

**JACOBS TEMPORARY SLOPE STABILISATION**  
DURBAN, KZN

**EMERGENCY & TEMPORARY WORKS / TEMPORARY WORKS**

**Product:** Macmat-R™, Gabions

**Problem**

The Quality Street bridge which spans the M4 Southern freeway, has in recent years experienced a major increase in traffic volume. A large percentage of this traffic volume includes articulated trucks travelling between the 3 lane, M4 Southern freeway and the Jacobs industrial area. To cope with this increased traffic volume, the Ethekeeni Roads Provision Department & their consultant, VelaVKE / Eyethu Engineers Joint Venture prepared a design which required Quality Street bridge and the existing approaches to be widened.

Extending the existing bridge required the widening of the bridge support structures. To extend the reinforced concrete bridge support, the existing material had to be excavated using heavy plant machinery. The roads had to remain open to traffic during construction, which posed several problems to the contractor, one been that access to the slope adjacent to the busy freeway and Quality Street was difficult. Furthermore, the excavation of the slopes that supported Quality Street had to be near vertical, in order to keep the road open to traffic, whilst allowing the base of the retaining wall and bridge support structure to be built. The cut slopes which varied between 1m and 8,5m required temporary support during construction.

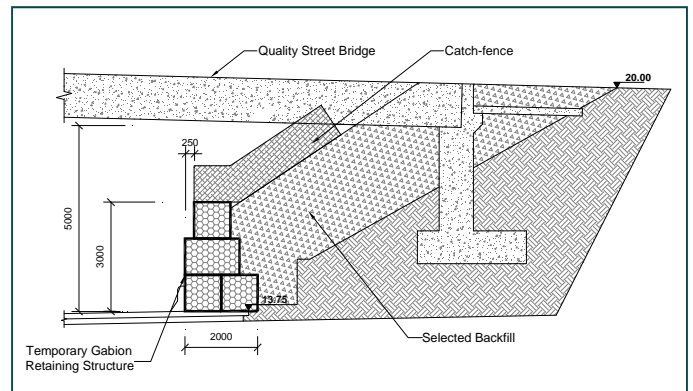
**Solution**

A temporary ramp was constructed over one of the lanes of the freeway for access to the area adjacent the existing bridge support. The ramp was supported by a 3m high temporary vertical mass gravity gabion structure. To prevent the spill of excavated material over the gabion wall onto the M4 freeway, AG200 geotextile positioned along the perimeter of the structure was used as a temporary catch-fence.

Various options were investigated for the temporary lateral support. However, Maccaferri provided a unique alternative that was eagerly adopted by the contractor. MacMat™R was laid on the slope, secured through 300x300mm anchor trenches at the top and bottom of the embankment.



Aerial View of Site



Gabion ramp section



Temporary Gabion Wall

Date: Mar 2005

Client name:

ETHEKWENI ROADS PROVISION

Main contractor name:

ERBACON/CORPCLO 1345cc

Consultant:

VELAVKE / EYETHU ENGINEERS JOINT VENTURE

Product used:

450m<sup>2</sup> MacMat™R, Gabions

Construction info:

Construction date: SEPTEMBER 2004

Completion date: 2005

Soil nails to the designed length and spacing were then driven through the MacMat™R and proof-loaded to ensure that the specified design strengths were achieved. The face of the embankment was later shotcreted with low slump concrete. Small holes were punched through the shotcrete at the bottom of the stabilised embankment to facilitate drainage and mitigate build up of pore water pressures.

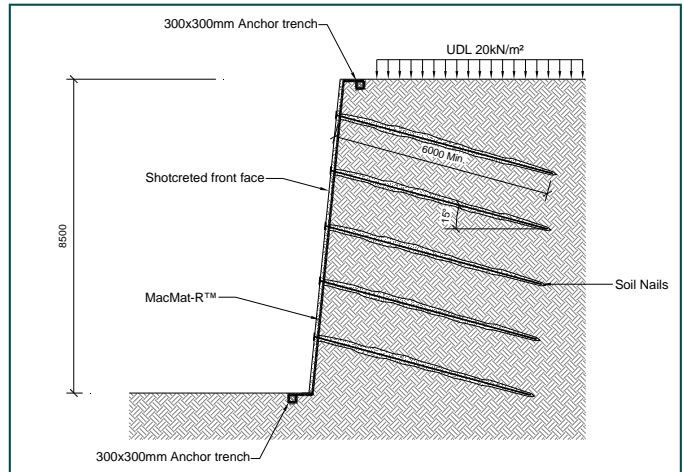
MacMat™R is a three dimensional polypropylene mat manufactured from entangled filaments that have been heat bonded at the contact points. The polymer mat is reinforced with woven steel mesh incorporated during the manufacturing process. MacMat™R is supplied in roll form.

**Benefits**

- The temporary gabion retaining structure was put up quickly and easily. Packing was done by hand assisted by machines.
- The gabion structure was easily removed upon completion of the works.
- The unique lateral support system proposed by Maccaferri proved to be considerably more cost effective when compared to conventional methods.
- The simplicity and versatility of the lateral support system allowed for rapid installation by the contractor even in areas where access was restrictive.
- Maccaferri's design team provided the contractor with design and technical assistance from conception to completion of the temporary slope stabilisation works.
- MacMat™R provides erosion protection from the environmental effects of wind and water, preventing the washout of the soil from the slope face, before shotcrete is applied.
- MacMat™R prevents overspray of shotcrete.
- MacMat™R minimises shrinkage cracking of the shotcrete.
- MacMat™R reinforces the shotcrete.
- The rough texture of the underside of the MacMat™R provides additional safety against slippage along the slope face.



**Installed Soil Nail** Date: Mar 2005



**Soil Nail Cross-section**



**Finished soil-nailed and shotcreted face** Date: Mar 2005

**Maccaferri SA (Pty) Ltd**

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