

# NEWS

The latest news magazine from the NAUE Group

Issue 27 - May 2006

## Introduction

### *Twenty-one persons died as Saxony sank into the floodwaters of the River Elbe and its tributaries in August of 2002.*

There alone the flood damaged or destroyed 25,652 residential buildings, 236 schools and 7 hospitals. Fifty thousand people had to leave their homes. One hundred and eighty bridges, 750 km of roadway and 540 km of railroad tracks were washed away (source: "Die Zeit", 04/06/2006). Affected communities near our Adorf plant were in dire need of our products (sandbags, sand containers, filter mats and sealing liners) to ward off the catastrophic flood. NAUE employees spontaneously organized their own donation program for flood victims which collected € 11,000 for immediate aid that was made available to neighboring townships. This 100-year flood that occurred four years ago caused damage that went into the billions. In the aftermath everyone was in agreement; improvements would have to be made to floodwater protection and crisis management.

The call for better protection became louder every time water broke through another levee. Unfortunately, subsequent years of experience have seen many plans go under in the wake of lobbying interests. And regretfully, the passage of time has also eroded interest in flood-related matters. Astonishingly, this has not only affected politicians but residents in low-lying areas as well! With every passing day it becomes more difficult to implement necessary projects and measures.

The results of floodwater protection policy are mixed. On the one hand, the flood catastrophes of 1999 and 2002 have indeed induced re-

thinking; many new levees were planned, areas at risk have been specified, the chain-of-command has been trimmed and some centralized authorities have been created. But in many instances the problem lies in implementation. For years it has been impossible to implement some protective measures because these projects became stuck in quarrels over authoritative responsibility and local interests. Flooding along the River Oder in 1997, the 1999 Pentecost flood in Bavaria, high-water levels along the River Elbe in 2002 and the high-water level in the foothills of the Alps in 2005 all prove that the next flood will come for sure! The current situation has once again severely affected Saxony and Lower Saxony with record-breaking floodwater levels from the River Elbe.

Neighboring German states have flood-induced emergencies. A struggle against the Danube's floodwater is being fought in Serbia, Romania and Bulgaria. High water levels are being produced by the rivers Elbe and Morava in the Czech Republic; the River March has been breached out of its banks in Austria. These countries also appear to be rather helpless in preventing a flood from becoming a catastrophe. Evacuation is often the last recourse to save lives and some valuables.

We need neither climate discussions nor public finger-pointing to improve protection against floodwater damage in the future. What we need is to start working on specific measures that can be implemented from an engineering standpoint - in keeping with a floodwater protection concept that is economically feasible.

NAUE and its employees continue to work

actively on improvements to floodwater protection and prevention - because "after the flood" is also "before the flood"!

It won't be long now. The Football World Cup begins in Germany on the 9th of June. All of Germany is anxiously anticipating this major event. NAUE has also come up with something for its customers and employees. A Football World Cup betting game has been set up on the NAUE internet site ([www.naue.com](http://www.naue.com)). Here you have a chance to apply your expertise and win prizes.



The NAUE Group is working intensely on the first quarter - or, in keeping with the subject of football, playing hard through the first 30 minutes. The modifications already made to our nonwoven plant and Bentofix® plant along with the planned overhaul of our extruder in Tönisberg and the forthcoming production start of the third Secugrid® plant in July at our Adorf site are all contributing factors to ensure that the NAUE team can achieve necessary product quality and capacity for a successful year. Sales have surged forward in a most promising manner. First third results clearly indicate that the good performance attained in 2005 could even be exceeded.

But the game has 90 minutes and the year has 365 days; it is clear that much has yet to be done. The struggle must go on to achieve success in the end stretch. In this context we wish all of our readers a great World Cup tournament and just the right geosynthetics to produce a successful "rest of the game". ■

## NAUE's first South East Asia distributor conference



From the 21st to the 23rd of March NAUE was invited to the first South East Asia distributor conference. During the three day conference NAUE educated their distributors from Brunei, Indonesia, Malaysia, Vietnam and Thailand in geosynthetics, especially in landfill design, coastal protection engineering, designing with geogrids and presented the recently distributed SecuSlope software. The NAUE distributors not only introduced their own company structures but also highlighted geosynthetic projects and together all discussed hot topics and future strategies. The distributors received for their outstanding performance in 2005 NAUE award plaques. The future

