

NEWS

The latest news magazine from the NAUE Group

Issue 28 - September 2006

Introduction

The Football World Cup has ended and the whole of Germany was over the moon with the achievements of the German team.

The occasion gave Germany the opportunity to prove its hospitality under the championship's motto: "The world as guest among friends".

Many of our customers and employees took part in the NAUE World Cup football betting game. And numerous heated discussions on football before and after the matches provided a lot of fun and, as a side effect, made for intensive communication. A particular cause of amusement was when those who professed to know nothing at all about football were sometimes top of the list with their forecasts! Our hearty congratulations to the winners and lots of fun with your prizes.

Looking back on our own "half-time" in 2006, we can report as follows: the market for geosynthetics is increasing and with it NAUE is experiencing strong growth. This statement applies to 2005 and for the first six months of 2006 in spite of the fact that geosynthetic constructions are unfortunately still are often looked upon as being unconventional. Scepticism regarding the efficiency of geosynthetics and the often unlimited confidence in the service life of steel, concrete or mineral building

materials shows that geosynthetics still have a long way to go before reinforcing soil with synthetic material is just as much a matter of course as with steel-reinforced concrete. Or until Bentofix® B 4000 with a service life of more than 400 years (as determined by BAM, the Federal Institute for Material Research and testing) is accepted as being equivalent to the classical clay capping of waste landfill. Having said that, this limited degree of acceptance which momentarily *still* prevails leads us to expect an unimaginably large potential for the use of geosynthetics.

However, only those companies who strengthen their production capacities early enough on will be in a position to participate in this market growth. With the start-up of the third Secugrid® production plant and the new bar extruder in Adorf on July 1, 2006, we have created additional conditions to do just that. The new capacities will ensure considerably shorter delivery times and the building up of the amount of material in stock will also enable us to meet customer demands in the short term. At the Tönisberg site, the two big extrusion plants will be retrofitted to state-of-the-art and their performance enhanced.

In contrast, the expansion of our sales team is proving to be difficult. In spite of a compre-

hensive advertising campaign it is not easy to find suitable sales staff for the foreign assignments. This is all the more surprising when seen against the backdrop of the German labor market, which is still depressed. Another fully unknown factor at the moment is the development in oil prices. We already described our concern about oil price developments in the NAUE News Issue 22 from September 2004 when the barrel price had reached \$44.

Today, 2 years later, a barrel of crude costs \$78. Oil remains the main component of our polyolefine raw materials and thus has a significant impact on the prices of our preliminary products. The manufacturers of geosynthetics have borne a large part of the price increases themselves, especially for liners. We reckon that manufacturers will no longer be able to bear any further price increases for raw materials themselves.

We hope the optimistic mood in Germany will remain through the "second half" of 2006 and that escalation in the raw materials markets will not cut short the present positive business situation. Together with our customers, we shall be doing our best to overcome the challenges which lie ahead of us. ■

Mr. Horstmann - 20 years of service to the company

On October 1, 2006 after almost 20 years of service with NAUE, Hans Horstmann will be entering the passive phase of his partial retirement.

Hans Horstmann began his career with the former Naue Fasertechnik on July 1, 1987 as a graduate engineer in the Sales Department as an advisor for applications engineering. Successful sales and rapid expansion in the number of sales staff necessitated the determination of clear-cut sales areas and responsibilities. On November 23, 1989, he was granted the power to act on behalf of the company and on January 1, 1991 he was appointed Head of Sales for the "general civil engineering" sector. On March 10, 1993 he was appointed Prokurist with full power of attorney. Over the years, Hans Horstmann gained an enormous amount of product know-how and had a major influence on product developments and product improvements. From January 1, 2001, he was appointed product manager for Secugrid®. He is an active and much valued member of several working groups. In addition to his large repertoire of product knowledge, Hans Horstmann is the perfect salesman, one who customers can trust and who keeps his word. Our young engineers see Hans Horstmann as a mentor who they love to

"bombard" with all their questions as he always has an answer to everything up his sleeve.

His open, honest and friendly character is valued by all of our staff. Always willing to listen, his opinions and advice have enriched our own knowledge, not only in matters of geosynthetics.

We would like to take this opportunity of expressing our gratitude to Hans Horstmann for the many years of trust and cooperation and wish him all the best for happy and healthy years ahead in which to enjoy his well-deserved retirement.





national projects

Safe crossing of inhomogeneous subsoil for German freeway A38 [Ralph Werner]

The construction of freeway A 38 south of Leipzig involved one section having to cross over the dump of the former open-cast mine Espenhain. The future route runs along the borders of the Markleeberger Lake to the Störmthaler Lake both of which are connected by a canal with one another.

