



Tensor's GreenSlope reinforced earth slope system delivered a cost-effective alternative for constructing the rockfall protection bund, using locally-sourced fill.

## Stable protection

A TensarTech GreenSlope reinforced soil system was a fast and cost-effective solution for a 500m long bund built to protect homes from the risk of rockfall.

### CLIENT'S CHALLENGE

A new rockfall protection bund was needed above homes in Ulstad, in the Lom Municipality of Norway. The original design comprised a soil embankment, with a vegetated gabion facing. Main contractor Rolstad Maskinentreprenør asked Tensor's Norwegian distributor TenTex to cost the design, but it proposed an alternative approach using a Tensar GreenSlope solution.

### TENSAR SOLUTION

Tensor provided a design for the bund using GreenSlope. The system enabled locally-sourced fill to be used, removing the need for the imported soil needed for the original proposal. This resulted in faster construction, which was more economical and had lower environmental impact.

## Rockfall protection bund

Walls and Slopes

📍 Ulstad, Lom Municipality, Norway

### BENEFITS

**Enabling** the use of site-won fill

**Faster** more economical construction

**Minimising** visual impact while maximising protection



The 500m long, 6m high bund has 76° slopes that will eventually blend into the surrounding landscape, minimising its visual impact, while protecting homes for many years to come.

## PROJECT BACKGROUND

Main contractor Rolstad Maskinentreprenør won the contract to build a 500m long, 6m high earth bund to protect homes in Ulstad from potential rock falls. Work was carried out on behalf of Lom Municipality and the Norwegian Water Resources and Energy Directorate.

Rolstad Maskinentreprenør approached Tensar's Norwegian distribution partner TenTex to cost consultant NGL's design, which comprised an earth bund with vegetated gabion facing on both long sides. However, TenTex proposed an alternative approach, using the TensarTech GreenSlope system.

GreenSlope uses layers of uniaxial geogrid to reinforce the soil mass, linked to durable steel mesh facing panels using a high efficiency bodkin connection. The facing is lined with an erosion mat, which helps retain a thin topsoil layer which is then hydroseeded to encourage vegetation cover.

Tensar provided a design for the bund, with 76° vegetated faces on each of the long sides, helping it to blend into the surrounding landscape. As GreenSlope can be used with many varying types of soils, it allows for the use of cheaper non-standard and site fills as long as it has been tested against design parameters. Also, moraine which is locally sourced fill could be used. These factors ultimately saved time and money on construction and reduced the project's environmental impact.

Tensar's alternative design was accepted by the client. Rolstad Maskinentreprenør installed a total of 4,100 steel mesh panels to retain a total of 53,400m<sup>3</sup> of soil, reinforced with Tensar geogrid.

Main Contractor:

**Rolstad  
Maskinentreprenør AS**

Tensar Distributor:

**TenTex AS**

Client:

**Lom Municipality/  
Norwegian Water  
Resources and Energy  
Directorate**