



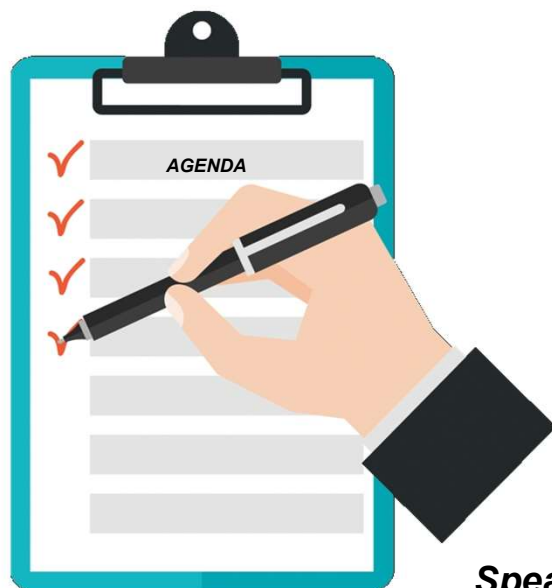
EFFECTIVE ROCKFALL BARRIERS FOR LOW ENERGY IMPACTS

Date 24 February, 2022

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Webinar Agenda?

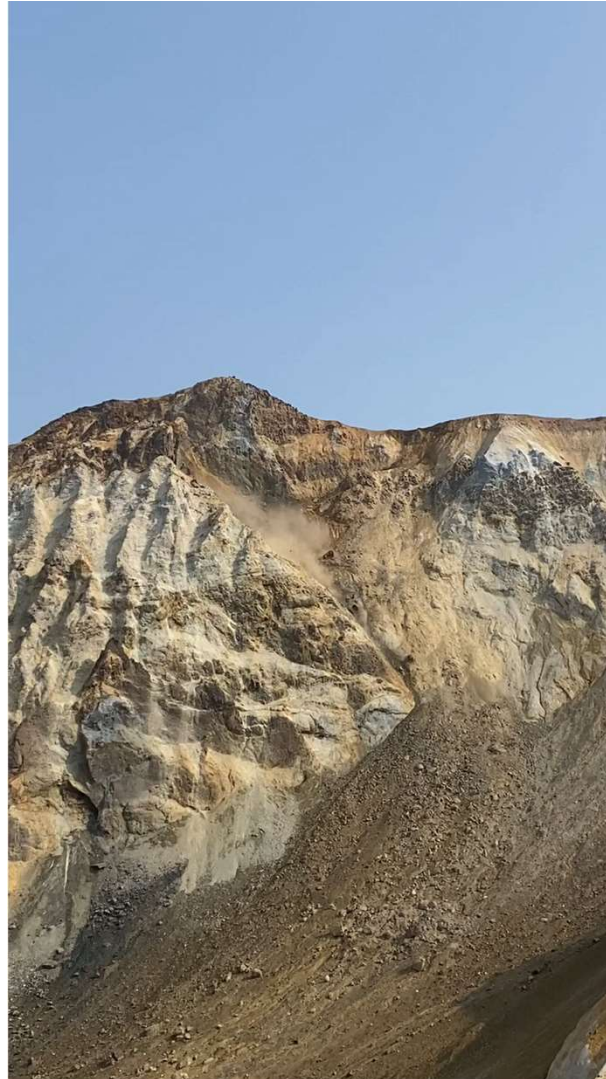
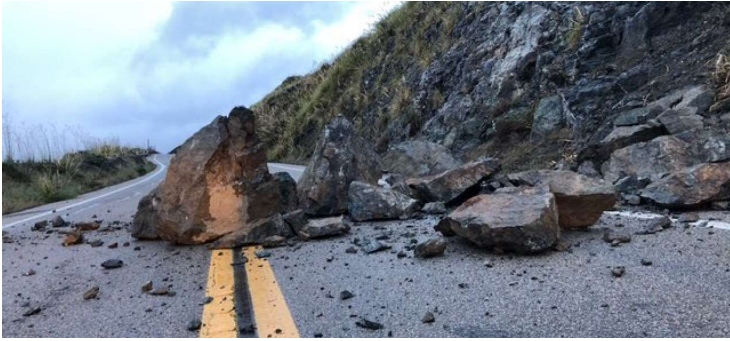


