

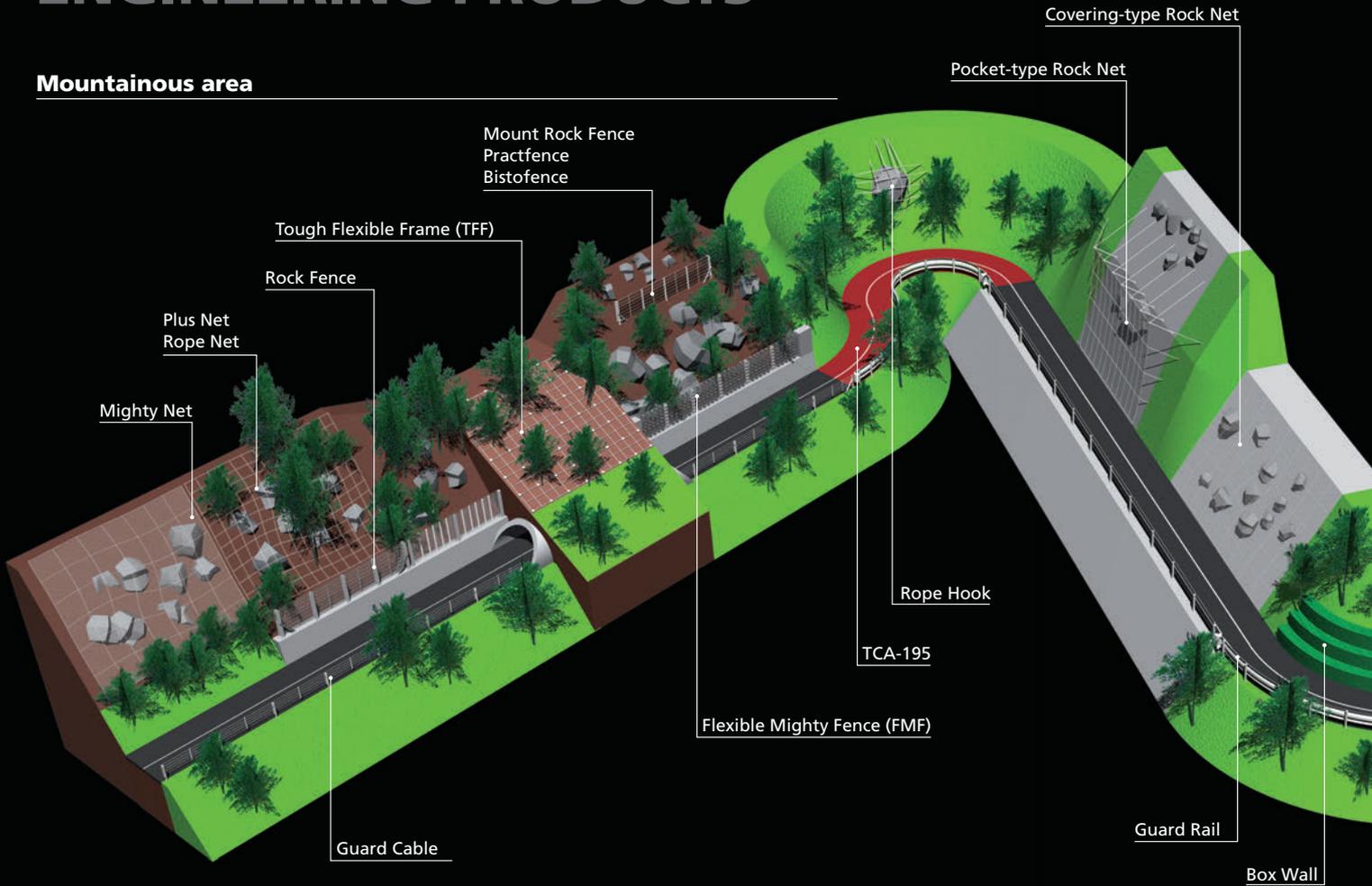
# ENGINEERING PRODUCTS



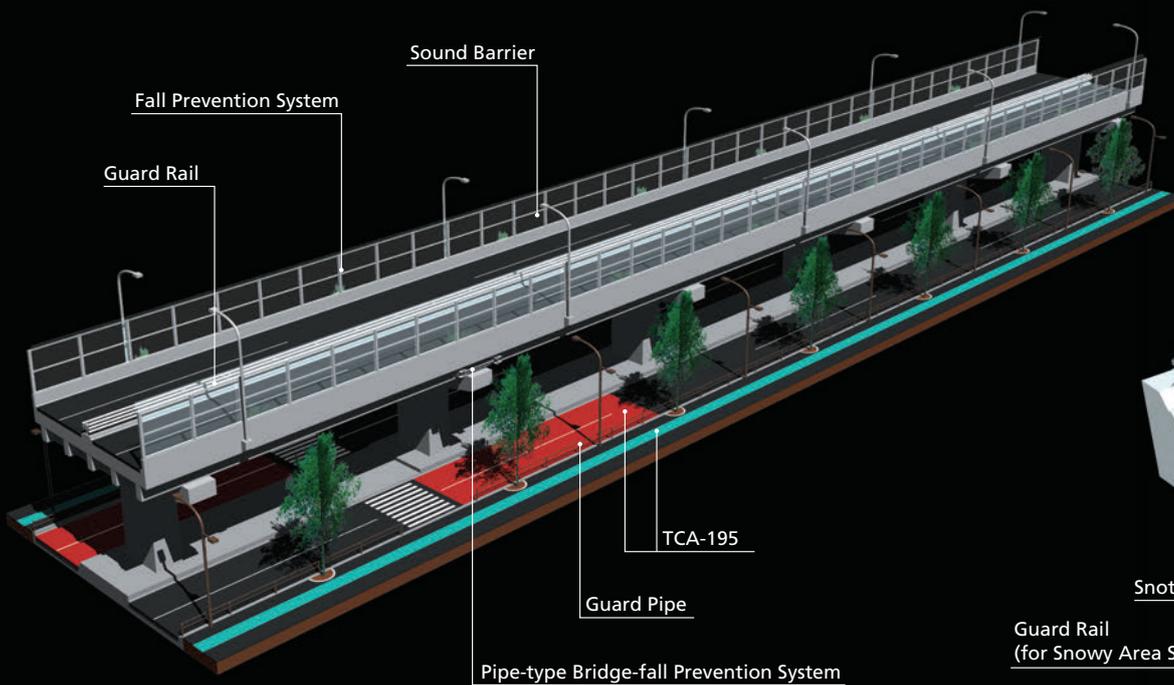
We are developing higher quality products based on safety, security and the environment.

