

Report on
TECHNOTEX- 2009
“Providing Better, Secure & Sustainable Life”
Workshop-cum-Exhibition on
Strengthening Government-Industry-Consumer Partnership in Geotech

- The Workshop on Geotech (Geotextiles), fourth in the series of TECHNOTEX-2009 Workshops on Technical Textiles was organized on 23rd September 2009 by Ministry of Textiles and FICCI in New Delhi. Over 160 representatives of Industry, Government, State Governments, PWDs and infrastructure companies attended the Workshop. Key speakers of the Workshop were:
 - **Dr. Sutanu Behuria**, Additional Secretary & Financial Advisor, Ministry of Textiles
 - **Shri Bhupendra Singh**, Joint Secretary, Ministry of Textiles
 - **Shri Shishir Jaipuria**, Chairman, FICCI Taskforce on Technical Textiles & Managing Director, Ginni Filaments Ltd.
 - **Shri C. Kandasamy**, Chief Engineer (Standard & Research- Roads), Ministry of Roads & Highways
 - **Dr A N Desai**, Director, BTRA (Bombay Textile Research Association)
 - **Shri Sudripta Roy**, Secretary General, International Jute Study Group
 - **Shri A. B. Joshi**, Textile Commissioner, Government of India
 - **Dr Guru Vittal**, Senior Scientist, Central Road Research Institute
 - **Shri M Venkataraman**, Advisor, Garware Wall Ropes
 - **Smt Roli Jindal**, Business Manager Building Innovations, E. I. Dupont India Private Limited
 - **Shri Ashok Wasson**, Former Member (Technical), NHAI & Consultant, NHAI

Following are the main highlights of the discussion of the Workshop:

- Dr A N Desai, Director, BTRA made a detailed presentation on Geotextiles. Dr Desai explained that geotextiles has four basic functions viz filtration, drainage, separation and reinforcement. The benefits derived from these functions are more significant when sub-grade soils are weak.
- There are many advantages of geo-grids. Geogrids helps in labour and time saving, material costs are lower in case of geogrids, geogrids are technically superior, geotextiles can be installed quickly, provides flexibility to construct during short construction seasons, allow a

single crew to efficiently deploy multiple geotextile layers and most importantly geotextile reduce the use of natural resources and environmental damage associated with quarrying, trucking and other material handling activities.

- Dr Desai also highlighted the requirements of geotextiles for subsurface drainage, separation, stabilization for permanent erosion control, temporary silt fencing and prevention of reflective cracking. Dr. Desai also touched upon the standards available for geotextiles in India.
- Dr Desai highlighted that many new equipments have been added in their lab like carbon black tester, ESCR apparatus, Meltflow indexer, peel bond tester, porometer, Universal tensile tester, and Luva humidification unit. In the Lab test methods such as ISO, ASTM, EN are conducted as per NABL Accreditation ISO/IEC-17025:2005 standards.
- Following are some disadvantages to Indian manufacturers of Geotextiles vis-a- vis global manufacturers:
 - While Indian manufacturer brand name is never specified in a tender, the same is not applicable for imported products.
 - In overseas aided projects, local manufacturers with same kind of product do not get duty exemption like imported products hence, no level playing field.
 - Imported materials do not pay sales tax but local manufacturers have to pay sales tax. Hence imported materials get cheaper by the tax amount.
- It is recommended that:
 - Guidelines on usage of geotextiles in Railways that are available with Railway Board should be implemented.
 - Guidelines on the use of geotextiles can be prepared for different applications by concerned agencies like NHA and RDSO for making engineers aware about the availability of geotextiles for different applications.
 - More trials need to be conducted.
 - Preference should be given to local manufacturers and duty anomalies should be removed.
 - Need for a central agency to monitor the quality of products supplied and evaluation of design.
 - There is a need for a unified code and performance criteria.

