

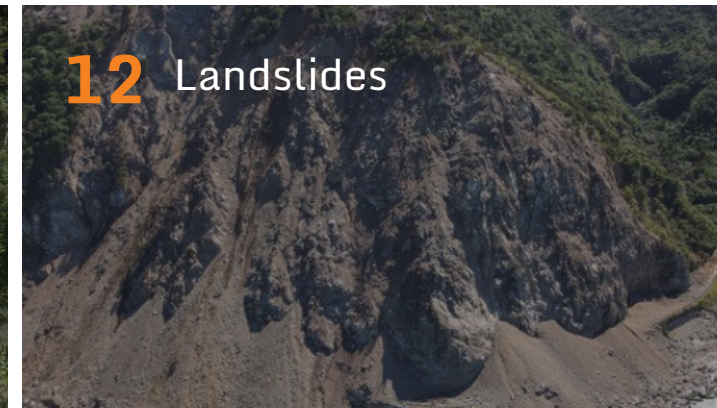
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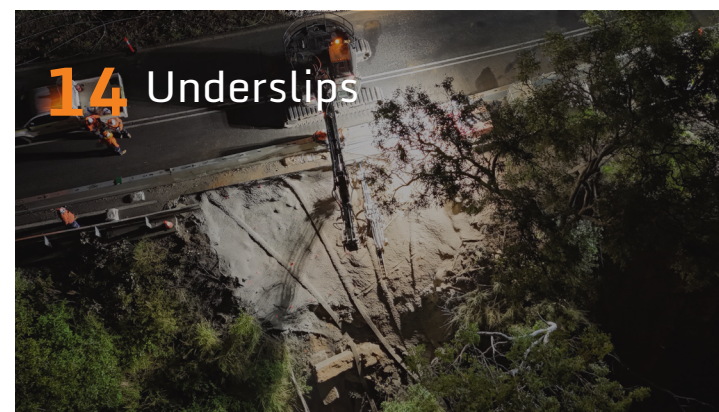
**DISASTER RESPONSE
CAPABILITY STATEMENT**



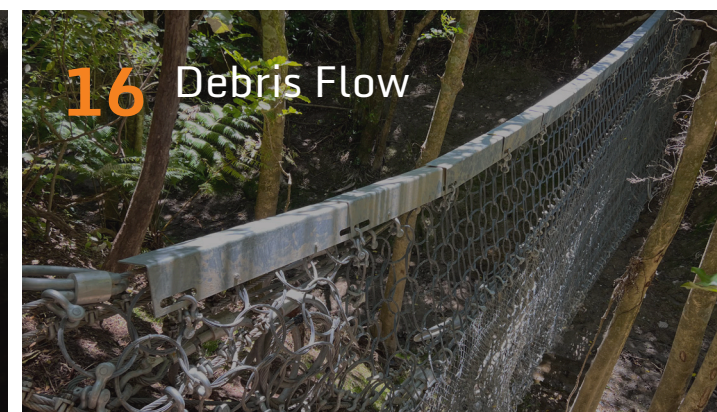
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Geovert is committed to providing Municipal, State and Federal Authorities with a trusted natural hazard mitigation design/build partner who can be called on to rapidly deploy in times of need.

Pukurua Bay Emergency Slope Stabilization
- Wellington, New Zealand



Underslip Emergency Works
NSW Australia

Geovert Experience

Recognized as a leading authority in Natural Hazard Mitigation Solutions, Geovert's reputation as a pioneer and industry leader is built on a 25-year track record of emergency response services in high-trust scenarios. Having managed some of the most catastrophic natural disasters in recent times, our success in reconnecting lifeline routes for affected communities is a point of pride for the whole company. Our expertise spans a wide range of natural disasters, including earthquakes, fires, hurricanes and cyclones, across multiple continents.

SOLUTIONS: We offer slope stabilization, landslide remediation, rockfall protection, debris flow protection, and avalanche mitigation.

TRUSTED PARTNERSHIPS: We collaborate with private sector entities, municipal, state and federal authorities, providing reliable capabilities with trust and transparency.