with NAUE geosynthetics can be built on such great partners. ■



## national projects

### Federal Autobahn A23, noise barrier for the community Kölln-Reisiek [Marc Iken]

As a result of the annexation of new areas by the community Kölln-Reisiek (B-Plan 4), north of Hamburg, it became necessary to increase the height of an existing noise barrier on the A23 autobahn. The stipulations of roadway authorities required that the slope at the side of the autobahn could not be steeper than 1.5 (H) : 1 (V). The formation of a natural slope inclination on the roadway-side of the wall was impossible due to the increased amount of space that it would have required. Adding to the problem, a gas pipeline is routed in the immediate vicinity of the wall from which certain minimum spacing had to be maintained. The construction of a concrete retaining wall was ruled out because of high construction costs and too much soil pressure. With the approval of the customer (the community Kölln-Reisiek), the responsible engineering firm (Ing.-Gemeinschaft Klütz & Collegen headquartered in Bokel) decided on a reinforced retaining wall with Secugrid® geogrids.

tation of soil with appropriate plants. The geocells have a height of 20 cm each so after three layers of geo-cells anchorage is provided to the Secugrid® 40/40 Q6. Sand was used as the fill material for the wall. The sand used was being excavated from another project being carried out simultaneously on the adjacent federal autobahn A23 by the contractor firm Ernst Karl, Westerhorn.



Filling of the Secugrid® reinforced geocells

This symbiosis made it possible to realize a very economical method of construction.

A space-saving structure with a 0.36 (H) : 1 (V) rear-side embankment slope was built within only a very brief period of time. The ground area saved directly behind the noise barrier is a benefit to the tennis courts being built there. Once the planted ground cover has taken hold the following summer it will be less obvious to tennis players that this noise barrier along the A23 was constructed with the help of 4,275 m<sup>2</sup> of Secugrid® from NAUE. The geosynthetic materials in our product lines are almost always hidden away from sight and perform their tasks there successfully in the way they were intended. ■

Brandenburg roadway authority was responsible for the planning. Preliminary investigations for the new roadway established that it would inevitably cross over mining recovery areas, old mining areas and mine-waste dumping areas. Due to the prognosis of a mid-term rise in groundwater levels in this region, an increased risk for settlements and soil failure can be presumed and substantial subsidence can be anticipated. This is why initial ground preparation procedures were carried out to stabilize the subsoil with vibration compacting and other compaction methods.

Because of the special geological conditions prevailing in this area, conventional construction techniques were only suitable to a limited degree. For example, the use of pilings was rejected. Such an approach would be too expensive and yet not entirely effective as potential sinkholes could still be produced by the anticipated rise in groundwater level. A stabilization with high-tensile geogrids was chosen to ensure long-term utilization as well as the equalization of settling differences.



Cross section diagram of the noise barrier

The consulting office BBG Bauberatung Geokunststoffe, who was contracted to perform a survey and calculations for geogrids, determined that Secugrid® 40/40 Q6 with 60 cm layer-spacing intervals and an embedded length of about 2.40 m would have to be employed in the autobahn-side of the noise barrier. Secugrid®, which exhibits a very good stress-strain behavior, can transfer the required design stresses over the service life of 120 years. Geo-cells were employed as the exposed facing and were laid over the Secugrid® geogrids. This makes it possible to have a vege-

### Senftenberg bypass - homogeneous settling for road embankments with Secugrid®

[Heiko August]

The construction of a new bypass was planned so as to relieve the City of Senftenberg from heavy inter-regional traffic on the B 169 highway. The Cottbus branch office of the State of



Secugrid® installation

The design required four layers of Secugrid® in the lower part of the embankment body at the eastern junction. Of interest in this respect: a bridge structure's foundation was built on this four-layer geogrid reinforcement. The geogrids were able to reduce the settlement differences between the bridge structure and the embankment's body to a minimum. The necessary geogrid characteristics - high rigi-

## Nonwoven geotextiles over HGT [line stabilized base courses] in roadways



General Roadway Construction Circular No. 05/2005 from the Bundesministerium für Verkehr-, Bau- und Wohnungswesen [federal ministry for transportation, building and residences] in Bonn has redefined the criteria for selecting and evaluating various building techniques related to the pavement of multilane, divided federal highways. The circular literally states, "In RStO [guideline for the standardization of paved traffic surfaces] the relative attributes of structural behavior for building techniques of a given construction class are established according to the principle of technical equivalence. The special stresses associated with traffic surfaces is to be accommodated in the

selection of building techniques. Concrete construction "directly bonded to the base layer by hydraulic bonding materials (e.g. line) is not equivalent to the same construction technique with nonwoven geotextiles."