Due to the heterogeneous nature of the material present in the foundations and the ensuing irregular rate of settlement, the Autobahnamt Sachsen, clients of the project, required that the subgrade be stabilized by means of reinforcement. The geogrid transversal and longitudinal reinforcement was required to have rated tensile strength of 40 kN/m.



Secugrid® 100/100 Q6 before being covered using a former overburden excavator

In agreement with BBG (geosynthetic consultant) calculations showed that the product Secugrid® 100/100 Q6, with a transversal and longitudinal short-term strength of 100 kN/m fulfilled the necessary conditions for long-term strength and was therefore selected for use by the general contractors (Heilit+Woerner, Dresden).

The installation of 50,000 m² of Secugrid® geogrid was carried out between the end of 2005 and the Spring of 2006 whereby

Secugrid® was installed over the whole breadth of the freeway. In accordance with official requirements, 0.5 m overlap was made. The areas around existing manholes were easily cut out on site using angle drive grinders.

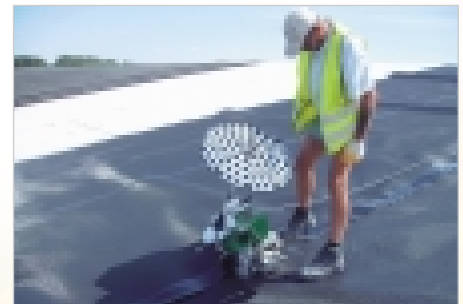
After flooding the remaining holes left behind from the open-cast mining, the freeway south of Leipzig linking freeway A 9 to freeway A14 now fits in perfectly with a newly-created landscape of lakes. The route runs directly past the old excavator which has been kept as a landmark and a reminder of the former industry for future generations. In addition to the Cospudener Lake which is already in use, another tourist highlight with excellent transport connections has been created in the immediate vicinity, thanks to NAUE geosynthetics. ■

Securing and re-cultivation of the landfill cap in Emden [Andreas Fricke]

The landfill on the Normannenstraße is west of the city of Emden and was in use from 1945 to 2005. Up to 1982, disposals consisted mainly of domestic and bulky waste, commercial and industrial waste, excavated earth, sewage sludge, building rubble and waste from building sites. From 1983, the landfill was used only for disposing of soils, building rubble, building site waste, sewage sludge, other types of sludge, fly ash, blasting waste and similar waste materials. The landfill holds approximately 1,600,000 m³ of waste of which 50 % is soil, building rubble, blasting waste and sludge.

Already in the planning phase, the owner, Bau- und Entsorgungsbetrieb Emden in agreement with the contracting engineering office Hinrichs GmbH, Dr. Knipschild's office (which had been commissioned to carry out an ex-

ternal audit) and the Staatliches Gewerbeaufsichtsamt Oldenbau defined the design of the final surface sealing system to be used. The surface sealing system was to consist of a single-layer DIBt-approved geosynthetic clay liner (GCL), a BAM-approved geomembrane and a drainage mat carrying BAM approval. The surface to be sealed and re-cultivated was stated to be approximately 171,000 m² in size. At the end of 2005, the ARGE Deponie Normannenstraße Emden comprising the Matthäi Bauunternehmen GmbH & Co. KG, the Wittfeld GmbH and ARGE partners Bohlen & Doyen Bau und Service GmbH and the Müsing Bau GmbH & Co. KG were awarded the contract to carry out the construction work. At the beginning of February 2006, Naue Sealing GmbH & Co. KG received an order from the ARGE to deliver and install GCL Bentofix® B4000 DIBt, geomembrane Carbofol® 508 BAM smooth/smooth for flat areas, Carbofol® 507 BAM Karo-Noppe/Megakron for embankments (maximum gradient 1:3) and the drainage mat Secudrän® R201Z WD601Z R201Z. Installation of the geosynthetics began in July 2006 and will presumably be completed in 2006.



Welding the Carbofol® under sun protection

Construction work is scheduled to end in August 2007 as the total amount of 171,000 m² cannot be installed in one construction season. ■

Did you know...?



... that NAUE took part in the "First Kiel Duck Race"?

The Lions Club in Kiel planned a so-called "Duck Race" in which 10,000 plastic ducks were all given start numbers and "launched" into the Kiel Fjord from where they were to "swim" inside a restricted lane to the wining post. Around 10,000 ducks were on sale for € 5 each, the proceeds going to a good cause.

