Avalanche protection system

TS-LV - Data Sheet

Classification

Model	TS-LV Snow Net
Style	Hinged System
Typical Fence Height* (D_K) *m (ft)*	up to 4.5 (14.8)
Typical Row Length* *m (ft)*	4 - 120 (13.1 - 393.7)
Typical Post Spacing* *m (ft)*	up to 4 (13.1)

* Values are project related and have to be customized to the site and loading conditions.

Area of Application:
TRUMER avalanche protection systems are designed on a site-to-site basis to protect infrastructure, utilities, buildings, reafforestation and lives from avalanches. Unlike other mitigation methods such as control through triggering with explosives, these static defence structures help to prevent snow avalanches from starting in their first stage of occurrence.

Material:
TRUMER uses steel components and steel wire rope made from high quality materials, following a stringent quality assurance program. TRUMER is ISO 9001 certified. TRUMER avalanche protection systems are designed in accordance with the Austrian ONR 24806 [1] and the Swiss guideline “Defense structures in avalanche starting zones” [2].

Installation:
Structures by TRUMER are designed with as few components as possible to simplify installation and reduce maintenance. Foundation design and construction is dependant on site conditions and are the responsibility of the project engineer.

Advantages:
TRUMER avalanche protection is a permanent technical solution that guarantees maximum safety because they stop avalanches from occurring continuously. The combination of a well thought-out frame with the properties of the TRUMER Omega-Net leads to a premium quality product without affecting the landscape.

Design Parameters

Site
- ☑ Topography
- ☑ Ground Roughness
- ☑ Boundary Conditions

Load Scenario
- ☑ Snow Thickness (D_K) *m (ft)*
- ☑ Max. Slope Angle (Ψ) *deg*
- ☑ Height Factor (f_c)
- ☑ Snow Density *kg/m³ (lb/ft³)*
- ☑ Glide Factor (N)

Fence
- ☑ Length of Single Row *m (ft)*
- ☑ Number of Rows

References:

1. Austrian Standards Institute. *ONR 24806, Permanent Technical Avalanche Protection - Design of Structures*, 2011.

2. WSL Swiss Federal Institute for Snow and Avalanche Research SLF. *Defense structures in avalanche starting zones - Technical guideline as an aid to enforcement*, 2007.

Trumer Schutzbauten GmbH • Weissenbach 106 • 5431 Kuchl • Austria
Tel.: +43 6244 20325 • Fax: +43 6244 20325-11 • www.trumer.cc

Primary Net*

Omega-Net Model	6.0/135	7.5/135
Type	Steel Wire Cable	
Rope Diameter *mm (in.)*	6.0 (0.236)	7.5 (0.295)
Rope Construction	1 x 7 Spiral	
Single Wire Diameter *mm (in.)*	2.0 (0.078)	2.5 (0.098)
Corrosion Protection**	Zn, ZnAl	
Mesh Size *mm (in.)*	~ 135 x 135 (5.3 x 5.3)	
Unit Weight kg/m² (lb/ft²)	~ 3.6 (0.73)	~ 5.6 (1.15)
Mesh Tensile Strength calculated *kN/m (lbf/ft)*	246 (16856)	386 (26449)
Connection to Main Ropes	Threaded	
Connection to Adjacent Panel	5/16" Shackle	3/8" Shackle

** in accordance with European Standard EN 10244-2, class A

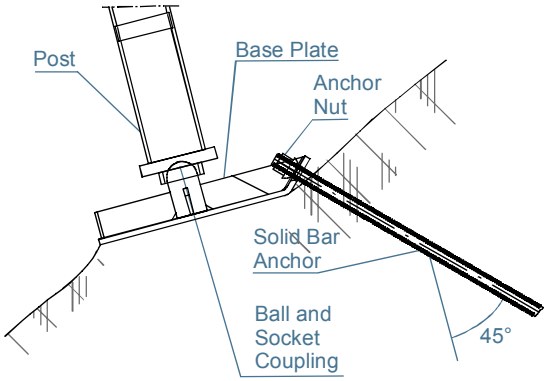
Ropes*

Upper Bearing	Quantity per fence segment	1
	Rope Diameter *mm (in.)*	up to 24 (0.945)
	Corrosion Protection	Zn or ZnAl (Class A or B)
	Connection Post Head	Clamped
Lower Bearing	Quantity per fence segment	1
	Rope Diameter *mm (in.)*	up to 24 (0.945)
	Corrosion Protection	Zn or ZnAl (Class A or B)
	Connection Anchor	Threaded
Retaining	Quantity per Post	2
	Rope Diameter *mm (in.)*	up to 24 (0.945)
	Corrosion Protection	Zn or ZnAl (Class A or B)