5' *Introduction*

20' *Effective rockfall barriers for Low Energy Impacts*

10' Live Q&A Session

Speaker: Fabien Gazado – Business Development Manager - Rockfall
Luca Gobbin – Corporate Technical Specialist



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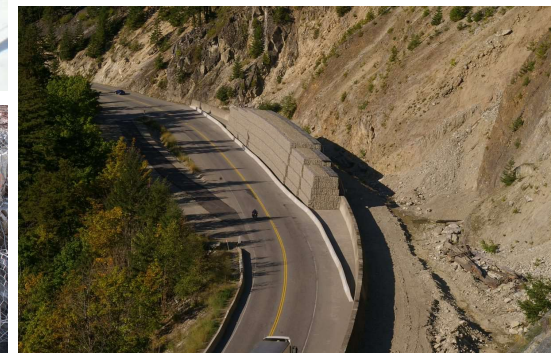
**Rockfall
protection and
rockfall mitigation
are key elements
in the security and
safety of
infrastructure,
buildings and
people**

OUR COMMITMENT TO A CONTINUOUS IMPROVEMENT

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We have developed a 140 years' experience in geohazards mitigation systems. Every day we work to apply the most appropriate solution to the specific hazard.



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We have been continuously working to improve our designs and to provide a wide range of **robust** and **effective** solutions.

ETA CERTIFIED ROCKFALL BARRIERS

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EAD

harmonised technical
specification developed by
EOTA

- Methodology to carry out the Full-Scale Crash Tests
- Definition of the controls on the production procedure and materials



With the aim of maximizing value for clients, we added a new range of rockfall barriers to our portfolio to mitigate hazards coming from low energy impacts.





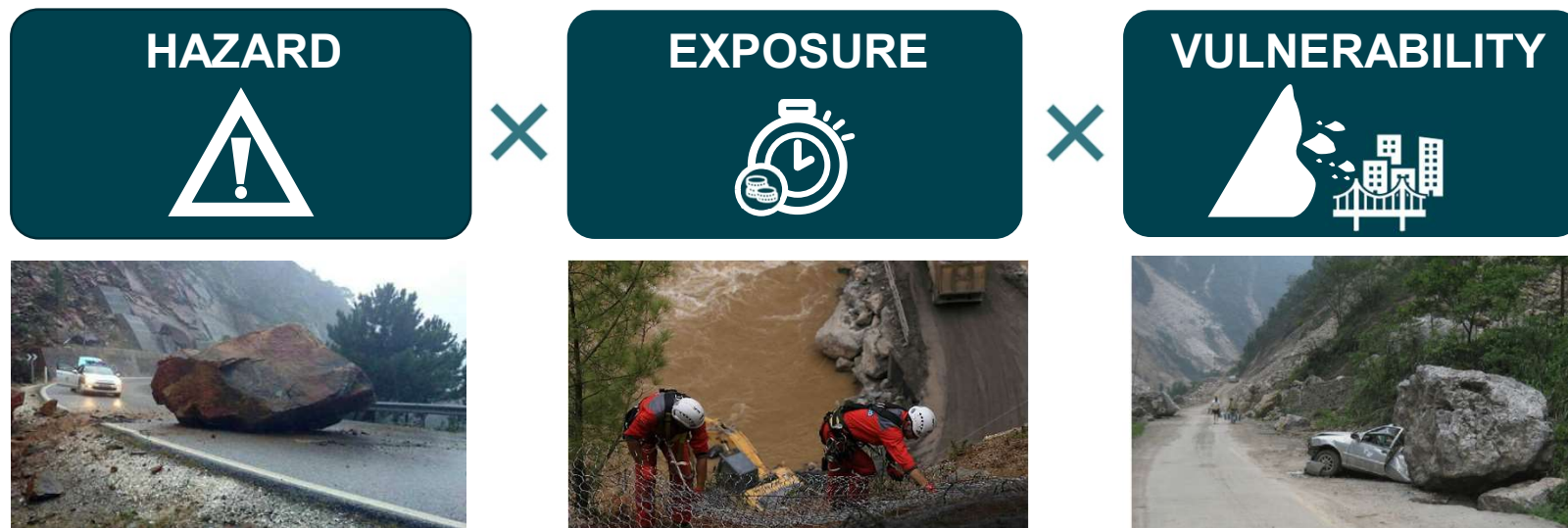
WHY RISK AND UNCERTAINTY ANALYSIS IN THE ROCKFALL SECTOR?

