



The latest news magazine from the NAUE Group

Issue 23 - December 2004

## Introduction

At the very beginning of the latest issue of our company newsletter - Naue News No. 23 - one word is missing: Fasertechnik!

From the 1 January 2005, the name of our company, Naue Fasertechnik GmbH & Co. KG, will be replaced by NAUE GmbH & Co. KG.

We have been wanting to change the name of the company for a long time as the word Fasertechnik (fibre engineering) describes only a small part of what our company does. As our products Carbofol®, Carbofix®, Secugrid®, Secudrän® and Secumat® are extruded, they must be allocated to the term extrusion engineering and not fibre engineering. As the NAUE Group activities become increasingly globalized, we are repeatedly confronted by the problem that our customers abroad neither understand the word "Fasertechnik" in our name let alone being able to pronounce it!

With the move to our new corporate offices in Fiestel in March 2005, and the re-registration of the company headquarters from Lübbecke to Espelkamp, we thought it a good time to change the name of the company as well. This means



that our company logo will also be getting a new look without having to replace the familiar and successful Naue "N".

The year 2004 is now gradually coming to a close and assessments for the NAUE Group reflect what we read every day in the press and hear on the business news.

The export business is booming. Our Export Department (VE) is heading (as we predicted in the Summer already) towards a new record high for the year with double-digit increases in sales. However, not just our own sales forces are booking successes abroad but also our holdings in Australia and South Africa are reporting record sales and turnovers. We are parti-

cularly pleased that not only NAUE blazed a trail of success by selling 70 % of its products abroad but also our installation subsidiary Naue Sealing was able for the first time to acquire several major projects in foreign countries and thus successfully meet its requirements to increase international sealing activities in tunnel constructions.

And what about Germany? The construction industry in Germany is still suffering, or really is suffering more and more not only from the lack of money in the public coffers of the Federal government and the States but also reductions in building activities. The situation of the building industry has further worsened because of other factors: the flop with the motorway toll, the rigorous savings campaign of the Deutsche Bahn AG (the German federal railways) as well as adverse weather conditions affecting the construction of landfills. In view of all this, our German sales will find it difficult to achieve even the sales figures of the previous year. Full utilization of capacities and ensuing bottlenecks in supply - particularly for Secugrid® - aggravated the situation even more and gave our logistics immense challenges. At this point, we would like to take the opportunity to thank our customers for their support and understanding in this situation. The start-

up of the second Secugrid® production plant in Spring 2005 and the doubling of the Secudrän® production capacity at Adorf have made sure that we are well equipped to face the challenges of the coming year.

Although 2004 is not yet quite over, it can already be said that the company has succeeded in increasing sales in all product sectors thanks to its consistent targeting of export markets and increased exploitation of all the potentials for geosynthetic applications. And here we would like to express our thanks to all those involved in this joint show of strength. Together we have succeeded in securing and increasing the acceptance of geosynthetics in many areas of geotechnics!

After all the busy months in 2004, Christmas is once more just what we all need right now! The Christmas season gives us a chance to wind down a little and re-charge the batteries among our family. We would like to wish all NAUE friends and customers and our workforce a peaceful and reflective Christmas and a great start to the New Year 2005.

## Company Management

### Did you know...?

#### Depotex PP black, range of highly UV-resistant nonwovens

Depending on the field of application, e.g. as protection nonwoven in landfills, geosynthetics can be exposed for several years to direct sunlight if construction or operational circumstances so require. Tests carried out in a global UV radiation tester accord the nonwoven an excellent UV resistance with high remaining tensile strengths. Depotex® PP black can therefore be installed on sites which do not allow an immediate cover material placement. ■

#### ...that several interesting articles, supported by the NAUE company appeared in October in the ASTM STP1456 book "Advances in Geosynthetic Clay Liner (GCLs) Technology"?

