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CASE HISTORY Ref: USA029-Rev:01. Issue Date 14.12.2004

WILKENS BOULEVARD EROSION REPAIRS

BALTIMORE, MARYLAND, USA

RIVER BANK PROTECTION Product: Gabions

Problem:

In July 1972, Hurricane Agnes dropped great quantities of rain water onto the eastern United States. The extreme rainfall quickly caused peak watercourse discharges in excess of 100 year events. Water run-off was made worse as the ground had already been saturated by rain in the weeks before the hurricane.

Wilkens Boulevard (MD Highway 1) in south-west Baltimore crosses Gwynns Falls River at S. Dukeland Street. Here, the storm surge caused by Agnes had washed out the road bridge, which needed replacing permanently.

An economic, hard wearing and free-draining retaining structure was required to retain the channel banks. Also, the structure had to train the river within a strict channel to divert the existing erosion impact away from susceptible areas. The river also has a heavy bed-load.

Solution:

City of Baltimore engineers appreciated the benefits of gabions and with Maccaferri Inc., designed gabion retaining structures with a maximum height of 18ft. Maccaferri double twisted woven steel wire mesh gabion baskets form permeable, monolithic and flexible structures. The woven mesh allows these gabions to accommodate large differential settlements without rupturing or unzipping.

Gabions were also detailed as anti-scour 'aprons' at the toe of each of the retaining walls to prevent erosion undermining the wall. Where gabion walls faced each other on opposite sides of the channel, gabions were used to line the entire channel between the walls.

As the wall was to be along the water course, PVC coated gabion units were specified (In 1974, the PVC offered by Maccaferri Inc was black in color).



View upstream towards drop-structures

Date: Spring 1985



Date: Spring 1985

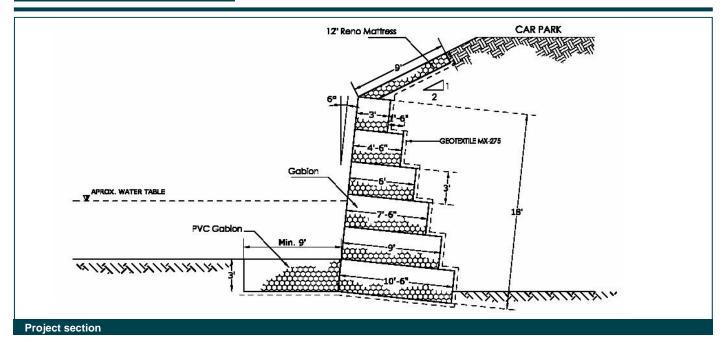
Client:	
CITY OF BALTIMORE, MD	
Main contractor:	
GABION CONSTRUCTION INC.	-
Designer:	100
CITY OF BALTIMORE	-
Products used:	
GABIONS	
Date of construction	Ve
FALL 1974	



tation through gabion

Date: Jan. 2004

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Upstream of the Gwynns Falls bridge, a series of gabion drop structures were designed to reduce the shear forces and bed load capacity of the channel flow. To limit damage to the crests of the gabion drop structures by the heavy bed load, the crests were protected with a 2-4" thick layer of concrete.

Specialist gabion installation contractor Gabion Construction Inc., began the installation in late fall 1974, and completed the project before winter. This installation used geotextiles placed behind the gabion structure. The woven polypropylene textile was used to limit wash out of fine material from behind the gabion wall.

In 2004, 30 years later, Maccaferri revisited the gabion retaining wall. Samples of the PVC coated mesh were taken. Laboratory tests were carried out on the zinc coating left on the steel under the PVC, and the residual properties of the PVC after 30 years of UV and abrasion exposure.

As in the Falls Road Project, the results were very good. By comparing the loss of PVC properties to recent reference results from accelerated heat aging laboratory tests, the structure has a life expectancy of around 60-65 years. (See Maccaferri TECHNICAL NOTE - GABION DURABILTY for

Working with Maccaferri

For 125 years, Maccaferri has provided engineering expertise to clients around the world. We believe that the combination of this experience, our professionalism, design software, technical support services and our aim of providing the best products in the market, sets us apart from our competition. We hope you agree.





View downstream

Date: Jan. 2004

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