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When facing a geohazard problem, we deal with risk.
Loss and damage are a function of hazard, exposure and vulnerability.



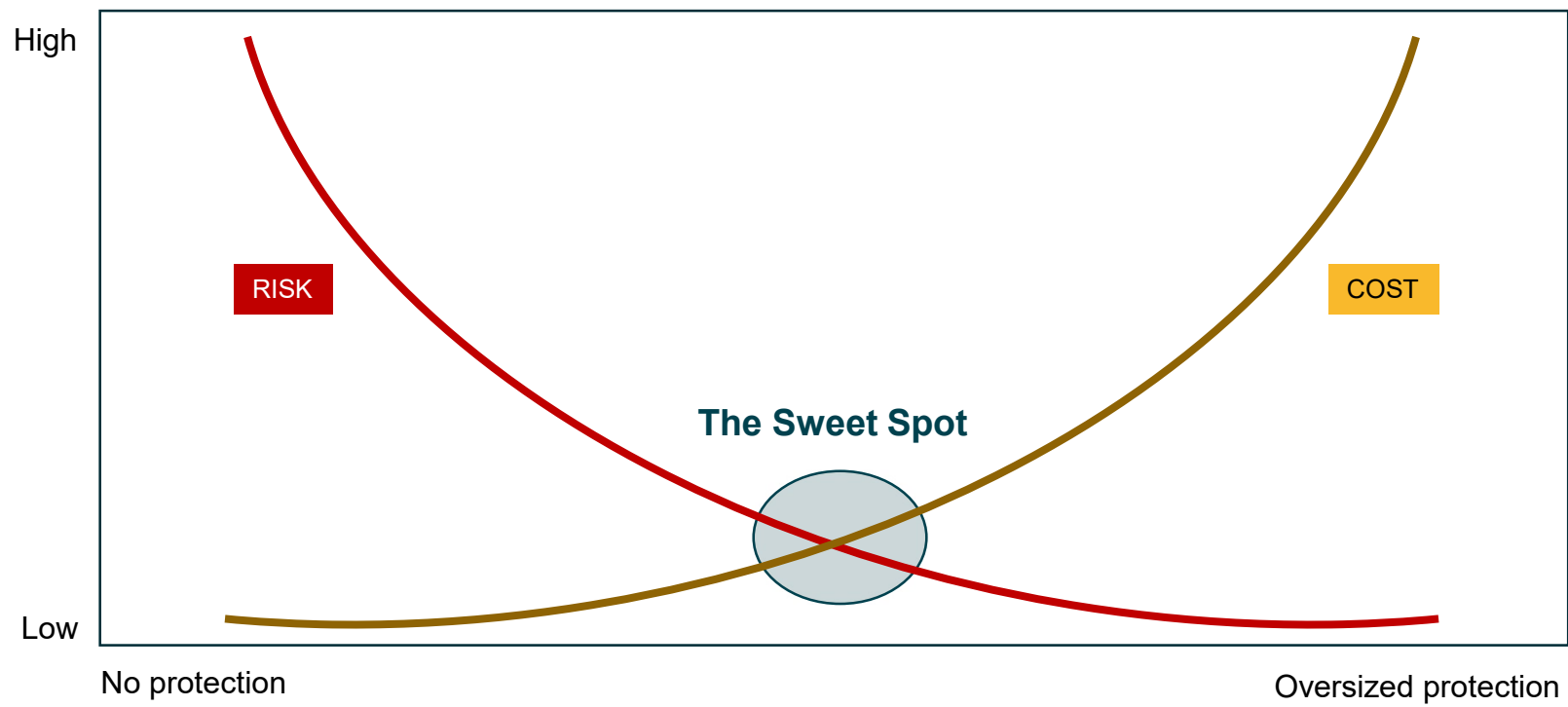
RISK



Source: Protezione civile, Italy

COST-EFFECTIVENESS IN ROCKFALL

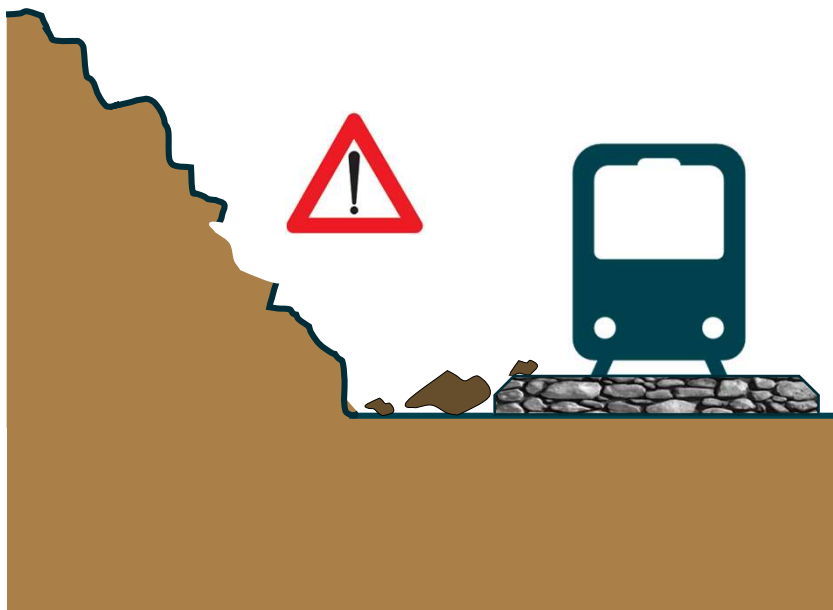
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LOW ENERGY IMPACTS

Even small debris can have a high disruption potential

Rockfall hazards are not always related with the falling of big boulders.
For impact energy **below 100 kJ**, traditional rockfall barriers are not a cost-effective solution.



OUR RANGE OF BARRIERS FOR LOW ENERGY IMPACTS

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We tested a series of barriers for impacts lower than 100 kJ in accordance with the specific EAD for *FALLING ROCK PROTECTION KITS WITH ENERGY LEVEL LESS THAN 100kJ.*



European Organisation
for Technical Assessment

EAD 340089-00-0106 GUIDELINE FOR EUROPEAN TECHNICAL APPROVAL OF FALLING ROCK PROTECTION KITS WITH ENERGY LEVEL LESS THAN 100kJ – 2019

1. Defines the methodology to carry out the **Full-Scale Crash Tests**
2. Defines the **controls** on the production and materials

ETA (European Technical Approval)

The **Energy Level (EL)** is defined as the highest level of energy to which the barrier can withstand.

Actually, it is the minimum value for the **domain of resistance** of the barrier.



The test is passed if:

- M** The barrier stops the block
- M** The block has not touched the ground before the barrier has reached its maximum elongation
- M** Residual height must be equal or superior to 70% of the nominal height.

EAD 340089-00-0106 doesn't refer to any category concerning the residual height



EAD < 100kJ vs EAD ≥ 100 kJ

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What changes?

