IGS NEWS

NEWSLETTER OF THE INTERNATIONAL GEOTEXTILE SOCIETY

VOLUME 2 NO 3 APRIL 1987

A Long-Term Strategy for the IGS

by
J.P. Giroud
President of IGS

The first eight months after the Vienna conference, held in April 1986, were devoted to urgent tasks. A major task was the preparation and the approval by the Council of a document describing the benefits that IGS individual and corporate members are entitled to enjoy. This document is at the final editing stage and will be released soon. Other tasks included the formation of eight committees and the organization of their work, and the beginning of the selection process of the host country for the Vth International Conference on Geotextiles, Geomembranes, and Related Products.

When the IGS Council met in January 1987, it was time to concentrate on something other than the immediate work and discuss the long-term strategy of the IGS. In a long discussion, the Council agreed that the primary objective of the IGS, at this stage, is to disseminate knowledge about geotextiles, geomembranes, and related products. I invite you to read a summary of the IGS Council meeting by G. Massenaux, IGS Secretary, in this issue of IGS NEWS.

There are many ways by which the IGS can disseminate knowledge. First, IGS membership must increase because the exchange of ideas is exponentially related to the number of people involved. Then, more national or regional chapters must be formed to provide opportunities for the IGS to meet and disseminate information between international conferences. Third, IGS committees must produce documents and generate activities which contribute to the dissemination of knowledge. Finally, the IGS must cooperate with other professional organizations to ensure that the concept of designing and constructing with geotextiles, geomembranes, and related products is widely accepted.

All the above is underway and I am presently reviewing the work done by IGS to ensure that it is properly focused. Accordingly, the next Council meeting will be devoted to a detailed review of the work done by committees. Your comments and suggestions are welcome.

Geosynthetics'87 - A Resounding Success

by
Prof. R. Kerry Rowe

Geosynthetics '87 is now part of history, but for the 740 of us fortunate enough to be able to attend it will be long remembered both for the high quality of the technical presentations and for the good times that we had in New Orleans. Sponsored by the Industrial Fabrics Association International, under the auspices of the American Society on Geosynthetics and the International Geotextile Society, Geosynthetics '87 provided something for everyone. For those new to the world of geosynthetics, two introductory seminars on geotextiles and geomembranes together with a seminar on designing with geosynthetics, provided an effective means of obtaining a basic knowledge of geosynthetic types, properties and applications as well as some guidelines relating to design and construction. For those wishing to obtain insight concerning the current state-of-the-art, the technical sessions could not have been more rewarding.

The nearly sixty papers presented at the conference were subdivided into twelve categories - unpaved and paved roads, slopes and walls, laboratory and model evaluation, embankments over weak soils, design and construction, durability, filtration, quality assurance/quality control, material selection, testing and "other geosynthetic applications".

Cold climates provide a real challenge to an engineer responsible for road construction and provide an important but underutilized application for geosynthetics. Thus it was particularly appropriate that two of the eight papers in the session on unpaved and paved roads provided insight concerning the use of geosynthetics in the design and construction of roads in situations where thawing ice masses could be expected to cause serious problems. The third paper which examined the behaviour of a number of geotextiles as separating membranes on glacial till subgrades suggested that certain geocomposites may be particularly suitable for this application. Applications for geogrids or polymer grid cells as reinforcement in pavement structures was the subject of the next three papers in this session and it was shown that geosynthetics can provide a significant improvement in performance of a road base or ballast when suitable reinforcement is used. The remaining two papers described successful field performance of asphalt overlays which were constructed using geosynthetics to control reflection cracking.

The session on slopes and walls provided an interesting combination of theoretical papers and papers dealing with field cases. Reinforced walls was the subject of two papers, one of which presents a design method and the other reviewing the design, construction and performance of a reinforced wall. Two papers considered different aspects of the design of reinforced slopes and a third provided an interesting description of the design of a reinforced test fill constructed using a number of different geogrids and a cohesive fill material. A useful discussion of the importance of stress-strain relationships, pullout resistance and long-term allowable tension for the reinforcement resulted from the remaining three papers.