This decision reflects the positive experiences made over recent years that confirm the viability of concrete pavements on a hydraulically bonded base layer (HGT) containing nonwoven geotextiles as an intermediate layer. NAUE not only actively participated in this development but has also already delivered and installed millions of square meters of Secutex® R 504. ■



dity, immediate interlocking with the soil, great stress absorption, no structural elongation and high flexural stiffness, all while being cost effective - were met by Secugrid® geogrids from NAUE GmbH & Co. KG with its firmly welded junctions.

## international projects

### Rehabilitation of the sewage system in Baneasa using a Carbofix® concrete protection [Bogdan Tronac]

The north part of Bucharest is an important business location due to its near location to the airports Henry Coanda and Baneasa and is therefore very good developed in its infrastructure, e.g. with the DN1 national road that connects to the central area of Romania. As the old infrastructure was obsolete and unsuitable for the further development of the area, the authorities decided to encourage the development of internationally funded projects to improve the road, the sewer and the water supply networks. Also, private investments were supported for the building of three super markets and a brand new residential area. All these raised the demand for a larger sewer.

After an international tender, the consortium J&P Avax - C. Psallidas from Greece was awarded the contract for the rehabilitation of the sewage system, with INOCSA from Spain as the consultant. The requirements for the main sewer were concrete pipes with a diameter of 1,200 mm and lined at the inside either with a coating or with an HDPE membrane. After detailed discussions and clarifications it was decided and accepted by the contractor and the consultant to use Carbofix®-10 406, 2.00 mm concrete protection liner from NAUE GmbH & Co. KG. The concept was based on manufacturing Carbofix® cylinders with 3 metres height, then introducing them into the vertical steel shutterings, where the concrete was poured and vibrated. The Carbofix® studs were this way



Carbofix® sealed pipes

firmly incorporated in the concrete of the pipes. The decision to use Carbofix® was based on the overall liner performance, robustness,

In all, about 260,000 m<sup>2</sup> of Secugrid® geogrid materials of types 400/40 RS6, 200/40 RS6 and 80/20 RS6 were delivered and successfully installed in the period from June to September of 2005. ■

quality control, ease of installation and the cost effectiveness.

The manufacturing of one pipe took 8 hours in summer and one team of welders could produce



Feeding of a Carbofix® sealed pipe in the shaft

10 Carbofix® cylinders per day. Due to handling issues only longitudinal hot wedge weldings were used. The installation was done according to the "pipe -jacking" technology by excavating 7 m diameter holes and pushing the pipes into each other. The horizontal digging process is controlled by a laser positioning device that ensures the correct level. One section is typically 150 m long, with one jacking shaft and two ventilation shafts. In the airport area, the length of the tunnel between two shafts increased to 300 m.

Once two pipes were connected the joints between the pipes were sealed. In the particular case a 2.00 mm Carbofol® HDPE smooth geomembrane collar, 300 - 500 mm wide was applied over the joint and extrusion welded. All the welds had a copper wire incorporated and were tested with a spark tester. In some sections the water table was so high that water penetrated the pipes and made welding impossible. In this case a special cement mix was injected into the soil in the area of the joints, so that water infiltration was reduced and welding was possible. Up to now 1.2 km of 2.8 km of the main sewer with Carbofix® were successfully installed and final completion is expected by the end of the year. ■

## Did you know...?



... that an evaluation of NAUE News (performed by questionnaire in conjunction with registration of the new SecuSlope software) resulted in an average rating of 1.6 (on a scale of 1 = very good to 4 = satisfactory)?

We would like to thank you for this vote of confidence! Of course we will continue to try to improve. ■



... that we have recently published an update of our flyer series "Advantages of Carbofol® geomembranes"? In addition a new "Advantages of Secugrid® geogrids" is in preparation. Please contact us if you wish to receive your personal hard copy.

E-Mail: [info@naue.com](mailto:info@naue.com) ■

### Secugrid® reinforced "soil pressure absorber" for the construction of an IKEA market Gdansk, Poland [Rafal Ciesielski]

As part of a new construction for an IKEA market in the "Matarnia" commercial park near Gdansk, a solution had to be found to relieve horizontal pressure on the walls of the building's underground level. The geosynthetic consultants BBG Bauberatung Geokunststoffe GmbH & Co. KG had worked out a proposal for the Polish NAUE subsidiary, Geosyntetyki Naue, that was based on a Secugrid® reinforced support structure designed as a "soil pressure absorber". The construction of the vertical support structure could absorb loads from parking areas and foundations as well as intercept the severe loading that results from soil pressure in front of adjacent cellar walls in the IKEA



