continues to indicate the principal physical characteristic, while the sub-family indicates the production method.

PROPOSED TERMINOLOGY

The Italian group of experts for CEN/TC 189 has prepared the proposal for the definition of product families and sub-families listed below. Definitions for “geomembranes and geomembrane-related products” have not been defined by the Italian group since this is the task of the CEN Joint Working Group TC 189-TC 254.

Geotextile: A permeable, polymeric (synthetic or natural) textile material, in the form of manufactured sheet (which may be woven, nonwoven or knitted) used in geotechnical and civil engineering applications.

Woven geotextile: A geotextile produced by interlacing, usually at right angles, two or more sets of fibres, filaments, tapes or other elements.

Knitted geotextile: A geotextile produced by interlooping one or more fibres, yarns, filaments or other elements.

Nonwoven geotextile: A geotextile produced by bonding (by means of friction and/or cohesion and/or adhesion, see ISO 9092) of directionally or randomly oriented fibres.

Geotextile – related product: A permeable polymeric (synthetic and/or natural) material, such as a geogrid, geonet, geomat, geocell, geocomposite or others, excluding geotextiles, used in geotechnical and civil engineering applications.

Geogrid: A polymeric structure, in the form of manufactured sheet, consisting of a regular network of integrally connected elements, which may be linked by extrusion, bonding or interlacing, whose openings are larger than the constituents, used in geotechnical and civil engineering applications.

Extruded geogrid: A geogrid produced by making a regular network of holes in an extruded sheet and then stretching the sheet uniaxially or biaxially.

Bonded geogrid: A geogrid produced by bonding, usually at right angles, two or more sets of strands or other elements.

Woven geogrid: A geogrid produced by interlacing, usually at right angles, two or more sets of fibres, yarns, filaments, or other elements.

Geonet: A polymeric structure, in the form of manufactured sheet, consisting of a regular network of integrally connected overlapping ribs, whose openings are usually larger than the constituents, used in geotechnical and civil engineering applications.

Geomat: A polymeric structure, in the form of manufactured sheet, consisting of a non-regular network of fibres, yarns, filaments, tapes or other elements (which may be thermally or mechanically connected), whose openings are usually larger than the constituents, used in geotechnical and civil engineering applications.

Geocell: A polymeric cellular structure, consisting of a regular open network of connected strips, linked by extrusion or adhesion or other methods, used in geotechnical and civil engineering applications.

Geocomposite: An assembled polymeric material, in the form of manufactured sheet or strip, consisting at least of one geotextile-related product among the components, used in geotechnical and civil engineering applications.

Many of the proposed terms are currently under discussion with CEN/TC 189. The writers believe that the present range of geosynthetic products is wider than the products currently defined by ISO and CEN. In the future, other terms may emerge such as “geomesh”, “geostrip”, “geopipe”, “biomat”, “bionet” (and so on).

The writers welcome discussion by IGS members.

IGS Technical Committee sets objectives

At the IGS Council meeting held in Fukuoka in November 1992 it was agreed to establish a technical committee to review technical matters as they affect the industry. The committee was established under the Chairmanship of Chris Lawson, with Vice-Chairman Barry Christopher. Currently, the technical committee is charged with three tasks:

1. Develop a bibliography of all codes of practice which relate to geotextiles, geomembranes, related products, and associated technologies.
2. Review and update the list of text symbols applied to geotextiles, geomembranes and related products. This is to be completed by the time authors are notified of their paper acceptance for the 5th International Conference in Singapore.
3. To formalize a list of graphic symbols describing geotextiles, geomembranes and related products. This is also to be completed by the time authors are notified of their paper acceptance for the 5th International Conference in Singapore. A draft of a proposed graphic symbols set for geosynthetics was reported by Dr. J-P. Giroud in IGS News (Vol 7 No. 3 November 1991).

If any IGS members have views on how the technical committee may best serve the membership they are invited to contact either Chris Lawson or Barry Christopher at the addresses listed below:

C.R. Lawson
Exxon Chemical Geopolymers Ltd,
Mamhilad Park, Pontypool, Gwent NP4 0YR
U.K.

Tel: (0495) 767407
Fax: (0495) 762383

B.R. Christopher
Polyfelt Inc.
100 Abernathy Road, Building 400, Suite 825
Atlanta, Georgia 30328
U.S.A.

Tel: (404) 6682119
Fax: (404) 6682116

*reported by C.R. Lawson
Chairman of the IGS Technical Committee*

Proceedings of GEOFAD'92 available

The UK Chapter of the IGS has approximately 80 copies of the GEOFAD'92 Proceedings for sale at a special price to members of the IGS (see IGS News Vol 8 No 2 p. 13, July 1992). The proceedings are being published by Thomas Telford Ltd. with a cover price of £35.00 and will be available from 1 April 1993. IGS members can obtain their reduced price copy of the proceedings (one copy per member only), on a first come first served basis, at a special price of £30.00 including post and packing.

Orders should be sent to:

Mr. Steve Corbet
Secretary, IGS UK Chapter
G. Maunsell and Partners
Newlands House, The Newlands, Witham
Essex, CM8 2UW
UK

Tel: (44) 376 513531
Fax: (44) 376 520585

All orders must be accompanied by a bankers draft. Receipts will be issued on request but no invoices will be issued. When the copies of the proceedings available at the special price have been sold, the UK Chapter will pass orders to the publishers who will invoice for the balance of the cost. Extra copies of the Proceedings can be ordered direct from the publishers at £35.00 per copy:

Thomas Telford Ltd.
Thomas Telford House
Heron Quay, London, E14 4JD
UK

Fax: (44)71 538 4101

*reported by S. Corbet
Secretary, IGS UK Chapter*

Geosynthetics Bibliography on schedule

In the last issue of IGS News (Vol 8 No 3 November 1992) we reported on the Geosynthetics Bibliography under preparation by Dr. J-P. Giroud. In the same article we solicited the help of the IGS members to ensure that the bibliography was complete as practical up to 31 December 1992. In a recent conversation with the Editor of IGS News, Dr. Giroud was pleased to report that Volume 1 dedicated to conferences (i.e. Parts 1,2 and 3 of the bibliography) should go to press in April and be ready for pur-

chase in May 1993. The second volume dedicated to papers published in journals (Part 4), lists of publications of selected authors (Part 5) and a list of theses, books, reports and monographs on geosynthetics (Part 6) should follow shortly thereafter and be ready to purchase by the end of August 1993.

