SOLCOMAT: A product aimed to protect and strengthen the surface of river banks and waterways, to protect from erosion and flooding and other water disasters, with consideration to the environment and bio diversity.

Environmentally Friendly River Embankment Protection Method

SOLCOMAT®

(Soil Conservation Mat)

Neo Concrete

株式会社ネオ コンクリート

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NEO Concrete

ISO 9001:2008認証取得

1、Established ： November 1990

2、Business： Concrete manufacturer, providing technology and services to public sector projects in mainly civil engineering environment (such as soil and water banks) with consideration to the environment.

3、Main Product： SOLCOMAT

① Share in Japan56, 7%(2013)
② No of projects 1, 695(1991～2010)
③ Total area 2, 534k㎡(total) ※佐賀県面積 2, 440k㎡

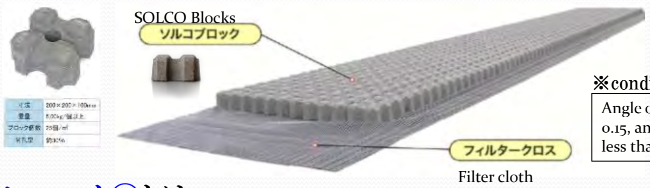
4、U R L ： http://www. neo-con. jp/

5、E－mail ： info@neo-con.jp

Proposed Method：Block Mat Method

平成 26 年度 準推奨技術
新技術活用システム検討会議（国土交通省）
●NETIS QS-080013-V
●佐賀県認定リサイクル製品

Product name：SOLCOMAT®



※conditions

Angle of slope lower than 0.15, and river flow speed less than 4m/

1、ソルコマット®とは

SOLCOMAT, or the Soil Conservation Mat is a soil and erosion protection mat called block mats. They were originally developed in Holland around 1965, and later was transferred to Japan in 1973. They have since been improved and used for various river banks and dikes. The concrete blocks in unique form called SOLCO blocks are bonded by glue onto a synthetic fiber cloth and laid into a mat. The product was sited in the MLIT guidelines as an environmentally friendly method and also introduced as an innovative erosion protection method and for recovery from disasters in rivers by the Guidelines on Methods to recover from river flood disasters. It is used in various water environments such as river banks, canals, water reservoir ponds, and dikes in Japan.

SOLCOMAT® implementation photos

Fukuoka Prefecture
(rehabilitated from the erosion damage)

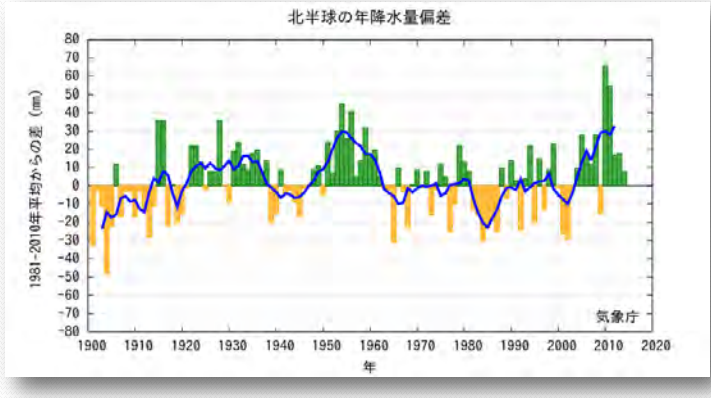
Miyazaki Pref (water reservoir)

Fukuoka Prefecture
(water creek for farming)

Saga Pref (embankment of dam river)

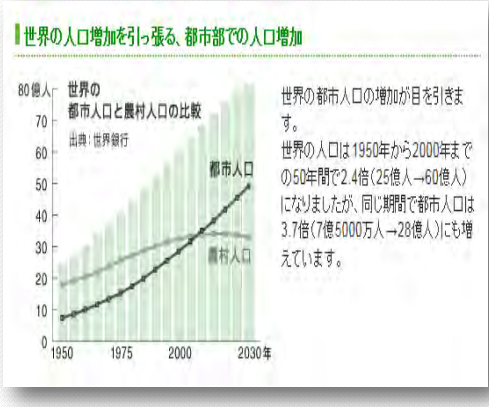
Background1：Increase of Rainfall

Affected by climate change, the amount of rainfall has increased in the northern hemisphere above the equator.
(Also in Japan, unpredicted and local short term heavy rainfall is causing Both human and economic damage)



Background2：Population increase and Water Disaster Risks

Population increase and rapid urbanization (urbanization of infrastructure such as increase in pavements) has increased risks and damages of urban inland water related disasters.