Embankments over weak soil is another important application for geosynthetics which received considerable attention. Three papers in the session reported the results from finite element studies of reinforced embankments. In the first paper it was shown that a substantial increase in the height to which an embankment could be constructed could be achieved by using geotextile reinforcement, however it was also demonstrated that careful consideration must be given to selecting a geotextile with an appropriate modulus and strength for each specific application. The limitations associated with using limit equilibrium analyses for this type of problem were also discussed. The second of these papers showed that geotextile reinforcement may be effective in embankment widening, while the third paper compared the observed and calculated behaviour for an embankment on a soft foundation. Four papers described cases where geosynthetics were used as reinforcement for embankment stabilization and made comments concerning current design practice and field performance. Finally, one paper dealt with potential improvements in embankment performance solely due to the separation and drainage functions of geotextiles.

Soil-geosynthetic interface strength and stress-strain behaviour were the primary focus of the session on laboratory and model evaluation and one of the two papers in the session on "other geosynthetic applications". The products considered included wovens, nonwovens, geogrids and stitchbonded composites while the soils considered varied from Ottawa sand to lateritic gravels and clays.

Geomembranes received considerable attention at the conference although the papers were split amongst the sessions on design/construction, quality assurance/quality control, material selection and testing. With the exception of one paper on canal liners, the remaining 13 papers in these sessions were concerned with applications relating to waste disposal.

The transmission session had four papers. Of particular interest in this session was a report of tests conducted to study creep of geocomposite drains. The filtration session contained three papers, two of which discussed geotextile filtration related to waste disposal projects.

The session on durability only attracted two papers however this was augmented by a very useful panel discussion on durability/aging which was chaired by Dr. R. M. Koerner.

Geosynthetics '87 was a great success. The technical sessions were interesting and the exhibits provided an excellent opportunity to keep abreast of the current geosynthetics. Undoubtedly, a highlight of the conference was the excellent keynote presentation "Geosynthetics -From the products to the Engineering Discipline" given by Dr. J. P. Giroud which served to place the week's discussions within an appropriate context.

The organizers of the conference did an excellent job and the chairman Joe Fluet, the organizing committee and the staff of IFAI are to be congratulated on a job very well done.

First Chinese Conference on Geotextiles

Reported by
Mr. Liu Zong-Yao &
Mr. Hong You-Wei

The first Chinese Conference on Geotextiles sponsored by the Chinese Network of Information on Geotextiles was held in Tianjin, China, 21-25 October 1986.

The conference was attended by more than 440 participants, including engineers, researchers, and manufacturers from 260 different organizations or localities. Sixty-seven papers concerned with both the application and testing of geotextiles and geomembranes were presented at the Conference. In addition, a technical exhibition held during the conference attracted twelve manufacturers.

On behalf of the IGS, Dr. J. P. Giroud wrote a congratulatory letter to the Conference. Mr. E. Leflaive, president of the Comite Francais des Geotextiles et Geomembranes (CFGG) attended the conference and made a congratulatory speech. Mr. J. Girollet, vice-president of CFGG and other specialists from abroad also attended the Conference.

The conference was presided over by Mr. Wang Wen-Shou, President of the Chinese Society of Geotechnical Engineering. In the opening session, Professor Huang Wen-Xi, former president of CSGE, gave a brief review of the development of geotextiles. Mr. Li E-Ding, former vice-minister of the Chinese Electric Power Ministry and Professor Zhao Jin-Sheng former vice-president of Tianjin University, made speeches about the significance of geotextiles in Chinese construction. Mr. Liu Zong-Yao, president of the Network, reviewed the 3rd International Conference on Geotextiles and outlined some problems relevant to geotextiles. One hundred papers from the 3rd International Conference were translated into Chinese and distributed to the participants.

Ten Chinese and foreign specialists read their papers to the full meeting. The conference then divided into eight sessions, namely, Road and Railway Applications; Foundations and Reinforcement; Slope Protection and Retaining Walls; Erosion Control and Special Applications; Drainage and Filters; Properties and Tests; Waterproofing and Liners, and Manufacturing of Geotextiles.

On October 25, the participants made a visit to Tianjin Economic Development District where a geotextile was used in the construction of a new road.

The Conference was a great success and it is considered a milestone in the development of geotextiles in China. From 1980 to 1985 the application of geotextiles in China was on trial. Following this Conference, production, application and research relating to geosynthetics are expected to enter a new period of rapid development.