*reported by R.J. Bathurst,
Editor IGS News*

GEOSYNTHETICS CASE HISTORIES BOOK

edited by G.P. Raymond and J-P. Giroud

NOW AVAILABLE

The publication titled "Geosynthetics Case Histories", edited by G.P. Raymond and J-P. Giroud is now available. The book was prepared under the auspices of the International Society for Soil Mechanics and Foundation Engineering's Technical Committee TC9 on Geotextiles and Geosynthetics.

The book contains 127 case histories involving geosynthetic materials used in geotechnical engineering applications reported from 24 countries. The case histories are organized into 11 chapters based on type of application. These cover most of the applications of geosynthetics in geotechnical engineering.

The chapters are as follows:

1. Dams (12 case histories)
2. Containment ponds, irrigation and reservoirs (14 case histories)
3. Scour erosion control (10 case histories)
4. Slope, bank and pipeline erosion control (15 case histories)
5. Tunnel and hydroelectric applications (4 case histories)
6. Railways and asphalt pavements (13 case histories)
7. Deep foundation improvement (11 case histories)
8. Pavement subgrade and base reinforcement (16 case histories)
9. Fill and embankment reinforcement (12 case histories)
10. Reinforced soil slopes (9 case histories)
11. Reinforced soil walls (11 case histories)

The materials used in the projects presented in the case histories encompass all types of geosynthetic materials including geotextiles, geomembranes, geomats, geonets, geogrids, geocomposites, and related products (some of them made from natural fibres, but included in the geosynthetics category according to the prevailing usage). Also, a number of case histories deal with geosynthetic systems: soil-yarn and soil-mesh mixtures, geotextile-concrete erosion control mattresses, and concrete blocks or panels associated with geosynthetic reinforcement, to name a few.

All case histories are presented in a consistent manner. The left-right two-page format gives quick access to all the information provided for each case history. All case histories contain the same type of information presented, as much as possible, in the same order. The titles of all case histories start with a "geoword" that identifies the

geosynthetic(s) used, and all titles end with the name of the location where the project is sited. As a result, valuable information can be found just by scanning the Table of Contents.

The 127 case histories presented in this book demonstrate the feasibility of using geosynthetics in a wide spectrum of geotechnical applications. Many of the projects described have been in use for ten or more years and their excellent performance since construction provides a valuable indication of the durability of geosynthetics.

Some case histories describe projects more than twenty years old. The geosynthetics used in these projects are still performing well. In one of these projects, for example, the geosynthetic performance was established through an extensive investigation – which should encourage those potential users of geosynthetics who may still have doubts regarding the durability of these materials.

One case history describes the construction of a temporary structure more than thirty-five years before the publication of this book. This temporary structure does not give any information on geosynthetic durability, but the difficult conditions of the construction and the elegance of the "geosynthetic" solution that was adopted illustrate the power of innovative techniques.

Many people contributed to the success of this collection of case histories including the 41 members of the ISSMFE Technical Committee TC9 on Geotextiles and Geosynthetics and 181 authors.

It is hoped this book will not only provide useful examples to designers and constructors, but will also encourage users of geosynthetics to write about their projects and provide their peers with more case histories. We hope this book will be regarded as an example of a collective effort of many transferring knowledge to many, thereby contributing to the progress of our discipline.

Readers can purchase the book by writing to:

BiTech Publishers Ltd.
173 – 11860 Hammersmith Way
Richmond, British Columbia, V7A 5G1
Canada

The book contains 277 pages and is printed in hard cover. The cost of the book is \$(US)107.00 or \$(Cdn)131.00 plus GST if applicable. The cost includes shipping and postage.

reported by
G.P. Raymond and J-P. Giroud

Corporate Profiles

The IGS Council has decided that in each issue of the IGS News up to three Corporate Members will be allocated space to allow them to introduce their company or association and present their achievements. The criteria for selec-

tion of corporate profiles were described in IGS News, Vol. 4, No.2, p. 7. Alternatively, you can get details by writing to the Editor. There is no charge for having a corporate profile published; it is a benefit of corporate membership.

NATIONAL SEAL COMPANY

by

Lisa Jones

1245 Corporate Blvd. Suite 300, Aurora, Illinois 60504, USA

National Seal Company (NSC) is a well-established manufacturer and installer of lining systems for waste and liquid containment. The company has earned a solid reputation by providing consistently high quality products, quality workmanship and innovative installation technology.

In its 14 years of existence, NSC has experienced tremendous growth. NSC started in 1979 as a small fabricator of a variety of geosynthetic products and has since risen to be one of the worlds largest manufacturers and installers of geosynthetic products.

Today, National Seal Company's extensive product line includes: high density and very low density polyethylene geomembranes; COEX SEAL™, an innovative coextruded three-in-one liner combining the strengths of HDPE and VLDPE; FRICTION SEAL®, a complete line of textured geomembranes; BENTOFIX™, geosynthetic clay liners; POLY-NET drainage nets and TEX-NET geocomposites.

