



# LENK, BERNESE ALPS, SUÍÇA

Proteção contra correntes de detritos

# Lenk, Bernese Alps

## Proteção contra correntes de detritos

<b>Projeto</b>	Lenk, Bernese Alps
<b>Lugar</b>	Lenk Seiten
<b>País</b>	Suíça
<b>Ano de instalação</b>	2017
<b>Promotor</b>	Community of Lenk
<b>Empreiteiro</b>	Emch+Berger AG Bern
<b>Contratante</b>	Steiger Ingenieure + Planer AG
<b>Outras empresas envolvidas</b>	Burn & Künzi AG

### Situação inicial

The village of Lenk in Simmental valley (Bernese Oberland) was already affected by debris flows in the past. For example, mudflows in summer 1930 from side streams clogged the bed of the river Simme what caused a deluge in the village. Access to this mountain village - street and rail - was also blocked. During this large event, the quantity of debris flow was estimated as 135'000 m<sup>3</sup>.

Many other minor to medium events were observed in the following decades. After a flood in 2005 (with minor damage), the danger map was revised and the present project was launched.

The origin of the debris flow mobilization area is mainly a slump in the Bühlggraben as well as the strong gut erosion of the alluvial soils below it. The catchment area covers an area of around 20 km<sup>2</sup>. It is assumed that the debris flows occur in several discharges. The location of the barrier is at the end of a winding stream.

Based on a 3D debris modeling (RAMMS DEBRIS FLOW, carried out by Emch + Berger AG from Bern), the input parameters for the dimensioning flexible barriers were obtained. The final solution is dimensioned with a retaining capacity of 70'000 m<sup>3</sup> (in four to five bays of 15'000 m<sup>3</sup> each) and flow velocities up to 9 m/s.

### Descrição

To prevent medium size debris flows reach the riverbed of the Simme, a restraint system for sludge and driftwood was created in geologically very demanding terrain. The annual normal water discharge with smaller solid particles can easily pass through the basal opening.

Due to the required spans and the specified loads, a design with concrete slabs was chosen. For this purpose, Geobruugg dimensioned the nets and ropes between the concrete slabs (based on the Geobruugg standard barrier VX160-H6). The design of the concrete slabs was developed by Emch + Berger AG Bern.

The six foundations of the concrete slabs were securely deeply seated using 15 m deep reinforced pails.

Nevertheless, in the case of a major event, this retention volume could be exceeded. Then the remaining debris material passes via the overflow section in the middle of the barrier.

### Objecto protegido

Estrada, Caminho de ferro, Edifício, Infra-estrutura turística, Área residencial, Infra-estrutura, Outros

<b>Proteção contra a corrosão</b>	GEOBRUGG SUPERCOATING
<b>Altura do sistema</b>	5.0 m, 7.0 m, 10.0 m, 12.0 m
<b>Comprimento do sistema</b>	40 m - 40 m
<b>Número de barreiras</b>	1
<b>Capacidade de retenção</b>	40000 m <sup>3</sup>

**Em caso de dúvidas por favor contacte com nosso especialista Geobrugg na sua área**

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