Type approval of safety nets for protection against rockfall

Test Certificate No. S07-20

System description

- System designation: ROCCO RXI-150
- Address of manufacturer: GEOBRUGG Fatzer AG Schutzsysteme, Hofstrasse 55, 8590 Romanshorn

System description:

- Energy class: 1500 kJ
- Posts:
  - Profile: HEB 160
  - Length $a_1$: 4.24 m
  - Interval $a_2$: 10 m
- Support ropes:
  - Type: 6 x 36 W-Seale + SE, DIN 3064
  - Diameter: 22 mm
- Net:
  - Type: ROCCO ring net with 12 windings
  - Diameter: Ring diameter 350 mm, wire diameter 3 mm
  - Mesh: -
  - Height $h_v$: 4.25 m
- System drawings:
  - Description: System handbook RXI-150
  - No.: 150-N-FO/EKLS 03
  - Date: 18.07.2007
  - Description: Technical documentation RXI-150
  - No.: EKLS 03
  - Date: 18.07.2007
  - Description: Maintenance handbook RXI-150
  - No.: 108-N-FO/EKLS 03
  - Date: 18.07.2007

Basic documentation

- Field test:
  - WSL test report: Date 31 July 2007
  - Report no. 07-20
- Overall assessment:
  - Overall assessment of the EKLS (FECAR): Date 18 September 2007
  - Report no. S 07-20

Test results

- Preliminary test of outer part:
  - Penetration of test body: yes ☑ / no ☒
  - Additional observations: none
### Preliminary energy test (50%)

- **Penetration of test body**: yes / no ☐
- **Braking time** $t_s$: 0.28 s
- **Braking distance** $b_s$: 4.7 m
- **Sum of the tensile forces in the 2 upper cables and the guy rope**: 322 kN
- **Sum of the tensile forces in the 2 lower cables**: 175 kN
- **Maximum of the tensile forces in a stay cable**: 123 kN

- **List of damaged elements**
  - No damage to the load-bearing parts of the structure. All 16 breaking elements were deformed.

- **Assessment of repairs**
  - 16 breaking elements and the middle part of the net were replaced. The work took 24 man-hours. The repairs necessary after the test were considered to be normal.

### Main energy test (100%)

- **Penetration of test body**: yes / no ☐
- **Braking time** $t_s$: 0.37 s
- **Maximum permissible braking distance** $b_s$: 9.0 m
- **Measured braking distance** $b_s$: 6.30 m
- **Minimum permissible residual braking height** $h_n$: 2.0 m
- **Measured residual braking height** $h_n$: 2.4 m
- **Sum of the tensile forces in the 2 upper cables and the guy rope**: 375 kN
- **Sum of the tensile forces in the 2 lower cables**: 227 kN
- **Maximum of the tensile forces in a stay cable**: 211 kN

- **List of damaged elements**
  - No damage to the load-bearing parts of the structure. In the middle part of the net one ring broke. All 16 breaking elements were deformed.

### Assessment of special criteria

- **Comments on assembly and on assembly instructions**
  - The assembly presents no particular difficulties.

- **Comments on adaptability to the terrain**
  - The adaptability to the terrain is normal.

- **Comments on design complexity**
  - Using the documentation supplied, safe and simple assembly is possible.

- **Comments on anticipated service life**
  - Depending on the service life required of the installation, parts with different levels of corrosion protection are supplied. The net has an aluminium-zinc coating (150 g/m2).
  - The anticipated service life is ascertained to be adequate.
Overall assessment

☑ Test passed  ☐ Test passed with reservations


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

Date  Name, position  Signatures
8.11.2007  Andreas Götz, Vice Director  

Federal Office for the Environment FOEN
Risk Prevention Division
3003 BERN
http:// www.bafu.admin.ch/typenpruefung