

Rockfall protection strategies in the Tarentaise Valley

Topic: Protection of the road and railway from rockfall hazards

Stakes: Maintain the unique access to a valley (ski resorts, a chemical plant) served by a road and a railway

Keywords: protective structures (rockfall detection wires, flexible barriers, embankments, mesh drapery system), monitoring (radar), linear infrastructures (road and railway)

Stop 1: Ponsérand slope

The safety of the RN90 with respect to rockfalls is a major concern for the road manager at the level of the Ponsérand gorges. One lane is in a tunnel but the other lane is exposed to rockfalls of a few tens of m³ which can reach the road after propagation in the slope with a very high energy level. Various structures have been successively set up: mesh drapery systems, flexible barriers and embankments. Works in 2022 allowed the installation of 8000 kJ flexible barriers. To ensure the safety at the work site, an operational monitoring system (GB-Insar) has been set up with difficulties to monitor the cliffs at the top of the slope. The continuous improvement of the protection structures is carried out in parallel with the search for alternative solutions for the road.



Ponsérand slope



Net screens 8000 kJ - Ponsérand slope

Etape 2 : Saulcette

After Moutiers, the national road is diverted to avoid the unstable slope. On the other hand, the historic railway line (helicoïdal tunnels) is forced to cross a site known from falling rocks. This line is strategic for some big issues : ski resorts around Bourg Saint Maurice (trains from London), plus a chemical factory strongly dependent on the train. Shortly after latest rockfall event and because the geotechnical background do not allow easily an embankment, a protection strategy was decided with the installation of 3 additional lines of parades :

1. mesh drapery systems (attenuating the energy and the height of trajectories)
2. rockfall flexible barrier CE 5000 kJ
3. warning system (DCR detection) of ultimate events exceeding the capacity of lines 1 and 2

A particular focus will be discussed on foundations (scree) and safety for crews during job (real-time radar monitoring).



Protective devices - La Saulcette slope