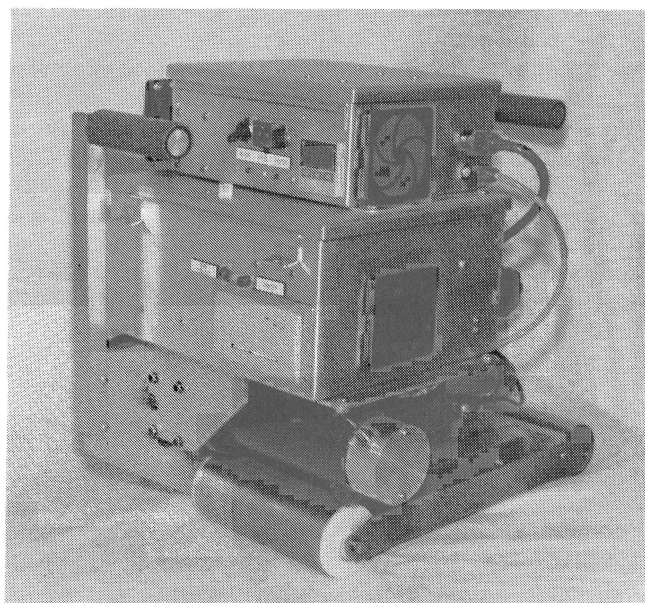
A recent application using NSC's textured COEX SEAL, known as FRICTION SEAL@CX, was a Michigan landfill serving the Flint area. Faced with dwindling storage space in the existing 12 hectare clay-lined disposal site, the owner wanted to develop two 1.8 hectare cells immediately adjacent to the filled area. One wall of the new cell would actually be compacted refuse which made differential settlement a concern and, to add to the challenge, the construction site was on a 4 to 1 slope that extended for about 140 m. In order to meet the challenge, a lining system was designed that used FRICTION SEAL CX geomembrane. Along with its excellent chemical resistance this geomembrane material has more flexibility than HDPE and higher tensile strength than just VLDPE. It also offers good puncture resistance as well as better friction. Given the requirements of the job, this product proved to be successful in meeting the demands. Another unique job using COEX SEAL was at Mountain High Ski Area in Southern California. The owner encountered problems with a five-year old, 120 million litre reservoir which supplies the water for making snow. Due to the severe wind conditions COEX SEAL was chosen as the geo-

membrane which could best withstand puncture and environmental stress cracking.

NSC is also known throughout the polyethylene industry for pioneering the double fusion weld, now the standard in the USA. Its recently introduced "Smart Mouse" is one of the most technically advanced welders in the industry. The heart of the new welder is its process control computer, which measures and records critical parameters that can affect welding quality. The Smart Mouse allows NSC to gather and use real-time data regarding welder performance and the process of joining two geomembranes in the field.

NSC has a 9300 square metre manufacturing plant in Galesburg, Illinois and sales and construction offices throughout the United States.

NSC has been a corporate member of the IGS since 1992.



The National Seal "Smart Mouse" – a technically advanced welder for geomembrane seaming

Synthetic Industries, Inc.

by

C. Ted Koerner

4019 Industry Drive, Chattanooga, TN 37416, USA

Synthetic Industries, Inc. is one of the largest manufacturer of polypropylene based industrial textile products in the United States. The company's primary business centres are carpet backing, technical textiles and construction/civil engineering products.

The company was founded in 1969 to produce primary carpet backing. Product line expansions and acquisitions commencing in 1981 diversified the business programs to include geotextiles, FIBERMESH™ concrete reinforcement fibre, specialty fibrillated yarns, technical fabrics and, more recently, erosion control systems. Principal products for addressing infrastructure challenges and critical environmental issues are FIBERMESH concrete reinforcement fibres and geosynthetic fabrics, yarns and fibres.

The FIBERMESH Division of Synthetic Industries is a world leader in the sales and marketing of polypropylene fibres for concrete reinforcement. Regional offices are located throughout the United States and Europe, while 30 distributors serve other international markets.

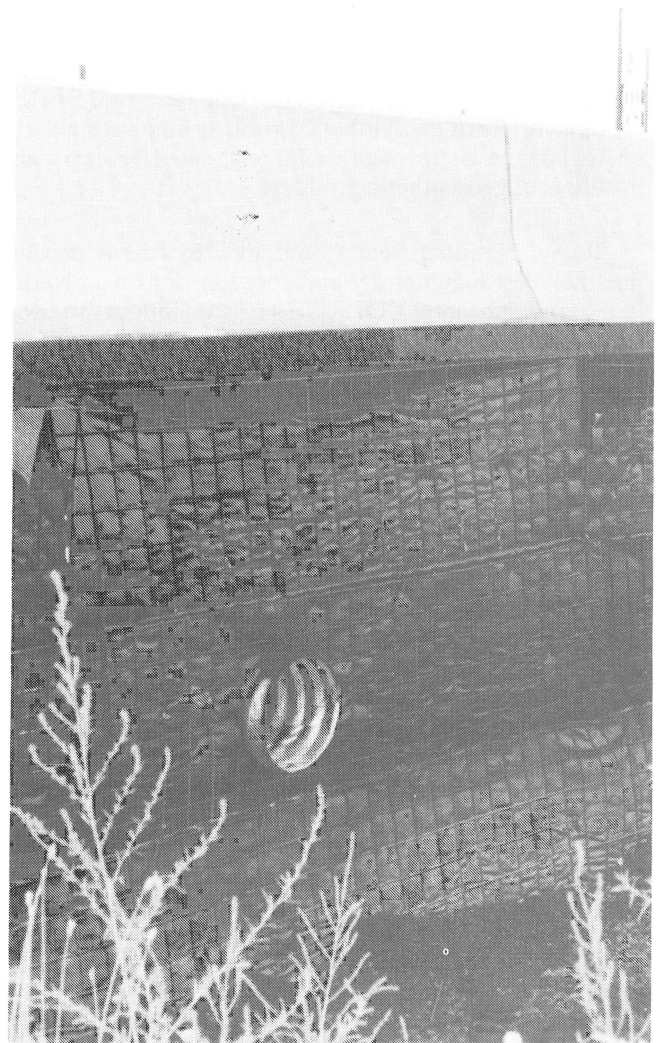
The Construction Products Division (CPD), headquartered in Chattanooga, Tennessee, markets Synthetic Industries' new generation of geosynthetic materials, in addition to time-proven conventional geotextiles, to the construction and civil engineering industries. CPD offers a broad complement of soil engineering and erosion control products. Wovens, nonwovens, three-dimensional fabrics, strands and patented FIBERMESH for isotopic reinforcement of soils, are core product lines which provide the engineering community with cost-effective solutions to ever changing needs.

Geotextiles including nonwoven needlepunched, woven tape and monofilament geotextiles have been used on major highway, airport, railroad, and waste containment sites throughout North America and Europe. Recently, our woven geotextile was used to construct a temporary roadway for the widening of I-25 through Denver, Colorado. The project originally had a grade change between the temporary lanes and the final roadway. This posed a safety problem to motorists as well as unnecessary construction problems. The grade of the temporary road was raised through the use of woven geotextiles that were used to (1) stabilize and separate coarse aggregate which functioned as both a foundation and drainage layer; and (2) reinforce the fill and form a wall (see photograph at right). Several layers of geotextile were installed utilizing wire mesh for the face of the wall with a maximum wall height of 2 - 3 metres.