As a sample: One article describes the topic of permeability testing, one discusses the use of GCLs in the arctic as a diesel barrier, and another on shows the performance of GCLs as a barrier in landfill base seals. We would be pleased to send you further information. Please address your requests to Mr. Kent von Maubeuge, telephone +49 5741/4008-28, fax +49 5741/4008-84 or to bentofix@naue.com. ■

## national projects

### **B 239 Herford bypass - Secudrän® WAS 7 as vertical drainage system, André Weßling**

The B 239 Herford bypass was planned and put out for tender in three sections by the Minden branch of the state highway authorities for road constructions in North-Rhine Westphalia, Germany. The contract for the third section was awarded to a joint venture between Bickhardt Bau AG and Bickhardt Brücken- und Ingenieurbau GmbH in Kirchheim, Germany. The job involved building a bridge across the B 239 road to close up the gap between the Lockhauser Street and the exit from the A 2 highway. Prior to commencing construction of the bridge abutments, a bored pile wall was erected. The design also provided for the

Secudrän® WAS 7 is a three-dimensional drainage system consisting of a stable, pressure-resistant, corrugated collection layer encased with a filter nonwoven layer on each side. The highly effective level of stability of the corrugated collection layer gives this product - which was developed specially for WAS 7 applications - the required drainage rate of 0.3 l/s\*m even for bridge abutments to a depth of about 12 m. In addition, Secudrän® WAS 7 meets all other WAS 7 requirements:

- high weather resistance
- effective AOS in the nonwoven filter ranging from 0.07 mm to 0.2 mm and
- water permeability of the filter nonwoven 100 times higher than that of the soil.



Concrete was used as a level regulating course

installation of a drainage layer between the bored pile wall and facing for the bridge abutment and on the wing walls. The requirements made on the tendered vertical drainage layer follow those of WAS 7, a German drainage recommendation. It allows drainage in the vertical for those areas in contact with earth at a rate in the back-filling of structures of > 0.3 l/s\*m under the respective earth pressure.

After examining all of the tenders submitted, the decision was finally taken to install the geosynthetic drainage system Secudran® WAS 7 produced by NAUE GmbH & Co. KG.

### **9. FS-KGEO in Munich**

The German information and presentation event "Kunststoffe in der Geotechnik" (The Use of Geosynthetics in Geotechnics) will be taking place once again in Munich from 16 to 17 February 2005 where an interested audience of professionals will be able to see demonstrations focusing on:

- design examples, accompanying measuring methods
- sealing by using synthetic liners

As Secudrän® is easy to handle and install, it was possible to install the drainage layer section for section as the level regulating concrete course was put down, Secudrän® was rolled out at the bored pile wall and spot-fixed using shot-anchors. The cavities were then filled in with concrete prior to installing the pre-fabricated facing elements. The use of 1,500 m<sup>2</sup> of Secudrän® on the bridge abutments of the B 239 Herford bypass will ensure long-term and controlled drainage of any water occurring. Simple and safe installation, even on complicated construction shapes, provided a cost-efficient solution which would not have been possible using conventional mineral materials. ■

- methods of calculation, dimensioning.

There will also be, of course, more detailed information on the general range of applications for geosynthetics in earthworks, civil engineering, railroad works as well as tunnel constructions, hydro-engineering and landfill projects. NAUE will also be there to present highlights from the sector of "Geotechnics with geosynthetics". We are looking forward to seeing you there! ■

### **Have you heard...?**

**Dr.-Ing. Georg Heerten  
appointed honorary professor**

On September 21, 2004, Dr.-Ing. Georg Heerten, managing partner of Naue Faser-technik was appointed honorary professor by the president of the Rheinisch-Westfälische Technische Hochschule (RWTH) in Aachen, thus paying recognition to his many years of teaching during his lectureship "geosynthetics in geotechnical application" for the chair geotechnics in structural engineering at the faculty for civil engineering at RWTH, Aachen. ■