Mr. Liu Zong-Yao at the opening session of the First Chinese Conference on Geotextiles.

Past-President Schaerer Elected First Honorary Member of the IGS

At the last Council Meeting, held in Tampa, Florida, USA, President Giroud proposed that past-president Schaerer be elected honorary member of the IGS in recognition of services he had rendered as first president of the IGS between 1983 and 1986. The Council voted by acclamation and, while membership card No. 001 was given to the honorary member by treasurer P. Stevenson, President Giroud declared that, if this honorary membership was meant to honor the past-president, the choice of Mr. Schaerer as the first honorary member was an even greater honor for the IGS. Needless to say, being past-president is a rather active retirement for Mr. Schaerer. He participates actively at Council meetings and officers meetings, and he is presently preparing a proposal for setting up a committee which will be in charge of establishing rules for IGS awards.

Congratulations to past-president Schaerer for his well-deserved honorary membership, and for his dedication to the IGS.

Publications

The next issue of the IGS News will contain a listing of information sources together with a listing of 1986 publications relating to geotextiles, geomembranes and related products. If you have a publication that you would like included in this list, please send it to:

Dr. R.A. Douglas
Dept. of Forest Engineering
University of New Brunswick
P.O. Box 4400
Fredericton, N.B. E3B 5A3 CANADA
Telex: 014-46-202

– Proceedings of Geosynthetics '87. Contains approximately 60 papers presented in New Orleans, February 1987. Available from: IFAI 345 Cedar Building, Suite 450, St. Paul, MN 55101, USA. Cost $50 plus postage.

ISSMFE Forms Technical Committee on Geotextiles and Geosynthetics

by
Professor A. Arman

Professor Bengt B. Broms, President of The International Society for Soil Mechanics and Foundation Engineering (ISSMFE), recently announced the formation of the "Technical Committee on Geotextiles and Geosynthetics". The official designation of this committee is TC 9. Professor Broms has appointed Dr. Jean-Pierre Giroud chairman, and Professor Ara Arman secretary, of this committee.

The ISSMFE was founded fifty years ago. ISSMFE is an international organization composed of National Societies of fifty-four countries accepted into membership by the Executive Committee of ISSMFE. The ISSMFE promotes cooperation, exchange and development of knowledge among the engineering and scientific community of the world in the fields of soil, rock, snow and ice mechanics and geology. Among primary activities of ISSMFE are the holding of international conferences and establishing of technical committees to facilitate the development and exchange of ideas.

The precursor of Committee TC 9, the Technical Committee on Geotextiles, prepared a report on "Geotextiles and Geotechnical Engineering Practice and Research", published in Volume 2, No. 3 of "Geotextiles and Geomembranes". This report was presented at a technical session of the 11th International Conference on Soil Mechanics and Foundation Engineering held in San Francisco, California, in August of 1985.

The objectives of the Technical Committee on Geotextiles and Geosynthetics are: to provide geotechnical engineers with information on case histories, methods of design, properties and performance of geotextiles, geomembranes and related products; to foster communication and cooperation between the ISSMFE and other international professional societies interested in geotextiles, geomembranes and related products, such as the IGS; to foster development of international terminology and standard procedures for testing and identification of geotextiles, geomembranes and related products; to encourage civil engineering departments at universities and research centres to pursue research on the geotechnical aspects of the use of geotextiles, geomembranes and related products.

The committee is composed of representatives of the international geotechnical and geotextile community as follows: Mr. P.R. Aguiar (Brazil); Prof. S. Andrei (Romania); Prof. A. Arman (U.S.A.); Mr. I. Brorsson (Sweden); Ing. D. Cazzuffi (Italy); Mr. P. Delmas (France); Prof. R. Floss (Federal Republic of Germany); Dr. J.P. Giroud (U.S.A.); Mr. J.P. Gourc (France); Dr. M.R. Hausmann (Australia); Prof. V.D. Kazarnovski (USSR); Mr. H. Larsen (Denmark); Mr. K.R. Legge (South Africa); Mr. C. Legrand (Belgium); Mr. L. Marczal (Hungary); Prof. A. McGown (Scotland); Prof. J. Pachowski (Poland); Mr. H. Rathmayer (Finland); Dr. G.P. Raymond (Canada); Prof. T. Yamanouchi (Japan); Prof. F.F. Zitscher (Federal Republic of Germany).

