

Wyssen Reference Projects

Avalanche Protection at Trans Canada Highway #1



Safety through **innovation**

WYSSSEN switzerland **avalanche control**



Avalanche Protection at Trans Canada Highway #1

Project:	Avalanche Protection at Trans Canada Highway #1
Place:	Revelstoke, BC
Country:	Canada
Year:	Installation 2016 and 2017
Customer:	Ministry of Transportation and Infrastructure (MoTI)
Protected Object:	Road and townw
Installed Systems:	9x Wyssen Avalanche Tower 12 shots



Initial Situation

The Trans Canada Highway #1 is the main highway from East to West in Canada. It is over 7000 km (4,350 miles) long and therefore one of the longest traffic routes in the world. Especially in the area Rocky Mountains and Columbia Mountains between Banff and Salmon Arm the highway passes through mountain regions with many avalanche paths that directly affect the road (e.g. Kicking Horse Pass, 3 Valley Gap or Rogers Pass).

In the 3 Valley Gap area avalanche control, up to now, could only be performed by deploying explosive charges from a helicopter or by preventive closures. The challenging terrain and weather conditions made avalanche control by helicopter a risky task and limited these operations to flying conditions (e.g. daylight).



Our solution

In 2016 Wyssen Avalanche Control got awarded to build 9 Remote Avalanche Control Systems (RACS) in the 3 Valley Gap avalanche starting zones. The terrain is characterized by gully features on a steep forested rock face which ends up nearly vertical on the highway. The exposure of the highway to avalanches and rockfall in the 3 Valley Gap area is significant.

The work terrain at the locations where the towers were planned to be installed is very challenging due to rockfall, close proximity to the highway and is mostly only accessible by rope access. This situation was further complicated as only a limited amount of closures was available (considering that the shortest detour for traffic is 6 hours). After extensive preparation it took Wyssen and its team led by Walter Steinkogler around 1 month to successfully install 4 avalanche towers.



Operational experience

Closure times

Already in the first year, with only 4 towers out of 9, the overall closure times (including snow removal) were reduced by 50%. The time needed for avalanche control itself was reduced from approximately 1 hour (for preparing charges, loading helicopter, flying there and performing control) to about 5 minutes (initiation of all towers at the same time).

The installed Wyssen towers allow performing avalanche control at any time (e.g. day and night) and in a very fast and efficient manner.

Worker Safety

The installed RACS allow separating the risks involved when handling explosives from the operational risks during avalanche control. All deployment boxes are prepared and loaded in the fall when operational pressure on workers is minimal. At the time of avalanche control, the avalanche control team only needs to focus on the tasks and not manipulating explosives.

Worker resources

Usually when avalanche control is needed in the 3 Valley Gap region other areas along the highway also see avalanche activity. The time efficient operation of the RACS allow to free worker resources for other areas where avalanche control is needed.





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