# ENGINEERING PRODUCTS

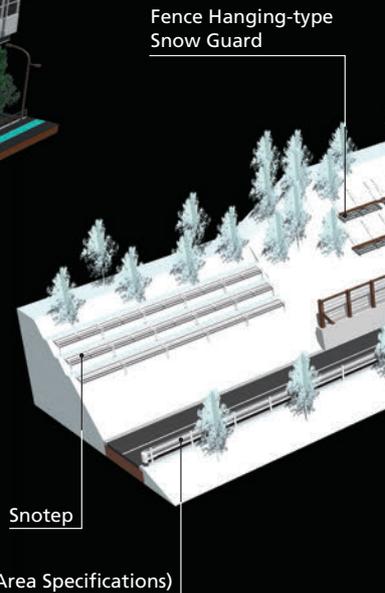
## Mountainous area

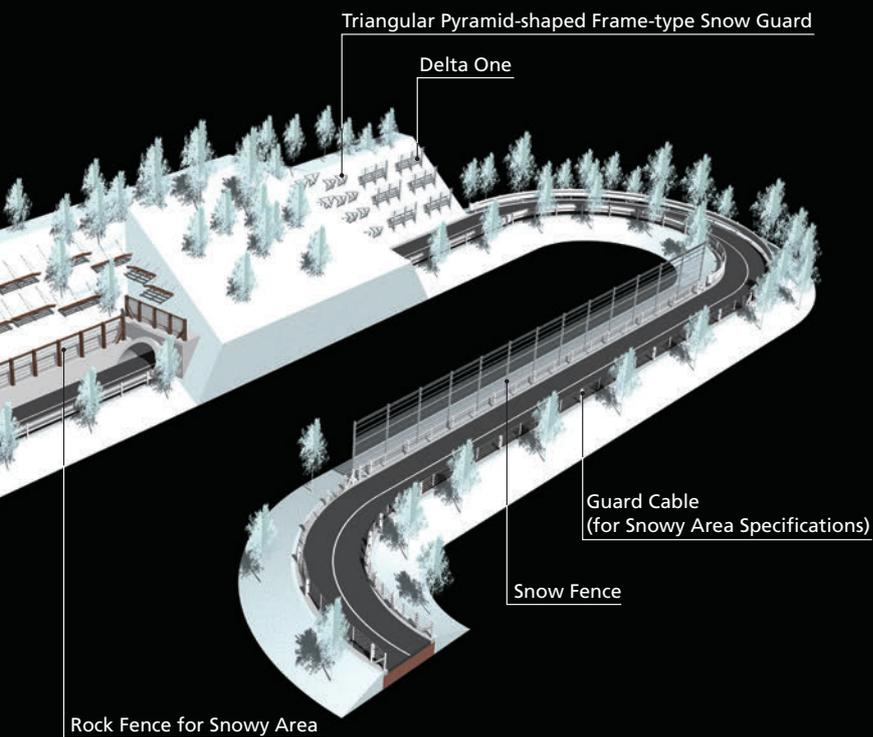
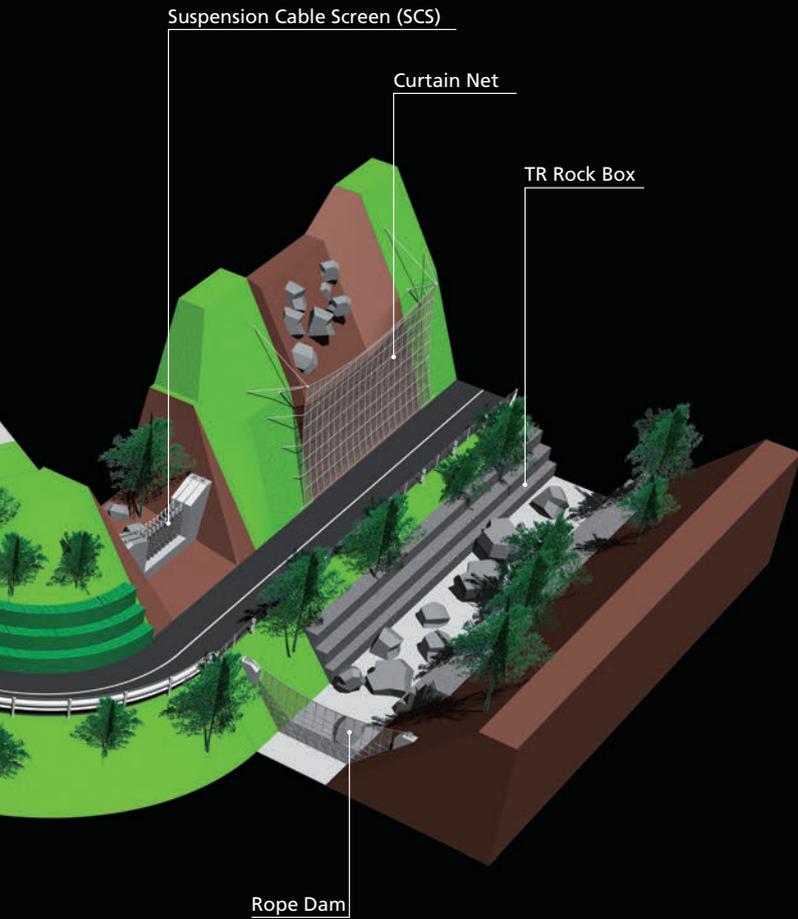


## Urban Area



## Snowy Area





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## Guard Cable

Superior appearance in achieving extreme view thanks to the use of wire ropes. When a vehicle collides, the spacer distributes the energy of collision to all wire ropes, thus reducing the impact. Ideal for snowy areas, as it is less affected by differential settlement, produces fewer snowdrifts, and thus reduces snow removal work.



## Wire Rope-type Protective Fence for Medians

This fence prevents vehicles from crossing into the opposite lane, thereby significantly improving road safety. It has many advantages such as a compact size, high shock-resistance, and promptly recoverable structure.



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Road  
Safety-related  
Products

## Mamorope (Fall Prevention Device for Multistory Parking Systems)

Its flexible wire ropes efficiently absorb the shock of collision. This product secures a wide field of view, keeping the space bright and unoppressive. It can be used for a wide variety of shapes, which facilitates installation.



**Guard Rail**

Our guard rail has both the flexibility to absorb shock and the rigidity to resist breakage due to external forces. Its delineating function enables drivers to drive safely using the guard rail as a guide. It can also be installed on roads having tight curves.



**V-GP (Guard Pipe)**

Less oppressive as it uses steel pipes, giving the driver a wide field of view. With its simple shape, it does not affect the surrounding landscape.



**TCA-195**

A slip-prevention thin-layer color pavement using acrylic resin. Boasting excellent visibility and high slip-prevention performance, for the safety of people and vehicles. Having a high durability, it can be applied to metal surfaces, which used to be difficult. Its short curing time enables work for a large area to be done in a day.



**Guard Fence**

Used for various purposes, such as preventing pedestrians and bicycles from falling out of the road or crossing the road in urban areas.



**Windbreak Fence**

Superior wind-breaking performance thanks to its perforated panels. It uses a wave-formed folded panel structure to ensure high strength.



