

How to deal with bridge structure landslides



Overview

This diagram groups landslide mitigation into four core strategies: water control, slope geometry modification, structural reinforcement, and surface protection. Notice that each method changes the stability problem differently. Among these risks, interactions with landslides can sometimes be critical, as landslides can introduce new loads onto the existing structure that were not. Definition: Landslide mitigation is the set of geotechnical measures used to reduce slope movement risk by lowering driving forces or increasing resisting forces. Use case: It is used when natural or constructed slopes threaten roads, buildings, utilities, retaining systems, or long-term site. This paper aims to verify the main causes and mechanisms of collapse of bridges due to landslides, mainly of rocks and soils. Landslides exert forces with a significant horizontal component that may impact the supports, piers, or directly on the bridge deck, leading to deformations and, in extreme cases, collapse. The 390m long bridge consisted of an access part.



Article Content

Jun 04, 2026

Insights into Landslide Interaction with Bridges and Viaducts: Lessons ...

To analyze the complex mechanisms of interaction between a bridge and a landslide, a comprehensive database of case studies concerning bridges located in Italian territory, which have

Jul 08, 2025

Mitigation strategies and measures for the protection of working ...

Landslides and structural problems Bridges belonging to the line stretch Ventimiglia â€œ Breil were mostly affected by erosion phenomena that occurred to bridge piers foundations within the

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The Landslide Handbook— A Guide to Understanding Landslides

Landslides affect manmade structures whether they are directly on or near a landslide. Residential dwellings built on unstable slopes may experience partial damage to complete destruction as

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Understanding Landslide Bridge Interactions Through a

Details on the interaction between the structure and the landslide, the observed damage, and any stabilization or bridge maintenance interventions carried out following the landslide event.

May 19, 2026

Landslide Mitigation Techniques: A Comprehensive Guide -

Landslide Mitigation infographic This diagram groups landslide mitigation into four core strategies: water control, slope geometry modification, structural reinforcement, and surface

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Impact of landslide on bridge superstructures

This paper aims to verify the main causes and mechanisms of collapse of bridges due to landslides, mainly of rocks and soils. First, the ways in which the landslides are presented, including in the form

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Building a bridge over an active landslide Geotechnical and Structural ...

In 2003 a major landslide destroyed a highway in southern Greece causing a mass displacement of about 6.000.000m³. An arched steel bridge was designed over the active landslide creating

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Understanding Landslide-Bridge Interactions through a

The study's findings highlight the importance of implementing preventive strategies and monitoring systems to mitigate the impact of

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Preparing for Natural Disasters: Designing Resilient Bridges | Live to ...

Natural disasters pose significant threats to infrastructure, with bridges particularly vulnerable to damage from earthquakes, floods, hurricanes, and other catastrophic events. In recent

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USGS Circular 1325: The Landslide Handbook—A

The Landslide Handbook—A Guide to Understanding Landslides The Landslide Handbook—A Guide to Understanding Landslides By Lynn M. Highland, United

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Effects of Landslides on the Displacement of a Bridge Pile Group ...

In order to improve the resistance of the bridge structure to the horizontal thrust caused by a landslide, an envelope design or local reinforcement should be adopted to accommodate the

Mar 15, 2026

Landslide-bridge interaction: Insights from an extensive database of ...

The collapse of the Albiano Magra bridge stands as a prominent example of the interaction between landslides and bridges. In this instance, the bridge's failure (Fig. 2) was attributed to a

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Understanding Landslide-Bridge Interactions through a

Infrastructures such as bridges and viaducts are exposed to numerous natural hazards that can compromise their safety and stability over time. Among these risks, interactions with

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Landslide mitigation

Landslide mitigation refers to human construction activities on slopes undertaken with the goal of lessening the effect of landslides. Landslides can be triggered by

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Engineering Measures for Landslide Disaster Mitigation

According to IUGS WG/L, landslide remedial measures are arranged in four practical groups, namely: modification of slope geometry, drainage, retaining structures and internal slope reinforcement. This

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Analysis of the interaction of a landslide with viaduct foundations ...

This article investigates the interaction between bridges and landslides by evaluating the interaction of a landslide with the foundations of a viaduct located on a moderately inclined slope,

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Building Resilience: How Modern Bridges Are

Discover how engineers design modern bridges to withstand natural disasters like earthquakes, hurricanes, and tsunamis.

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Landslide Best Practices Handbook

Landslide Investigation Perform a purpose driven subsurface investigation; samples for laboratory testing, water level readings, and any instrument will be installed during the investigation

Oct 04, 2025

Landslide Preparedness Guidelines for Safety of Buildings on Slopes

The document "Landslide Preparedness Guideline for Safety of Buildings on Slopes" has been developed to provide a basic idea about landslides, triggering factors and mitigation measures to

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Effects of Landslides on the Displacement of a Bridge Pile Group ...

Abstract Engineering practice shows that the deformation of the slide-resistant pile may be transferred to the adjacent bridge foundation on an inclined slope, which can compromise the safety of the entire

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Sustainability of Bridges: Risk Mitigation for Natural Hazards

Considering the vulnerability of bridges to catastrophic events, this study aims to provide a viable method for data collection related to hazards, mathematical modelling of incorporating risk ...

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Seismic response of a motorway bridge founded in an active landslide

In this study we examine a bridge of the Egnatia motorway in Greece, which is supported on pile and caisson foundations on top of an active landslide. A detailed numerical model of the whole structure

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Landslide

Landslide - Mitigation, Prevention, Risk: Landslides pose a recurrent hazard to human life and livelihood in most parts of the world, especially in some

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How to Design Bridges That Withstand Natural Disasters

Bridges play a critical role in connecting communities, facilitating trade, and providing essential access to vital services. However, they are often the first structures to be impacted by

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Understanding Landslide-Bridge Interactions through a

This work presents the development of a database containing 41 international case studies on interactions between landslides and bridges or viaducts. These events are classified according to

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Landslide-bridge interaction: Insights from an extensive database of ...

Recognizing the urgency of addressing this challenge, various countries, including Italy, have introduced guidelines and strategies to manage infrastructure risks and enhance safety.

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Landslide Mitigation Techniques

Landslides are primarily caused by geology, morphology, and human activities, with human factors like inadequate slope grading, poor drainage, and

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Landslide Best Practices

The Landslide Task Force created the Allegheny County Landslide Portal website, which serves as a central location for region-specific landslide data and resources.

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://www.moletenare-ew.co.za>

Email: info@moletenare-ew.co.za

Phone: +86 138 1658 3346

Address: Ningbo, China

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