

**PROTECTIONS AGAINST NATURAL HAZARDS**

# ELITE® 5000 kJ Screens - Barriers

Back by 25 years of experience in the field of natural hazard protection, GTS has developed a new range of products called **ELITE® Products**.



This new range is the first ever to provide a specific rockfall protection solution. Depending on the desired level of protection, the **ELITE®** nets – the main component of the system – may be made from metal or fibre cables. Its patented adjustable clamping system guarantees it with a very high energy absorption capacity.

## APPLICATIONS

**ELITE®** products are used in the following applications:

- Protection of roads, railways and waterways,
- Protection of people and property,
- Protection of civil engineering structures,
- Protection of industrial facilities, factories, mines and power stations,
- Protection of military facilities.



*PROF-FIL production facility, Réunion Island*

## USES

- Retaining capacity of 5000 kJ, equivalent to a 10 tonne block thrown at 114 km/h,
- The screens complies with French standard NF P 95-308 (class 9) and is currently undergoing ETAG 27 class 8 certification,
- A cost-effective, lightweight and visually non-intrusive rockfall protection system,
- May be installed along the edges of areas to be protected; low system deflection,
- The fence height may be adjusted to suit the terrain.



*ELITE® ECS-5000 Screens*

## BENEFITS

- Easy to install, cost-effective, easy to maintain,
- Load-bearing structure protected from typical impacts,
- Manufactured by a Registered ISO 9001 Company,
- Traceability of materials and production,
- Low deflection following impacts,
- Tested in the field, design calculations,
- Conforms to the contours of the terrain.

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**SPECIFICATIONS**

- Standard height at middle of net: 6 m,
- Maximum height of a unit: 7 m,
- Post-to-post distance: 15 m,
- Rated capacity: > 5000 kJ,
- Net: **ELITE®** ECS350-169. May be reinforced with an optional 2.7 mm double-twist mesh (80/100 mm mesh openings).

**CONSTRUCTION**

- Posts: hot-dip galvanised E24-2 steel,
- Fasteners: hot-dip galvanised E24-2 steel,
- Top support ropes: galvanised IWRC wire rope (6 x 19, dia. 28 mm),
- Upslope stays: galvanised IWRC wire rope (6 x 19, dia. 26 mm).

**ENERGIES**

We have performed full-scale comparative tests on the energy absorption capacities of other products already available on the market.

These tests revealed the following:

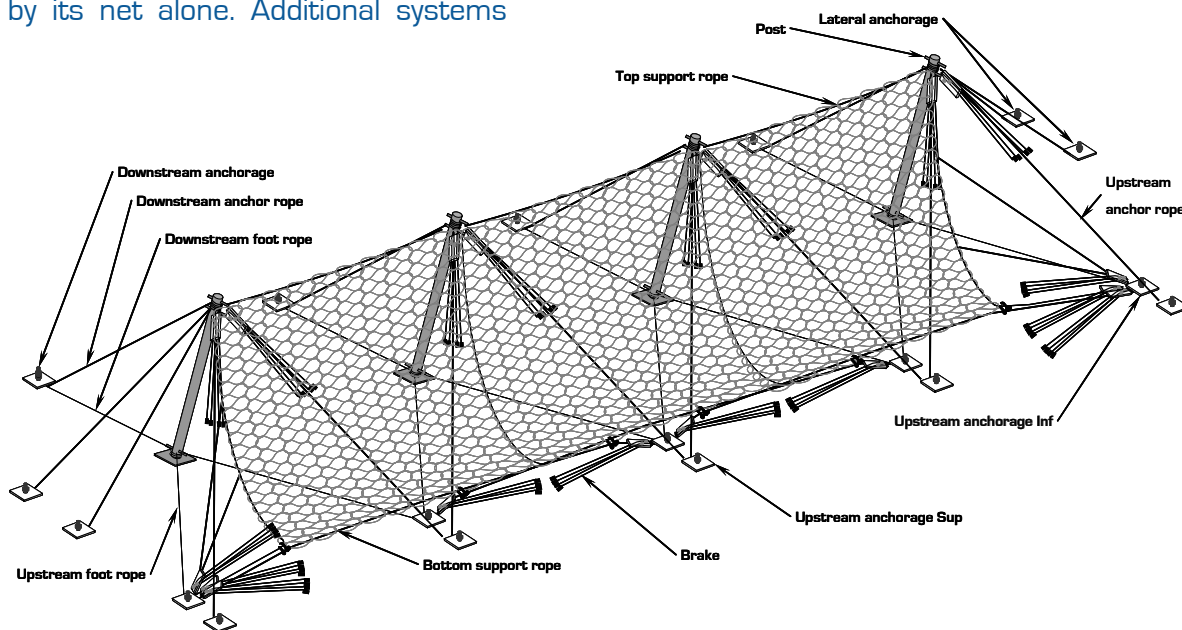
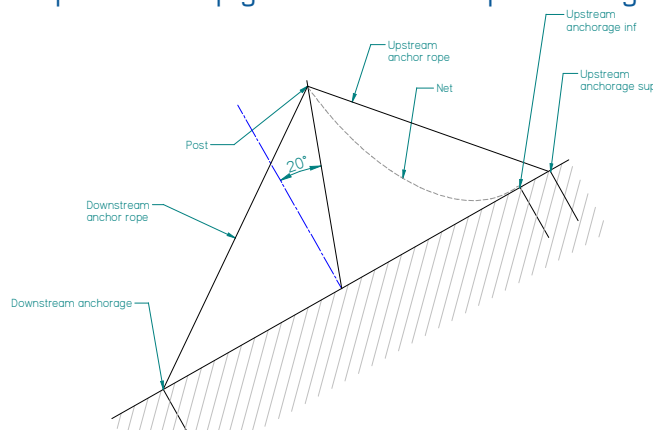
- The **ELITE®** net has a higher energy dissipation capacity yet has lower elongation,
- The energy absorption capacity of a fence cannot be ensured by its net alone. Additional systems

