

Experiences from full-scale rockfall testing of protection gallery

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Vertical drop tests have been performed at the Swiss *Oberalppass* road. The planned deconstruction of two avalanche protection galleries enabled a precedent evaluation of one gallery (*Parde 1* regarding its capacity against rockfall. The background for this evaluation was also to evaluate an existing model for predicting the protection capacity of a rockfall gallery. Based on this model existing galleries can be evaluated whether their residual capacity is sufficient or if it is necessary to strengthen the structure according to the current guidelines. This contribution focusses the conduction of the experiments and the experiences obtained from. The presentation gives details on experimental setup, impact characterization, gallery performance, weather implications, data retrieval and data analysis.

According to the limited time span for testing and the resources available, a compact testing series has been setup. Three fields of the gallery were tested with drop weights of 800, 1600 and 3200 kg falling from up to 25 m height. The blocks were lifted by a mobil crane. The concrete roof is supported by columns on the valley side and on the mountainside simply supported on the retention wall. The roof slab spans approximately 6x5 m with a thickness of about 0.60 m and is covered by a soil cushion, which has been unified to 0.40 m thickness previous to the test. Additional wooden columns have been installed at the roof's valley side to avoid a failure of the concrete columns and to favorize a failure of the roof itself due to bending or punching. The measurements performed consist of high speed video records, accelerations within the impactors and on the bottom surface of the gallery roof.