

### REINSTATEMENT OF HIGHWAY EMBANKMENT HIGHWAY 555, NEW MEXICO, USA

#### SOIL REINFORCEMENT RETAINING WALLS

**Product:** Terramesh®, Gabions, Gabion Mats®

##### Problem

In late Spring 1999, intense rainfall fell on the Rocky Mountains in northern New Mexico. The existing mountain snow-pack reduced water infiltration and the resulting runoff caused flooding downstream in the Canadian River.

As the river ran parallel to Highway 555, the flooding caused severe erosion of the channel banks exposing the highway foundation; four sections of the road were washed out. In addition, the flood jeopardized the abutments of a bridge, which was in danger of becoming unstable if protection works were not implemented.

##### Solution

New Mexico State Highway and Transportation Department (NMSHTD) engaged Maccaferri to assist in the design of structures to mitigate the damaged highway.

The typical channel remediation incorporated a combination of Maccaferri products to achieve the requirements of stability and erosion control. The structure consisted of;

- 1.5' thick Gabion Mat® scour protection apron / foundation
- 12' high Terramesh® mechanically stabilized earth structure
- 1' thick Gabion Mat® erosion protection upon a 2:1 slope
- 6' high gabion retaining wall

Where necessary, the slope above the Terramesh® wall was not only protected by Gabion Mats®, but also reinforced with geogrids to ensure the structural stability of the system. The geogrids were the same double twisted PVC coated steel wire grids used in the Terramesh®. This enabled the Gabion Mats® on the slope face to be secured to the geogrids reinforcing the slope - see typical cross section.

Client:

NEW MEXICO STATE HIGHWAY & TRANSPORTATION  
DEPARTMENT (NMSHTD)

Main contractor:

TWIN MOUNTAIN, ALBUQUERQUE, NM

Consultant:

NMSHTD & MACCAFERRI TECHNICAL DEPT.

Product used:

TERRAMESH®, GABION MATS®, GABIONS, MACTEX®  
MX155 GEOTEXTILE

Date of building:

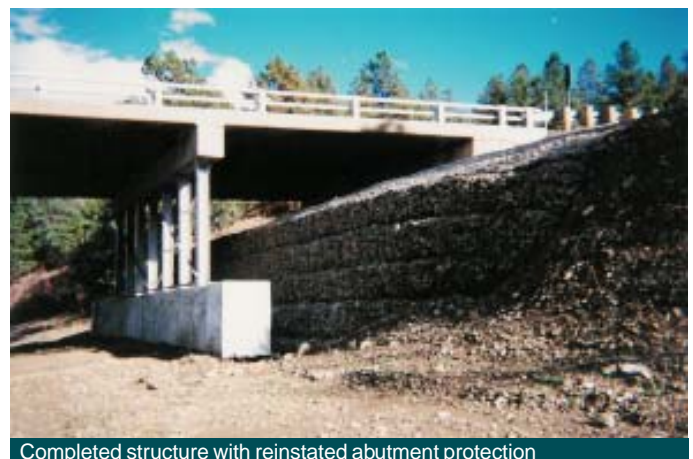
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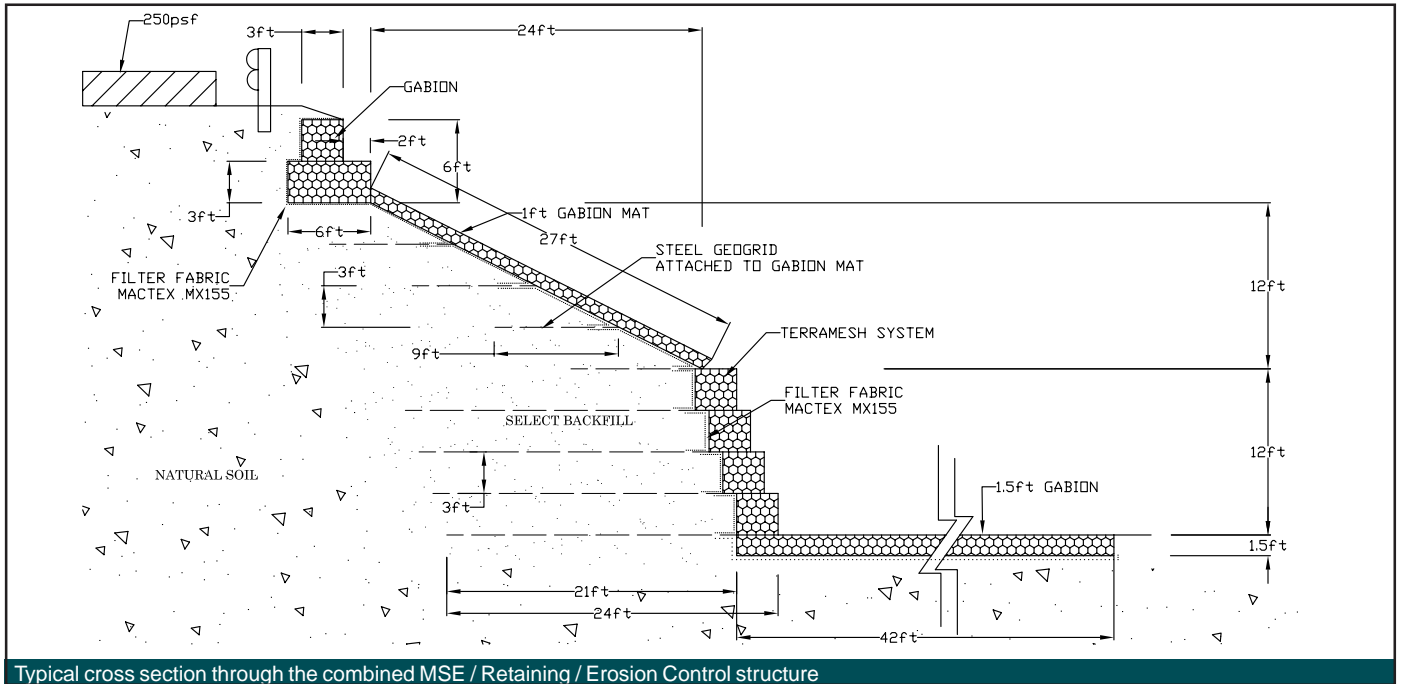
Erosion of channel banks beginning to undermine Highway 555



Erosion of bridge abutment, exposing foundations



Completed structure with reinstated abutment protection



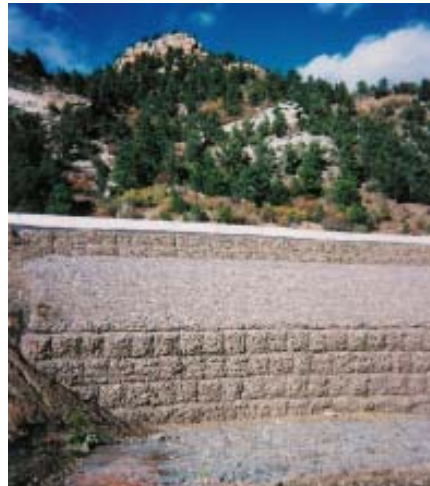
In certain locations, it was also necessary to construct gabion foundations beneath the Terramesh® MSE structure.

Project contractor, Twin Mountain Construction of Albuquerque, NM, used approximately 8000 CY of rock to fill the gabions, Terramesh® and Gabion Mats® on the project.

Maccaferri Terramesh® has been evaluated by HITEC, an independent organization created through collaboration of the FHWA, TRB and the ASCE to assess innovative solutions for use in public sector Civil Engineering projects. This report is available from the HITEC website at [www.cerf.org/hitec](http://www.cerf.org/hitec).

The MSE and gabion structures not only retained Highway 555, but also provided erosion control and training works for the Canadian River at the foot of the structures. Because Terramesh®, Gabion Mats® and Maccaferri gabions are manufactured from **double twist woven steel wire mesh**, they can accommodate large differential settlements without rupturing, 'unzipping' or sustaining damage.

This is a crucial capability in channeling works, where erosion can cause settlement.



Completed structure adjacent to bridge abutment



Completed structure supporting Highway 555

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