

# Abstract of test report no. 0103

System TS-100-oA  
Test V0203 / Eisenetz / 09.05.2003

## General information

Energy class:	100kJ
Manufacturer:	Trumer Schutzbauten GmbH Maria-Bühel Straße 7 5110 Oberndorf bei Salzburg Austria
Product name:	TS-100-oA
Test report number:	0103
Test report creation date:	23.07.2003

## Specification of rock-fall protection kit TS-100-oA

The tested rock-fall protection kit TS-100-oA of TRUMER SCHUTZBAUTEN GMBH is a flexible rock-fall protection system for energy impacts up to 100kJ. The rock-fall protection kit TS-100-oA is characterised by a support structure which is fixed to the underground by anchored ground plates. Because of a welded connection between post and ground plate uphill retaining cables are not necessary. The interception structure of the tested rock-fall protection kit consists of a rectangular netting characterised by a small mesh-size, which makes an additional layer unnecessary. Because of the low energy class of 100kJ, there is no need for energy dissipating devices.

## Main components of rock-fall protection kit TS-100-oA

INTERCEPTION STRUCTURE	
<b>PRIMARY NET</b>	Type: rectangular netting Wire diameter: 4.5mm Mesh-size: 50mm x 50mm Tensile strength of wires: 400 to 500 N/mm <sup>2</sup> Dimensions: 2.50m x 20.00m Connection to bearing ropes: steel cable (Ø 4.0mm) Connection to side posts: none Net to net connection: none
<b>ADDITIONAL LAYER</b>	none

SUPPORT STRUCTURE	
<b>POST</b>	HEA-140 (IPBI-140) S 235 JR 2.20m
<b>GROUND PLATE</b>	644mm x 300mm x 15mm S 235 JR
<b>GUIDANCE OF ROPES</b>	Connection to post: welded Connection to underground: fixed by three anchors Bearing ropes: 5/8" shackle

CONNECTING COMPONENTS	
<b>UPPER AND LOWER LONGITUDINAL BEARING ROPES (cp. DIN 3060, ISO 2408 and EN 12385-4)</b>	Rope 16 / 6x19 Standard / DIN 3060 / steel core / galvanised / 1770N/mm <sup>2</sup> Nominal rope diameter: 16mm Calculated breaking load: 188kN
<b>SIDE CABLES (cp. DIN 3060, ISO 2408 and EN 12385-4)</b>	Rope 16 / 6x19 Standard / DIN 3060 / steel core / galvanised / 1770N/mm <sup>2</sup> Nominal rope diameter: 16mm Calculated breaking load: 188kN

## Summary of test results

The tested rock-fall protection kit TS-100-oA of TRUMER SCHUTZBAUTEN GMBH was hit by a block of reinforced concrete with a mass of 413kg and a velocity of 24.43m/s. The impact was placed in a height of 1.75m. The angle of block trajectory was determined with 35.50°. The impact energy was determined with 123kJ. The maximum horizontal system elongation was 2.22m.

The block was stopped by the rock-fall protection kit and did not touch the ground during the test until the system reached the maximum elongation. The whole impact energy was absorbed by the tested rock-fall protection kit.

There were no visible damages in connecting components but the connecting cable of the primary net to the lower longitudinal bearing rope was ripped at the left outer post. The posts of the middle functional module showed slight plastic deformation and in the place of impact the primary net was deformed irreversibly. As a consequence of the impact the vertical height of the rock-fall protection kit was reduced from 2.16m to 1.81m, which means a remaining height of the tested system of 87.0% of the original vertical height.

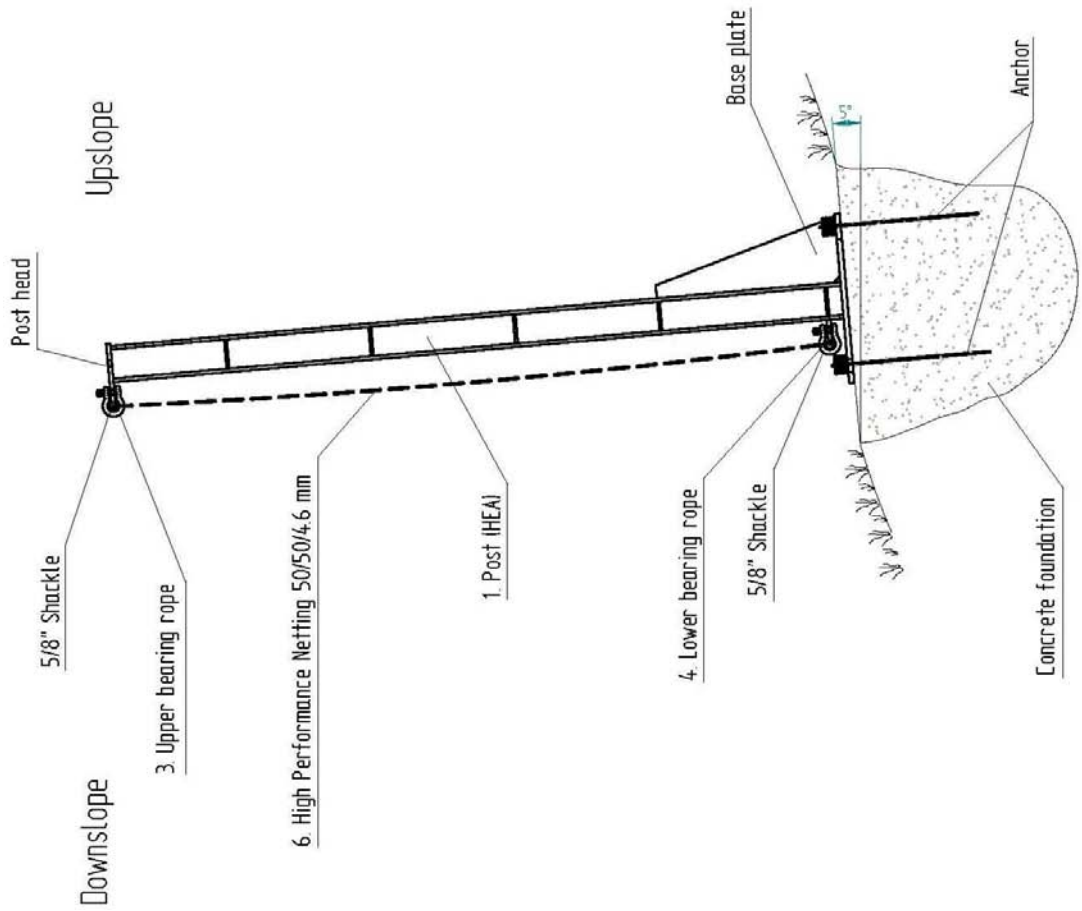
**THE ROCK-FALL PROTECTION KIT TS-100-oA OF TRUMER SCHUTZBAUTEN GMBH WAS TESTED SUCCESSFULLY.**