DESIGN-BUILD CAPACITY: Our turnkey, one-stop-shop approach significantly reduces response time without compromising the involvement of trusted professional engineering consultancies.

RAPID DEPLOYMENT: With extensive engineering, management, skilled technicians and specialized plant & equipment resources across USA, Canada, Australia & New Zealand we can mobilize quickly.

CONCURRENT DESIGN & IMPLEMENTATION: Our "Start with The Answer" approach allows for immediate action while detailed designs are developed concurrently by trusted consultants with appropriate Professional Engineering licenses.

SAFETY FOCUS: We prioritise safety in both design and construction phases of our projects.

Some of our valued partners...



DISASTER RESPONSE: Assess & Make Safe

Diana Falls Emergency Rockfall Protection
- New Zealand



FEMA Forest Fire Disaster Response
- Gallinas Canyon, New Mexico

Assess & Make Safe Lifeline Routes Connecting Communities & Affected Infrastructure

In the aftermath of a catastrophic natural disaster, it is vital that lifeline routes can be safely re-opened to connect communities to emergency services, fuel and water. The implementation of a systematic, multi-phase response protocol is critical for effective management and risk mitigation. As geotechnical specialists, our approach combines rapid mobilization capabilities with comprehensive hazard assessment methodologies, engineered stabilization techniques, and data-driven decision-making frameworks to work hand in hand with disaster response teams including US&R, USAE and FEMA.

The following key operational elements form the backbone of our first response strategy, designed to address both the technical complexities of geohazard management and the crucial aspects of public safety:

RAPID DEPLOYMENT: Mobilize engineering, specialized teams and equipment to affected areas within hours of notification.

INITIAL ASSESSMENT: Our in-house geohazard experts will conduct swift, comprehensive evaluations of impacted infrastructure and geohazards.

EMERGENCY STABILIZATION: Implement immediate measures to prevent further damage including securing lifeline routes and ensuring public safety.

COMMUNITY SUPPORT: Establish communication channels with local authorities, US&R and emergency response teams and provide expert advice on immediate safety measures.

DATA COLLECTION: Gather crucial information to inform subsequent stages of response and long-term solutions.

DISASTER RESPONSE MISSION: Geohazard Solutions & Construction



FEMA Emergency Project
- Gallinas Canyon, New Mexico



Rockfall Mitigation Works
for USBR - Hoover Dam

GEOHAZARD PROTECTION: Emergency Response through to Permanent Solutions

With our expert team involved early to develop solutions for slope failures, debris flow and rockfall hazards, effective temporary protection solutions can be accomplished without compromising on long-term resilience. Our approach recognizes that initial emergency responses can provide temporary remediation measures which can be developed into long-term permanent solutions which leave more resilient infrastructure assets for the future. Our protection measures are put in place to reconnect communities and provide pivotal access to lifeline routes for emergency services. This is done with a strong focus on safety for these vital pathways.

Through careful engineering, temporary installations are used to address immediate hazards while informing and complementing subsequent permanent infrastructure. This progression from emergency response to optimal, transparent value is maximised from the use of public funding

An Emphasis on Safety

The US Bureau of Reclamation recently commented on Geovert's record after completing work at the Hoover Dam, managing rockfall risk in a high-value and high-consequence environment:

"Geovert's exemplary safety record not only safeguarded the well-being of all personnel but also resulted in uninterrupted project progress and avoided costly delays associated with accidents."

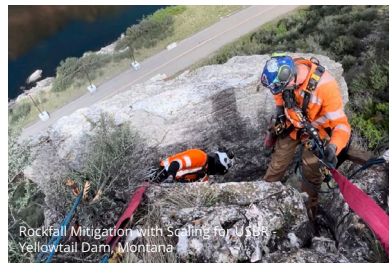
Their dedication to safety has set a benchmark for industry standards and has provided the Government with the confidence that the project is being managed with the highest regard for human life and safety. Their performance in safety is truly commendable and justifies the Exceptional rating, as it has been a significant benefit to the Government throughout the contract."



1.0 Upslope Rockfall

Rockfall Explained

Loose and unstable surface debris located above active work zones that pose a hazard to personnel, equipment, and infrastructure below.