Erosion and sediment control products include LANDLOK™, Turf Reinforcement Mats (TRM's) and Erosion and Revegetation Mats (ECRM's). These products are three-dimensional matrices designed to synergistically mesh with plants to produce Biotechnical Composites™ that are permanently anchored to the soil

surface. Traditional applications include roadside ditches, storm water channels, and steep slopes. Other products include POLYJUTE™, a woven, photo-degradable, erosion control mesh and LANDSTRAND® systems that are designed for temporary erosion control allowing revegetation of slopes and moderate flow channels. FIBERGRIDS™ and TURFGRIDS™ are Synthetic Industries' newest patented products for three-dimensional soil reinforcement and are made from discrete polypropylene fibres. When mixed in with soil, they can be used to stabilize subgrades, slopes and athletic playing field surfaces. Recent projects include a college football field and a highway in Texas.

Synthetic Industries has been a Corporate Member of the IGS since 1991.



Example of wire mesh facing as part of a geotextile reinforced soil wall structure

PAVCO S.A.

by
Ernesto Parra

P.O. Box 14456, Santafe de Bogotá, D.C., Colombia

PAVCO S.A. was founded in 1963. The company began as a producer and distributor of vinyl floor tiles but has grown to become one of the largest industrial corporations in Colombia. The company is a market leader for many products related to the construction industry and home renovation and has about 1100 employees. The company's operating facilities are located in Santafe de Bogotá and Barranquilla, the main administrative offices being in Santafe de Bogotá. Company facilities cover 71,300 square metres. PAVCO S.A. has more than 150 distributors in 53 cities. It exports products to South American countries including Mexico and Costa Rica and to other countries such as Australia and New Zealand.

The company is organized into three operating units: Interior Decoration Products, P.V.C. Pipes and Fittings and, Industrial Textiles. PAVCO is the major producer of geotextiles in Colombia and the Andean Group Countries. It started producing woven polypropylene geotextiles in 1983 and, in 1985, initiated the production of needlepunched nonwoven geotextiles. Today, the company produces a wide variety of geotextiles for drainage, filtration, soil reinforcement, and repaving. In addition, the company manufactures concrete forming bags and oil absorbent fabrics.

A recent project that used geotextiles in Columbia was the construction of "The Troncal del Magdalena Medio" road in the Magdalena river basin. High modulus woven geotextiles were used to reinforce road embankments constructed over soft foundation soils on this roadway.

More than 60,000 square metres of this product were used.

Another recent application of geotextiles was the construction of a series of subdrains under the Combeima River for the Municipal Water Supply Company of Ibaque. More than 12,000 square metres of nonwoven geotextiles were used in this project.

PAVCO S.A. has been a Corporate Member of the IGS since 1991.



Construction of the Magdalena Medio road near Barrancabermeja in Colombia using 1.400 T PAVCO woven geotextiles.

IGS Inventory of Geosynthetics—related Computer Software

An issue of the Journal Geotextiles and Geomembranes will soon be published that is devoted exclusively to computer software programmes for the design and analysis of civil engineering structures that incorporate geosynthetics (Computer Programmes for Geosynthetic Applications, Vol. 12 No. 5, April 1993). The IGS Council at its annual meeting held on 9–10 November 1992 in Kyushu adopted a motion to continue the momentum established by this issue and begin an inventory of geosynthetics—related computer software.

IGS members are asked to contribute to this inventory by supplying the following information for candidate computer software programmes:

Software name: (e.g. Geowall ver 2.1)

Hardware requirements: (e.g. IBM 386 computer or compatibles, 2Mb extended memory, MacIntosh, HPGL plotter, etc.)

Operating system: (e.g. MS-DOS 3.1 or better, OS/2,

etc.)

Program description: This section should include no more than 300 words describing the scope of the program and the analytical methods and design strategies implemented in the code (include references to papers available in the literature).

Typical results: Not more than one page.

Contact: (i.e. vendor or contact person).

Cost:

The information on each programme will be restricted to two pages. Enquiries and submissions can be made by contacting Dr. R.J. Bathurst (see address on back cover of this issue) or:

Prof. J.M. Rigo
GRC-LMC – Liège University
Quai Banning, 6
B 4000 Liège, Belgium
Tel: 32 41 669234 Fax: 32 41 523395

Abstracts due 31 July 1993
**5th International Conference on Geotextiles,
Geomembranes and Related Products**
5–9 September 1994, Singapore

The 5th International Conference on Geotextiles, Geomembranes and Related Products to be held in Singapore has been heavily publicized in recent months. Bulletin 1 was sent to all IGS members in September/October 1992. The conference was promoted at IS Kyushu'92 in Fukuoka, Japan with a special booth manned by the SEAC-IGS Chapter and provided courtesy of the IS Kyushu organizers and the Singapore Convention Bureau. The call for papers in Bulletin 1 also appeared in the December 1992 issue of Geotechnical Fabrics Report and in the 1993 Specifier's Guide published by the Industrial Fabrics Association International.

Bulletin 1 has also been sent to many universities around the world to the attention of the civil and environmental engineering departments. The **deadline for receiving the abstracts of papers is 31 July 1993**. The themes for the conference include: Bank and Bed Protection; Erosion Control; Soil Reinforcement; Roads and Railways; Drainage and Filtration; Dams, Canals and Reservoirs; Waste Containment and Pollution Control; Long Term

Experience; Special Applications; Materials, Properties, Testing and Installation; New Solutions and Directions.

A technical exhibition will also be held in conjunction with the conference. The exhibition bulletin will be released shortly to all IGS corporate members in the first mailing. A computer and poster display session will also be held for interested groups.