### **Küstrin-Kietz Bypass**

**Embankment reinforcement with Combigrid® and Secugrid®**

The implementation of the Küstrin-Kietz roadway bypass project on the interstate B 1, east of Berlin, is scheduled for 2004/2005 and calls for a crossing of an all-purpose rural road in addition to the construction of the actual bypass. Construction for the all-purpose rural road began in the summer of 2003. The subsoil here in this classic low-lying area of the Oder river is primarily peaty. This confronts subsoil experts and planners with the problem of providing a secure foundation for the earthen ramps (part of which are up to 8 m high) needed to connect the rural road to its overpass bridge at its crossing site over the future B 1 roadway. The foundation must limit settling and absorb expansion forces in the embankments base. A two-layer geosynthetic reinforcement was adopted in conjunction with an overload layer of crushed stone to avoid much more costly foundation techniques like, for example, pilings. After a settling period of about one year the overload layer is removed and the actual rural road is created. According to calculations, about 90 % of the settling has already occurred by this point in time so that after the overload layer is removed there is hardly any further settling to take place. About 7,000 m<sup>2</sup> of Combigrid® 60/60 Q1 251 GRK 4 were used as the bottom reinforcement layer, to ensure the filter stability and the reinforcement with one product. The second reinforcing layer consists of 6,000 m<sup>2</sup> of Secugrid® 40/40 Q1 geogrid and this is positioned 50 cm above the Combigrid®. The primary advantages lie in the simple handling and the absence of any edge fold, as is generally required by most other reinforcing products (to direct forces safely into the reinforcing plane by way of the edge belt). These extra material-savings make the application of Combigrid® and Secugrid® an economical construction technique. The on-site construction workers from the MATTHAI company, headquartered in Velten, were pleasantly surprised at how fast Combigrid® and Secugrid® could be installed. ■

## international projects

### Landfill Miskolc, Hungary, Sándor Roméncsak

The local authority of the city of Miskolc (North Hungary) decided to build a new landfill designed according to the state-of-the-art in the county Borsod. The calculated waste capacity of this landfill should be more than 2,000,000 m<sup>3</sup>. The lowest bid company, which was also awarded with the final contract was MOTA-ENGIL S.A. and the whole project was financed by the ISPA with 12.9 million Euros.

The design requirements for this landfill project asked for a double lined system with a leak detection system installed between the two HDPE geomembranes. Additionally a composite sealing system with a HDPE geomembrane and a mineral sealing liner were considered as last line of defense. After comparing all possible geosynthetic offers MOTA-ENGIL decided to select the NAUE products, mainly because they were offered as a package and came all from one manufacturer. This selection resulted then in the following cross section (top to bottom) or the Miskolc landfill:

- waste
- 50 cm thick gravel (16/32 mm) leachate collection layer
- Secutex® R 1204 (1200 g/m<sup>2</sup>) protection nonwoven, 100,000 m<sup>2</sup>
- Carbofol® HDPE 2,0 mm thick smooth geomembrane, 100,000 m<sup>2</sup>
- Secudrän® XX5-141 leachate detection layer, 93,000 m<sup>2</sup>
- Carbofol® HDPE 2,0 mm thick smooth geomembrane, 100.000 m<sup>2</sup>
- 3 layers of 20 cm thick compacted clay in the flat areas and Bentofix® NSP 4900 for the slopes, 7,600 m<sup>2</sup>

The entire landfill area of approx. 100,000 m<sup>2</sup> was delivered, installed and sealed from May 2004 to November 2004 and was far ahead of the scheduled expectations of the owner. This was mainly due to the ease of installation of the 9.40 m wide Carbofol® geomembrane, with an estimated installation performance per 8 hour day of one welder (rate 1 m per minute)

of approx. 4,800 m<sup>2</sup>. This would be roughly 47 % more than with a 5 m wide geomembrane and approx. 25 % more than with a 7,50 m wide geomembrane. Additionally the installation of compacted clay on the 1.5 H : 1 V steep slopes would have slowed down the whole sealing operation dramatically so that the use of the shear resistant needlepunched Bentofix® GCL



Installation of geosynthetics on the Miskolc landfill

increased the installation rate on the slopes as well. Overall the county of Borsod as well as the contractor were very happy with the installation performance on site and the early finalisation of the landfill sealing operation. The community now owns a modern and safe landfill sealed and protected with a complete geosynthetic system from NAUE. ■

### Embankment reinforcement using Secugrid® geogrids - "Tabing-Duku" - road-widening in Indonesia, Holger Pohlmann

The Tabing-Duku project near the town of Padang on the largest of the Indonesian islands, Sumatra, required an existing road from the airport to the city center to be widened at the most cost-efficient price possible. In spite of extremely problematic ground conditions on the site with low load-bearing properties and a high ground-water level, NAUE worked out a possible solution in cooperation with BBG Bauberatung für Geokunststoffe (consultants for geosynthetics) in Lemförde. The solution involved an embankment reinforced with multi-layer Secugrid® R-geogrids.

