



KAYTECH CASE STUDY

SLOPE STABILISATION USING REINFORCED SOIL RETAINING STRUCTURE FOR ROAD REALIGNMENT ON THE R56

GEOSYNTHETICS USED

RockGrid® KX 60/20: Geogrid used as tensile reinforcement in reinforced soil retaining structures, helping to restrain lateral soil movement and improve the stability of the reinforced fill mass.

bidim® A2: Nonwoven geotextile offering filtration and separation, preventing soil migration behind the retaining structure.

Kaybion®: Rock-filled galvanised steel mesh baskets forming the visible retaining face of the reinforced soil structure.

SoilSaver®: Biodegradable erosion control matting protecting topsoil and supporting vegetation establishment for long-term surface stability.



CONTACT



Julian Maastrecht



083 265 7089



julianm@kaytech.co.za



www.kaytech.co.za



35 Manchester Road,
Chiselhurst, East London

PROJECT DESCRIPTION

A road realignment at km 155.8 on the R56, east of the Mzimvubu River Bridge near Matatiele, required widening of an existing road cutting. The cutting was formed in a deeply weathered dolerite profile comprising clayey silt overlying sandy silt and silty sand, with weathered and unweathered dolerite boulders present within the profile. Excavated material was reused in the road construction layers. To accommodate the widening while maintaining a 33° vegetated cut batter and achieving a design Factor of Safety of 1.5, a 4m high reinforced retaining structure was required.

A BETTER SOLUTION

The solution adopted a reinforced soil retaining system, using RockGrid® KX 60/20 geogrid layers placed within compacted site-won fill to form a stable reinforced mass behind the Kaybion® structure. This reduced the need for extensive excavation and imported selected fill, while allowing suitable excavated material to be reused. Finite element stability analysis verified that the required Factor of Safety was achieved for long-term performance.

A 230m long, 4m high Kaybion® -faced reinforced soil structure was constructed to support the widened road alignment. RockGrid® KX 60/20 geogrid reinforcement layers extended 4m behind the facing at 1m vertical intervals, positioned perpendicular to the wall face to mobilise tensile resistance within the compacted fill.

The foundation surface was cleared and levelled prior to installation to promote uniform reinforcement placement. bidim® A2 geotextile was installed behind the structure to provide filtration and prevent fines migration. Approximately 15,000m² of SoilSaver® biodegradable matting was installed over 150mm of topsoil to reduce erosion and prevent seed washout. The area was hydroseeded to promote future vegetation establishment, which will provide long-term surface protection.

The Kaybion® reinforced soil system provided a practical and robust solution for the road widening works, combining structural stability, reuse of site-won material and effective surface erosion protection.

By integrating RockGrid® KX reinforcement, bidim® filtration and SoilSaver® vegetation support, the completed structure delivered a stable, durable and environmentally considerate retaining solution for the widened R56 alignment.



Existing Mzimvubu cut prior to construction.



Construction of reinforced Kaybion® structure underway.



Completed 230m Kaybion® wall with SoilSaver® stabilising the embankment.

Did you know?



Reinforced Soil Mass

Geogrid layers develop soil-reinforcement interaction with the compacted fill, forming a reinforced soil mass that behaves as a stable gravity structure.



Vegetation Establishment

Biodegradable erosion control matting helps retain topsoil and seed on newly formed slopes, reducing surface erosion and seed washout while promoting vegetation establishment.



Material Reuse

The solution allowed suitable excavated material from the cutting to be reused within the reinforced soil structure, reducing imported fill requirements and limiting haulage, spoil disposal and associated environmental disturbance.