Rockfall Mitigation with Scaling in aid of Yellowtail Dam, Montana

ROCKFALL SCALING

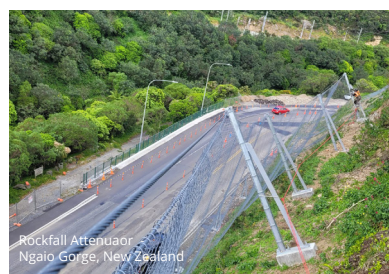
- Best utilized as a quick “Make Safe” solution for addressing overhead hazards in work areas.
- Quickly reduces immediate surface hazards.
- Rope Access teams deployed in Geovert standardized top-down approach to keep technicians safely above hazards at all times.



Geovert PSMB-015, Portable Small Mesh Barrier for CDOT Scaling - 17th Colorado

TEMPORARY ROCKFALL BARRIERS

- Temporary rockfall barriers to quickly protect active work zones and infrastructure.
- Systems can quickly be placed via helicopter assistance or via rope access teams.
- Installation of a Geovert rockfall, shallow landslide or debris flow barrier system can allow work to continue above and eliminate transport corridor interactions.
- Barriers can be used to allow transport corridors to operate contemporaneously to the works, which can be vital for emergency services on a lifeline route.



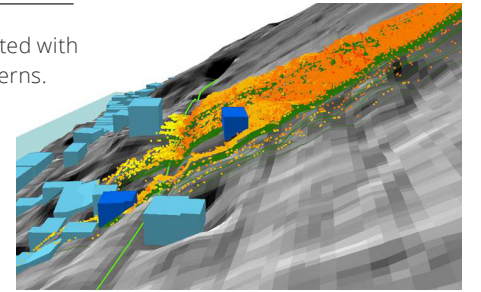
Rockfall Attenuator, Ngaio Gorge, New Zealand

CABLE NETTING & DRAPING

- Drape and rockfall attenuator designs can be used to reduce bounce height and kinetic energy from rockfall.
- Systems can quickly be placed via helicopter assistance or via rope access teams.
- Rockfall attenuator are rockfall barriers where the mesh is draped from the top support rope thus allowing energy to be dissipated but not completely halting rockfall.

3D Rockfall Modeling

Following the devastating Christchurch earthquakes of 2010-2011, Geovert collaborated with the Canterbury Earthquake Recovery Authority (CERA) to address critical safety concerns. Through comprehensive 3D modeling of earthquake-triggered rockfall zones and detailed cost-benefit analyses, Geovert delivered a complete design-build proposal that included specific protection systems, construction timelines, and detailed cost estimates to help secure Christchurch’s future safety.



[Read more about the CERA 3D Rockfall Modeling study here](#)

Rockfall Solution Case Study



10,000kj Rockfall Barrier Installation, Kern, California

KERN ROCK BARRIER & ROCKFALL ATTENUATOR

Overview

As part of critical geohazard mitigation works to protect dam infrastructure in Kern, California, Geovert were engaged to install a huge, specially modified 10,000kj rockfall barrier system. Geovert mobilized rapidly to procure this high-capacity flexible barrier system which incorporates high-tensile steel nets and energy-dissipating brake elements, offering a balance of strength and flexibility.

This system was chosen because its design allows it to operate within the elastic deformation range for a high percentage of impacts, minimising routine maintenance requirements. However, in the event of a high-energy event where elastic deformation occurs, affected elements can be individually replaced, providing owners with a fully maintainable asset.

With a certified and tested rating of 10,000kj impact energy without failure the barrier’s capability to absorb very high kinetic energy from falling rock masses is huge, representing a significant geological risk management strategy. This future proofs the asset and mitigates against potentially catastrophic rockfall events and emergencies.

Technical Solutions

- Installation of high capacity rockfall barrier system
- Integration of modular component design for maintainability
- Implementation of geological risk management system

1.1 Upslope Landslides

Landslides Explained

Some common causes of landslide events during natural disasters include super saturation of soils during high rainfall, loss of vegetation, erosion, seismic activity, poor construction or a combination of the above. Slopes with poor drainage are especially susceptible.