For more information please direct all enquiries to:

Conference Secretariat
5th International Conference on Geotextiles
Thomson Road, PO Box 0177, Singapore 9157

Tel: (65) 353 5511
Fax: (65) 353 2424
E-Mail: CVEKARUN@NUSVM.BINET

reported by G.P.Karunaratne
SEAC-IGS

**The 6th Italian Conference on Geosynthetics in Earth
Structures**
by
Daniele Cazzuffi, Associate Editor of IGS News (Europe)

More than 180 professionals attended the 6th Italian Conference on Geosynthetics held in Bologna on 23 October 1992. Organized by Associazione Ingegneri e Architetti della Provincia di Bologna and the Bologna Fiere, the Conference was focussed primarily on erosion control.

After an opening address by Ing. G. Tasselli, President of the Italian Society of Engineers and Architects, the Conference was introduced by Prof. A. Di Tommaso, Chairman of the Italian Group of RILEM (Réunion Internationale des Laboratoires d'Essais sur les Matériaux et les Constructions).

The General Report was presented by Prof. A. Lamberti, who described the mechanics of erosion processes, the possible effects of uncontrolled erosion phenomena and finally the types of geosynthetics used in erosion control applications. The General Report was followed by seven communications. Dr. Ben Northcutt emphasized the importance of erosion control in protecting natural resources; Ing. P. Vella described some experiments on the effectiveness of natural and synthetic geotextiles for the control of soil erosion, while Ing. D. Cazzuffi outlined the standards for geosynthetics and related products in erosion control applications. In the afternoon, Dr. M. Harding presented the erosion and sediment control plan developed in Oakland, California for firestorm emergencies; Dr. G. Sauli illustrated some biological engineering tech-

niques and Prof. R. Guercio reviewed the evolution of hydraulic works referring to erosion control. Finally, Dr. S. Malcevschi pointed out some issues related to environmental compatibility and erosion control. As in previous Italian conferences, the "lunch break" included a tour of the exhibits dealing with geotextiles, geomembranes and related products at the International Exhibition of Building Industrialization (SAIE).

The proceedings of the 5th Italian Conference on Geosynthetics (see IGS News, November 1991) were distributed during the 6th conference. They are published in an 102 page issue of the Italian technical journal "L'Ingegnere" (No. 9/12 - 1991) and each contribution contains an English abstract. The publication is dedicated to the geotechnical design of structures, incorporating geosynthetics, with special reference to existing standards and guidelines, prepared by various international committees. The Proceedings of the 5th Italian Conference on Geosynthetics in Earth Structures are now available at a cost of \$(US)40.00 + postage \$(US) 10.00 from:

Associazione Ingegneri e Architetti
della Provincia di Bologna
Strada Maggiore, 13-40125 BOLOGNA, Italy

Fax: 39.51.230001

Annual Report of the Japan Chapter of the IGS (JCIGS) January 1993

On 29 January 1993 the JCIGS General Assembly was held in Tokyo. The following items were reported and approved by the membership:

1) Membership as of December 31, 1992:

Honorary members	1
Individual members	163
Student members	41
Corporate members	20

2) Publications in 1992:

- JCIGS Membership Directory, January.
- JCIGS Newsletters: March, July and December.
- The 2nd Tokyo Geotextile Seminar, Tokyo, November.
- Proceedings of the 7th Geotextile Symposium, Tokyo, December.

3) Programs sponsored by JCIGS in 1992:

- JCIGS General Assembly, Tokyo, 14 February
- Mercer Lecture: Given by Professor R.M. Koerner during the JSSMFE annual meeting in Kochi, 3 June. Co-sponsored by the Japanese Society of Soil Mechanics and Foundation Engineering.
- Geotextile Lecture Meeting: Lecture by Professor R.M. Koerner, Tokyo, 6 June: 70 participants.
- IGS Council Meeting: Fukuoka, 9–10 November. Preceded by the IGS Officers Meeting on 8 November and followed by IS Kyushu '92, 11–13 November.
- Geotextile Seminar for Student Members: A lecture was given by Mr. D. Cazzuffi to students at Tokyo Science University on 15 November: 70 participants.
- 2nd Tokyo Geotextile Seminar: Lectures were given by Drs. R.K. Rowe, R.J. Bathurst, J.M. Rigo and Messrs B. Myles, D. Cazzuffi and P.E. Stevenson, Tokyo, 16 November: 80 participants. A luncheon for IGS Council members and Japanese Corporate members, and an evening reception for Council members and individual members.
- Field trips for visiting IGS Council Members in the Tokyo area, 17–18 November.
- 7th Geotextile Symposium, Tokyo, 1 December: 12 papers were presented and a special lecture given by Professor K. Makiuchi: 120 participants.

4) Activities of JCIGS Committees:

- Steering Committee: 20 January, 8 April, 22 June, 6 October, 16 November and 1 December.
- Programs Committee: 5 and 20 November.
- Editorial Committee for JCIGS Newsletters: 9 and 30 January, 19 March, 16 and 21 April, 28 May, 8, 23 and 27 July, 31 August, 15 October, 8 and 11 December.
- Audit Committee: 3 February.

5) Contacts with IGS:

- Council Meeting at Fukuoka: Attended by Professors M. Fukuoka and T. Akagi, November.
- IGS News: The Annual Report of JCIGS published in the November 1992 issue.
- List of JCIGS Members: Transmitted to IGS in February, August, November and December.

6) Election of JCIGS officers for 1993:

JCIGS Officers for 1993:

Chairman: Masami FUKUOKA

Advisors: Shigeru TANAKA and Toyotoshi YAMANOUCHI

Secretary General: Komei IWASAKI

Board Members: Hiroshi ABE, Toshinobu AKAGI, Hitoshi ARAI, Fumihiro HASHIZUME, Takanori HIRAI, Shigekazu HORIYA, Yoshimi HOSOYA, Masao ITOH, Kiyomaro KASAHARA, Koji HUMAGAI, Katsuhiko MAKIUCHI, Takayuki MASUO, Hiroshi MIKI, Masaaki MIYATA, Kazuyuki NAKAMURA, Takao NAKAYA, Tatsuaki NISHIGATA, Masahiko SAKAGUCHI, Sigeru SUZUKI, Shuzo TAKAHASHI, Kyouzo TAKAOKA, Masatoshi TANAKA, Hideki TSUKAMOTO, Tanehide TSURUOKA, Yoshiharu WATARI, Tsuneo YAMASHITA, Shin-ichi YAMATO and Susumu YOSHIKAWA

Treasurer: Kenkichi MARUYAMA

Auditors: Shigekazu HORIYA and SHUZO TAKAHASHI

Secretaries: Norio YOSHIOKA and Toshiro MORITA

7) Programs proposed for 1993:

- Publication of JCIGS Membership Directory in January. JCIGS Newsletters to be issued in March, July and November. Seminar textbooks and Proceedings of the 8th Geotextile Symposium to be held in December.
- Sponsorship of the Geotextile Seminar.
- Sponsorship of the 8th Geotextile Symposium to be held on 1 December.
- Committee activities by Steering Committee, Planning Committee, Programs Committee, Editorial Committee for JCIGS Newsletters and Technical Committees.
- Participation in the IGS Council. JCIGS will continue close contact with the IGS and send the Japanese Council members to the IGS Council meeting to be held in Milan on 9–20 October.
- Promotion of a IGS membership drive with the goal to increase membership by 10% by the end of 1993.