The decision for the Tabing-Duku project was taken in favor of the installation of around

15,200 m<sup>2</sup> of Secugrid® 120/40 R1 geogrids made of polypropylene (PP) which were installed at right angles to the embankment axis with an anchorage length of 10.0 m (lower layer) and 6.0 m (layers 2-5). The spacing between layers of Secugrid® geogrids was 1.0 m and the outer layer (embankment slope > 50°) was constructed with the wrap-around method and additionally greened.

The original design envisaged a geogrid reinforcement with 60 - 80 kN/m tensile strength with layer spacing of 0.50 m. However, the limited budget did not allow the implementation of this version and so the decision fell on Secugrid® 120/40 R1.



Secugrid® as embankment reinforcement

The selected type of product allowed installation with a greater layer spacing because of its higher short-term and long-term tensile strength and this led to greatly reduced installation costs.

The Secugrid® solution in installation widths of 4.75 m likewise allowed faster and more cost-efficient installation in particular as the loss through overlapping is less compared with narrower products.

As subsoil conditions were extremely adverse and because, in some parts, it was necessary to install Secugrid® "under water", the bottom layer of the embankment suffered extreme deformation, as was expected. But Secugrid® was able to absorb these enormous forces without any problems and without any visible damage. The deformations were remedied as further layers of Secugrid® were installed to reinforce the body of the embankment. Finally, the whole of the visible surface of the embankment was covered with soil and greened. Measurements were taken on the upper edge of the embankment to determine the degree of subsidence and deformation. Hardly any deformation was noted and confirmed that Secugrid® had allowed an existing road on an extremely soft subsurface to be successfully widened - at a favorable cost, measurably and safely. ■

## Have you heard...?

...Secudrän® geosynthetic drainage systems manufactured by NAUE have now been available since June 2004 in widths of 3.90 m in addition to the previous 2.00 m width. This width of drainage products allows you to cover over double the number of square meters in just one single placement process, resulting in fewer losses if cutting is required and for overlapping. Furthermore, the 3.90 m wide drainage system allows optimal freight utilization which in turn is easier on the environment and means reduced freight costs for you. NAUE has also developed a new type of production technology to attach the nonwoven to all of the Secudrän® variants. Instead of the spot-welding, the full area of the nonwovens is now applied using heat. We would be pleased to send you further information. Just contact Ms. Walz under tel. +49 5443/206-70; fax +49 5443/206-79 or Email swalz@naue.com. ■

## Products

### Secudrän® meets BAM guidelines (NAUE)

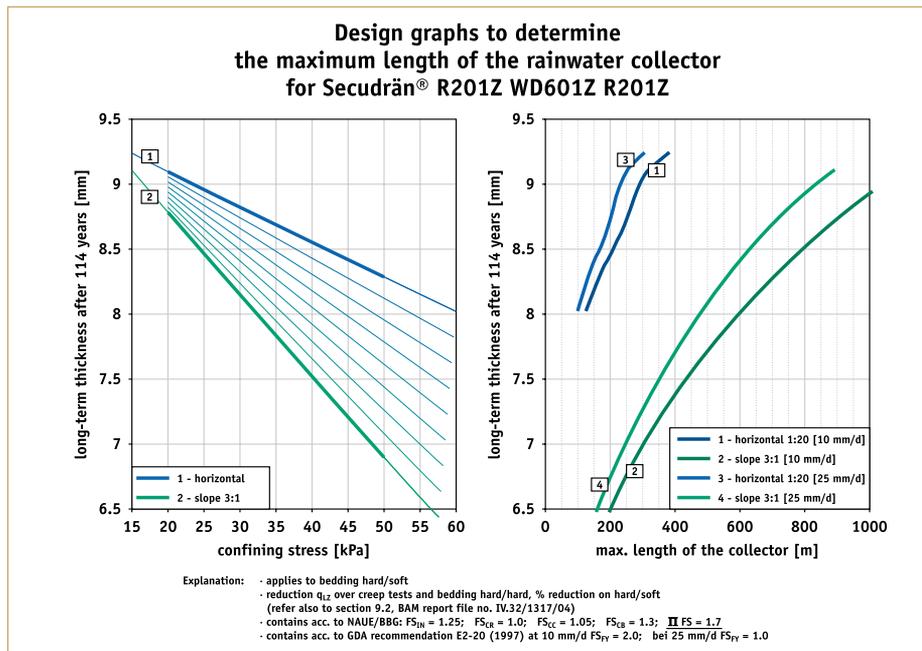
In October 2003, the Bundesanstalt für Materialforschung und -prüfung (BAM) [German federal institute for materials research and testing] published its guidelines "Proof of the suitability of geosynthetic drainage elements for use in landfill caps and covers". These guidelines give comprehensive requirements for geosynthetic drainage elements, the raw mate-

