

PROTECTION OF THE LONGONE RIVER KOUSSERI, CAMEROON

HYDRAULIC WORKS – BANK PROTECTION

Product: Reno Mattresses[®], Green Terramesh[®], ParaLink[®], gabions

Problem

The Logone River is a major tributary of the Chari River and forms part of the international border between Chad and Cameroon. The Logone's sources are located in the western Central African Republic, northern Cameroon and southern Chad. Settlements on the river include Kousseri, Cameroon's northernmost city.

The river banks in Kousseri were eroding due to the hydraulic action of the river water, and needed stabilising. The geology of northern Cameroon consists of "Karal" clay and there is limited availability of rock fill. With good availability of suitable sized rock fill, a gabion revetment would have provided an ideal and proven solution. However, the quantity of rock required for this solution would not be available cost-effectively in the region.

The protection was required over a length of 1800 meters and a height of 10.00 meters.

Solution

The solution adopted was to reinforce the river banks with Green Terramesh[®] soil reinforcement system. Green Terramesh[®] soil

To enhance the cost-effectiveness of the solution, the Green Terramesh[®] was supplemented with ParaLink[®] geogrids spaced at matched with a reinforced geogrid with double face using Reno[®] Mattresses in order to realize a flexible and monolithic structure, able to absorb the swelling of clay in the river floods.

Green Terramesh[®] is an environmentally friendly modular system normally used to form vegetated (green) faced soil reinforced slopes (also known as Mechanically Stabilised Earth) and embankments. It consists of pre-fabricated units of double twisted wire mesh (8x10 type) lined with an erosion control blanket and stiffened with a welded mesh panel. However in this project, a Reno Mattress[®] was secured to the face of the Green Terramesh[®] unit to provide a thick erosion protection., therefore the revegetation coir blanket was changed with a geotextile.

Client:

MINISTERE DES TRAVAUX PUBLICS FINANCE-
MENT COMMUNAUTE EUROPEENNE

Main contractor:

BEC/SETUBA

Products used:

20 000m² RENO MATTRESSES
18 000m² TERRAMESH VERT
3000m³ GABIONS
1800m² PARALINK

Date of construction

1998-1999



Placing the Green Terramesh units



During installation—note geotextile at face of unit



Completed project

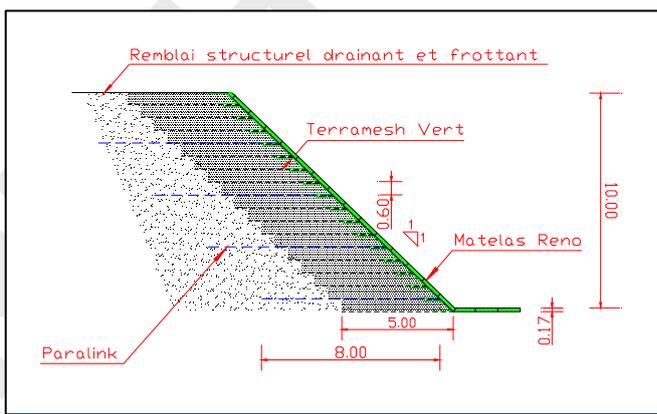
As all components are factory fitted, Green Terramesh® is more rapid to install than competitor reinforced soil systems. The unit is simply erected on site, the bracing angles supports the face at the designated angle without the need for any external formwork or shuttering. Structural backfill is placed upon the soil reinforcement geogrids and compacted. The Paralink® product was placed at 2.4m vertical centres to deliver the additional soil reinforcement strength required in the design. The Green Terramesh® reinforcement unit is fabricated from heavily galvanized steel wire with an additional polymer coating to provide a long design life.

Following installation of the reinforced soil slope, the Reno Mattress® units were assembled, secured to the sloping revetment fascia and filled with stone.

In selected factories, the Green Terramesh® units are produced in compliance with CPR - Construction Product Regulation 305/2011, having EC marking in compliance with ETA-13/0295. The management and production system is certified in compliance with ISO 9001 and ISO 14001 (related to environmental management system)



Typical gabion weir structure on project



Indicative cross-section



Finished project

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