

## LANGENI - REINFORCED EARTH WALL ANCHORED WITH DEEP SOIL NAILS

The construction of a road between the town of Ugie and the Langeni Sawmill in the Eastern Province has recently been completed. This is an important Eastern Cape Department of Roads and Transport project to link extensive timber plantations in the Ugie – Maclear district to a large sawmill at Langeni. The final 17 kilometres of the road crosses the Ncembu Plateau, before descending the 500 metre high Langeni Escarpment to the sawmill. The escarpment is dominated by sheer cliffs of dolerite, extending for many kilometres in each direction. The key to the route down the escarpment is a break in the cliff line which takes the form of a steeply sloping talus “nose”. The talus slope comprised very hard dolerite boulders, very variable in size and frequency, in a clayey silt matrix. By cutting deeply into the dolerite cliffs of the escarpment edge, it was possible to locate a route down and around this “nose”. The road gradient is 11 percent and a 600 metre long earth reinforced wall has been used to carry the road across the slope.



Partially completed earth reinforced & soil nailed wall

- ◆ 12 metre high embankment was required to carry road
- ◆ Required factor of safety for overall slope stability was 1.4
- ◆ Temporary haul road had to be accommodated within earthworks prism, creating severe space constraints
- ◆ 15 metre deep soil nails were used to improve stability of slope and to provide lateral support for the slope below the haul road. Approximately 9000 metres of nails were installed
- ◆ Polyester "Paraweb" straps provided earth reinforcement and linked the steel mesh facing panels to the soil nail heads
- ◆ Crushed dolerite backfill was used to provide free drainage. Maximum size was limited to 37 mm to prevent damage to polyester straps



Polyester straps linking mesh facing panels with soil nails



Drilling in soil nails



Connection of paraweb straps to soil nail heads