



KAYTECH CASE STUDY

GROUND STABILISATION USING GEOGRID AND GEOCELL REINFORCEMENT ON A HAUL ROAD AT MOTOTOLO MINE

GEOSYNTHETICS USED

RockGrid® PC: A composite geogrid bonded to a nonwoven geotextile.

RockGrid® PC 100/100: Installed over the prepared subgrade to provide reinforcement and separation within the working platform structure.

Multi-Cell® HD: A high-density polyethylene geocell system that forms a three-dimensional confinement structure for granular materials.

Multi-Cell® HD: Used to confine granular infill and stabilise working platforms and low-water drift crossings under heavy mining traffic.



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PROJECT DESCRIPTION

During the construction of a new haul road at Mototolo Mine, Turnkey Civil International required stable working platforms along the route to support heavy mining equipment, while low-water drift crossings required reinforcement to withstand seasonal flows. The route also crossed several low-water drifts that were susceptible to erosion and structural weakening during seasonal flows. These conditions required a solution capable of improving load-bearing capacity across variable ground conditions while maintaining stable drift crossings that could withstand intermittent water flow and repeated vehicle loading.

A BETTER SOLUTION

Geosynthetic reinforcement systems improve ground performance by distributing loads over a wider area and confining granular materials within the pavement structure. Geogrids provide tensile reinforcement and separation between layers, while geocells create a three-dimensional confinement system that increases shear resistance and reduces lateral movement of fill materials.

To construct the working platforms, RockGrid® PC 100/100 composite geogrid was installed over the prepared subgrade to provide reinforcement and separation between the subgrade and the overlying base layers. The high tensile stiffness of the geogrid interacts with the granular base material to distribute applied loads more effectively, reducing shear stresses on the underlying soil. This improves load distribution and limits deformation under repeated heavy vehicle loading. Above the composite geogrid, Multi-Cell® HD geocells were deployed and filled with compacted granular material to create a stiff confinement layer. The same system was used in low-water drift areas, where the geocells were anchored between gabions and infilled with graded material to form a stable crossing capable of resisting washout during intermittent flow conditions.

The reinforced platform system improved load-bearing capacity along the haul road while limiting deformation under heavy mining traffic. The geocell confinement reduced lateral movement of the granular infill, helping maintain the integrity of the working platforms. At the drift crossings, the system provided a stable, erosion-resistant pathway capable of accommodating intermittent water flow. This integrated reinforcement approach enabled durable haul road construction while reducing the risk of rutting, material loss, and structural degradation.



Did you know?



Three-Dimensional Confinement

Geocells confine granular material within interconnected cells, increasing shear resistance and improving load distribution in weak ground conditions.



Load Distribution

Geogrids reinforce pavement structures by spreading loads over a wider area, reducing stresses transmitted to the underlying subgrade.



Drift Protection

Geocell-reinforced crossings can improve erosion resistance in low-water drifts by stabilising infill material during intermittent flow events.