The committee is planning to participate, with various activities, in the 12th International Conference on Soil Mechanics and Foundation Engineering to be held in Rio de Janeiro in 1989.

Society Activity

Council Meeting

A well attended meeting of the IGS Council took place in Tampa, U.S.A. on January 24 and 25, 1987. This was the first meeting since the IIIrd International Conference on Geotextiles in Vienna and Council members, both old and new, had to go through a lengthy agenda within what turned out to be a short time. The agenda included consideration of the following items:

(1) Mr. Ch. Schaerer, past president of IGS, was made its first honorary member.

(2) The newly co-opted members were introduced to the Council. They are: Jacques Perfetti (Rhone-Poulenc Fibres, France), Jean-Marie Rigo (Professor, Liege University, Belgium) and Paul W. Barker (Gundle Lining Systems, USA).

The Council decided not to co-opt additional members at this time. It was, however, regretted that there is presently a shortage of qualified candidates from Japan and South-East Asia.

(3) The long-term strategy of IGS was thoroughly discussed. Article 2 of the bylaws set a series of objectives for the Society. Which of these various objectives should be given priority?

It was agreed that the IGS was a technical society, whose primary aim, at this stage, should be to disseminate knowledge about geotextiles wherever needed and possible. Such knowledge should be transferred between geographical areas and also from the specialists to the less well informed (e.g. some authorities or contractors). These objectives could be addressed by the following actions:

- collect information on actual performance of geotextiles and encourage members to undertake research;
- intensively promote the IGS by:
  . making it clear that a professional body exists which is available for people interested in geotextiles;
  . publishing special brochures; and
  . reaching people by other means,
- educate some specialized groups (e.g. contractors) especially by "technology transfer" to other geographic areas,
- write IGS technical notes and booklets.

In this article, Geotextiles should always be understood as encompassing Geotextiles, Geomembranes, and related products.

The activities to be undertaken by the Committees would reflect these overall objectives. It was acknowledged that IGS had already started some of these things.

- conferences: IIIrd International Conference and other sponsored events, other sponsored Conferences in U.S. and Japan,
- publications: IGS directory
  IGS list of symbols
  IGS inventory of methods
  (all available from the IGS secretariat)
- periodicals: Newsletter
  Agreement with Geotextiles/Geomembranes

(4) The Council also discussed the specific and immediate benefits deriving from being an individual or a corporate member of IGS. A document was drafted which summarizes these advantages. Benefits include:
- receiving a membership card
- being listed in and receiving the IGS directory
- being informed of IGS activities (minutes, etc.)
- receiving the IGS Newsletter and other IGS documents
- using the IGS secretariat for ordering publications.

ALL THIS AT A DISCOUNT

Individual members also will enjoy some preferential treatment in the selection of papers at Conferences held under the auspices of the IGS and will have access to these conferences and related exhibitions at a discount price.

An IGS award will be established to foster special geotextile achievement. This will be granted to IGS members only.

Corporate members will be allocated some preferential treatment in the selection of sites at Exhibitions held under the auspices of the IGS and will have access to exhibition space and to conferences at a reduced rate.

The possibility of forming a special committee including corporate members only will be explored.

(5) The Council also formally ratified the IGS guidelines for International Conferences and Exhibitions, and about IGS chapters. It also set the guidelines and conditions under which national conferences could be organized "under the auspices of IGS".

(6) Under the guidance of Mr. P. Sembenelli, the Council started the preliminary procedure of selecting the time and venue of the Vth International Conference on Geotextiles, Geomembranes and related products.

(7) Dr. P. Jarrett reported on the activities of the IGS Education Committee. He focused on three groups: (a) General consumers, (b) Students, (c) Designer-engineers

After a thorough discussion it was agreed that IGS
. would review and maybe endorse the brochure presently being prepared by IFAI,
. would be able to use the slides and tape courses developed by IFAI,
. would be presented further proposals relating to:
- series of lectures for undergraduates
- video productions
- a concept of technical notes

(8) Drs. A. Arman and R. Floss reported on the Research committee. This has more long-term objectives and research needs funds. The Committee will focus on an inventory of research needs and will promote the setting-up of a geotextile research forum around the time of the ISSMFE Conference to be held in Rio de Janeiro in 1989.