EAD 340089-00-0106

- ENERGY LEVEL (EL)
- NOT SEL 1
- NOT SEL 2
- NOT CATEGORIES FOR RESIDUAL HEIGHT

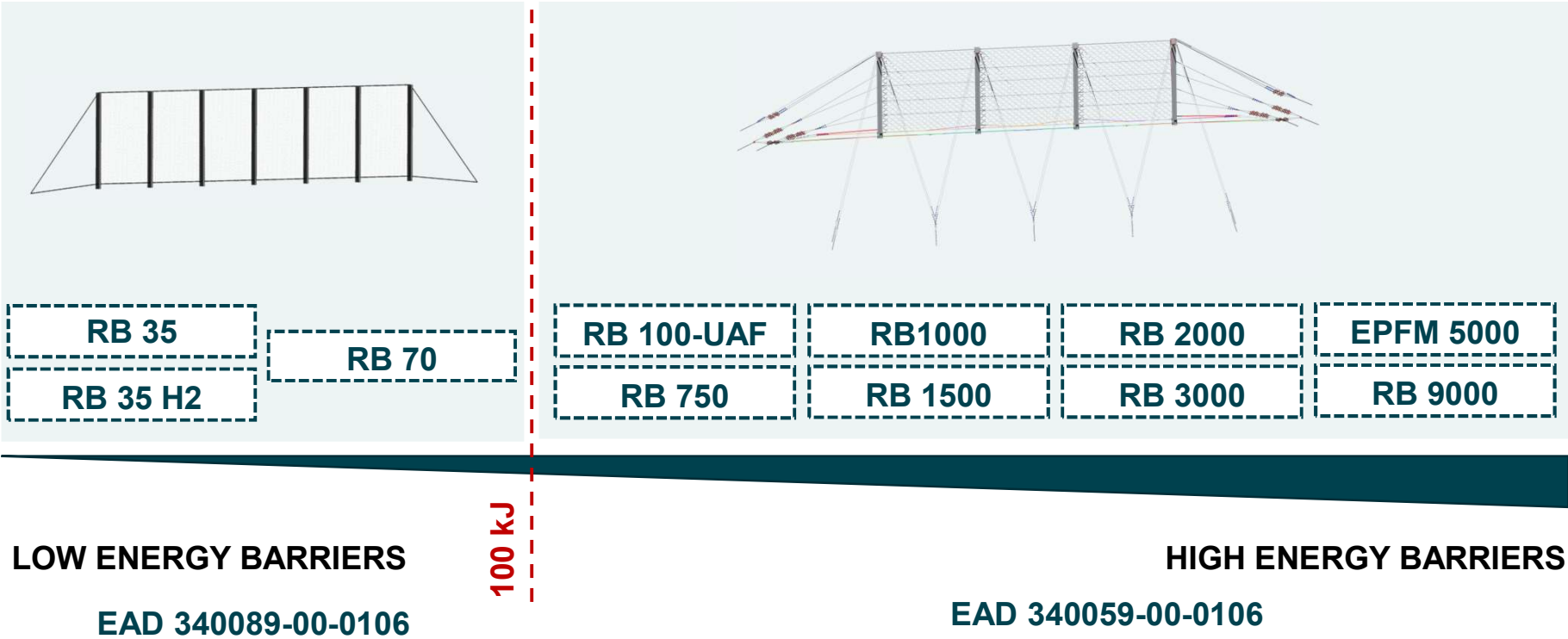


EAD 340059-00-0106 (EX ETAG 027)

- MEL
- SEL 1
- SEL 2
- RESIDUAL HEIGHT CATEGORY (MEL)

MACCAFERRI ROCKFALL BARRIER PORTFOLIO

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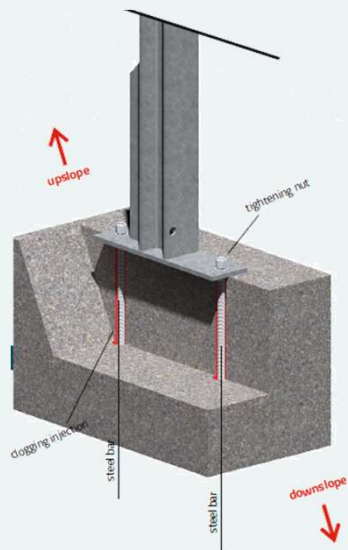
MACCAFERRI LOW ENERGY BARRIERS - PORTFOLIO

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RB 35, RB 35 H2 and RB 70 are available in 3 configurations:

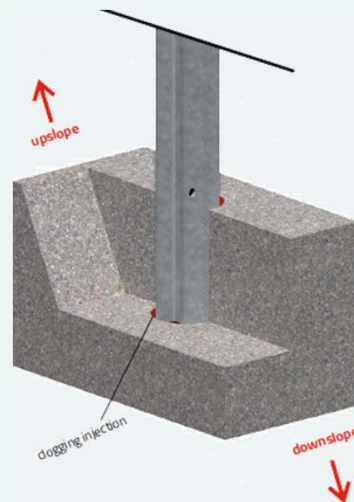
Standard configuration:

with 2 anchors
(for soil or rock)



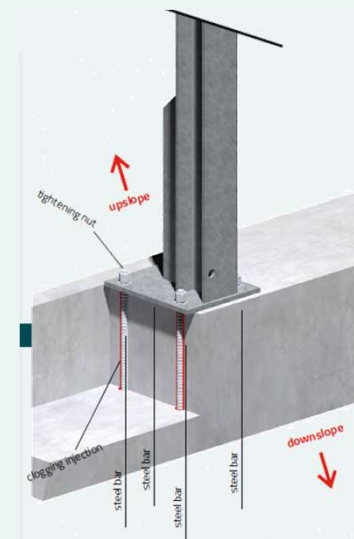
NP configuration:

no plate at the base of the post
(for soil or rock)