Secugrid® reinforced "soil pressure absorber" in front of the cellar wall

building. This produced an opportunity to "trim down" the dimensions of the cellar walls which, in turn, led to savings in overall building cost. In comparison to other concepts, NAUE's solution proved to be the most secure and economical, which is why it was chosen by the



planners. The reinforced sections had a total length of 300 m and varied in height between 3.5 m and 6 m. The Secugrid® reinforced earthen bodies are fabricated in the

wrap-around method with maximum spacing of 0.5 m. A total of 1,900 m<sup>2</sup> of Secugrid® 400/40 R6, 6,175 m<sup>2</sup> of Secugrid® 200/40 R6, 2,850 m<sup>2</sup> of Secugrid® 80/20 R6 and 14,250 m<sup>2</sup>

of Secugrid® 40/40 Q6 was installed by the company Budimex-Dromex. ■

## IMPORTANT NOTICE

Calls and fax transmissions to our old locations in Lemfoerde (+49 5443 206-...) or Luebbecke (+49 5741 4008-...) are currently still forwarded. However, call forwarding from these locations will be discontinued in the near future so we would like to point out again our new contact data: **Phone +49 5743 41-0** and **Fax +49 5743 41-240** ■

## Products

### CE marking for geosynthetics

- now also for Bentofix® and Carbofol®!

The majority of our geosynthetic products have been subject to CE marking requirements since October 1, 2002. This certifies compliance of a product with respective European (EU) guidelines for specific applications and functions. Since this point in time, a majority of geotextiles and geotextile-related products may not be sold without the CE marking if they are for use in applications covered by standards EN 13249, EN 13257 and EN 13265. These standards deal with the functions filtration, separation, draining, protecting and reinforcement for the following applications:

- roadway and traffic surfaces
- railroad construction
- earthworks and foundations
- drainage systems
- erosion protection systems
- reservoirs and dams
- canal construction
- tunnel and underground earthworks
- disposal of solid waste
- encapsulation of liquid waste

Another five application standards for sealing barriers were published in 2004 and 2005 (EN 13361, EN 13362, EN 13491, EN 13492, EN 13493). Thus beginning in September 2006 (\*),







January 2007 (\*\*) and February 2007 (\*\*\*) there is a mandatory CE marking requirement for the "sealing" function with respect to corresponding standards.

This applies to all geosynthetic sealing liners (polymer - GBR-P; bitumen-coated - GBR-B; clay, e.g. bentonite GCL or GBR-C used in applications for

- reservoirs and dams (\*)
- tunnels and underground earthworks (\*)
- landfills with liquid waste (\*)
- canals (\*\*)
- landfills with solid waste (\*\*\*)

The table lists the characteristics, depending on function, for which the manufacturer must supply an accompanying document which details a value with tolerances. The necessary investigations can be carried out in the manufacturer's testing laboratory or an external testing laboratory. Statements made with res-

pect to proof of a product's durability can be carried over within a product group / raw material. Of course the manufacturer's activities must be, and will be, monitored by an authorized agency (notified body) in the context of the CE marking requirement. After NAUE took all steps well in advance to fulfill CE marking requirements for geosynthetics with respect to the functions filtration, separation, drainage, protection and reinforcement that took effect on October 1, 2002 (see NAUE News November 18, 2002), it was our intent to also be among the first to obtain CE markings for respective geosynthetic product groups used in sealing applications. We have been able to accomplish this goal; since February 14, 2006 NAUE has obtained CE marking for a myriad of Bentofix® geosynthetic clay sealing liners and Carbofol® geomembranes. One can build on this kind of quality! ■

							
	Filtration	Separation	Drainage	Protection	Reinforcement	GBR-P	GBR-C
<b>Strength</b> md/cmd	X	X	X	X	X	X	X
<b>Elongation</b> md/cmd				X	X		
<b>Penetration behavior</b>		X			(X)	X	X
<b>Protection efficiency</b>				X			
<b>Impact behavior</b>	X			X	(X)		
<b>Opening size</b>	X						
<b>Water permeability</b> vertical to plane	X					X	X
<b>Gas permeability</b> vertical to plane						X	
<b>Water permeability in the plane</b>			X				
<b>Durability</b>	X	X	X	X	X	X	X

md = machine direction cmd = cross machine direction (X) = not applicable to all products

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## Schedule of shows and conferences

### May

29.-31.05.06 XIII. Danube-European Conference on Geotechnical Engineering, Ljubljana, Slovenia

### June

12.-14.06.06 Rencontres Géosynthétiques, 6<sup>ème</sup> colloque francophone; Montpellier, France

13.-16.06.06 CIWM 2006 - Changing the Face of Waste Management; Paignton, England

26.-30.06.06 ISSMGE: 5th Int. Congress on Environmental Geotechnics; Cardiff, Wales