red geomembranes. A detailed description of the testing procedure was published in the NAUE News No. 22, September 2004 for the Bentofix® product.

In accordance with the above-mentioned guideline for Secudrän® R201Z WD601Z R201Z, NAUE applied for the relevant suitability certificate from BAM in January 2004 and received it in a BAM report, dated 1 September 2004.

With the BAM report, the requirement set forth by the Landfill Directive (see Appendix 1, Table 2) is met; i.e. "the responsible authority ..., (can) at the request of the operator, permit reductions in layer thickness and permeability coefficient for the drainage layer as it is proven that the hydraulic performance of the drainage layer and stability are assured".

The data of the BAM report resulted in two new design graphs for Secudrän® R201Z WD601Z R201Z based on a load-dependent long-term thickness. This allows the maximum lengths of the rainwater collections drains to be read off under various parameters (precipitation, load, slope inclination) and takes into direct account the relevant reduction factors for the product. Drainage rates for Secudrän® were determined in compliance with EN ISO 12958 whereby a practice-relevant hard/soft bedding (geomembrane on the one contact surface, soil on the other contact surface) was selected for the test device. Are you interested in further details? Contact Mr. Henning Ehrenberg on the telephone number +49 5743/41-326 or by fax on the number +49 5743/41-370 or by Email [info@naue.com](mailto:info@naue.com) quoting "Secudrän® BAM RL" and you will receive further information immediately.



rials and components used to produce them and also on the supporting documents for geosynthetic drainage elements. The guidelines are based on European CE identification with requirements on drainage elements under EN 13252. Furthermore, application-specific requirements are made which prove the permanent suitability of geosynthetic drainage elements as an alternative to the 30 cm gravel drainage required under TASI [Technical guidelines for landfills]. For example, the requirements for the long-term shear strength are based on the same requirements as for the BAM-approved structu-

This product consists of a 600 g/m<sup>2</sup> corrugated PP collection layer encased with a 200 g/m<sup>2</sup> needle-punched PP nonwoven layer on each side. All the layers are connected and shear-resistant to one another by spot welding.

### Impressum

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### Exhibition and Seminar Schedule

#### January

18-20/01/2005	acqua alta	Munich
24-26/01/2005	Geo-Frontiers 2005	Austin, Texas
26/01/2005	GRI 18	Austin, Texas
27-28/01/2005	IV NAUE Geosynthetics Colloquium	Garmisch-Partenkirchen
30/01-02/02/2005	Environment 2005	Dubai

#### February

10-11/02/2005	SKZ Conference "Safe Landfills"	Würzburg
16-17/02/2005	FS-KGEO	München
21-22/02/2005	5. Austrian Geotechnical Meeting	Wien
22/02/2004	VSVI seminar	Münster

#### March

08-11/03/2005	Terra Tec., specialists' trade fair for environmental technology and environmental services	Leipzig
17/03/2005	12. Geotechnology Colloquium	Darmstadt

#### April

25-29/04/2005	IFAT 2005	München
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