8) Treasurers Report:

In the year 1992 JCIGS Chapter revenue was 7,423,706 yen, while expenditures were 7,950,727 yen resulting in a deficit of 527,021 yen. Without the efforts of the officers and the considerable support given by the Japanese Society of Soil Mechanics and Foundation Engineering (JSSMFE), the deficit would have been far greater. JCIGS has no office of its own nor full-time employees.

Any questions regarding the foregoing should be directed to the undersigned.

*reported by T. Akagi,
Liaison Secretary JCIGS and IGS Council Member*

Dr. Katsuyuki Kutara

It is with deep regret that the IGS announces the death of one of the brightest stars in the field of geosynthetics in Japan. Dr. Katsuyuki Kutara who was the Head of the Mechanical Construction Division at the Public Works Research Institute of the Ministry of Construction died at the age of 49 on 1 February 1993. Dr. Kutara served the PWRI for 25 years during which time he devoted himself actively to research on various geotechnical subjects. Particularly during the past 10 years he took the initiative in promoting and conducting diversified research activities on the practical application of geosyn-

thetics including geotextiles, geomembranes and expanded polystyrene to civil engineering works. Dr. Kutara also played a major role in compiling manuals and standards for testing geosynthetics materials and designing geosynthetic-reinforced earth structures in Japan. He was always been a key figure in geosynthetics-related conferences and symposia both in Japan and abroad in recent years.

*reported by T. Akagi
Japan Chapter of IGS*

Geotextiles & Geomembranes: An Official Journal of the IGS

In 1993 the Journal will be published in 8 issues in order to provide a more frequent service to subscribers and more timely publication for the authors. The subscription price for 1993 has been set at Pounds 270 (UK). The reduced subscription offer to individual IGS members represents a 40% discount off the full price, i.e. Pounds 162 (UK).

Reduced subscriptions are available directly from the publisher:

Subscription Department
Elsevier Applied Science Publishers
Crown House, Linton Road,
Barking, Essex IG11 8JU
United Kingdom

Members are reminded that to take advantage of this discount they must inform Elsevier Publishers that they are a member of IGS.

The Editor, T.S. Ingold, the Editorial Chairman, J-P. Giroud, the IGS Editorial Board Representative and the IGS President, R. Kerry Rowe, all hope that IGS members will use *Geotextiles & Geomembranes* as an outlet for their technical papers and thus contribute toward the continuing success of this high quality publication which now has subscribers in over 40 countries worldwide. Papers should contain work not published in full elsewhere and should be sent to:

Dr. T.S. Ingold
Mulberry Lodge
St. Peters Close, St. Albans
Hertfordshire AL1 3ES
United Kingdom

Instructions to authors are also available from Dr. T.S. Ingold.



President of the IGS, Professor R.K. Rowe smiles at the camera after finding the IGS logo on a plate for sale in Japan.

GEOMEMBRANE OVERLAY FOR DAM RESERVOIR

by H. Yoshikoshi

Tokyo Electric Power Co., Inc., Japan

The Tokyo Electric Power Co., Inc. constructed the 1050 MW Imaichi Pumped Storage Power Plant in 1988, located about 130 km north of Tokyo. The plant was constructed to meet the rapidly growing demand for electricity in the Tokyo Metropolitan area. The Kuriyama Dam that was constructed to create a reservoir for the plant is a 97.5 m high rockfill dam. The water tightness of the upstream reservoir was a crucial design issue in the civil engineering works.

To minimize seepage through the reservoir it was decided to use flexible geomembranes, concrete cover and gum asphalt over the entire ground surface of the reservoir but not including the dam itself (approx. 30 ha). In accordance with topographical and geographical conditions, the choice of these three different surface treatments was determined as follows:

- (1) A geomembrane was used for the shallowest slopes with a gradient of less than 1:3 (V:H) and for the bottom of the reservoir.
- (2) A concrete overlay treatment was used for slopes with a gradient of 1:1.5.
- (3) Gum asphalt overlays were used for steep slopes with a gradient of 1:0.5. These steep slopes were the result of an existing quarry that was ultimately inundated by the reservoir.

The geomembrane overlay was designed to cover 60% of the total reservoir bottom and to resist pressures corresponding to a maximum water depth of 40 m. Design and construction details of the geomembrane overlay are as follows:

- (1) A polyvinyl chloride geomembrane with a thickness of 1.5 mm was used.
- (2) The geomembrane seaming was carried out using thermal welding and dual seams were employed to ensure

the integrity of the seams. Vacuum testing was used to ensure water tightness.

- (3) The geomembrane was fixed to reinforced anchors. The anchors and adjoining concrete structures were also covered by the geomembrane to ensure water tightness at these connections.
- (4) A nonwoven geotextile (400 g/m²) was placed over the foundation to protect the geomembrane from puncturing.
- (5) To protect the geomembrane from ultraviolet degradation and surface ice the geomembrane was covered with a 40 to 80 cm thick layer of sand. A nonwoven geotextile (800 g/m²) was placed between the geomembrane and the sand layer to act as a cushion.