- Price escalation formulae should be applicable to geotextile manufacturers like steel or cement.
- Mr M Venkataraman, Advisor, Garware Wall Ropes made a presentation on industry perspective. Mr Venkataraman highlighted the fact that geotextiles can solve many problems of engineers through their various functions like separation, filtration, reinforcement, drainage, containment etc.
- Mr Venkataraman highlighted that water leakage was reduced from 45-60% to 0% in Dudhganga project by using geotextiles.
- Presently, for any applications, the technical specification includes all the properties irrespective of the function to be specified. There is a need for performance related specifications since these specifications describe how the finished product should perform over time. Such specifications are required which use quantified quality characteristics and life cycle cost relationships correlated to product performance.
- Performance Related Specifications (PRS) have many advantages like :
 - Improved link between design and construction
 - Improved and focused testing on characteristics related to performance.
 - Promoting best practices to improve quality
 - Improving flexibility, efficiency and value of the system
 - Adding private sector innovation
 - Allow contractors more freedom to implement their own procedures, choose their own equipment and conduct site specific process control programs.
 - Transferring risk away from the owner
 - World over various agencies have implemented PRS like FHWA, AASHTO, European Union, DOT California etc to name a few. In California, 36% improvement in highway ride quality and 10% savings in life cycle cost were observed by using PRS in pavements.
 - In view of the above advantages, it is recommended that performance related specifications be established. There is also a need to identify relationships that link designing and construction with product performance.
- Ms. Roli Jindal, Business Development Manager, DuPont highlighted the industry perspective. She explained that in the United States the usage of geotextiles in certain

applications is mandatory like in landfills. She emphasised the need for similar awareness and mandation in India also.

- There is a need for adopting correct, application related specifications and there is need for Government support to promote use of geotextiles in key road applications.
- Ms Jindal highlighted that in India specification terminology is inappropriate. There is a critical need for relevant parameters like tensile strength, CBR puncture resistance, elongation, cone drop test, installation damage etc for geotextiles to be used in road construction.
- In India, use of geotextiles is neither mandatory nor recommended nor encouraged. It is one of many 'acceptable solutions'. Hence, it is recommended that:
 - Ministry of Road Transport & Highways should issue a notification to various agencies, making use of geotextiles compulsory in roads.
 - We need to introduce a clause which encourages the use of geotextiles along the lines of European specifications.
 - Indian codes need to drop their ambivalence towards geotextiles and need to accept internationally proven construction practices.
 - There is a need for inclusion of geotextiles in central PWD and State PWD manuals and schedule of rates.
 - Tariff support should be provided to the industry since geotextiles are highly technology intensive.
- Mr Bhupendra Singh, Joint Secretary, Ministry of Textiles in his presentation highlighted some important features of global technical textiles industry, like technical textiles accounts for 22% of total fibre consumption globally. In countries like USA, it is as high as 23% whereas in India technical textiles accounts for only 4% of total fibre consumption.
- Total market size of technical textiles in 2007-08 is Rs.37118 crore out of which geotech constitutes only Rs.185 crore (0.5%). But there are many projects underway in India which will require geo textiles at a huge scale. 21000 km roads would be constructed under NHAI that would require geotextiles worth Rs 1260crores. Under Bharat Nirman target for 2009-10 there is requirement of Rs 768 crores worth of geotextiles and Rural Roads Development Plan- Vision 2025 will require huge amount of geotextiles.

- Mr Shishir Jaipuria, Chairman, FICCI Taskforce on Technical Textiles & Managing Director, Ginni Filaments Ltd. Said that a great deal of construction activities are taking place in our country where geotextiles can play an important role. India has an extensive road network of 3.3 million kilometres and many more has to be added. Government expects an investment of \$ 78.5 billion in road sector during the Eleventh Plan. Geotech can provide cost effective solutions to the Government and private sector in the development of road network in our country.
- There has been considerable increase in the lifetime of roads and pavements with the use of geosynthetics as reinforcement or separation material. In order to increase the usage of geotextiles in roads and highways, it is important to give emphasis on right material to be used in the initial design stage of the projects. There is an immense potential for exports also. Government could also consider promoting exports of these products to stimulate domestic manufacturing in the country.
- Dr. Sutanu Behuria, Additional Secretary & Financial Advisor, Ministry of Textiles emphasised the need for cost- benefit analysis for promoting geotextiles in the country. He said so far no such analysis have come up which shows that there is a net benefit in using geotextile products over traditional products. Dr Behuria highlighted the importance of reducing costs of geotextiles for increasing demand for them and said that Ministry of Textiles is ready to support the industry financially for carrying out cost- benefit analysis studies on geotech.
- Shri Sudripta Roy, Secretary General, International Jute Study Group highlighted the importance of Jute Geotextiles (JGT) in his presentation. Jute has many advantages over other materials like it has high strength, moisture absorbing ability, good thermal stability, low extensibility and above all it is renewable and biodegradable. In this era of Global Warming, there is a need to use natural fibres like jute which have many advantages over synthetic fibres. Both synthetic and natural fibres can coexist depending on the nature of applications.
- Shri C. Kandasamy, Chief Engineer (Standard & Research- Roads), Ministry of Roads & Highways said that joint ventures between Government and geosynthetic industry is required for taking geo textiles to the next level of usage. User should be given autonomy between the usage of geotextiles and traditional materials.