CW configuration:

with 4 anchors
(for concrete wall)

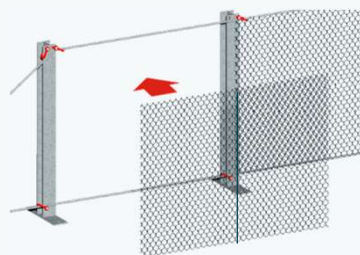


MACCAFERRI LOW ENERGY BARRIERS

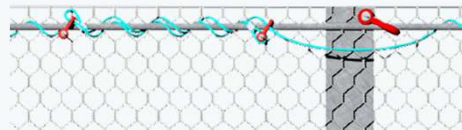
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RB 70 and RB 35

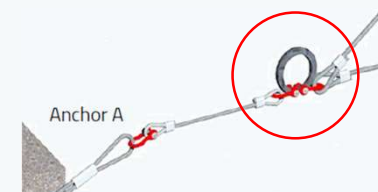
DT mesh **panels** of 4 m length



A sewing rope for the panel / longitudinal wire ropes connection

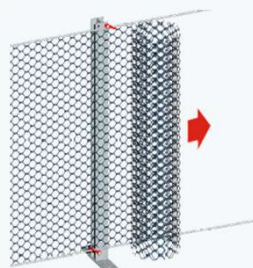


Energy dissipating device on lateral sides

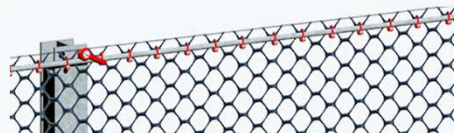


RB 35 H2

DT mesh **rolls** of 21 or 31 m length



Shackles for the roll / longitudinal wire ropes connection

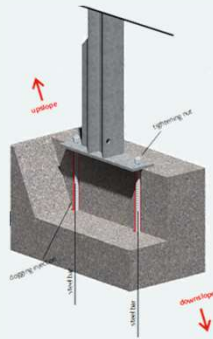


No energy dissipating device on lateral sides



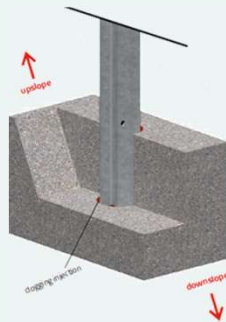
MACCAFERRI LOW ENERGY BARRIERS - ANCHORS

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Standard configuration:
with 2 anchors
(for soil or rock)

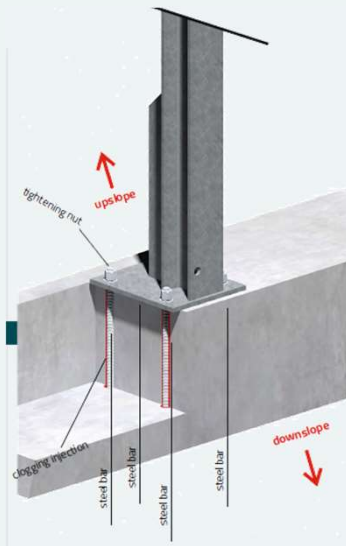
NP configuration:
no plate at the base
of the post
(for soil or rock)



MACCAFERRI LOW ENERGY BARRIERS - ANCHORS

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CW configuration:
with 4 anchors
(for concrete wall)