**Entrance Prevention Fence**

Prevents entrance by outsiders into the site. As the main components are zinc-plated, it is not susceptible to rusting and has excellent workability.



Founded on our basic policy of prioritizing human life, we are committed to safety, offering functional and highly-durable products while also considering the surrounding environment.

## Acrylic Translucent Panel

These acrylic translucent panels offer excellent transparency and sound insulation, ranging from low to high frequencies. Designed to prevent scattering of fragments upon impact, they also meet the flame resistance standards of NEXCO. Moreover, they are easy to maintain and recycle.



Acrylic translucent panels are used in a wide range of fields in addition to sound barriers, thanks to their excellent characteristics.



Fence to prevent throwing of objects (pedestrian bridge)



Fence to prevent throwing of objects



Wave splash barrier



Water cutoff fence



Shelter



Blast fence

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Road  
Safety-related  
Products

## Ceramic Panel (Tunnel Interior Tile)

Installation of these panels on the tunnel wall increases the illumination intensity and helps drivers to acquire visual information more easily. With excellent durability as well as flame and shock resistance, the panels make tunnels safer for drivers.



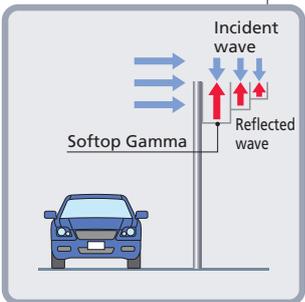
### Integrated Noise Guard

Both sound-absorbing panels and translucent panels offer excellent sound insulation, ranging from low to high frequencies.



### Softop Gamma (Sound Tube-type Sound Barrier Equipment)

Constructed to eliminate noise through sound wave interference, Softop Gamma reduces noise more effectively than conventional sound barriers, while also handling the major frequencies.

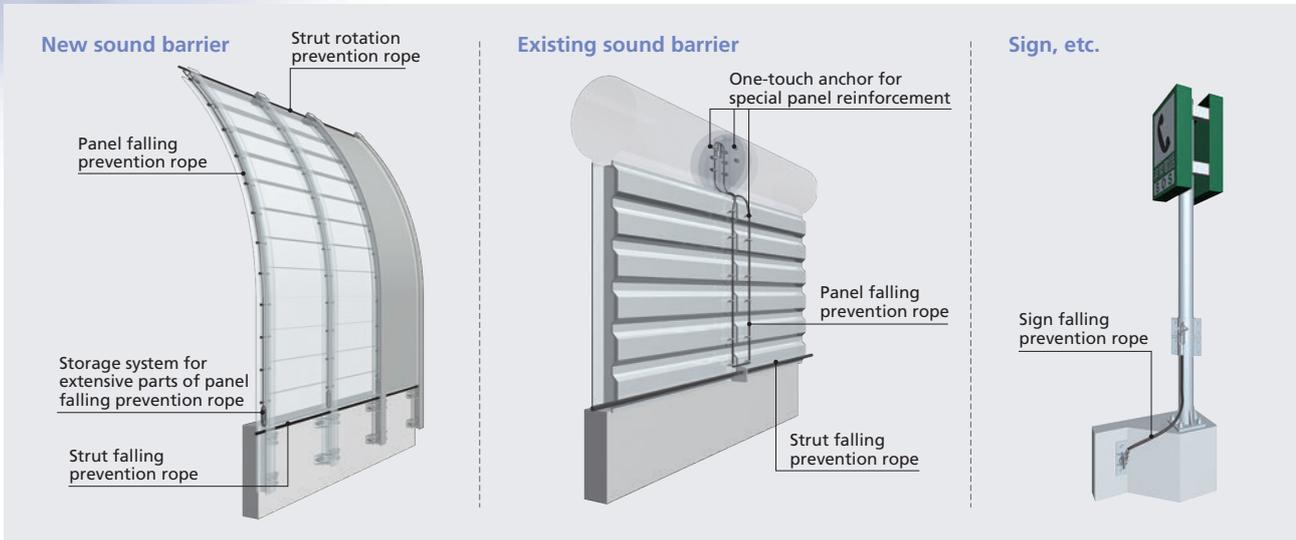


These products create a safer, more comfortable living environment by reducing noise along roads, and making landscapes more open and lighter.

PRODUCTS

### Falling Prevention System

Connects the structures on elevated roads such as highways and the foundation with wire ropes to prevent, at the time of a collision of cars, etc., objects from falling below the elevated structure or the rotation of struts by absorbing shocks.

