Rockfall Protection

BALMI-TSCHUGGEN, CH
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Rockfall Protection

Project
Balmi-Tschuggen

Street
Brünigstrasse

Zip code
3856

Place
Brienzwiler

Country/Region
Switzerland

Year of installation
2015

Customer
Bundesamt für Strassen (ASTRA)

Engineering
IMPULS AG

Contractor
Gasser Felstechnik AG

Initial situation
The existing rockfall barriers above national highway A8 over the Brünig Pass were greatly weakened after years of prevalent heavy snowfalls and had to be replaced. Therefore, the Swiss Federal Roads Office (ASTRA) in 2014 invited IMPULS AG to consult the new project (installed by Gasser Felstechnik AG).

Description
A total of eleven lines* with energy absorption capacities between 1,000 and 2,000 kJ were installed:

- 1000 kJ: height = 6 m, length = 30 m
- 1500 kJ: height = 6 m, length = 56 m
- 2000 kJ: height = 5 m and 6 m, length = 122 m

In addition, five lines were dimensioned for rockfall as well as for snow slide so that multi-hazard barriers were installed:

- 2000 kJ: height = 5 m and 6 m, length = 139 m

* The RXI barriers used are now superseded by the RXE barriers.

Protected object
Road

Corrosion protection
Galvanized

Energy absorption capacity
2000 kJ, 1000 kJ

System height
5.0 m, 6.0 m

System length
16 m - 80 m
View from the protected road of two barriers: On the line 1.1 (2000 kJ, H = 6 m) installed on the bare rock face and on the line 1.7 (2000 kJ, H = 5 m) installed on a very steep and high slope.

Technical pre-approval of the line 1.2 (1500 kJ, H = 6 m).

View from above the line 1.3 (1000 kJ, H = 6 m).
In anticipation of small diameter falling rocks on the line 1.2 (1500 kJ, H = 6 m), a very fine secondary mesh was installed (25 mm x 25 mm) along with the barrier.

View of heavy traffic and the rockfall barrier protecting the road from above the 1.2 line.

The very same day of installation acceptance by the customer (ASTRA - Federal Roads Office), several blocks were successfully retained by the line 1.9 (2000 kJ H = 5 m, adapted to withstand snow pressure).
View of the lines 1.9, 2.0 and 2.2 (all 2000 kJ, H = 5 or 6 m). Due to their location, they are also adapted to withstand snow pressure.

Impact October 2019 and the protected road

Rockfall impact October 2019
Successful rockfall protection

"... blocks of about 3.5 Cubic meter ..."
(Jungfrau Zeitung, November 1st, 2019)
For questions please contact our Gebrugg specialist at your side

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