- Mr Kandasamy emphasised the need for cost- benefit analysis so that life cycle cost can be quantified and Government could come out with some guidelines for geotextiles. Another area that requires experimentation is Cost reduction. He said they will keep interacting with Ministry of Textiles and industry to make the usage of geotextiles prominent in the country.
- Mr Guru Vittal, Central Road Research Institute highlighted some of the studies conducted by CRRRI on usage of geotextiles. One of the studies was conducted to analyse relative efficacy of geotextiles as compared to use of conventional techniques for BC soils. Along with conventional construction thin sand cushion, moorum blanket, lime stabilised BC soil and sand blanket were tested. Performance was tested over three years. It was found that geotextiles are an effective substitute for conventional sand blanket course and its use is very cost effective when good quality sub-base materials are not available within economic lead and CBR of sub-grade is low i.e. less than 3.
- Geotextiles could also be used for ground improvement and could also be used in agriculture. Agriculture geotextiles are 100% biodegradable, helps in erosion control, vertical drains for consolidation of clays, horizontal drains for stabilisation of slopes and subsurface drains.
- CRRRI observed and recommended that:
 - Under PPP regime, Road Projects be taken up on DBFO Basis
 - Geosynthetic usage can be boosted in case it is techno economically feasible for the Concessionaire
 - For proven applications like RE walls, Erosion Control and Ground Improvement usage will be enhanced
 - QC/QA of the geosynthetics to be ensured
 - Use of right type of materials/correct techniques
 - Evolving our own codes/guidelines
 - Establishing countrywide geosynthetic testing/certification facilities
 - For potential application areas like reinforcing pavement layers, for bituminous overlay, drainage/separation, etc usage can be further enhanced
 - R&D Efforts required to refine the techniques
 - Evolving rational design procedures and solving problems associated with construction
 - Taking up field demonstration projects followed by performance monitoring
 - Application to be cost effective

- Agro based geotextiles-price & environmental advantage over synthetic product is vital, ideally suited for erosion control applications
- Mr Ashok Wasson, Ex-Member, National Highways Authority of India highlighted the importance of geotextiles in National Highways Development Project (NHDP).
- Mr Wasson said India has a total road network of 3.3 million kms. Roads carries 85% of passenger and 70% of freight traffic. National Highways constitute only 2% of length of roads network but carries 40% of traffic on Indian roads.
- NHDP is the largest ever highways project matching with international standards. There will be 4/6 laning of around 24000 kms of roads.
- Suggested applications of geotextiles in roads are in stabilization, separation, reinforcement, erosion control, drainage and reflexive cracking reduction. Geotextiles can be laid down as sandwich between overlay and distressed cracked layer to avoid reflective cracking. Geotextiles used on the top of poor sub-grades helps in separation and stabilization. Embankment-slopes could be reinforced for vegetarian growth and erosion prevention, can be used in tunnel lining, RE walls and coastal, riverbank erosion problems. Mr Wasson also laid down the physical and hydraulic properties of geotextiles.
- In discussion, the following issues were highlighted:
 - It was requested by one of the participants that there is a need to get a study done on the improvement in the life of roads after using geo-textiles vis-a-vis traditional materials.
 - A point was raised regarding the standardization of geotextiles. It was emphasised that standards should be performance based (durability, installation requirements etc). It was mentioned that inputs from industry are required before setting up standards by the Ministry.