(9) Mr. S. Warner presented the Council with proposals for a promotion campaign for the IGS. He gave as an example actions that will be undertaken at the upcoming Geosynthetics Conference and he suggested the following additional actions:
- develop a slide and script presentation on IGS.
- develop a brochure about IGS in the form of questions and answers,
- identify some specific advantages for students,
- increase the number of news releases about geotextiles.

These proposals were approved by the Council and funds were allocated in the IGS budget.

(10) The IGS accounts for 1986 were approved by the IGS Council which also examined the 1987 budget. The 1986 accounts closed with a net surplus of US$16,388 mainly stemming from the IIIrd International Conference.

Budgeted expenditures for 1987 were increased by over 20% compared with 1986. A small surplus of $2,000 is forecast. $12,500 has been set aside for promotion and other similar activities.

(11) The next meeting of the IGS Council will take place in Brussels (Belgium) on 23 and 24 May 1987.

(Reported by G. Massenaux)

IGS Committee on Research

An IGS committee on Research is currently being formed under the chairmanship of Ara Arman. The committee's goals are:

a) To develop and publish a list of research needs relating to geosynthetics;

b) Promotion of research: Once the needs for research in geosynthetics are identified, this committee will work closely with the IGS membership and ISSMFE Committee on geotextiles and geosynthetics to promote appropriate research through industry, government organizations and universities;

c) Research forums: The committee will organize research forums where open discussions can take place concerning ongoing, completed, or needed research. Present plans call for the preparation of such a session either for the IVth International Conference on Geotextiles to be held in the Hague (1990) or the XIIth International Conference on Soil Mechanics and Foundation Engineering to be held in Rio de Janeiro (1989).

IGS members interested in work of the committee are invited to contact Professor Ara Arman at the Louisiana Transportation Research Center, P.O. Box 94245, Baton Rouge LA 70804-9245, U.S.A.

IGS Publications

First International Conference
"Proceedings of the International Conference on the Use of Fabrics in Geotechnics" (Three Volumes)
to be ordered from:
ENPC, Service Formation Continue, 28 rue des Saints Pères, 75006 Paris, France

Second International Conference
"Proceedings of the Second International Conference on Geotextiles." (Four Volumes)
Price: $72 plus postage to be ordered from:
IFAI, 345 Cedar Street, Suite 450, Saint Paul, MN 55110, USA

Third International Conference
"Proceedings of the Third International Conference on Geotextiles" (Four Volumes)
Price: US$ 128 for America, 300 hfl for the rest of the world to be ordered from:
IFAI (see address above), for America, or, for the rest of the world, from:
BALKEMA, Postbus 1675, NL-3000 BR Rotterdam, Netherlands

The publications listed below can be ordered from
IGS Secretariat, 51 Avenue des Cerisiers, 1040 Brussels, Belgium

Directory of Members 1986
Name, address, telephone, telex and telecopy number of all IGS members as of 30 June 1986. All IGS members have already received a free copy
$10 per additional copy for members - Price for nonmembers: $15

Geotextile Testing Inventory 1986
A 217-page compilation of geotextile test methods used in 13 countries.
Price for IGS members $60, Price for nonmembers $90

Symbols for Geotechnical Engineering, Geotextiles and Geomembranes
A list of symbols adopted by the IGS for the Third International Conference on Geotextiles
Free for IGS members, Not available to nonmembers

Editorial Request

The value of a newsletter lies not only in the basic articles but in the presentation of useful and up-to-date information. We ask all members to provide information that they feel will be of interest to other members. Such information would include:

Technical News
Calls for Papers
Announcements of Conferences and Short Courses
Lists of Recent Publications and Proceedings
Items for the Calendar of Events
Interesting Glossy Black and White Photographs
Unique Uses of Geotextiles or Geomembranes
Cartoons
Letters of Opinions, etc.

Please do not hesitate to provide information because you feel everybody must know of it already. If we hear of something two or three times that does not hurt us. What hurts us is if all three of the people think that someone else will tell us and then we never find out!

