RETAINING WALLS & SOIL REINFORCEMENT

Product: MacRes® T

Problem

The construction of Kwabhoboza Interchange on National Route 2 Section 30 (Km 5.1) is a SANRAL project near Mtubatuba in the region of KwaZulu-Natal, South Africa. SANRAL appointed Mott MacDonald PDNA to be the professional consulting team on the project. The tender was awarded to Leomat Construction (Pty) Ltd in December 2013 and construction was estimated to run over a period of 22 months.

A retaining system was required to support the widened main carriage way (which directs traffic both North and South) and also, most importantly, provide grade separation to allow for a tavern access road located adjacent to the main carriage way.

Solution

Maccaferri Africa (MA) was approached by Leomat Construction (Pty) Ltd to submit their proposal to design and supply a Mechanically Stabilised Earth Wall (MSEW) system with heights ranging between 4m and 7m, approximately 130m long and 145m² of facia.

MA suggested the use of MacRes® T retaining system which was subsequently approved by the consultant Mott MacDonald PDNA.

The system consists of granular structural fill which is reinforced with horizontal layers of high strength polymeric reinforcing Paraweb® strips. This produces an apparent cohesion in the direction of the reinforcement and permits the fill to function as a homogenous gravity structure. The vertical or battered outer face of the reinforced soil structure comprises of a concrete panel cladding which is connected to the reinforcing strips which are embedded in the structural backfill.
Benefits

- Economy: The low cost of the elements and simple efficient means of installation realise significant cost savings compared to traditional forms of construction.
- Speed: Construction is much faster than for a reinforced concrete structure. This is advantageous especially when other works such as earthworks depend on the completion of the retaining wall for rapid construction.
- Simplicity: Only 3 main components are required namely: Panels, reinforcement and soil. Unskilled labour and small plant can be used for construction.
- Aesthetics: Precast facing units can be cast with a variety of patterns and different colours to match the surrounding environment.
- Foundations: No reinforced concrete foundations are required. A simple unreinforced blinding layer / footing is required only for the purpose of aligning panels with ease.
- Resistance to corrosion: Use of polymeric reinforcement eliminates the danger of corrosion which is of paramount importance for long term structures.