

LAKE BOONE TRAIL EROSION REPAIRS RALEIGH, NORTH CAROLINA, USA

RIVER BANK PROTECTION

Product: Gabions, Reno Mattress

Problem:

Development adjacent to Lake Boone Trail in the north-west of Raleigh, NC, required alteration to the existing storm-water drainage system. The storm-water pipework from a retail area to the north of Lake Boone Trail, and from an office complex to the west of the road, met adjacent to a brand new office building. The increase in water flow had washed out a segmental reinforced blockwork wall retaining the office car-park and severely eroded the channel banks. Above the channel bank is another car park for an apartment block. A solution was needed that could withstand the high erosive forces and retain the channel banks and car parks above.

Solution:

City of Raleigh and their project engineers, Thompson & Associates, approached CFP Inc., Maccaferri's distributors in the Carolinas, for assistance in designing a gabion retaining wall and erosion protection. The retaining wall was to be a maximum height of 24'.

A number of options were considered including mechanically stabilized earth (MSE) using gabion faced Terramesh®. For this height of structure, the cost of Terramesh® materials alone would have been less than a gabion structure.

However the space to construct an MSE structure was limited by the steep slope above, and the cost of temporary works to support the slope made this proposal uneconomic. Therefore, a traditional gabion wall was selected as the most cost effective, and simplest to install. The flexibility of double twisted woven mesh gabions was also an advantage due to their ability to accommodate large differential settlements without rupturing; a key requirement in this channel environment.

The gabion wall varied in height and thickness depending upon location. Reno mattresses were detailed at the toe of the gabion structure as a scour protection apron and limit erosion undermining the retaining wall.

Client:

CITY OF RALEIGH, RALEIGH, NC

Main contractor:

SOUTHERN SITE INC., RALEIGH, NC

Designer:

THOMPSON & ASSOCIATES, RALEIGH, NC

Products used:

GABIONS, RENO MATTRESS

Date of construction

SPRING 2004



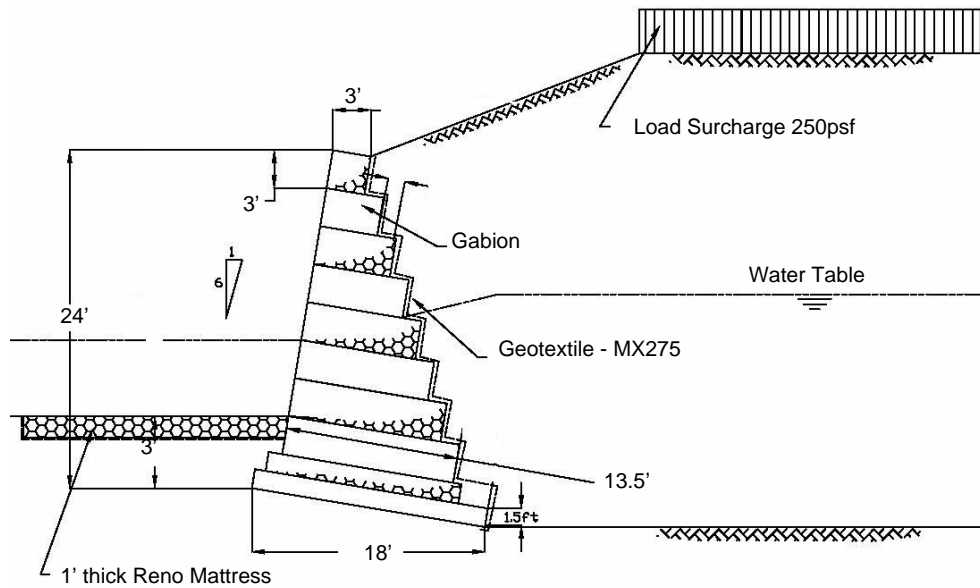
Severe erosion threatening car park above



Severe erosion with car park above



Gabion retaining wall and Reno Mattress channel lining



Project section

Where the gabion wall ended, it was 'returned' back into the channel bank. This limits erosion of the bank and behind the wall, caused by the turbulence created when water flows past the end of any structure in a water course

The new storm-water pipework met at a new cast-in place concrete culvert. Mattresses were used at the mouth of the culvert and in the channel bed to provide high performance erosion protection.

Contractor, Southern Site Inc. completed the gabion structures and channel linings. As the gabion wall was constructed, the large washed out area of the channel bank behind was reinstated with a free-draining backfill.

This project illustrated how quickly storm water can erode channel banks, placing infrastructure in jeopardy.



Severe erosion looking upstream towards outfall



Completed gabion structure showing 'return'

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.

Headquarters—East Coast

10303 Governor Lane Blvd, Williamsport, MD 21795
Tel: 301-223-6910 Fax: 301-223-6134

MACCAFERRI INC.

E.mail: hdqtrs@maccaferri-usa.com
Web site: www.maccaferri.com

West Coast

3650 Seaport Blvd, West Sacramento, CA 95691
Tel: 916-371-5805 Fax: 916-371-0764