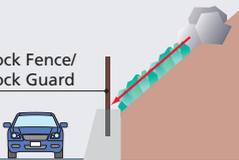


## Rock Fence/Rock Guard

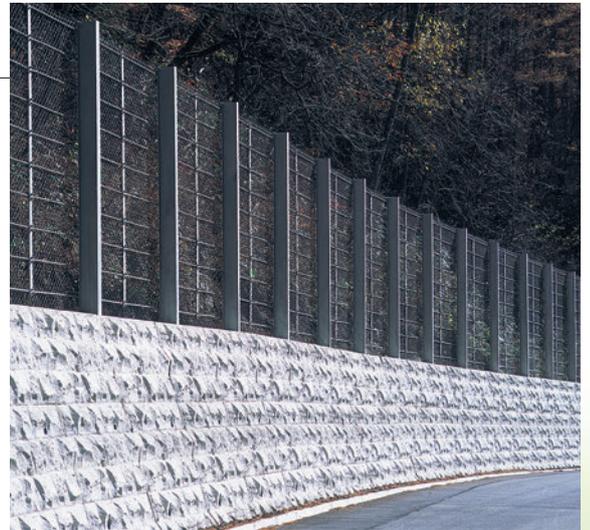
These products are rationally structured to absorb the energy of falling rocks by elastic elongation of wire ropes and plastic deformation of columns. They are typically placed with concrete foundations along roadsides.

Possible absorbed energy  
**Rock Fence: Approximately 50kJ**  
**Rock Guard: Approximately 120kJ**

Rock Fence/  
 Rock Guard



Rock Guard



Rock Fence

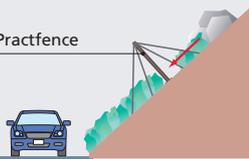
## Practfence

This is a universal-type small rock fall guard fence, offering cost efficiency, workability, and ease of maintenance. It enables environment-friendly, economical rock fall protection by being optimally placed to suit the slope topography without using concrete foundations (which destabilize the slope) or scaffolding (which increases construction time).



Possible absorbed energy  
**Approximately 60kJ**

Practfence



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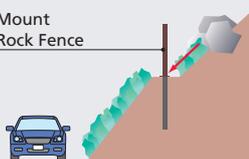
Slope-related  
 Products

## Mount Rock Fence

This rock fall guard fence is placed on a steel pipe pile foundation without using concrete foundation. It enables the energy of falling rocks to be captured at the early stage by being placed at the midslope. In addition, the construction method does not excavate the natural ground and so it has less impact on the environment and no waste earth is generated. The possible absorbed energy is approximately 30 kJ.

Possible absorbed energy  
**Approximately 30kJ**

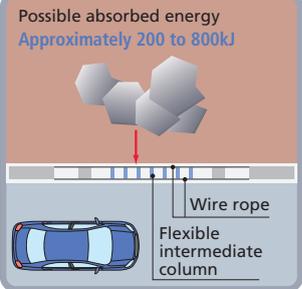
Mount  
 Rock Fence





### Flexible Mighty Fence (FMF)

This is a high-energy-absorbing rock fall guard fence with flexible wire ropes and steel materials with high relative stiffness combined in an intricate manner. It incorporates a double wire rope and flexible intermediate columns (that are unfixed to the foundation) between robust intermediate columns. Because it is resistant to impact and stops falling rocks within the elastic deformation of the fence, it can withstand repeated rock falls. Its possible absorbed energy is approximately 200 to 800 kJ.



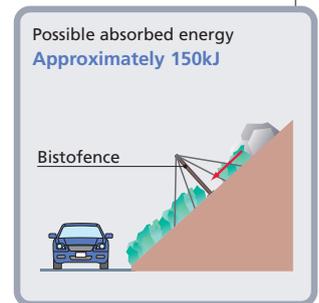
We have developed products to ensure safety against rockfall by analyzing data for various rockfall patterns. An extensive range of products are available, depending on the installation situation.

PRODUCTS



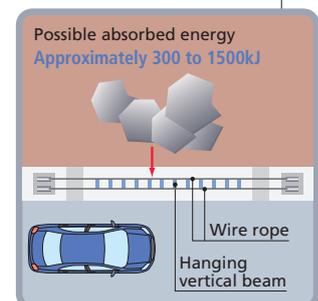
This multifunctional rock fall protection work has a wide range of applications, featuring newly developed raw materials added to existing technologies. With its new columnar structure, nets, and impact-reducing devices, it can efficiently absorb the energy of falling rocks and reduce the burden on structural components.

