

# Xbloc Newsletter March 2009

We are very pleased to send you another Xbloc Newsletter. In the last months the Poti project has been completed and a project on Guam has started up. Furthermore we are pleased to notice that with 2 other large projects expected to start in the near future the global economic situation is not affecting the workload for Xbloc.

Apart from news items about projects under construction, this Newsletter also describes some results of research that has been done in the past months. Monitoring of the Eco Xblocs in IJmuiden showed that a significant amount of algae and shell fish found a habitat on the blocks. Furthermore research has been done in the DMC wave flume into breakwater toe stability in depth limited wave conditions.



## Poti Rehabilitation Completed

The first phase of the rehabilitation of the main breakwater of Port of Poti, Georgia was completed at the end of last year. The breakwater that was built in the 19<sup>th</sup> and early 20<sup>th</sup> century has an armour layer of large concrete cubes (20-60 ton), but frequent maintenance was required and large settlements occurred over time. A large section of this breakwater has now been covered with rock layers and an armour layer of 2m<sup>3</sup> Xblocs. The low and wide crest of the rehabilitated breakwater structure is covered with Xbase Units. The

reason for this is that interlocking units like Xbloc are less stable on a horizontal berm as they are not pushed together by gravity. Due to the shape of the Xbase, wave loads on these units are reduced and the stability of the units is enhanced. The Xblocs were placed with a hydraulic excavator with a crane monitoring system and placement rates were up to 20 units/hour under water and 40 units/hour above water. Videos of the placement process in Poti have been added to our website:

[www.xbloc.com/projects/breakwater-port-of-poti-georgia](http://www.xbloc.com/projects/breakwater-port-of-poti-georgia)



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## Flume Research: Toe Stability in Depth Limited Conditions

For his master thesis at the Technical University of Delft, Reinder Ebbens performed physical model tests at the DMC 2D wave flume. His research comprised the toe stability of rubble mound structures in depth limited wave conditions with varying fore shore slopes (between 1:50 and 1:10). Based on his research Reinder proposes the following stability equation for very shallow water conditions:

$$\frac{H_s}{\Delta D_{n50}} = 3.0 \cdot \frac{N_{\%}^{1/3}}{\sqrt{\xi_{op}}}$$

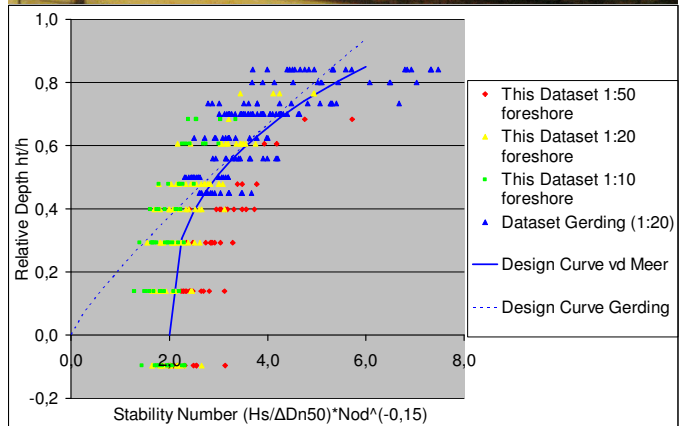
With  $N_{\%}$  = percentage of damage

## 8m<sup>3</sup> Xbloc Shore Protection at Guam

In December an Xbloc project was signed for a shore protection on the island Guam. The location is exposed to hurricane conditions and 8m<sup>3</sup> units are applied. Unit production started in March using horizontal moulds and lifting anchors to lift the 18tons units.

## Monitoring of Marine Life on Eco Xblocs IJmuiden

As reported in the Xbloc Newsletter of October last year, 10 Eco Xblocs have been placed in IJmuiden (The Netherlands) in order to monitor the development of marine life on the rough surfaces of these units.



(The range of validity of the proposed formula is  $h_m/H_s < 2.0$ . More information on this topic is expected shortly on: [www.hydraulicengineering.tudelft.nl](http://www.hydraulicengineering.tudelft.nl))

In March we visited the breakwater and observed algae growth and young mussels on many of the Xblocs. For the IJmuiden breakwater these shell fish are particularly important as they form an important part of the diet of several marine birds that live around the breakwaters.



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