Background3：Affects of Increased Rainfall

A Paralyzed urban functions (1999年 Hakata Station, Fukuoka)

※ the rainfall was beyond capacity of drainage and the rainfall flooded into the subway stations

B landslide and soil eroded into the farmlands (Yanagawa, Fukuoka)

※ Severe affect to agriculture

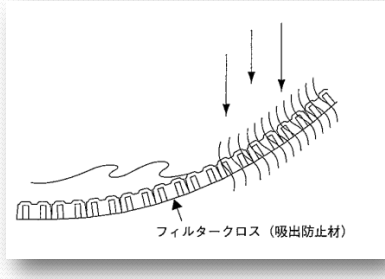
C Damage due to flooding of embankments and dikes

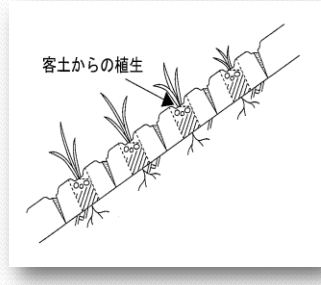
(2012 Yabe River in Miyama, Fukuoka)

2. Features of SOLCOMAT®

2-1 Prevention of surface erosion

The opening in SOLCOMAT allows green vegetation to grow and extend its roots; this enables a triple effect of the block, greens, and soil to prevent erosion. The water which flows on the surface of SOLCOMAT is absorbed through the opening and will spread. The bumpy surface of the block and the greens will divert the shock of rainfall and waves. This mechanism will allow prevention of small erosions to develop into large erosions.



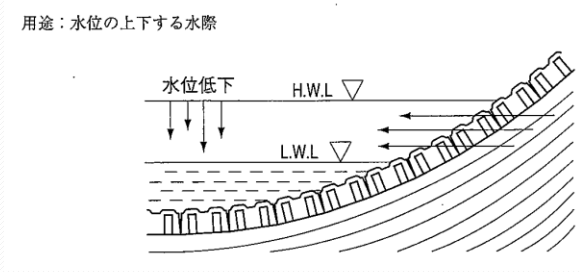


2-2 Flexibility

The blocks will be placed on the banks each with space in between. This allows flexibility to adapt and stay fit to the surface. This is most effective for soft soil areas with risk of erosion and land subsidence.

2-3 Permeability and prevention of absorbing soil

With the opening on the block and attached filter cloth, the permeability allows water underneath the block to flow out and decrease water pressure. This prevents the earth below the water body from losing strength. Also as the filter cloth prevents the soil from erosion.



2-4 Effects of cover vegetation and greenery

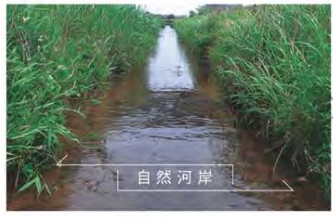
By planting greens or use cover soil for the openings of the blocks, the greens will spread its root and anchor itself to the banks. This will further help SOLCOMAT to be stably placed. It is also possible to create a 'nature rich river works' with special consideration to the surrounding eco systems, which can restore or even improve the natural environment.

①Before works ⇨

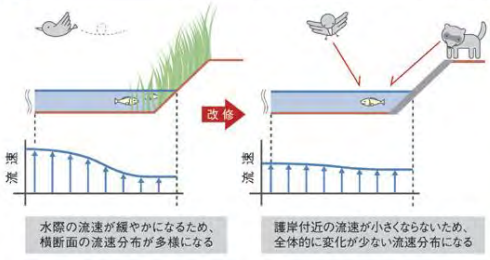
②Completion ⇨

③ One year after completion

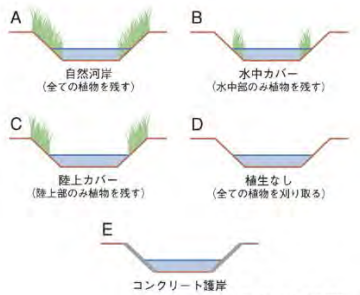
※参考資料 ： 多自然型川づくりと生態系・流速の関係



自然河岸とコンクリート護岸の特性の違い



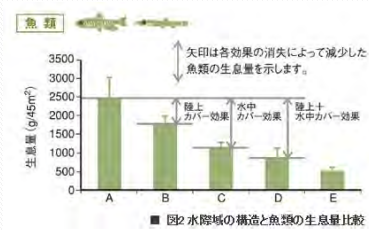
	自然河岸	コンクリート護岸
水際部の流速	緩やか	速い
横断面の流速分布	多様	単調
捕食圧	低い	高い
日陰効果	有	無
捕食者からの避難場	有	無
法面から川への餌供給	多い	少ない