### Bistofence



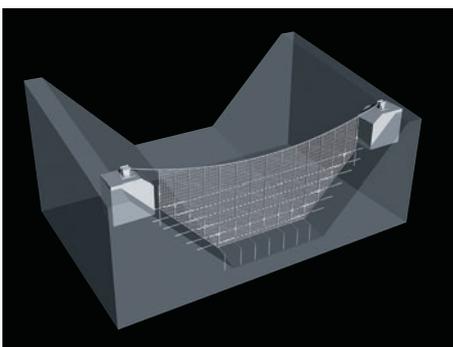
### Suspension Cable Screen (SCS)

This rock fall protection work is suitable for valley topography and mountain stream areas with concentrated rock falls. It is structured with two main ropes fixed to anchors on the foundation on both sides, a vertical beam hanging from each main rope, and wire ropes placed on both sides. With elasticity, impact resistance, and strength, it can absorb energy of 300 to 1500 kJ even in short spans in mountain stream areas, etc.



### Rope Dam

The impact of debris avalanches causes the extra length at the lower part of the vertical rope and the horizontal rope to slide, wrap and trap rock masses and dissipate the energy of debris avalanches.



## Rock Net

### Pocket-type Rock Net

This is designed to absorb the energy of falling rocks through an integrated movement of the rock fall and the net. With the upper part of the net kept open like a pocket, it can be applied to rock fall that occurs above the net itself.

### Covering-type Rock Net

This construction method completely covers a slope where there is a risk of rock fall. It prevents rock fall by a net that controls loose and rolling rocks by sticking to the slope. In addition, if a rock fall develops, the net guides the rocks to the foot of the slope by covering them.



Pocket-type Rock Net

Possible absorbed energy  
150kJ

Pocket-type  
Rock Net



Guides rock fall by  
sticking to the slope

Covering-type  
Rock Net



Covering-type Rock Net

## Curtain Net

This is a high-energy-absorbing protection work capable of absorbing repeated rock falls within the designed elastic limit. With the upper part of the net kept wide open and with a wide column interval, it can handle rock falls that develop high up without the columns being damaged.

Possible absorbed energy  
400kJ

Curtain Net



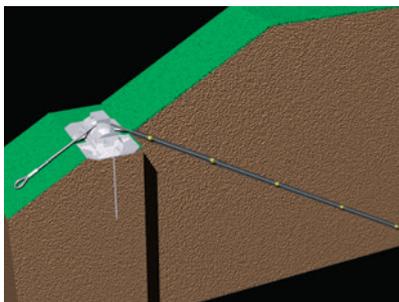
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Slope-related  
Products

## Anchor

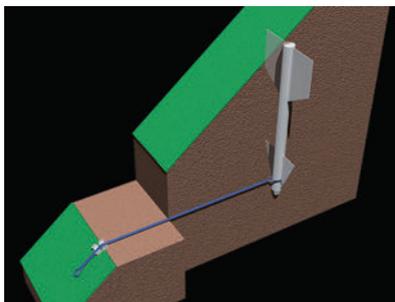
### FR Anchor

Integrated with a wire rope, this anchor for earth and sand areas has a high resistance regardless of the ground condition (soil property). The design resistance is a maximum of 290 kN.



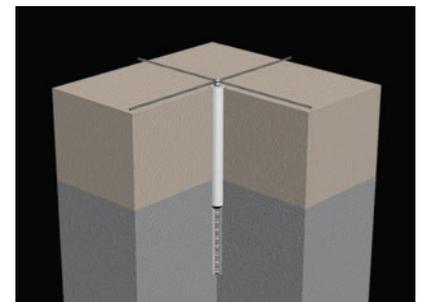
### Root Anchor

With a wide range of soil volume involved in resistance, this anchor for earth and sand areas constantly exerts a high resistance. Anchors with a design resistance of up to 105 kN are available.



### Break Anchor

This is a highly reliable anchor both for earth and sand areas and earth covering areas capable of resisting the drawing direction load while leaving the horizontal load resistance as it is. The design resistance is 25 kN and 35 kN.

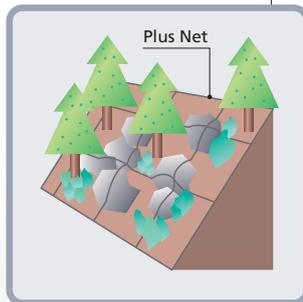




**Plus Net**



This product reduces the load on anchors and has double the strength of a rope net with new anchors additionally installed at the center of four anchors connected to the main rope.