The editorial deadline for the next edition of the newsletter is 19 June, 1987 but you do not have to wait until then, avoid the rush, act now and send your information to:

Prof. R. Kerry Rowe
Editor, IGS Newsletter
Geotechnical Research Centre
The University of Western Ontario
LONDON, ONTARIO N6A 5B9
CANADA, TELEX 064-7134

News of the World

Chinese Technical Association on Geosynthetics

The General Assembly of the Chinese Network on Information on Geotextiles was held in the afternoon of October 25, 1986. More than 150 members attended the Assembly. The Network was organized in October 1984 by a number of hydraulic, railroad, highway and harbour engineers from design and research institutes, and a few manufacturers. Initially, there were only 39 members. A newsletter has been published at three or four month intervals to provide members with information concerning geotextiles and geomembranes. More and more Chinese engineers have become interested in geosynthetics and by October 1985 the Network had more than 170 members. The objectives of the Network are to disseminate information concerning geotextiles and geomembranes and to promote their use in China.

At the Assembly the following decisions were made:

(1) The name of the organization was changed to "The Chinese Technical Association of Geosynthetics";

(2) The officers of the organization, one president, seven vice-presidents and one general secretary were elected. Mr. Liu Zong-Yao was elected as president and Mr. Wang Yu-Ren as general secretary of the Association. The vice-presidents are Messrs Wang Yan-Xi, Yang Can-Wen, Ni Ming, Chen Huan, Xu Bo-Mong, Chen Zhen-Wei and Jin Tai-Zhen;

(3) The draft bylaws were passed with some revisions;

(4) The future work of the Association was discussed. Contacts between the Chinese Technical Association on Geosynthetics and other similar organizations are expected.

The address of CTAG is the Hebei Designing Institute of Water Conservancy and Hydroelectric Power, Wang Chuan-Chang Street, Heibei District, Tianjin, China.

Geotextiles in Japan

The 1986 annual assembly of the Japanese Chapter of the International Geotextile Society (JCIGS) was held in Tokyo on December 2, 1986. Currently, JCIGS consists of 85 individual members and 5 corporate members, headed by Professor M. Fukuoka as President and Mr. T. Iwasaki as Secretary. The secretariat is located at the Japanese Society of Soil Mechanics and Foundation Engineering, Sugayama Building 4F, Kanda-Awajichou 2-23, Chiyodaku, Tokyo 101.

On the same day, the First Symposium on Geotextiles was held under the sponsorship of JCIGS. About 10 Japanese geotextile experts participated in the symposium. The presentation of 21 papers was accompanied by lively discussion from the floor.

Among the events to be sponsored by JCIGS in 1987 are the International Symposium on Geosynthetics - Geotextiles and Geomembranes to be held on Sunday July 19 in Kyoto (in connection with the Eighth Asian Regional Conference on Soil Mechanics and Foundation Engineering), and the Second Symposium on Geotextiles to be held in Tokyo in December.

Storm Surge Barrier Operational in the Netherlands

Professor K. van Harten reports that the storm surge barrier in the Eastern Scheldt was officially opened on October 4, 1986 by Queen Beatrix of the Netherlands. This is an historic event for the people of the Netherlands. The storm surge barrier represents the last stage of the multi-billion dollar Delta Project which is intended to protect the low lying regions of the Netherlands from storm surges such as the one in 1953 which resulted in the loss of more than 2000 lives.

Under normal conditions, the barrier is left open so as to maintain the normal tidal variations in water level, thereby preserving the unique natural environment of the estuary. However, when storms threaten, the gates are simultaneously lowered and the North Sea is effectively "locked out", protecting the inlands from the ravages of the storm.

The barrier, which cost 2.3 billion dollars, is one of the highlights of hydraulic engineering in the Netherlands. Completion of the barrier was also an historic moment for the Geotextile Society in the Netherlands since extensive use was made of geotextiles in the construction of the storm surge barrier. Much of this use has been documented in session 8A of the IInd International Conference on Geotextiles held in Las Vegas (1982) and in a recent publication "Geotextiles and Geomembranes in Civil Engineering" available from Balkema. Several different types of geotextiles and geomembranes were used. For example, approximately 5 million square metres of 750-1200 g/m² split fibre woven fabric was used for scour protection. The foundation filter mattresses represented a major design consideration. A number of different types of geotextiles were used in the construction of these mattresses, including the following:

a) The supporting material was a woven fabric with an ultimate design load of 800 kN/m in the warp and 80 kN/m in the weft direction. The warp of this fabric consists of splitfibre polypropylene yarns and steel cables.

