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## CASE HISTORY

SH3, Region 3, Mokau Bridge Replacement, Taranaki, New Zealand

PRODUCT      TENAX TT 060  
                  SAMP  
                  TENAX TT 090  
                  SAMP,  
                  TENAX TT 120  
                  SAMP

LOCATION        SH3, Region 3, RS  
                  156, Mokau,  
                  Taranaki, New  
                  Zealand

OWNER         Transit New  
                  Zealand

PROJECT        Beca Carter Hollings  
                  & Ferner Ltd,  
                  Auckland, New  
                  Zealand

CONTRACTOR   McConnell  
                  Smith/Fulton  
                  Hogan/Burgess and  
                  Crowley



## PROBLEM

The project involves the construction of a new two way bridge over the Mokau River to replace an existing old single lane steel bridge and the realigning of the approaches to the bridge on State Highway 3 (SH 3). The southbound approach is located on the side of a slope and required realigning to meet a specific design speed environment. The road designation boundaries above and below the road had been previously established. Therefore a retaining wall was required to support a fill to enable the road to be realigned and widened and remain within the road designation.

## SOLUTION

The realignment and widening of the road required filling over an existing slope which exhibited signs of instability. Several options were considered including a concrete retaining wall located at either the top or the base of the slope. The reinforced soil option was selected as being the most cost effective to meet the boundary requirements, and aesthetically combine with the rural and coastal environment. BCHF carried out the design (refer Typical Cross Section) which included a reinforced soil wall varying in face height between 1 and 8 m with a 2H:1V fill slope above the wall extending to the finished road level. The reinforced soil was built with 70° face slope.

The design included the use of ash and sand fill excavated from site reinforced with Tenax TT 060 SAMP, TT 090 SAMP or TT 120 SAMP geogrids (depending on the retained height) at 400 mm spacing. A drainage layer complying with TNZ F/2 specification was placed at the rear of the wall and immediately above the foundation layer. A 500 mm thick layer was placed as a foundation layer to support the wall. The grids have a wraparound topsoil filled bag facing which will be grassed and planted with small native flax to provide an attractive but protective facing. A small section of wall beneath the bridge abutment will have a shotcrete facing. The walls are designed for both static and seismic loadings as required by the NZ Loadings Code (NZS 4203). It is noted that Mokau is located in an area of New Zealand which is considered to have moderate seismicity. The foundation soils comprised soft to firm silts and silty sands over lying medium dense sand. The foundation is located on the medium dense sand.



## **CONCLUSIONS**

The use of TENAX geogrids as part of the State Highway realignment allowed:

- Cost effective support to the base of a large fill within road designation
- Use of fill materials excavated from new cut slopes forming part of the highway realignment works
- Fast construction, using standard earthmoving plant
- Creating aesthetic "environmentally friendly" vegetated slopes in a rural and coastal location.