View of Kuriyama Dam and reservoir

IGS News Editors

Editor

Dr. R.J. Bathurst
Civil Engineering Department
Royal Military College of Canada
KINGSTON, ONTARIO, CANADA K7K 5L0
Tel: 1 (613) 541 6479 or 541 6391 Fax: 1 (613) 545 3481

Associate Editor (Asia)

Dr. T. Akagi
Toyo University
Department of Civil Engineering
2100 Kujirai Nakanodai
KAWAGOE-SHI, SAITAMA 350, JAPAN
Tel: 81 (492) 311211 Fax: 81 (492) 311722

Associate Editor (Europe)

Mr. D. Cazzuffi
ENEL - Centro di Ricerca Idraulica e Strutturale
Via Ornato 90/14
20162 MILANO, ITALY
Tel: 39 (2) 72248445 Fax: 39 (2) 72248450

The IGS News is published 3 times per year. Material for publication should be submitted to the Editor or one of the Associate Editors by 16 February, 16 June, 16 October for the March, July and November issues respectively. Short articles and/or good quality photos (with a caption) are always very welcome.

Officers of the IGS

President

Prof. R. Kerry Rowe, P.Eng.
Geotechnical Research Centre
Faculty of Engineering Science
The University of Western Ontario
LONDON, ONTARIO, CANADA N6A 5B9
Tel: 1 (519) 661 2126 Fax: 1 (519) 661 3942

Treasurer

Mr. P. Stevenson
Industrial Textile Associates, Senior Associate
226 Sitton Road
EASLEY, SC 29642, USA
Tel: 1 (803) 855 0504 Fax: 1 (803) 859 1698

Vice-President

Prof. Dr. - Ing. Rudolf Floss
Technische Universitat Munchen
Lehrstuhl und Prufamt fur Grundbau
Bodenmechanik und Felsmechanik
Baumbachstrasse 7
D - 8000 MUNCHEN 60, GERMANY
Tel: 49 (89) 8895200 Fax: 49 (89) 8349291

Secretary

Mr. W. Voskamp
IGS Secretariat
P.O. Box 2233
3440 DE WOERDEN
The Netherlands
Fax: 31 (3480) 30961

Immediate Past-President NEW ADDRESS

Dr. J-P. Giroud
GeoSyntec Consultants
One Park Place, 621 N.W. 53rd Street, Suite 650
BOCA RATON, FLORIDA, 33487 USA
Tel: 1 (407) 995-0900 Fax: 1 (407) 995-0995

or: Akzo Industrial Systems B.V.

P.O. Box 9300
6800 SB ARNHEM, THE NETHERLANDS
Tel: 31 (85) 692644 Fax: 31 (85) 692666

The IGS Council

Elected in 1990: A. Arman (USA); D. Cazzuffi (Italy); S.D. Ramaswamy (Singapore); J-M. Rigo (Belgium). Elected in 1992: T. Akagi (Japan); R.J. Bathurst (Canada); B.R. Christopher (USA); R.A. Jewell (Belgium); C.J.F.P. Jones (UK); C. Lawson (UK). Co-opted in 1991: D. Price (Austria); D. Fayoux (Belgium); F. Goussé (France). Co-opted in 1992: M. Fukuoka (Japan). The IGS Council also includes the five IGS Officers elected for the period 1990-94.

List of Corporate Members of the IGS

Akzo Industrial Systems B.V. - Netherlands (1986)
Amoco Fabrics and Fibres Co. - USA (1987)
Asahi Chemical Industry Co. Ltd. - Japan (1984)
Associate Suisse Des Professionnels De
Géotextiles - Suisse (Aspg/Svg) - Switzerland (1984)
Belton Industries Inc. - USA (1989)
Bidim Geosynthetics - France (1984)
C.I. Kasel Co., Ltd. (1992)
Daito Kogyo Co., Ltd. - Japan (1992)
Don & Low Ltd. - UK (1984)
Du Pont De Nemours Int. S.A. - Switzerland (1984)
Exxon Chemical Geopolymers Ltd. - UK (1988)
Fibertex Aps - Denmark (1984)
Fritz Landolt Ag - Switzerland (1985)
Geotextiles (M) Sdn Berhad - Malaysia (1991)
Geotechnics Holland BV - Netherlands (1991)
Gundle Lining Systems, Inc. - USA (1988)
Hoechst Celanese Corporation - USA (1984)
Huesker Synthetic GmbH & Co. - Germany (1987)
Industrial Fabrics Association International (IFAI)
- USA (1985)
James Clem Corporation - USA (1992)
Japan Spunbond - Japan (1984)
Kajima Corporation - Japan (1985)
Kumagai Gumi Co. Ltd. - Japan (1987)
Kuraray Co. Ltd. - Japan (1989)
Maeda Corporation - Japan (1988)
Maeda Kosen Co., Ltd. - Japan (1992)

Mitsubishi Yuka Industrial Products Co., Ltd.
- Japan (1992)
Mitsui Petrochemical Industrial Products Ltd.
- Japan (1992)
Naue Fasertechnik GmbH & Co. KG
- Germany (1987)
National Seal Company - USA (1992)
Netlon - UK (1989)
Nicolon B.V. - The Netherlands (1984)
Ohbayashi Corporation - Japan (1988)
Okasan Kogyo Co. Ltd. - Japan (1984)
Pavco S.A. - Colombia (1991)
Polyfelt GmbH - Austria (1984)
Shimizu Co. - Japan (1990)
Synthetic Industries Inc. - USA (1991)
Taisei Corporation - Japan (1992)
Taiyo Kogyo Corporation - Japan (1992)
Tanaka Co. Ltd. - Japan (1993)
Tenax S.P.A. - Italy (1991)
The Tensar Corporation - USA (1989)
The Reinforced Earth Co. - USA (1989)
The Zenitaka Corporation - Japan (1992)
Tokyu Construction Co. - Japan (1984)
Uco N.V. - Belgium (1985)
Zeon Kasei Co., Ltd. - Japan (1992)

Dates indicate earliest year of continuous membership.