Soil Nailing Solution - Landslide Emergency Works, New Zealand

SOIL NAILING

- Useful when landslides have the potential to be large, due to global instability in the landslide zone, including slow slip landslides.
- Often erosion matting and/or mesh are required to prevent excessive erosion between nails ensuring integrity of the combined soil nail and mesh system.
- Geovert holds an extensive fleet of plant and drilling equipment which can be rapidly mobilized to disaster areas. The selection of the optimal drill rig for soil nail installation is determined based on safety, slope configuration and productivity. Often speed is of the essence when soil nails are required to be installed during and after an emergency to mitigate risk of further landslide activity. In some cases, we mobilize multiple types of drill rigs to respond to changing conditions and drilling requirements.



Shotcrete Solution - Shoalhaven Slip Remediation, Australia

SHOTCRETE

- Versatile application on vertical, upslope and downslope surfaces, with customizable structural design through anchor, thickness, and steel specifications.
- Multiple finish options available with color matching for environmental blending.
- Longer installation time compared to mesh solutions. Drainage holes required.



Pinned Mesh & Hydroseeding Solution - New Zealand

MESH & GREEN SOLUTIONS

- Pinned mesh, unlike drape mesh, can address large scale superficial slope instability issues.
- The slope configuration, height and size of the area to be treated will determine the type of drilling equipment to be used to pin the mesh. Geovert has developed bespoke in-house drilling solutions to suit the requirements.
- Compared to shotcrete it has a lower environmental footprint, can be designed with 100 year lifespan, is visually appealing as it can be revegetated, and is free draining so does not require drainage holes.

Landslide Solution Case Study



Upslope remediation - Kaikoura, New Zealand

KAIKOURA EARTHQUAKE, CHRISTCHURCH, NEW ZEALAND

Overview

In 2016 a catastrophic earthquake struck the Kaikoura region in NZ. The earthquake generated the strongest ground acceleration ever recorded in New Zealand and caused widespread damage closing both State Highway 1 (SH1) and the Main North Line railway between Picton and Christchurch.

With close to 1.3 million cubic yards of rock and material falling onto the dual mode road and trunkline rail coastal transport corridor, Kaikōura and the surrounding rural communities were isolated. All roads and the rail network in and out of the area were damaged and closed by the slips with an annual impact on GDP in excess of \$500m.

Due to the unprecedented scale of slope remediation required, Geovert was first on ground to make safe, and continued to provide specialist construction solutions but also importantly lead the solution identification process to speed up design for the North Canterbury Transport Infrastructure Recovery (NCTIR) alliance put together by the New Zealand central government.

Technical Solutions

- Slope remediation design and coordination
- Ground anchors
- Soil nails
- Self-drilling anchors
- Rockfall barriers
- Debris flow barrier systems
- High tensile slope stabilization mesh
- International supply chain management
- Enhanced rockfall protection practices

Geovert's involvement with this vital, time-critical project raised the bar for rockfall best practice in New Zealand.

Our ability to develop design solutions, share our knowledge and expertise and adapt to every challenge was recognized and praised by our partners.



Barrier Construction - Kaikoura, New Zealand



1.2 Downslope Underslips

Underslips Explained

Underslips are caused by much the same factors as landslides, high intensity rainfall, loss of vegetation, erosion, seismic activity, poor construction or a combination of the above. Additional contributors can be oversteepening of the slope by scouring below from waterways or coastal erosion. Potential remediation varies with size and complexity of damage.



EMERGENCY DOWNSLOPE SOIL STABILIZATION

- For smaller underslips, look for solutions that can quickly repair infrastructure without the need for heavy excavation or piling equipment.
- Geovert has created many typical details for systems that can be installed with minimal plant needs, typically just a Geovert drill excavator, grout plant, and compressor. Micropiles, soil nails, and shotcrete application can all be performed with the Geovert Superboom Drill Rig.
- Larger landslip and road collapse will often require large foundation installations and piling operations
- Temporary shoring and retaining wall systems can be placed to provide immediate road access, but will require a longer term solution to be installed at a later date.
- Stabilizing an underslip without the need for large excavation or piling equipment.



