SLOPE STABILITY

ROCK FALL PROTECTION

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SLOPE STABILITY -ROCKFALL

This Presentation I take from Maccaferri's Case Histories.

This presentation is about the protection from rockfall, which is very common on highways, rail routes, hydropower projects.

This Case Study is adopted from NH22 Highway which is affected by rockfall.

Strata Formation (Maximum height = 150m)

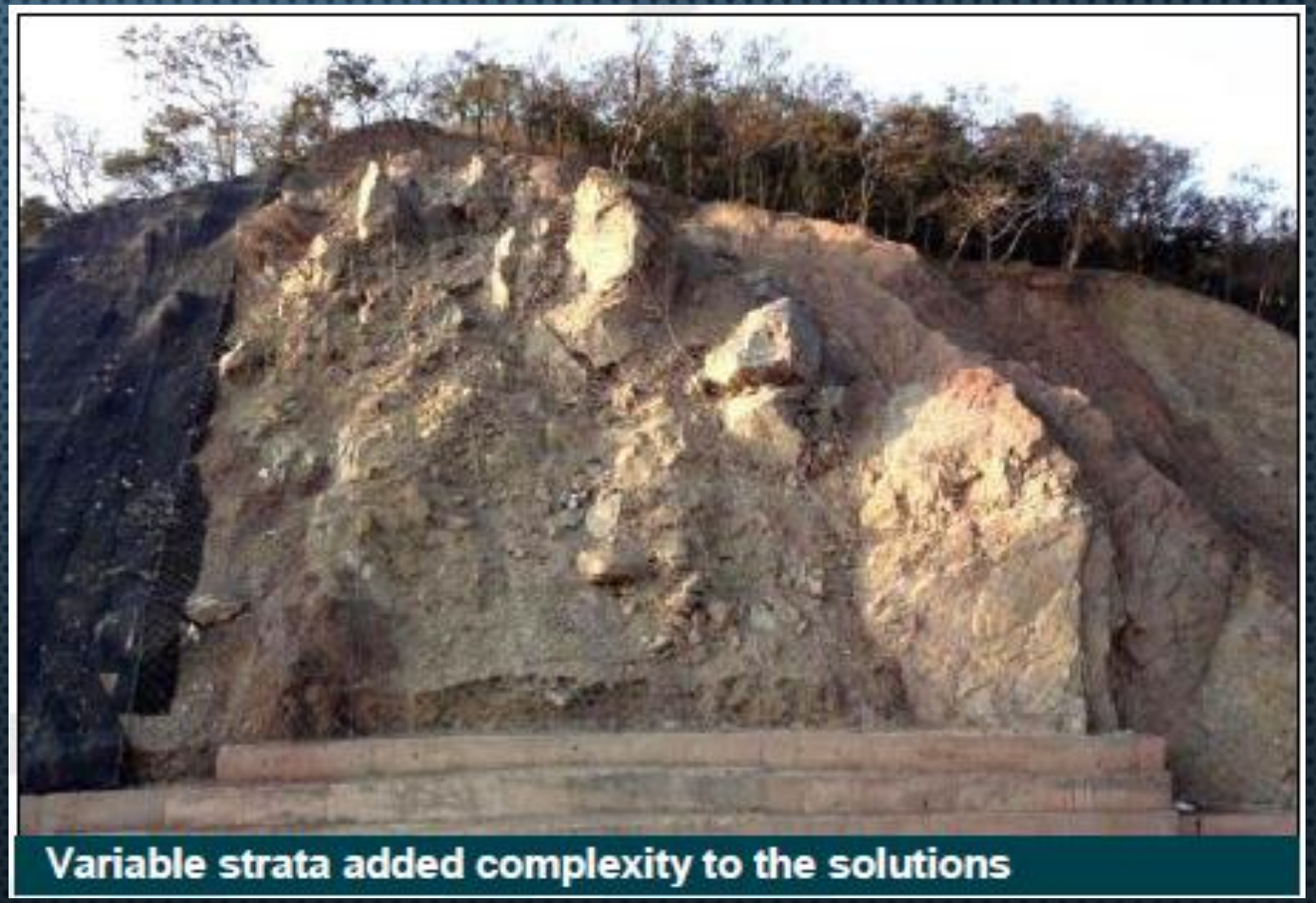
1. Shale
2. Sandstone
3. Medium and small sized rock fragments
4. Mixed strata of fine-grained soil
5. Medium sized rounded boulders exist

SLOPE STABILITY –ROCKFALL STRATA

Three distinct zones of hazard were identified on the rocky slopes above the highway;

1. Large boulders and exposed rocky outcrops
2. Medium rock fragments
3. Finer grained soils and smaller debris

Therefore, any rockfall protection measures had to be tailored to the varied geology of the area.



Variable strata added complexity to the solutions

ROCKFALL MITIGATION

Maccaferri proposed a solution to overcome the slope hazards

1. High Energy Absorption panels (HEA Panels) - For the zones where larger boulders and rocky outcrops.
2. Steelgrid BO - areas where medium rock fragments were expected.
3. Steelgrid BO + MacMat R. -areas where finer particles were to be expected.

Meshes were secured to rock slope with top, bottom and local intermediate anchors.

Steelgrid BO during installation

HIGH ENERGY ABSORPTION PANELS (HEA PANELS)

High Energy Absorption panels (HEA Panels) - For the zones where larger boulders and rocky outcrops.

1. HEA Panels are the stiffest and highest strength meshes in Maccaferri's rockfall mitigation range.

2. They are engineered from a single high tensile steel wire cable, laid into a grid configuration with a patented knot connection at each crossing point.

This provides the HEA Panel with 25% higher stiffness than traditional steel cable net panels with clipped node connections.

Steelgrid BO on rocky slope

STEELGRID® BO

Steelgrid BO - areas where medium rock fragments were expected

1. This is a combination of double twist woven mesh which is interwoven with high tensile steel cables.

2. Available in a range of strengths and stiffnesses, enabling the optimization of the solution for the geological conditions encountered.

Steelgrid BO during installation

STEELGRID® BO+ MACMAT R

Steelgrid BO + MacMat R. -areas where finer particles were to be expected

1. Geocomposite of a 3-dimensional polymeric geomat with an integral steel wire woven mesh reinforcement.
2. Providing immediate high- performance erosion control and root reinforcement for re-establishing vegetation on vulnerable slopes.
3. It is often used in conjunction with soil nails to provide deep seated slope reinforcement in conjunction with surface stabilization.

MacMat R used in conjunction with Steelgrid BO in places

THANKS FOR YOUR TIME

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