b) The top-fabric had a strength under biaxial loading of 100 kN/m warpwise and 80 kN/m weftwise. The fabic consists of polyamide warp and polyester weft yarns.

c) Two fabrics were used to provide separation between layers of granular filter material, namely: a polypropylene spunbonded nonwoven fabric and a polyethylene monofilament gauze woven fabric. A total of 6500 000 m² of these fabrics were used.

d) Gravel bags were placed around the piers to seal the cavity between pier and filter mattresses. These bags were made of a polyamide woven fabric with interwoven strengthening strips giving a strength in both principal directions of 150 kN/m. Approximately 73 000 m² of this fabric were used.

The importance of these geotextiles was illustrated in a television interview with the Project Leader. When asked at which moment after completion of the various phases of the work he felt most relieved, he replied without hesitation: "the moment the last foundation-filter mattress was placed".

The effectiveness of the Storm Surge Barrier was demonstrated during a severe storm shortly after its opening. The gates have now been closed several times and the present experience under actual severe storm conditions has shown that the barrier design has been effective. Specially designed geotextiles have played a major part in the success of this project.

CALENDAR OF EVENTS

Short Course: Reinforced Soil-Mechanics & Design
The University of Western Ontario (Canada) and
University of Oxford (England)
13-15 April, 1987; London, Canada
Contact: R.K. Rowe
Geotechnical Research Centre
The University of Western Ontario
London, Ontario, Canada N6A 5B9
(519) 661-2126

Advanced Technologies in the Field of Transport Construction
Varna, Bulgaria
14-16 May, 1987
Contact: Eng. S. Sapundzhiev
Union Scientifique et Technique de Bulgarie
Boite Postale 431
1000 Sofia, Bulgaria

Short Course on Reinforced Soil
University of Sydney
Sydney, Australia
27 May, 1987
Contact: Prof. H.G. Poulos
School of Civil Engineering
University of Sydney
Sydney 2006, Australia

NATO Workshop on Reinforced Walls
Royal Military College, Canada
8-12 June, 1987
Contact: P. Jarrett
Department of Civil Engineering
Royal Military College
Kingston, Ontario, Canada

Geotechnical Aspects of Waste Disposal
Ann Arbor, Michigan U.S.A.
14-17 June, 1987
Contact: Prof. D.H. Gray, Chairman
'87 ASCE Specialty Conference
Department of Civil Engineering
The University of Michigan
Ann Arbor, MI 48109 U.S.A.

Short Course: Designing With Geosynthetics
Auckland, New Zealand
10 July, 1987
Contact: Chris Bockliss
Ph. (09) 598215
Melbourne, Australia
13 July, 1987
Contact: M. Hausman
Ph. (02) 931234
Brisbane, Australia
21 July, 1987
Contact: N. Finn
Ph. (07) 839 7660

International Symposium on Geosynthetics - Geotextiles and Geomembranes
Kyoto, Japan (organized, under the auspices of the IGS, by the Japanese Chapter of the IGS)
19 July, 1987
Contact: T. Akagi
Dept. of Civil Engineering
Toyo University
Kawagoe City
Saitama 350, Japan

8th Asian Regional Conference on Soil Mechanics and Foundation Engineering
Kyoto, Japan
20-24 July, 1987
Contact: Mr. T. Adachi
Kyoto International Conference Hall
Takara-ike, Sakyo-ku
Kyoto 606, Japan

9th European Regional Conference on Soil Mechanics and Foundation Engineering
Dublin, Ireland
31 August - 4 September, 1987
Contact: Dr. T. Orr
Dept. of Civil Engineering
Trinity College
Dublin 2, Ireland

RILEM Conference
"From Material Science to Material Engineering"
Paris, France
7-11 September, 1987
Contact: RILEM General Secretariat
12 rue Brancion
75737 Paris CEDEX 15, France

Geosynthetics: Pavement Applications
Nottinghem, U.K.
22 September, 1987
Contact: B.D. Tribbick
Dept. of Civil Engineering
University of Nottingham
Nottingham NG7 2RD
England