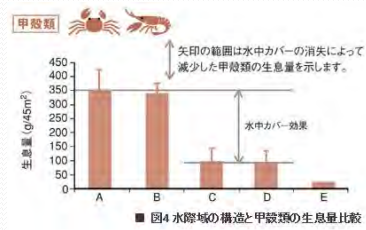
■ 図1 処理区の設定

処理区	陸上カバー	水中カバー	水際流速
A：自然河岸	○	○	小
B：水中カバー	×	○	小
C：陸上カバー	○	×	中
D：植生なし	×	×	中
E：コンクリート護岸	×	×	大

■ 表1 処理区の特徴



■ 図2 水際域の構造と魚類の生息量比較



■ 図4 水際域の構造と甲殻類の生息量比較

Simulation of SOCOMAT implementation (A)

① Actual photo

※ Erosion progresses

② Implementation of SOLCOMAT on river banks (right after placement)

③ changes across ages (natural growth of greens)

Simulation of SOLCOMAT Implementation (B)

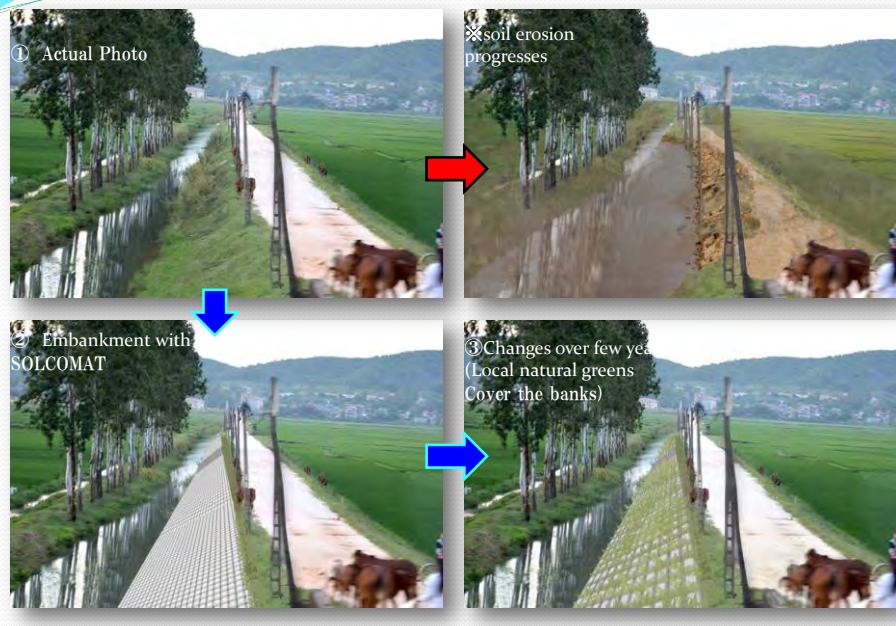
① Actual photo

※ soil erosion progresses

② right after SOLCOMAT implementation

③ changes over ages (local natural greens cover the slopes)

Simulation of SOLCOMAT Implementation (C)



Potential Partnerships with countries/cities in Asia and the Pacific region

1 Partnership with Local Company for manufacture and sales

1-1 Study on availability of raw materials and manufacture of sample products (use of local factories using locally available materials)

1-2 Market research and strategizing

2 Partner with Local university/research institutions

1-1 Information study on civil, architecture and environment areas

1-2 Joint development of locally adaptable product with locally available materials.

3 Consultation for local authorities

1-1 Information collection for public sector works

1-2 Formulation of disaster related infrastructure planning and consultations on suitable construction methods.

Other Environmentally Friendly Products

FURUSATO (interlocking blocks with flexible Angles)

UNEVEN (split bocks with fish nest functions

BIOLOG FILTER (**100% natural fiber water filtration**)

GREEN COSMO (Low maintenance greenery embankment methods)

Summary

1 It is important to plan and implement water disaster preventive measures to water bodies such as river banks from the viewpoint of saving lives and property of the people, and that these concrete products can be very effective.

2 Using concrete should not necessary mean to encase and solidify, but to consider the eco system and environment and select the most suitable and adaptable method and product.

3 SOLCOMAT is a product and method which is adaptable to any country and Neo Concrete wishes to contribute to creating an environment that is resilient to disasters and where all people in Asia would be able to live in safety.

Thank You

自然環境にやさしく、
地域の安心を支える、
誠実なコンクリート製品を考える。

株式会社ネオ コンクリート