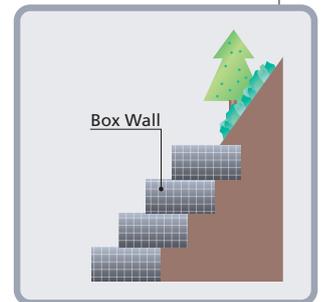


Double the strength of that of rope net

**Box Wall (Basket Frame)**

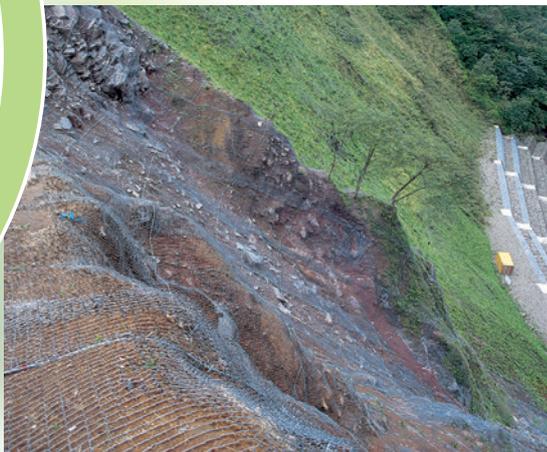


This is used for an extensive range of applications, such as stabilizing the slope, or for bank protection and small check dam works. Installation is easy. Moreover, after installation, plants grow thickly on it, forming a natural landscape.



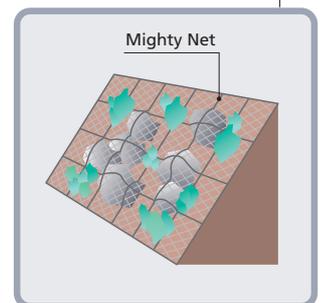
Solutions for slopes using wire ropes and wire meshes are available. These products can be installed on the side of roads having almost no shoulder, creek-like terrains, or significantly changing natural slopes.

PRODUCTS



**Mighty Net**

This construction method prevents the development of rock fall by controlling loose rocks and rolling rocks on a slope with a special wire net (thick net) kept in close contact with the slope. It can be constructed both on rock slopes and earth and sand slopes. With erosion of earth and sand controlled by keeping the net in close contact with the slope, it also effectively promotes greening.

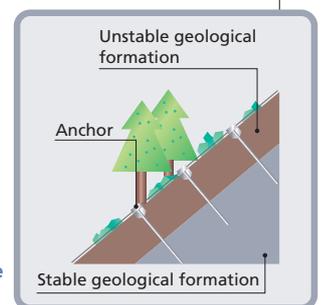


Effectively promotes greening



**Tough Flexible Frame (TFF)**

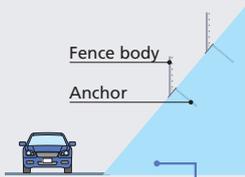
This construction method prevents landslides of slopes in unstable geological areas. It stabilizes the ground surface with loading slats by thrusting anchor bolts into the unstable geological formation to fix them to the stable geological formation. It can also be constructed in combination with Mighty Net or Rope Net.



Prevents landslide on unstable geological formation

## Delta One

Unlike conventional avalanche fences, this product is installed vertically (and not perpendicularly to the slope), thus controlling cornice generation and reducing the risks. It can also be installed in a compact space since it requires no supporting ropes, and there is no risk of fence lifting or turnover due to the settling force of accumulated snow.

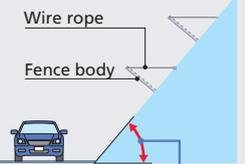


Controlling cornice generation with vertical installation.



## Fence Hanging-type Snow Guard

The fence body is fixed with an anchor and wire rope. Since it requires less drilling, the guard can be installed at places where it is difficult to drill, such as steep slopes with an angle of  $50^\circ$  or more, or soft ground. Mainly suitable for slopes having a snow depth of 4 m or less, it prevents total or surface layer avalanches.



Suitable for slopes with an angle of  $50^\circ$  or more



## Triangular Pyramid-shaped Frame-type Snow Guard

It fixes a triangular pyramid-shaped frame with an anchor and wire rope. Can be installed on natural slopes. Mainly suitable for slopes having a snow depth of 3 m or less, it prevents total layer avalanches.



## Snow Bridge

This product fixes the main post or the strut at the midslope with a concrete foundation. Mainly suitable for slopes having a snow depth of 4 m or less, it prevents total or surface layer avalanches.



## Assura

This product fixes the main post with a self-boring anchor. Requiring no concrete foundation, it does not damage the natural ground. Mainly suitable for slopes having a snow depth of 2 m or less, it prevents total layer avalanches.



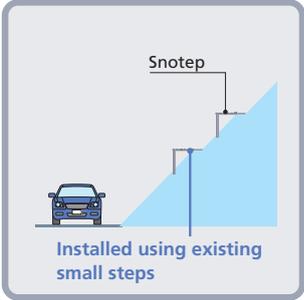
ENGINEERING

Snowy Area-related Products



**Snotep**

This product prevents slope avalanches by installing it on existing small steps. With fewer cornices generated, it promotes snow melting through the entire slope with the radiated heat from the fence in the snow melting season. Its low profile does not affect the natural landscape in the non-snow season.