Dr.-Ing. Hans-Gerhard Knieß, former President of the Water and Shipping Directorate North in Kiel was given the job of constructing a device which would "launch" all of the 10,000 ducks in one go into the water. He turned to us to ask whether the solution could be in the form of a sack made of NAUE geosynthetic material. No sooner said, than done. NAUE provided a big bag, accordingly dimensioned, which on the day of the race, May 14, 2006 was pulled up by the Lady Mayoress of Kiel to give the ducks a great start - with the NAUE flags flying bravely over the Kiel Fjord! The proceeds of € 50,000 benefited the Kieler Kinderherzzentrum - a centre for children suffering from cardiac disease. ■



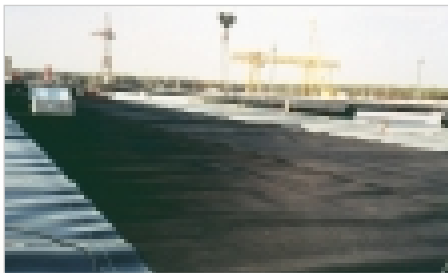
... the most interesting articles on geosynthetics contributed by NAUE at Conferences XIII. Danube-European Conference on Geotechnical Engineering in Ljubljana, ISSMGE: 5th. Int. Congress on Environmental Geotechnics in Cardiff and the Symposium on Levee Reinforcement and defense systems in Wallgau, Bavaria? If you would like to receive more information, then contact our Marketing departments under tel. +49 5743 41-232 or send us an email under info@naue.com ■



international projects

Construction of a surface repository in the Ukraine [Juri Schlee]

As part of the shutting down of the nuclear power station in Chernobyl, a surface repository for weak to medium radio-active waste is being constructed around 30 km away from the power plant premises. The total building project JCSR-Industrial Complex (for Solid Rodwaster Management) is sponsored by the EU and RWE Nukem GmbH, general contractors for these measures, commissioned NAUE GmbH & Co. KG with the planning of the sealing system for the base plate of the repository.



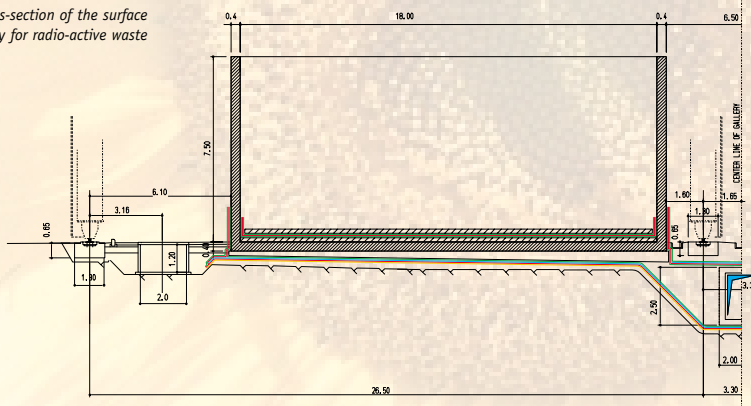
Sealed base plate with control drainage

The system put forward by NAUE was thoroughly reviewed and then approved by the Ukrainian authorities and supervisory bodies responsible. The sealing work was carried out by the Bueckeburg subsidiary Naue Sealing between September and October 2005.

The sealing system comprised the following components, from top to bottom:

- Concrete sub-base course
- Secutex® R 404 protective nonwoven
- Carbofol® HDPE 2.0 mm smooth - sealing
- Secudrän® XX8 - control layer
- Secutex® R 404 protective nonwoven
- 0.30 m non-reinforced concrete layer
- 0.70 m reinforced concrete layer

Cross-section of the surface repository for radio-active waste



To drain off the individual storage boxes, the sealing was linked up to a pre-fabricated drainage system which carries the drainage water via a collective line to the downstream treatment plants. To ensure the required quality during the construction phase, installation was permanently monitored by us, and additionally by the owner. This sealing system using NAUE geosynthetics thus meets all the requirements (from raw materials to completed installation) of both the owner and those made by the EU regarding ground water protection systems. ■

Secutex® sandcontainers save Bridge Căteasca on River Argeş [Bogdan Tronac]

As a result of the extreme rainfalls that occurred in Romania during the year 2005, many rivers had a significantly increase in water flow. One immediate consequence was that almost all the important rivers caused heavy floods with severe damage to civil structures and infrastructure. Another consequence with long-term effects was that the increased water flows created high flows and erosion of the river banks and bed especially around structures built in water. Due to the high speed of the water, the precipitation of the solid particles could not take place, which generally prevented scouring. One example with extreme consequences is the big bridge in Mărăcineni, over the river Buzău, in the South-Eastern part of Romania, that connects the historical provinces Muntenia and Moldavia. One pile of the bridge was eroded to the foundation level due to a water flow of more than 1.900 m³/s (typical average flow < 100 m³/s). Once the foundation was completely washed free, the pile collapsed, causing the bridge to collapse as well.

