Low Budget River Bank Protection

- International Consultancy Practise of Civil and Structural Engineers
- Established in 1963
- since 1992 a GmbH (Ltd)
- Sellhorn Ing. > 50 Employees
- Overturn 2008 > 6 million Euro (9 million USD)
Low Budget River Bank Protection

From first ideas . . .

. . . to design and modelling

. . . until commissioning

. . . to supervision of implementation...
Our consultancy services . . .
Low Budget River Bank Protection

- Pre-investment and feasibility studies
- Conceptual, preliminary and developed engineering design
- Preparation of and application for planning permission
- Preparation of tender documents
- Tender process and tender evaluation
- Contracting and site supervision
- Project management
Bank Protection Works in Bangladesh
River System of Bangladesh

- Dominated by Padma/Ganges, Jamuna/Brahmaputra River and Meghna River
- Average height in Bangladesh is 76 m
- Discharge of Meghna River at Mawa during Flood: 120,000 m³/s
- During high floods 30% of Bangladesh can be submerged
Migration of Rivers: Brahmaputra River
Erosion of a River Bank
Groins for River Bank Protection

• High Influence on Flow
• Expensive (Steel)
Dumping of Concrete Blocks for River Bank Protection

- Concrete blocks are dumped on the slope
- Problem: The grains size of the sand is too small
- Result: The concrete blocks are traveling through the sand
Asian Development Bank (adb) initiated JMREMP ("Jamuna-Meghna River Erosion Mitigation Project") with the goal to develop a cost-effective and sustainable river bank protection methodology.

The project was implemented by:
- northwest hydraulic consultant, Canada
- Beller Consult, Germany and
- Resource Planning & Management Consultant Ltd, Bangladesh

As an alternative for the use of groins or dumping of concrete blocks:
- Use of Concrete Blocks above Water and
- Sand Filled Geobags under Water
has been developed
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Project Summary

• 11 km of river bank have been protected

• 5,000,000 geobags (126 kg and 78 kg) installed as scour protection

• 150,000 m² of permanent wave protection (Concrete blocks)

• 25,000 m² of permanent wave protection (Grout filled mattress)

The author as an employee of northwest hydraulic consultant has been involved in the project as: designer, site engineer, survey expert and advisor
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Standard Cross Section
Casting Concrete Blocks
Storing Concrete Blocks
Placing Geotextile Filter
Placing Concrete Blocks
Placing Sand Filled Geo Bags
Delivery of Sand
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Filling Bags

![Image of people filling bags for river bank protection]
Checking Weighth of Bags
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Closing Bags

[Image of people working on river bank with bags]
Stacking Bags
Loading Bags
Piling Bags on the Barge

19/02/2006
Low Budget River Bank Protection

Moving Barge to the Defined Position

Hamburg, 08 April 2011
Low Budget River Bank Protection

Checking Position of Barge
Positioning Bags

20/02/2006
Low Budget River Bank Protection

Ready for Dumping Bags
Low Budget River Bank Protection

Dumping Bags
Low Budget River Bank Protection

Grout Filled Mattress as an Alternative for Concrete Blocks (1 km long Test Section)

Hamburg, 08 April 2011
Preparing the Slope for Implementing the Mattresses

2007/05/21
Placing of Geotextile

2007/04/16
Stitching of Mattress
Carrying of Mattress to the Final Location
Positioning of Mattresses on the Slope

2007/04/18
Pumping Grout into the Mattress
Parts of Mattress are Filled

2007/05/12
Implemented Mattress

2007/05/12
Implemented Mattress after One Year (2008)
Thank you!