Updating and Refurbishing Hydro Powerplants
Strasbourg, France
19-21 October, 1987
Contact: Price-Alexander
Water Power & Dam Construction
Quadrant House
The Quadrant, Sutton, Surrey, UK, SM2 5As

Canadian Geotechnical Conference
Regina, Canada
19-21 October, 1987
Contact: Mr. John Oosterveen
3250 Margret Road
Regina, Saskatchewan S4V 1G6

Seminar: Very Soft Soil Stabilization Using High Strength Geotextiles
Philadelphia, U.S.A.
22-23 October, 1987
Contact: Ms. Marilyn Macklin
(215) 895-2350

Conference on Geotextiles
Singapore
28-30 October, 1987
Contact: Dr. S.D. Ramaswamy
National University of Singapore
102 Eng Neo Avenue
Singapore

2nd International Conference on Case Histories in Geotechnical Engineering
St. Louis, U.S.A.
1-5 June, 1988
Contact: Prof. S. Prakash
Dept. of Civil Engineering
University of Missouri-Rolla
Rolla, MO 65401-0249, U.S.A.

International Geotechnical Symposium on the Theory and Practice of Earth Reinforcement
Kyushu, Japan
October, 1988
Contact: Prof. N. Miura
Dept. of Civil Engineering
Saga University
Saga 840, Japan

Twelfth International Conference on Soil Mechanics and Foundation Engineering
Rio de Janeiro, Brazil
13-18 August, 1989
Contact: Prof. Costa Nunes
12th ICSMFE
Caixa Postal 1559
20000 Rio de Janeiro, RJ
Brazil

Fourth International Conference on Geotextiles, Geomembranes, and Related Products
The Hague, The Netherlands
27 May - 1 June, 1990
Contact: Prof. K. van Harten
University of Technology, Delft
2 Mekelweg
P.O. Box 5036
2600 GA Delft The Netherlands

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.

MODE OF ACTION OF IGS

- promotion of seminars, symposia and conferences
- publishing or sponsoring of papers, books or journals
- publishing a Newsletter to appear three times a year
- establishing liaison with other groups or bodies which could have an interest in geotextiles, geomembranes and related products as well as their applications
- encourage research and development in Industry, Universities, Laboratories and other organizations
- encourage academic institutions to provide courses on geotextiles, geomembranes and related products
- afford recognition of achievement in the advancement of the science and practical use of geotextiles, geomembranes and related products
- establishment of international technical committees on topics of importance.

EXAMPLES OF IGS ACTIVITIES

- Publication of the IGS Directory
- Publication of a list of symbols for geotextiles and geomembranes (1985)
- Publication of the Inventory of Geotextile Testing methods (1986)
- Third International Conference on Geotextiles held in Vienna, Austria (April 1986)
- Geosynthetics '87, US national conference organized under the auspices of the IGS (February 1987).
- Fourth International Conference on Geotextiles to be held in The Hague, Netherlands, in 1990.
- Committees working on: Terminology, Standards, Publications, Education, Research and Conferences.

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) $30 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.

The following form may be used to apply for membership and sent to:

For application in North & South America
Mr. P.E. Stevenson
Treasurer, IGS
c/o Burlington Industrial Fabrics Co.
3330 West Friendly Avenue
Greensboro, North Carolina
27410 U.S.A.

for Other Countries:
Mr. Guy Massenaux
Secretary, IGS
c/o EDANA
51 Avenue des Cerisiers
B-1040 Brussels
BELGIUM

NAME .....

ORGANIZATION .....

ADDRESS (Street or Postal Box) .....

City ..... Province/State .....

Postal Code ..... Country .....

TELEPHONE ..... TELEX ..... FAX .....

ELIGIBILITY (i.e. evidence of suitable connection with geotextiles

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- Membership fee – Individual (US) $ 30.00 ☐
  Corporate (US) $1000.00 ☐
- Benefactor's contribution (at least (US) $200): _____

TOTAL: _____

Mode of payment – ☐ A check is enclosed ☐ The applicant hereby agrees to pay the above total amount upon receipt of an invoice

SIGNATURE ..... DATE .....

* A copy of the byelaws is available upon request.

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