**Snow Jetter (High-Performance Snow Fence) / Quartering Wind-compatible Snow Fence**

Reducing snowdrift on the road by preventing the flying of snow with the lower non-perforated plate, and blowing snowstorm out of the road with the upper blow-up plate, thereby securing better visibility. The quartering wind-compatible snow fence changes the orientation of quartering wind, and carries snow out of the road. It provides an excellent effect against quartering wind parallel to the road or at an angle of up to around 45°.

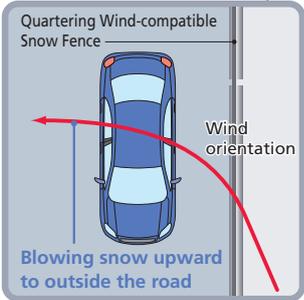
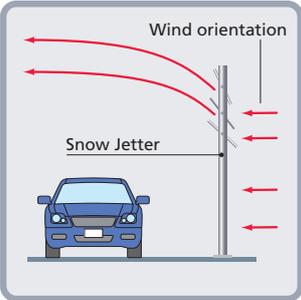
These products prevent lifelines from obstructing traffic due to avalanches, snowstorms, and snowdrifts in the winter season.



Snow Jetter



Quartering Wind-compatible Snow Fence



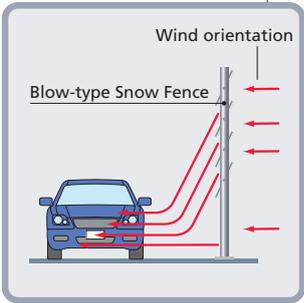
**Rock Fence for Snowy Area**

Designed by considering the settling force of accumulated snow and accumulated snow pressure on the slope. It can prevent rockfall as well as avalanches.



**Blow-type Snow Fence**

Reduces the impact of snowstorms on visibility, as well as snowdrift on the road. Passing snowstorm under the fence by concentrating it to within 1 m or less from the road surface, thereby securing the driver's field of view. The standard fence height is 3.5 m.



## Tie Rope

Our tie rope significantly improves the efficiency and economy of the steel pipe sheet pile method.

Having a high tensile strength, it can be easily transported, requiring no supports such as turnbuckles or joints.

It is widely used for development of ports, reinforcing soft ground, and securing rivers.



## Rock Mat

Rock Mat has a structure that combines a mattress basket, wire rope and safety sling.

It realizes more efficient wave extinguishing or foundation consolidation by accumulation of mattresses. Excellent workability and economy.



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## River and Port-related Products

We powerfully support river and port facilities with high corrosion-resistant plating technology and rich experience built on the development of wire rope.

## Tsunami Barrier

This barrier controls the inflow of ships, wood, and containers from the sea into the land when tsunami waves arrive, and prevents houses, vehicles, etc. being carried out to the sea by the rip current.

Effective for alleviating damages by tsunami, thereby protecting human life and property in the coastal strip.



## TR Rock Box

TR ROCK BOX is a method most commonly used for rivers, paved roads, landslide prevention sites with erosion control as a Gabion construction method. It enhances the resistance from pressure behind by using  $\phi 8.0$  wire net, and  $\phi 13$  or  $\phi 16$  steel bar frame, strengthening and widening the frame, flexible as well as multi-purpose structure.



### Construction Cable

Among the superb characteristics of wire ropes are high tensile strength and flexibility, which significantly improve the freedom of design, resulting in buildings with a variety of structures and novel designs.

In recent years, they have been used for new structures such as glass supports, and so their applications have been expanding further.



## Steel Structure-related Products

Our wire ropes are considered to be world-class in quality. They are used in many landmarks.

PRODUCTS

### Bridge Cable

Our bridge cables are used for the Great Seto Bridge, the Rainbow Bridge, the Akashi Kaikyo Bridge, etc., and are highly evaluated by both domestic and overseas customers.

We offer a broad range of product lines, including NEW-PWS, PWS, spiral ropes, locked coil ropes, and strand ropes.



### Small-scale Suspension Bridge

The biggest appeal of suspension bridges is the thrill they offer with a safe structure, while harmonizing with the natural environment.

We satisfy customer needs through our integrated production system from design and manufacturing to maintenance.



### Pipe-type Bridge Fall Prevention System

This system has a simple structure to prevent falls with plastic deformation of pipes.

Extremely compact, it can be installed in a narrow place where conventional brackets are difficult to install.



 **TOKYO ROPE MFG. CO., LTD.****TOKYO ROPE MFG. CO., LTD.**

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