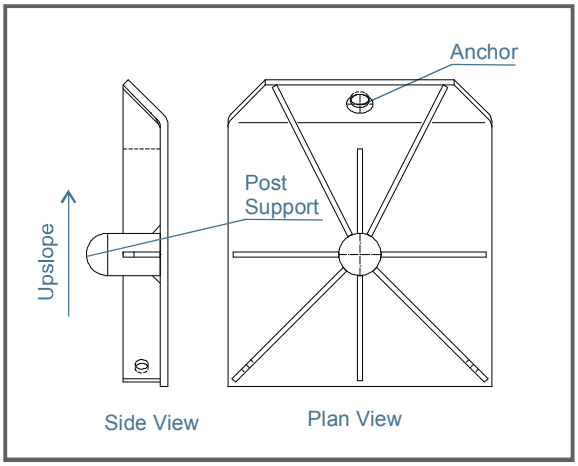
Support Structure*

Post Type	HEA / HEB
Integrated Ladder	Rungs every 0.5 m
Rope Guides	U-Bolts
Base Plate Connection	Ball and Socket Coupling
Anchors per base plate	1

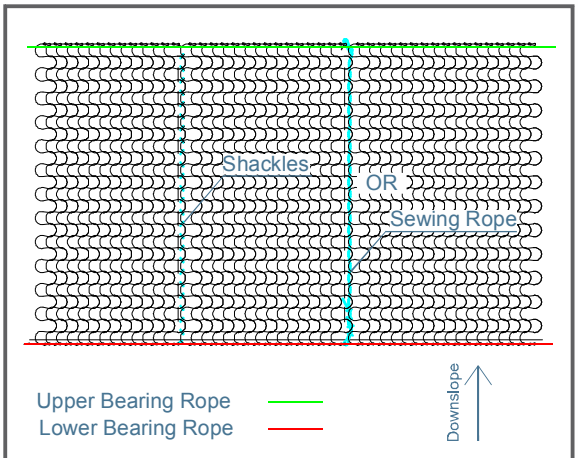
Base Plate/Foundation



Base Plate Layout

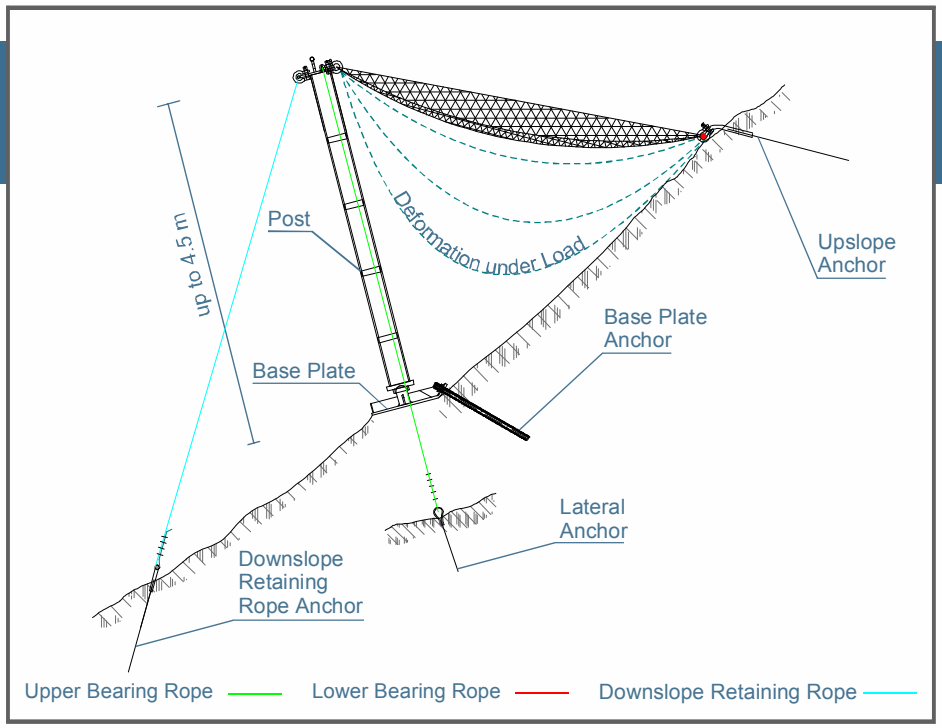


Seam Connection (Planview)



***Design and required items:**
Data is taken from existing projects. Every avalanche protection structure is customized to the site and loading conditions, thus stated items and values can change.