(braking systems, energy dissipating devices, etc.) must also be used.

- A fence's energy absorption capacity cannot be justified solely by its capacity to dissipate the energy of an object multiplied by its quantity.

**QUALITY ASSURANCE**

- Manufactured by a Registered ISO 9001 Company,
- Quality controlled production,
- Quality controlled materials,
- Testing of material samples,
- Traceability of production,
- Superior hot-dip galvanisation or super coating.



## PROTECTIONS AGAINST NATURAL HAZARDS

### PRINCIPLES

**ELITE®** screens:

- Absorb energy through the elastic and plastic deformation of the net and the energy dissipating devices,
- Transmit forces laterally,
- Maintain their effective height for the longest time possible,
- Protect posts from typical impacts,
- Conform to the contours of the terrain.

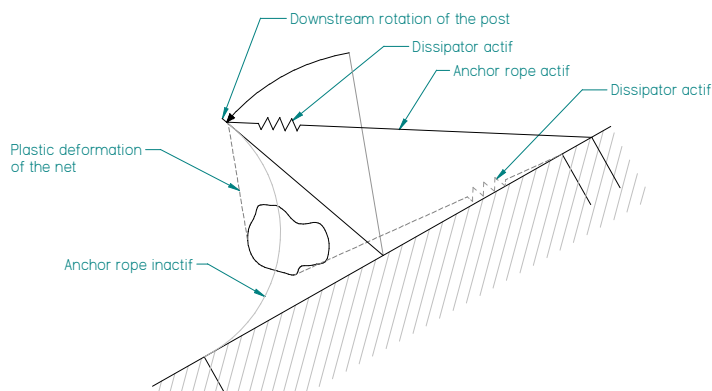
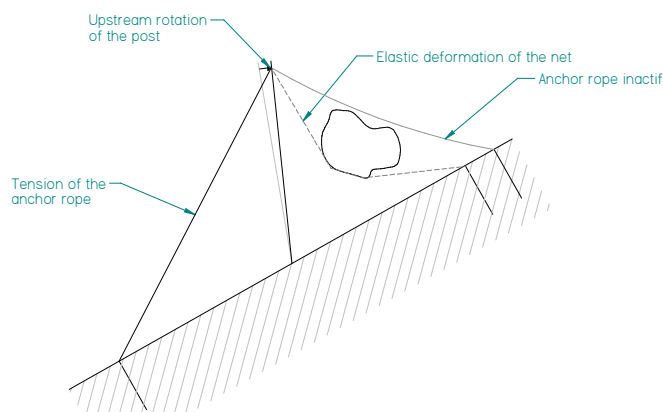
### SOLUTIONS