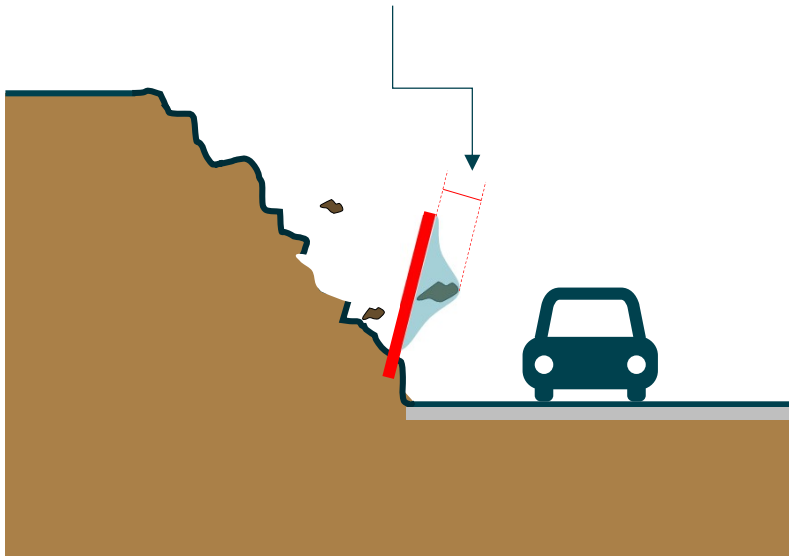


MACCAFERRI'S BARRIERS BENEFITS

SERVICEABILITY

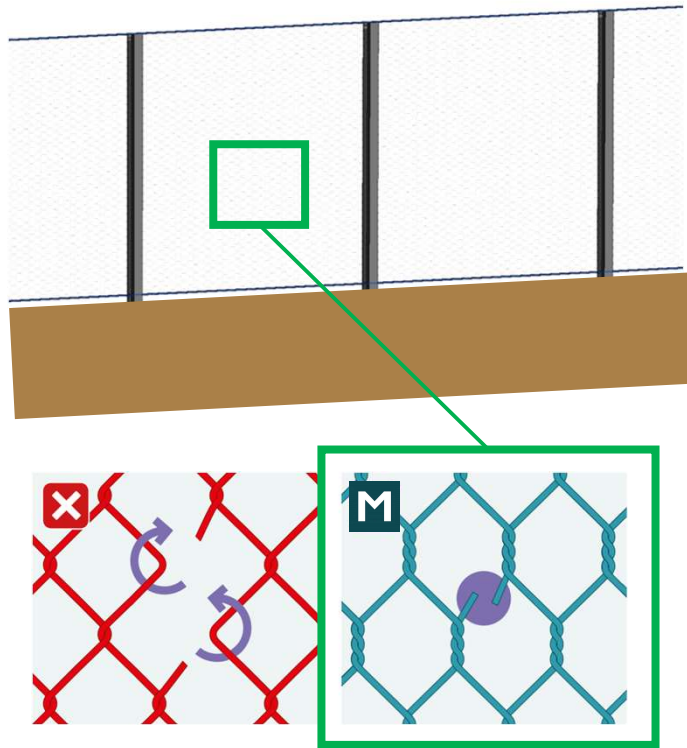
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The **maximum elongation** is an important aspect during the design because the barrier can be installed closer to the protected area



ENHANCED SERVICEABILITY

Maccaferri RB Rockfall Barriers are among the barriers with the shortest elongation on the market, maximising the **serviceability of the protected asset**.



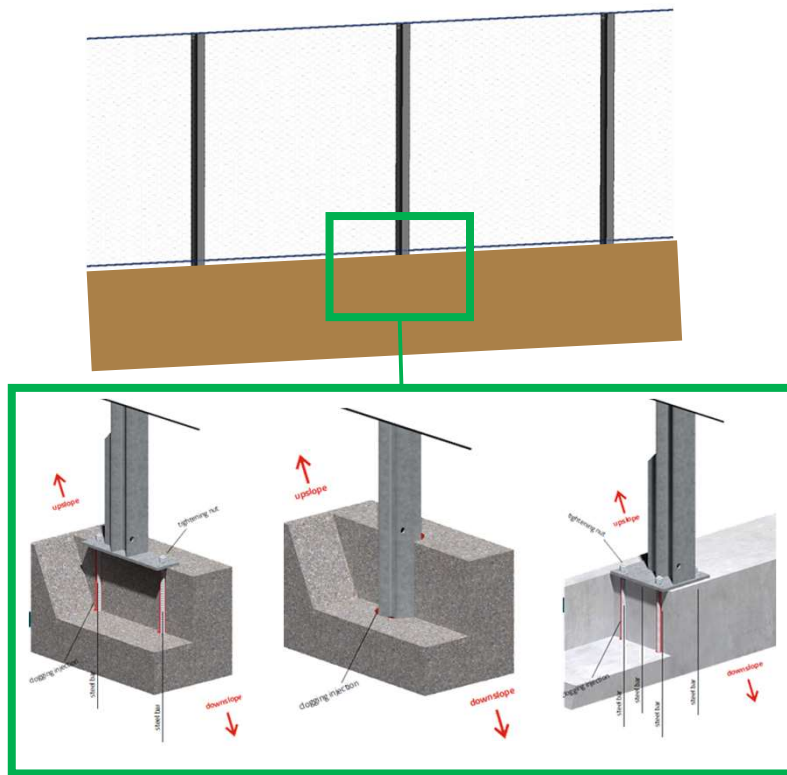
MORE PERFORMANCE

Rockfall Barriers interception structures are made with double twisted wire panels.