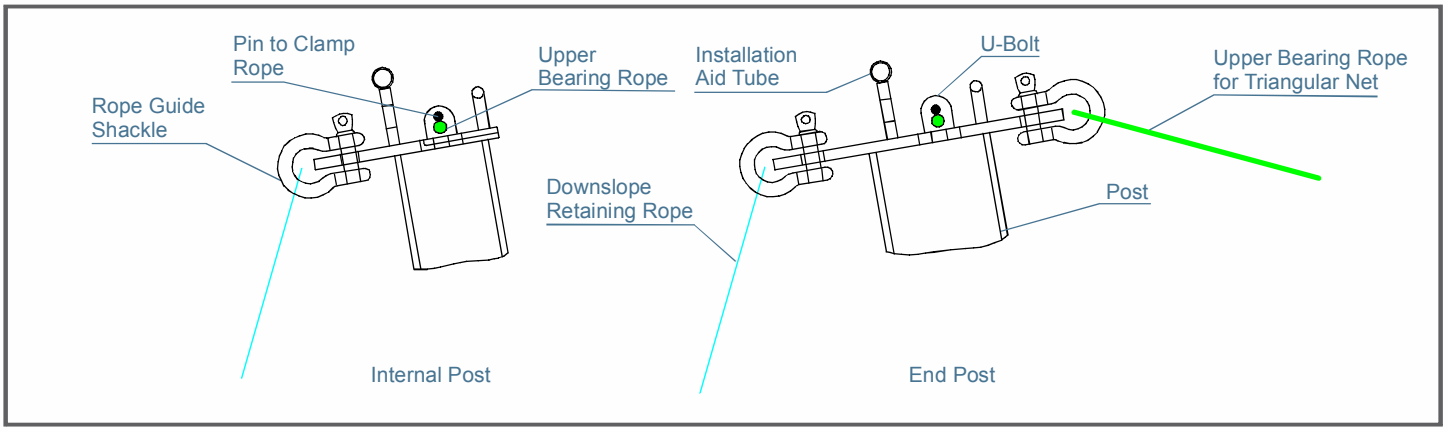
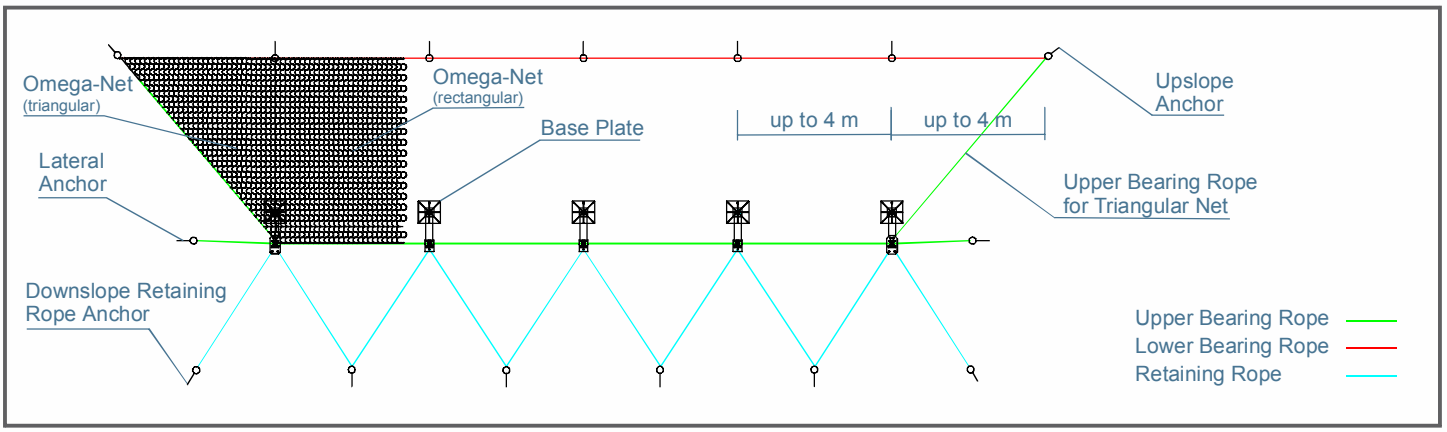
Typical Cross Section



General Layout and Anchorage:
The given layout for the static avalanche protection system is an example of an existing project. Every TS-LV project is customized to the site and loading conditions, thus stated values can change. In general, typical post spacing is up to 4 m.

Anchor layout should follow the geometry provided in the installation manual with the anchor oriented as close as possible to the direction of the anticipated rope forces. It is acknowledged that due to site characteristics deviations from the ideal are unavoidable. In this case, the project engineer should use their best judgement to find a suitable location and orientation.

Post Head Layout



Typical Layout