**ELITE®** screens consist of:

- An S350 net (lateral transmission of forces),
- New-generation energy dissipating devices (constant energy dissipation),
- Upslope-inclined posts,
- A top support rope without brake elements,
- Brake elements on the bottom support rope,
- A net positioned upslope of the posts,

### A SCREEN IN ACTION

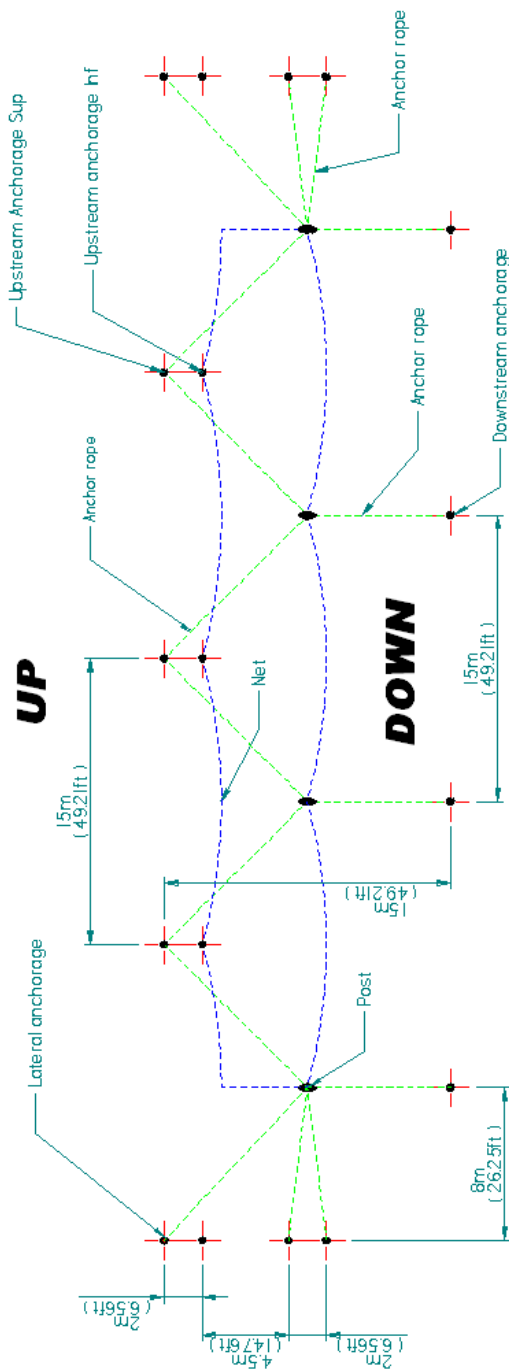
Impact energy is dissipated by the deformation of the net. The net's elastic behaviour is reversible. The fence is not subjected to plastic strain; it remains active and keeps its rated capacity. The posts tilt upward, maintaining the effective height.



The energy is dissipated by the plasticity of the energy dissipating devices and the net. The posts tilt downward.

# ELITE® Screen ECS-5000

## ANCHORS LOCATIONS



## FORCES ON ANCHORS

Anchor position	Dynamic Ts
Top upslope anchor	370 kN
Bottom upslope anchor	270 kN
Downslope anchor	200 kN
Lateral anchor	330 kN

## REINFORCEMENT DIAMETERS

Anchor position	FE500	S670
Top upslope anchor	40 mm	35 mm
Bottom upslope anchor	28 mm	25 mm
Downslope anchor	28 mm	25 mm
Lateral anchor	40 mm	35 mm

## HOLE DEPTH

Anchor bolts, ground with a compressive strength of 500 kPa

Anchor position	Dia. 70 mm
Top upslope anchor	4m70
Bottom upslope anchor	3m50
Downslope anchor	2m60
Lateral anchor	4m20

Anchor bolts for ground with a compressive strength of 900 kPa

Anchor position	Dia. 64 mm	Dia. 90 mm
Top upslope anchor	2m90	2m10
Bottom upslope anchor	2m10	1m50
Downslope anchor	1m60	1m20
Lateral anchor	2m60	1m90