Double twist structure prevents the opening of adjacent meshes in case of wire break.

DESIGN OPTIONS

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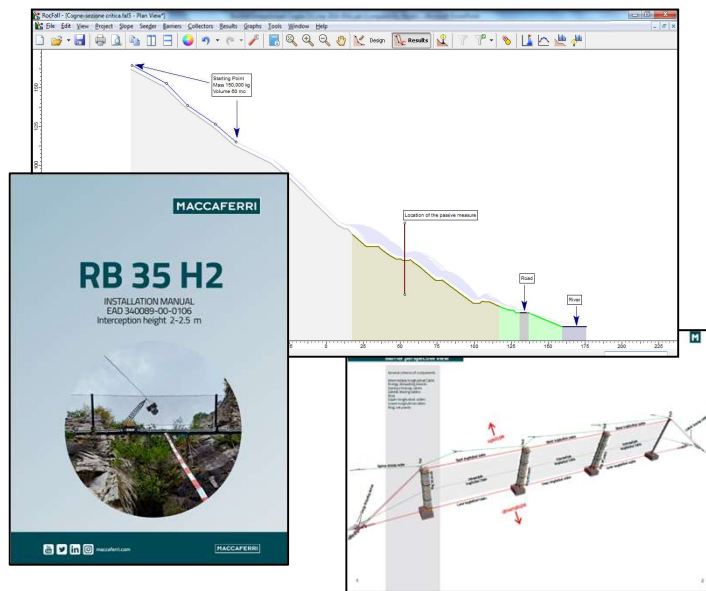


LESS DRILLING

Foundations are an economical fundamental aspect during the installation.

Contractors look carefully at number and length of upslope, lateral & post anchors.

Maccaferri low energy barriers have been designed to provide a wide range of configurations for anchoring the barriers (Standard, NP, CW) for saving drilling operations costs.

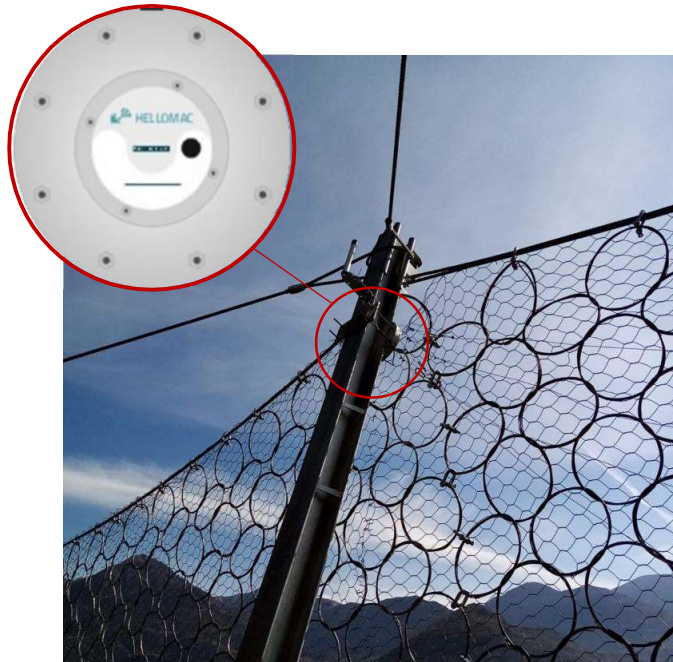


Choosing Maccaferri barriers means having a specialized support during all the project phases:

- M** Design (choice of the barrier)
- M** Installation support (staking out)
- M** Certificate of correct installation & maintenance guide

SMART ROCKFALL BARRIERS

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ALERT SYSTEM FOR
ROCKFALL PROTECTIONS



MAKE YOUR ROCKFALL PROTECTION SMARTER

Discover more about
HELLOMAC in our next
webinar

STAY TUNED!

**EFFECTIVE ROCKFALL BARRIERS FOR
LOW ENERGY IMPACTS**

LIVE Q&A