

Su ehri- ebinkarahisar Road Rockfall Risk Mitigation Project

EAST ANATOLIA REGION -S VAS



PROJE T R 
Y zey G  lendirme Ve
Destek

YAPIM YILI
2025

M   TERİ
HIGHWAY AUTHORITY

Y  KENİCİ
EGE ALTYAPI A. .

TASARIMCI

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MacArmour &  elik Kompozit Grid HR (Steelgrid 50 (HR50) - 8.580 Sqm)

Meydan Okuma

There is a significant risk of rockfall along the steep roadside slopes in the project area. Rockfall represents a major geohazard that threatens both traffic safety and the surrounding environment. The highly fractured, jointed, and partially weathered structure of the rock mass increases the susceptibility of the slope to instability. Discontinuities, blocky formations, and loosened rock fragments observed on the slope surface indicate a high potential for detachment and falling under gravity and external influences.

The presence of weathered zones, weak planes, and erosion effects further reduces the shear strength of the rock mass, thereby increasing the likelihood of rockfall events. Additionally, environmental factors such as precipitation, freeze-thaw cycles, and seismic activity may trigger the movement of unstable blocks. This situation poses a direct hazard to the roadway, passing vehicles, and personnel working in the area.

A detailed geotechnical assessment of the slope stability and rock mass characteristics is required. To minimize these risks, appropriate engineering measures such as rockfall protection systems (e.g., wire mesh, anchoring, and scaling works) should be implemented to ensure long-term stability and safety.



During the construction



During the construction – controlled scaling of loose rock

Çözüm

To evaluate and mitigate the rockfall risk in the project area, detailed geological and geotechnical assessments were carried out, and slope stability conditions were analyzed. Based on these evaluations, appropriate engineering measures were designed and successfully implemented to ensure long-term stability and safety.

Within the scope of the project, a total area of 8.580 m² was covered using high-capacity **Steelgrid HR50** systems. This flexible surface support system was applied to control shallow instabilities, prevent the detachment of loose rock fragments, and ensure overall slope integrity.

In addition, a total of **1.050 surface anchors** with specifications **2,0 m** length were installed in a **2.0 × 2.0 m grid pattern**. These anchors were designed to stabilize the rock mass by increasing internal resistance, securing potentially unstable blocks, and improving the interaction between the rock surface and the applied mesh system.

The combined application of Steelgrid systems and systematic anchoring significantly enhanced the mechanical stability of the slope, reducing the risk of rockfall and surface erosion. These measures also provide resistance against external triggering factors such as weathering, precipitation, and seismic effects.

All interventions were carried out as part of a comprehensive engineering approach to minimize geohazard risks and ensure a safe environment for road users and the surrounding area.



During construction – installation of surface anchors



After the construction