Underslip Solution Case Study



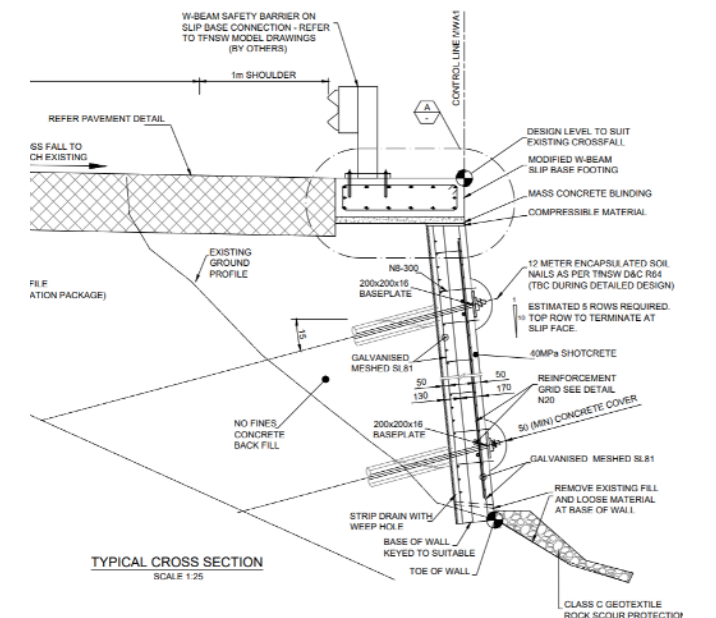
OXLEY HIGHWAY SLOPE STABILIZATION - NSW, AUSTRALIA

Overview

Geovert successfully delivered a critical downslope stabilization program for Transport for NSW State Government along the Oxley Highway. Working within a concentrated three-month timeframe, the project addressed four critical downslope failure sites through multiple specialized geotechnical solutions. Each slip site required a comprehensive stabilization approach combining various techniques to ensure long-term infrastructure stability.

Technical Solutions

- Advanced soil nailing with bar DCP anchors and hollow bar installations (5" boreholes)
- Rope access drilling for with Geovert wagons for challenging terrain
- Geovert SuperBoom drill for long reach downslope stabilization
- Shotcrete application and retaining wall construction
- Installation of structural capping beams
- Delivery by specialized teams of multi-skilled operatives



Typical cross section pictured above



1.3 Debris Flow

Debris Flow Explained

Bulk transportation of mud, vegetation and debris which can include massive boulders entrained in a high-volume flows can cause major issues downstream from hydraulic damming buildup or poisoning of water supply from charcoal or other hazardous material.



Debris Flow Barrier Construction
Plimmerton, New Zealand



DEBRIS FLOW BARRIERS

- Debris flow and rockfall barriers differ in loading mechanics: debris flows create area loads at 10-12 m/s, while rockfalls produce point loads at 25 m/s. This area loading requires stronger anchorage and support ropes in debris flow barriers despite their similar appearance.
- Geovert specializes in customizable, rapid-install systems tailored for emergency debris flow management. With equipment like mobile drill rigs, grout plants, and compressors, our team can quickly set up protective structures, including debris barriers, check dams, and flexible containment solutions to limit the reach and impact of debris flows.
- When dealing with small-scale debris flows, quick-response solutions can effectively redirect or contain debris without the need for intensive excavation or specialized equipment. These methods prioritize rapid deployment to safeguard nearby infrastructure.
- Severe debris flow incidents often require stronger containment solutions, such as reinforced catch basins, retention structures, or channelized barriers. These installations may demand secure foundations and, in some cases, pilings to withstand large volumes of moving debris and prevent damage.
- Temporary protective berms and shoring walls can be quickly placed to direct debris away from roads and critical access points, maintaining essential access. However, these emergency setups should be followed by long-term stabilization measures for lasting security.

