

## **Danish Minister of Transport visits dike experiments at the Coastal Research Centre**

**23 April 2008**

The Danish Minister of Transport Carina Christensen in company with the Ambassador of Denmark Carsten Søndergaard will visit the dike experiments in the Large Wave Channel of the Coastal Research Centre in Hannover on Friday 25th, 2008.

They will be welcome by Prof. Klaus Hulek, Vice-President for Research of the Leibniz University of Hannover, and Prof. Hocine Oumeraci, Managing Director of the Coastal Research Centre.

## **First test phase has been successful**

**22 April 2008**

The first test phase with focus on grass cover failure on the seaward slope due to wave impact as well as wave run-up and run-down flow has been finished successfully today.

Over 700 minutes of wave attack have been run on the seaward dike slope including more than 8.000 waves.

In general, no major damagers occurred to the grass cover. Detailed conclusions about the wave impact on the grass cover will be made based on all data registrations and video recordings.

## **Artificial lighting of the grass cover has been installed**

**17 March 2008**

Artificial lighting has been installed to promote grass growth during the coming weeks. In total, 21 light fixtures have been installed over the entire dike surface – 12 luminaries on the seaward slope, 2 at the dike crest and 7 luminaries are lighting the grass surface on the shoreward slope.

The lamps are positioned 2m above the grass surface in a spacing of about 1.7m. Illumination calculations showed that only one row of lamps is sufficient in order to light the 5m-wide grass surface. The light fixtures are provided with photosynthesis light lamps designed for horticulture. The mean luminance has been calculated to about 7000 lumens per square meter.

## **Construction of the dike model has been completed**

### **10 March 2008**

The construction of the dike model has been completed. In total, 6 weeks were needed to build the dike model, which consists of a sand core covered by a clay layer and a grass cover.

The grass cover consists of 0.2m thick grass sods, which measure 2.35m in length and 1.25m in width. The grass sods were placed on top of the clay layer in an arrangement that avoids longitudinal joints over both entire slope lengths. Due to this, some of the grass sods had to be cut to allow for the displaced arrangement.

Installation of the grass sods was first carried out on the seaward slope and afterwards on the landward slope. Finally, the grass sods on the dike crest were installed. After installation of the grass sods, all joints between the mats were closed by clay material.

Next, the supply equipment for grass growth will be installed to allow for a continued grass growth. The supply equipment comprises installations for illumination, ventilation and irrigation.

Moreover, the measurement devices that will allow for measuring e.g. the wave run-up and run-down velocity, the wave impact pressure and the wave overtopping volume will be installed during the coming four weeks. The test programme will start in the beginning of calendar week 15.

## **Excavation of grass sods succeeded**

### **14 February 2008**

The excavation of the grass sods at the wing dike of the Ribe flood defence in Southern Jutland, Denmark, succeeded. After only 2½ work days, all 80 grass sods were excavated and prepared for transportation.

Each grass sod is 2,35m long and 1,25m wide. The actual thickness of the grass sods varies between 0.18 and 0.21m, which is considered as a very good result taking the excavation method, the size of the applied machinery, the wet condition, and the natural unevenness of the dike crest into account.

The 0.2m thick grass sods are excavated by cutting and pulling a wood plate simultaneously underneath the grass sods. For transportation, the grass sods are secured by a frame around. The weight of one grass sod is about 1.1 tons.

The first truckload of 20 grass sods will arrive at the Coastal Research Centre in Hannover, Germany, on Friday morning.

PRESSEMEDDELELSE

## EroGRASS – storskalaforsøg med græsdiger

### 12. februar 2008

En af verdens største bølgeforsøgsanlæg bliver i de kommende uger midtpunktet for et storskalaforsøg med gennemgående test af et græsdige.

Kystdirektoratet opbygger i disse uger et dige i målestok 1:1 - altså et dige i helt naturtro størrelse – i det gigantiske bølgeforsøgsanlæg på Coastal Research Centre, Hannover i Tyskland. Her skal diget senere på foråret under kontrollerede forsøg udsættes for bølgepåvirkninger, der svarer til belastningen af f.eks. et vadehavsdiage i forskellige stormvejrssituationer.

Formålet med forsøget er at undersøge selve græsstyrken på et dige. Græslaget er det første, der udsættes for høje vandstande og bølgers store kræfter under en storm. Ved ethvert digebrud er det græslaget, der først giver op. Det er mekanismerne bag ødelæggelsen af græslaget, der skal undersøges i forsøget, hvorved der vil kunne afledes definition på et rigtigt stærkt græstæppe. Det vil kunne betyde større sikkerhed for de mennesker, dyr og andre værdier, der er bag digerne i dag og i fremtiden.

Forsøget gennemføres i et internationalt samarbejde med flere af de førende forskere og universiteter på området, men det ledes af Kystdirektoratets Thorsten Piontkowitz.

- Græstæppet kan sammenlignes med digets hud, og er huden stærk og modstandsdygtig, vil den bedre kunne modstå de store kræfter, havet påfører græsset under en storm, forklarer Thorsten Piontkowitz.

- Hvis ikke vi plejer græsset og sørger for de bedste betingelser, for at det kan vokse sig stærkt, er risikoen for et altødelæggende digebrud større, advarer Thorsten Piontkowitz.

Digets opbygning i bølgeforsøgsanlægget vil være som i virkeligheden. Inderst en sandkerne op til fem meters højde, hvorpå der lægges 60 cm klæg – et vandtæt lag – og øverst 20 cm tykke græsmåtter, der i disse dage skrælles af et af de sønderjyske fløjdiger og køres på lastbil til Hannover.

Læs meget mere om forsøget på [www.kyst.dk/eroglass](http://www.kyst.dk/eroglass)

Yderligere oplysninger kan fås hos:

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## EroGRASS homepage online!

### 12. February 2008

The official EroGRASS internet site has been launched.

This internet site informs about the background and objectives of the project. The dike model and its construction are described as well as an overview is given about the intended test programme. The project team behind EroGRASS is introduced on the Project Team page and the overall time-frame of the project is shown in a time schedule.

This internet site will be updated regularly on both the project progress and upcoming first outcomes. For this, please check our News page.

In order to save time and costs, the EroGRASS internet site has been integrated in the existing homepage design of the Danish Coastal Authority. Nevertheless, we would like to point out that this internet site should be seen as a detached project homepage.

## **Transportation of clay has started**

### **5 February 2008**

Today, transportation of 150m<sup>3</sup> of clay from a storage pile being located south of the Danish town Esbjerg to the Coastal Research Centre in Hannover has started. The clay is needed for the establishment of a 0.6m thick clay layer on top of the sand core of the prototype dike model which is currently being built in the wave flume of the Coastal Research Centre.

The clay springs from a clay mine close to Sneum sluice that is part of the Darum-Tjæreborg flood defence system. Sneum sluice is located about 12km south-east of Esbjerg town. The clay was dug about 5 years ago by the dike board and has been stored on the marsh surface to be used for repair works in case of slope failures after storms.

In spite of the 112mm of precipitation during January, geotechnical laboratory tests resulted in acceptable values for moisture content of the clay that will allow for a suitable clay compaction on the dike model.

Approximately 150m<sup>3</sup> of clay is needed to cover the entire dike sand core by a 0.6m thick clay layer. Loading of the trucks is processed in two steps: Firstly, a tractor trailer is loaded by an excavator. At an intermediate storage place, the clay is dumped again.

Next, the trucks are loaded by a wheel loader. This approach is necessary due to an unsafe access to the storage pile by large trucks on the wet marsh ground. In total, 12 truck loads are needed to transport the clay from Denmark to Germany.