The same situation appeared on a bridge on the

river Argeş, a main artery to the A1 motorway. In the vicinity of the bridge, the terrain is consisting of silty clays that are prone to erosion. Two piles of the bridge, with foundations on 17 m deep pillars, were heavily eroded to the level of -15 m. The bridge became unstable and immediate measures were required in order to save it from collapsing. The regional administration of the Romanian Waters decided on immediate intervention, taking two technical possibilities into consideration:

- the bridge piles around the foundation needed immediate protection
- two breakwaters are constructed downstream of the bridge in order to decrease the water flow and allow the precipitation of solid particles.



Installation of Secutex® Sand containers as down stream dam to capture sediments

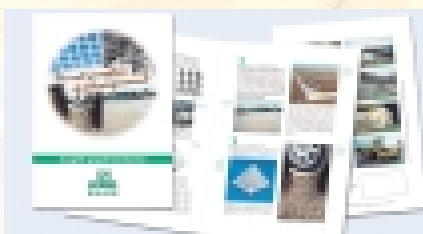
Comparing both solutions, the decision was made for the downstream breakwater since there was no stone available nearby. The Regional Water Administration decided to use Secutex® type "E" sandbags (1.45 m x 2.38 m for 1 m³), filled up with locally available soil. The sandbags had several advantages than the stone solution. First of all they are extremely flexible and therefore adjust perfectly to the subgrade contours. Additionally they are very robust and easily survive tough site conditions. Approximately 2,500 Secutex® "E" sandbags were filled with an excavator and local soil. After the filling process the bags were closed with a special portable sewing machine and a special robust robust sewed stitch. This way 300 bags were made per day with one sewing machine and one operator, and the bags were manoeuvred with a crane with lifting straps attached. After 4 months the engineers checked the installed sandbag protection and found out that sediments settled for more than one metre, increasing the stability of the bridge piles. ■

Did you know...?

... that we have recently published a new flyer "Secugrid® geogrid introduction" which describes the product advantages of Secugrid geogrids and shows two references of base reinforcement trials and persuading performance results.

Please contact us if you wish to receive your personal hard copy.

Email: info@naue.com ■



Encapsing an Encapsulation cell

[John Coulson]

The recent closure of one of Holfonteins' encapsulation cells in South Africa has introduced new aspects to the design and safe closure of these hazardous, long-term storage facilities. According to DWAF's (Department of Water Affairs) regulations, the operation of an encapsulation cell involves the encasing of hazardous waste in concrete.

Jones & Wagener (J&W), who are Enviroserv's Consulting Engineers at Holfontein, took an

in-depth look at the overall long term safety and integrity of this method, and found it to be flawed due to the possible degradation of the encasing concrete. By limiting the amount of oxygen that the encasing concrete is exposed to, the long term performance of these encapsulation cells would be greatly increased.

Jonathan Shamrock from J&W, who was responsible for the design comments, asked for the final closure of this cell to exceed the standards of the closure systems used to date. During the initial cell construction stage, a 1.5 mm thick HDPE liner at the base of the cell was already installed. This was then covered by a protective layer of soil and the standard encapsulation or encasement of the waste continued in this cell. Once the cell was full, the concrete structure needed tidying up and this was done by placing and compacting clay into the various steps and finally shaping the cell in preparation for installing the cap liner".

Engineered Linings, The NAUE South African geosynthetic distributor and installer, were contracted to cap this cell with another 1.5 mm thick HDPE Carbofol® liner and to weld this liner to the already installed base liner, effectively encasing the entire cell in an impervious HDPE membrane and cutting out any future oxygen exposure.

Due to the steepness of the side slopes of the cell, a Geogrid soil reinforcing layer was required to prevent the cover soil from slipping. J&W investigated the various geogrid reinforcing options available and designed the soil reinforcement layer. Secugrid® 30/30 Q6 was



Installation of 1.5 mm Carbofol® geomembrane

finally used and by incorporating this in the soil layer and effectively locking the soil structure into the geogrid, long-term stability was ensured.

The main reason J&W decided to recommend the use of Secugrid® was its high modulus, especially in the elongation range of less than 2 %. This means the product will 'pick up' the stresses quickly with little or no movement in the overlying soil materials.