## Affirmation of test report no. 0103 by the University of Leoben

The department of Mining & Tunnelling of the University of Leoben approves that test report no. 0103 created by Christian Heiss is correct in respect of content and matter of fact.



## Rockfall Protection System TS-100-oA - Lateral View



- Tested with 123 kJ

- Rigid base plate

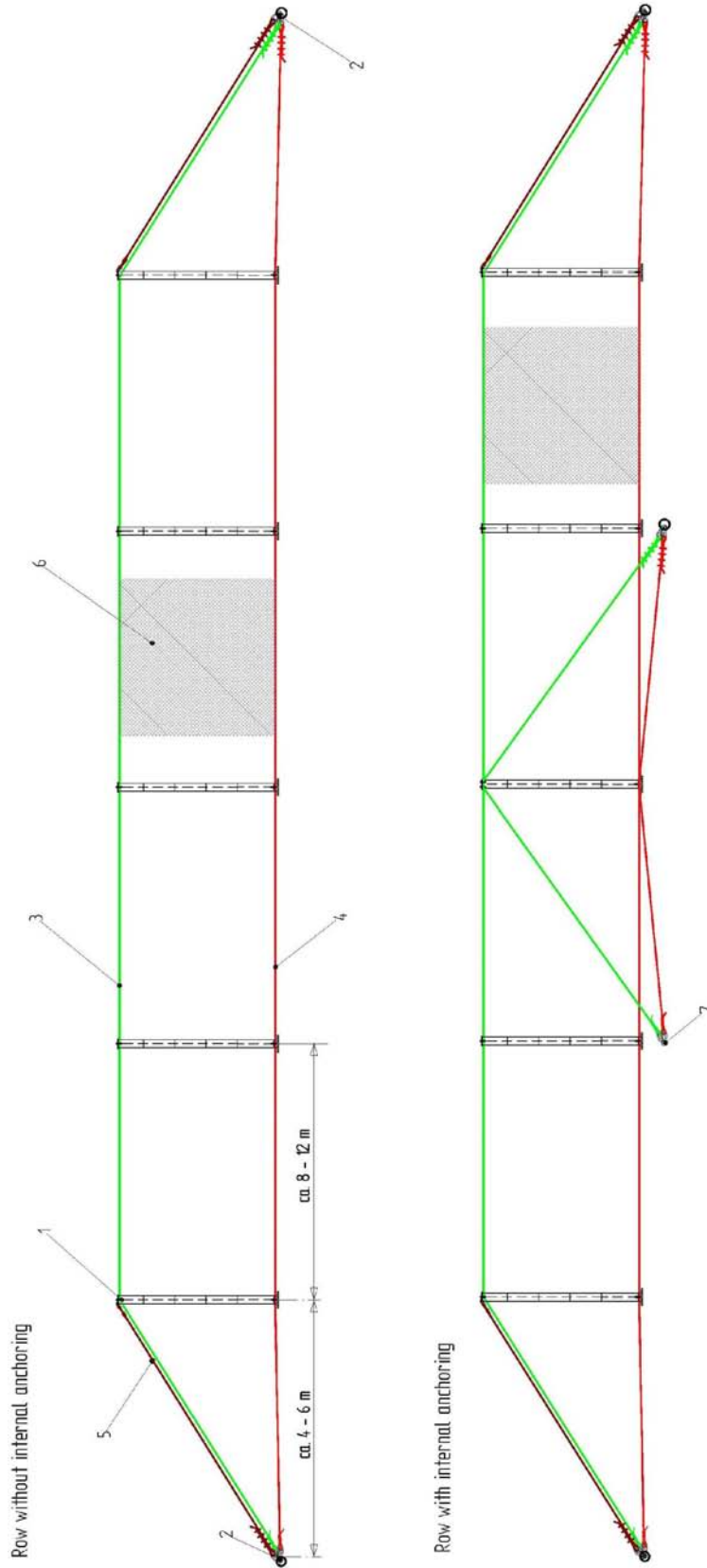
- No upslope retaining ropes

- Upper and lower bearing ropes

- No brake elements

- High Performance Netting

# Rockfall Protection System TS-100-oA - Frontal View



## Legend

- 1 Post
- 2 Lateral anchor
- 3 Upper bearing rope (at post head)
- 4 Lower bearing rope (along ground)
- 5 Side stabilisation rope
- 6 High Performance Netting
- 7 Internal lateral anchor