Debris Flow Barrier Case Study



FEMA Emergency Debris Flow Barrier Construction -
Gallinas Canyon, New Mexico

GALLINAS CANYON, NEW MEXICO - FOREST FIRE DISASTER RESPONSE

Overview

In the wake of New Mexico's most catastrophic forest fires on record, Geovert was involved in safeguarding vital infrastructure and town water supply. Our team delivered a design build solution, erecting multiple debris flow barriers in a super compressed timeframe. We deployed bespoke Geovert drilling equipment to reach and install lateral anchors, creating a comprehensive protection system across a live waterway in Gallinas Canyon, Las Vegas, New Mexico.

This emergency FEMA project, delivered by the US Army Corps of Engineers, was a race against time to protect critical infrastructure and the town's dwindling water supply before the onset of monsoon rains on the fire-ravaged slopes. The system proved its worth repeatedly, as our crew built, emptied, and rebuilt the protective structures multiple times, successfully intercepting several major debris flow events. Remarkably, one of the debris flow protection systems was completed by the end of the shift and was filled with storm-triggered debris less than an hour later.

Technical Solutions

- Multiple debris flow barrier installations
- Custom drilling equipment deployment
- Lateral anchor installations
- Live waterway protection systems
- Rapid-response barrier construction
- Debris removal and barrier reconstruction capabilities
- Emergency response protocols & agile in-field design engineering
- Cross-agency collaboration systems

The project's success stemmed from Geovert's expertise and collaboration with federal agencies. This experience underscores Geovert's commitment to leveraging innovative solutions for urgent environmental challenges, showcasing our ability to execute complex projects under extreme pressure while maintaining the highest standards of safety and effectiveness.



Emergency Debris Flow Barriers -
Gallinas Canyon, New Mexico

By leveraging our extensive experience and rapid response capabilities, Geovert aims to minimise the impact of natural disasters on infrastructure and communities, providing both immediate relief and long-term resilience.



Geovert Disaster Response team installing debris flow protection systems for FEMA/USACE, New Mexico.

What Sets Geovert Apart

Geovert excels in developing tailored solutions for challenging environments.

We drive stakeholder value by deeply understanding our clients' requirements, prioritizing collaboration and communication. Safety is paramount, with systems developed for high-risk work fully integrated into our operations from multiple disaster response scenarios over the last two decades. Our commitment to innovation, collaboration, and safety has earned us a reputation as a trusted partner worldwide.

We've successfully delivered complex engineering solutions in hazardous and challenging environments across the United States, Canada, New Zealand, Australia, Indonesia, Papua New Guinea, Singapore, and India.

We pride ourselves on our value-driven company culture, built on passion, engagement, drive, and teamwork. Each member of our diverse and inclusive team is respected and acknowledged for their contribution to the business.

Learn More

To learn more about Geovert's emergency response capabilities get in touch with our expert team today.

Lincoln Grody | Geovert US Business Development Manager
lincoln.grody@geovert.com | (205) 779-4561

GEOVERT

AUSTRALIA

SYDNEY (HQ)

1300 011 352
SUITE 31
61 MENTMORE STREET
ROSEBERY NSW 2018

MOOREBANK

+61 2 9700 7975
374 NEWBRIDGE RD
MOOREBANK NSW 2170

GLADSTONE

+61 7 4979 2870
46 CHAPPLE ST
GLADSTONE QLD 4680

GEELONG

1300 011 352
37 EDOLS ST
NORTH GEELONG VIC 3215

PERTH

1300 011 352
11 WILDFIRE ROAD
MADDINGTON
WA 6109

NEW ZEALAND

AUCKLAND

0800 88 88 38
15 KAIMAHI RD
WAIRAU VALLEY
NORTH SHORE 0627

CHRISTCHURCH

+64 3 962 5840
39 FRANCHELLA ST
BROMLEY
CHRISTCHURCH 8062

WELLINGTON

+64 9 837 7808
1684 STATE HIGHWAY 2
KAITOKE
UPPER HUTT 5018

UNITED STATES

DENVER

+1 720 452 1191
2780 INDUSTRIAL
LN, STE A,
BROOMFIELD
CO 80020

SINGAPORE

SINGAPORE

+65 9640 2997
#02-00 80 ROBINSON RD
SINGAPORE 068898



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- 📍 NEW ZEALAND
- 📍 UNITED STATES
- 📍 SINGAPORE