Once the geogrid was placed on top of the HDPE Carbofol® liner, a 500 mm thick selected soil cover layer was placed over the cell. This would later be seeded and grassed. A drainage system was designed to reduce erosion of the top soil and assist in the overall slope stability. Overall the design and construction of the cell sets new standards in the industry with regards to the way encapsulation cells are constructed. The use of geosynthetic products such as Secugrid® enables the side slopes of these structures to be steepened and in so doing they provide additional storage capacity and profits to the end user. ■

Have you heard?

The football pools, pre-voting, winners

Everything must come to an end... Including the NAUE competition for the Football World Cup! A big thank you to all who took part.

... and the winners are: Congratulations to Bob Symms on winning a Canon Digital Ixus 65 camera, Frank Müller on his prize of an Apple iPod nano and Ralph Fischer on winning a Buffalo FireStix (USB stick).

Norbert Hintzen won the special draw and we wish him a great weekend in wonderful Garmisch-Partenkirchen! ■



NAUE football pools

The Football World Cup has come to an end and all of the winners have been notified of their luck.

Once again, many thanks to all who participated. And here are just a brief overview of the points scored. Portugal and England scored the most points, the Czech Republic and Japan the fewest. Togo managed to get to Place 5, right behind Brazil. German landed on place 3, as it did in the Championship. Our World Championship pools which were released on our Internet page at the beginning of the Championships attracted 1,538 participants who bet on Germany, England, Argentine and Spain for the first 4 places, whereby the current world champions, finished up on place 7, the vice champions France on place 11 and the fourth Portugal on place 27. Owing to the sensational success of our competition, we shall be thinking up something new for the future! So it's worth taking a regular look at www.naue.com ■

Imprint

9th year, Issue 28
(12th English translation)

Publisher:
NAUE GmbH & Co. KG
Gewerbestr. 2
D-32339 Espelkamp-Fiestel
Phone +49 5743 41-0
Fax +49 5743 41-240
E-Mail info@naue.com
Internet www.naue.com

Editor: Management
Implementation:
Department for Marketing

Circulation: 2,000
Design/Production: TwoTypes².
Bahnhofstr. 14 · D-32312 Luebbecke

Reproduction, including extracts, may only be made with the prior permission of the publisher.

Schedule of shows and conferences

September

- 05.-08.09.06 Wastecon 2006 Biennial Conference and Exposition "Bridging the Gap"; Cape Town, South Africa
12.-14.09.06 Public Infrastructure; Hanover, Germany
13.-15.09.06 Acqua Alta; Hamburg, Germany
14.-15.09.06 Two decades of Geosynthetics in India - Seminar on "Applications of Geosynthetics - Present and Future"; New Delhi, India
20.-22.09.06 EcoTech 2006; Almaty, Kazakhstan
27.-29.09.06 Special exposition on "Roads and Traffic 2006"; Karlsruhe, Germany
29.-30.09.06 DGGT Congress on Foundations Engineering; Bremen, Germany

October

- 10.-12.10.06 BWEA 28: "Securing our Future", conference and exposition; Glasgow, Scotland
11.-12.10.06 16. Karlsruhe Landfill and Pollutants Seminar 2006 "Sealing and Recultivation of Landfills and Pollutants"; Karlsruhe, Germany
25.-29.10.06 SAIE 2006; Bologna, Italy

November

- 07.-08.11.06 XVII Saxon Pollutants congress; Dresden, Germany
07.-10.11.06 WASMA; Moscow, Russia
28.-30.11.06 Civils 2006; London, England
28.11.-01.12.06 Pollutec 2006 - International Exhibition of Environmental Equipment, Technologies and Services; Lyon, France



and all NAUE products are registered trademarks of NAUE GmbH & Co. KG.

No Secugrid®?



We boosted our Secugrid® capacity with a 3rd production line!

- Over 30 million m² successfully installed
- Now immediate supply on demand
- Secugrid® - the newest geogrid generation
- high stress at low elongation
- no production specific elongation
- high resistance to installation damage
- excellent pullout factors
- optimal product configuration
- 4.75 m wide
- excellent chemical and biological resistance

The soil reinforcement you want!

NAUE GmbH & Co. KG

Gewerbestrasse 2 · 32339 Espelkamp-Fiestel · Germany

Phone +49 5743 41-0 · Fax +49 5743 41-240

E-mail: info@naue.com · Internet: www.naue.com





- Over 30 million m² successfully installed can't be wrong
- Secugrid[®] the newest geogrid generation that works
- Quick installation and less aggregate keeps the costs down

Soil reinforcement is called Secugrid[®]

