



Type approval of safety nets for protection against rockfall

Test Certificate No. S 05-12

System description

• System designation	RXI-025		
• Address of designer	GEOBRUGG Fatzer AG Schutzsysteme, Hofstrasse 55, 8590 Romanshorn		
• System description			
– Energy class		250 kJ	
– Posts:	profile	HEB 100 (S235JRG)	
	length a_l	2.46 m	
	interval a_s	10 m	
– Support ropes:	type	Wire rope	
	diameter	18 mm	
– Net:	type	ROCCO ring net (7 windings)	
	diameter	Ring diameter 350 mm, wire diameter 3 mm	
	mesh	-	
	height h_v	2.32m	
– System drawings			
	Description	No.	Date
	System handbook RXI-025	-	11.07.2005
	Maintenance handbook	-	19.05.2005
	Technical documentation	-	19.05.2005
	Post HEB 100	-	17.05.2005
	Ground plate	-	05.05.2005

Basic documentation

• Field test			
WSL test report	Date 31 August 2005	Report no. 05-12	
• Overall assessment			
Overall assessment of the EKLS (FECAR)	Date 10 November 2005	Report no. S 05-12	

Test results

• Preliminary test of outer part			
– Penetration of test body		yes <input type="checkbox"/> / no <input checked="" type="checkbox"/>	
– Additional observations		none	



• Preliminary energy test (50%)	125 kJ
– Penetration of test body	yes <input type="checkbox"/> / no <input checked="" type="checkbox"/>
– Braking time t_s	0.20 s
– Braking distance b_s	3.25 m
– Sum of the tensile forces in the 2 upper cables	112 kN
– Sum of the tensile forces in the 1 lower cables	81 kN
– Maximum of the tensile forces in a stay cable	35 kN
– List of damaged elements	
No damage to parts of the installation as a whole (6 of the 8 braking components were deformed).	
– Assessment of repairs	
The central part of the net was replaced and the support ropes were tightened. This took 8 man-days.	
The repairs necessary after the test were assessed as minor.	
• Main energy test (100%)	250 kJ
– Penetration of test body	yes <input type="checkbox"/> / no <input checked="" type="checkbox"/>
– Braking time t_s	0.27 s
– <i>Maximum permissible braking distance b_s</i>	5.0 m
– Measured braking distance b_s	4.05 m
– <i>Minimum permissible residual braking height h_n</i>	1.0 m
– Measured residual braking height h_n	1.35 m
– Sum of the tensile forces in the 2 upper cables	145 kN
– Sum of the tensile forces in the 1 lower cables	94 kN
– Maximum of the tensile forces in a stay cable	51 kN
– List of damaged elements	
The load-bearing structure suffered only very slight, visible damage. One flange of the T profile welded onto the ground plate was slightly bent as a result of leverage by the shackle. One strand of the lower support rope tore at the foot of the post and came out of the rope.	
6 of the 8 braking components were deformed.	
• Assessment of special criteria	
– Comments on assembly and on the assembly instructions	No particular difficulties were encountered with assembly.
– Comments on adaptability to the terrain	Adaptability to the terrain is normal.
– Comments on design complexity	The design is simple. Damaged components are easy to replace.



– Comments on anticipated life cycle

Anchor bolts and posts are not galvanised as standard. The manufacturer recommends galvanisation, in particular for ground plates. The braking rings consist of galvanised steel tubes and aluminium press sleeves.

The anticipated service life is ascertained to be adequate.

Overall assessment

Test passed

Test passed with reservations

Examined based on the following guidelines: GERBER, W. 2001: Guideline for the approval of rockfall protection kits. Environment in practice. Swiss Agency for the Environment, Forests and Landscape (SAEFL), Swiss Federal Research Institute WSL. Berne, 39 pages. Revised June 2006.

RESERVATION: Should deficiencies arise following certification of the safety net, FOEN may revoke product release and delete it from the type approval list.

Date

19.05.2006

Name, position

Andreas Götz, Vice Director

Signatures