Calendar of Events

Geosynthetics'93 Vancouver, British Columbia, Canada
30 March – 1 April 1993

Contact: Secretary General NAGS
345 Cedar St., Suite 800
St. Paul, MN 55101 USA

Tel: (612) 222-2508 Fax: (612) 222-8215

Les Géosynthétiques (Short Course)
Montreal, Quebec, Canada, 20-23 April, 1993

Contact: Service de l'éducation permanente
École Polytechnique de Montréal
C.P. 6079, Succursale A
Montréal, Québec, H3C 3A7

Tel: (514) 340-4702 Fax: (514) 340-4169

ASCE Specialty Conference: Geotechnical Practice in Dam Rehabilitation
Raleigh, NC, USA, 25-28 April 1993

Contact: Jodi Brill, ASCE
345 East 47th Street
New York, NY 10017-2398

Tel: (212) 705-7350 Fax: (212) 980-4681

Geomembrane Liner Short Course (2 days)
Santiago, Chile, May 1993 (dates to be announced)

Contact: Peter Welkner
Rowe y Asociados
Monjitas 454 9^o Piso
Santiago, Chile

Tel: (562) 638-1603 Fax: (562) 638-1859

Geotextiles and Geomembranes: Rencontres 93
Paris, France, 29-30 September 1993

Contact: Dr. Philippe Delmas
Chairman of the Organizing Committee
Rencontres 93
9, rue Marcel Paul - B.P. 100
95873 Bezons CEDEX, France

Tel: (1) 34 23 53 96 Fax: (1) 34 23 53 98

Sardinia'93 4th International Landfill Symposium
S. Margherita di Pula (Cagliari), Sardinia, Italy
11-15 October 1993

Contact: Prof. Ing. Raffaello Cossu, CISA
Environmental Sanitary Engineering Centre
Via Marengo 34, 09123 Cagliari, Italy

Tel: 39 70 271652/281237 Fax: 39 70 271371

GRI Short Courses/Seminar:

Short Courses:

Designing with Geosynthetics
Chicago, IL, USA, 4-5 November 1993
Atlanta, GA, USA, 11-12 November 1993
Philadelphia, PA, USA, 18-19 November 1993

Seminar:

Innovation and Concerns with Geosynthetic Liner Systems
Philadelphia, PA, USA, 14-15 December 1993

Contact: Marilyn Ashley
Geosynthetic Research Institute
Drexel University
Philadelphia, PA 19104 USA

Tel: (215) 895 2343 Fax: (215) 895 1437

Eighth International Conference of the International Association for Computer Methods and Advances in Geomechanics

Morgantown, West Virginia, USA, 22-24 May 1994

Abstracts: 15 April 1993

Contact: Professor H.J. Siriwardane
Chairman for IACMAG 94
College of Engineering
637 Engineering Building
West Virginia University
Morgantown, West Virginia 26506-6101

Tel: (304) 293-3192 ext. 620 Fax: (304) 293-5042

ISF'94 International Symposium on Fiber Science and Technology

Yokohama, Japan, 26-28 October 1994

Abstracts: 30 November 1992

Contact: Prof. T. Uryu, Chairman ISF'92
Institute of Industrial Science,
The University of Tokyo
7-22-1, Roppongi, Minato-ku, Tokyo,
106 Japan

Tel: 81-3-3402-3067 Fax: 81-3-3402-5078

5th International Conference on Geotextiles, Geomembranes and Related Products
Singapore, 5-9 September 1994

Abstracts: 31 July 1993

Contact: Conference Secretariat, 5th IGC
Thompson Road, P.O. Box 0177
Singapore 9157

Tel: (65) 353-5511 Fax: (65) 353-2424

Note: Highlighted items are organized under the auspices of the IGS or with the support of the IGS.

OBJECTIVES OF IGS (*)



The International Geotextile Society was formed with the following objectives:

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

WHY BECOME A MEMBER OF THE IGS?

First, to contribute to the development of our profession.

Becoming a member of the International Geotextile Society:

- Helps support the aims of the IGS, especially the development of geotextiles, geomembranes, and related products.
- Contributes to the advancement of the art and science of geotextiles, geomembranes, and related products, as well as their applications.
- Provides a forum for designers, manufacturers, and users, where new ideas can be exchanged and contacts improved.

Second, to enjoy the benefits.

The following benefits are available now to all IGS members:

- A directory of members, the IGS DIRECTORY, published every year, with addresses, telephone, telex and fax numbers.
- Newsletter, IGS NEWS, published three times a year.
- Reduced purchase price on all documents published by the IGS.
- Reduced registration fee and preferential treatment at all conferences organized under the auspices of the IGS.
- Reduced subscription fee for the journal "Geotextiles and Geomembranes".
- A central system for ordering selected publications.
- Possibility of being granted an IGS award.

MEMBERSHIP APPLICATION

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

Send this completed form to:

Mr. P.E. Stevenson, Treasurer
226 Sitton Road
Easley, SC 29642
U.S.A.

Telephone: 1 (803) 855-0504
Fax: 1 (803) 859-1698

Eligibility (i.e. connection with geotextiles, geomembranes, or related products):

In this area, write your address as you wish it to appear in the next IGS Directory (your professional address is recommended but your personal address is acceptable provided the telephone, telex and fax numbers are also your personal numbers). *If the address below is your personal address please check this box:*

Title (circle one): Mr. Ms. Dr. Prof. Other _____

First Name _____ LAST NAME _____

Company, Division, Function (if applicable) _____

Address (Street or Postal Box) _____

City _____ Province/State _____

Postal Code _____ Country _____

Telephone _____ Telex _____ Fax _____

Bibliothek
LEHRSTUHL UND PRÜFAMT FÜR GRUNDBAU,
BODENMECHANIK UND FEUERMECHANIK
Technische Universität München
Außenstelle Pasing
Baumbachstraße 7
D 8000 München 60

* A copy of the By-laws is available upon request.

Membership fee: Individual (US) \$45.00 Corporate (US) \$1000.00 Benefactor's contribution (at least (US) \$200.00): _____

Mode of Payment:

Check enclosed Draft sent to Credit Suisse

SIGNATURE _____

DATE _____

Charge my account

Mastercard/Visa American Express

Account No: _____ Expiry date: _____

Name on card:

Authorized Signature: _____

IGS NEWS Published by the International Geotextile Society

Editorial Enquiries to: Dr. Richard J. Bathurst, Department of Civil Engineering,
Royal Military College of Canada, Kingston, Ontario, CANADA K7K 5L0
Phone: 1 (613) 541-6479 or 541-6391, Fax: 1 (613) 545-3481