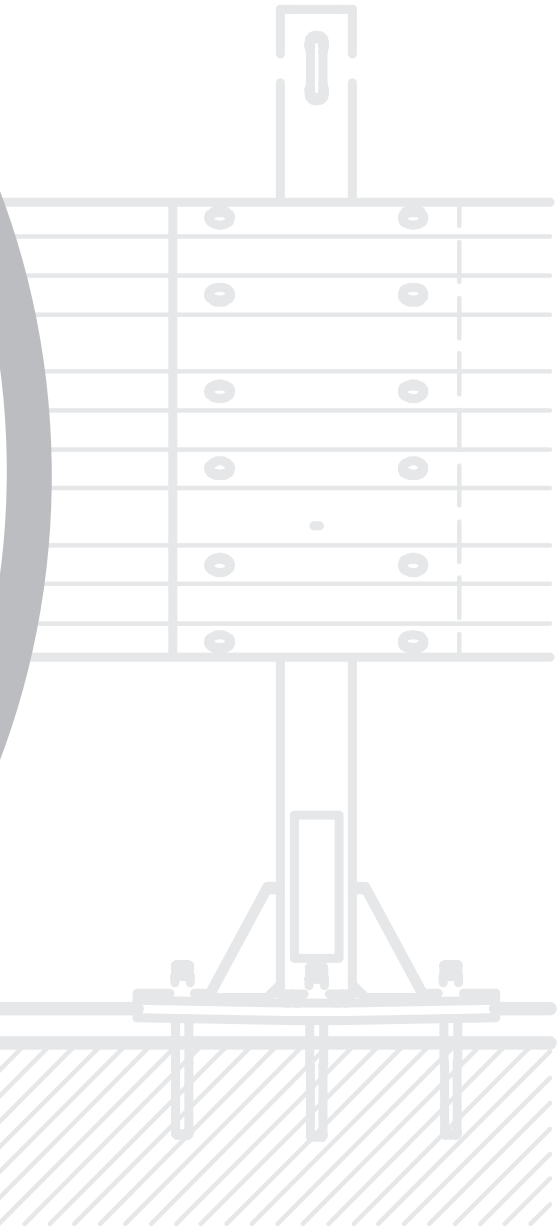
guardrails
soundproofing barriers
steel equipment
design
supply
production
installation



FRACASSO
holdings

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Note

This brochure can help to choose the guardrail systems suitable for own use.
In order to get the correct function of the safety barriers we suggest to read all the parts contained in the test reports.

Index

Rev 01/14/03/2016

FRACASSO HOLDINGS is an integral part of a multinational group seated in Rijeka, Croatia. The Group includes:

- FRACASSO RI (Croatia)
- FRACASSO HELLAS (Greece)
- FRACASSO INTERNATIONAL (Italy)
- FRACASSO DEUTSCHLAND (Germany)

Each of them represents FRACASSO HOLDINGS round the world.

Flexibility, reliability, and quality all feature the performance of FRACASSO HOLDINGS.

FRACASSO HOLDINGS is a group specialized in the production, supply and installation of safety barriers, guardrail, metal structures, and installation of soundproof barriers and road equipment inclusive of continuous installation supervision.

As designers and manufacturers, FRACASSO HOLDINGS offer a whole variety of road safety systems for modern motorways completely in conformity with both the European and international safety standards, such as the EN 1317 standard.

OUR VISION, MISSION

- To provide innovative and reliable solutions in the field of road and building site safety;

- To be a responsible participant in the field of road traffic safety and human life safety in traffic;

- To strengthen our position on the entire European market and on other markets within the region and to enhance our customers' satisfaction with our high quality services and products;

The mission of Fracasso Holdings is to win the leading position in the field of road traffic safety through continuous innovative solutions concerning their products and processes, technical skills, performance reliability, compliance with statutory rules and regulations, and fair attitude toward partners in commerce.

OUR VALUE

FRACASSO HOLDINGS supplies complete solutions and products, extending support to their customers continuously through all the stages from planning and supply up to installation following the sale and purchase.

The FRACASSO HOLDINGS Group is aimed in the first place at rendering their customers satisfied and strengthening their long-term and good business relationships.
Their strong adherence to the governing rules and regulations and their commitment to excellence in using only high quality materials in their production processes with minimum waste levels are the key elements used by their staff in seeking qualified and reliable partners toward the development of high quality and excellent performance solutions and products.
Permanent engagement in their process and product further development and innovativeness are themselves the guarantee for reliable and long-term technical solutions in compliance with the requirements of highest market standards.

Fracasso technicians and engineers are ready at all times to engage in solving any problem their customers may encounter and to offer solutions in line with their requirements.
Customer relations and mutual satisfaction is a top priority. Maintaining long-term business relationship with customers by providing complete support is the reason why the customers are coming back to us.
A team of experts is able to offer appropriate solutions for each customer according to their requirements (sometimes innovation is required due to different needs). The team is available at all times and is able to suggest in a short period of time most appropriate solutions to different problems. Flexible organisation ready to adapt when needed, has technical competence, reliability in execution of operations in compliance with the law, and good relationships with business partners. Long-term business associates, vendors, are essential for short time delivery of solutions and for fulfilling any customer needs. Professional support extended by engineers in the initial planning, coordination and management at construction sites is of essential importance in maintaining good relations with customers.
The approach mentioned above helped us to win a significant share on the markets both within the European Union and abroad. Plans for the future are even more export oriented thus to increase the share of exports in the total turnover of the companies within the Group.

4safe®

Safety Barriers 4Safe

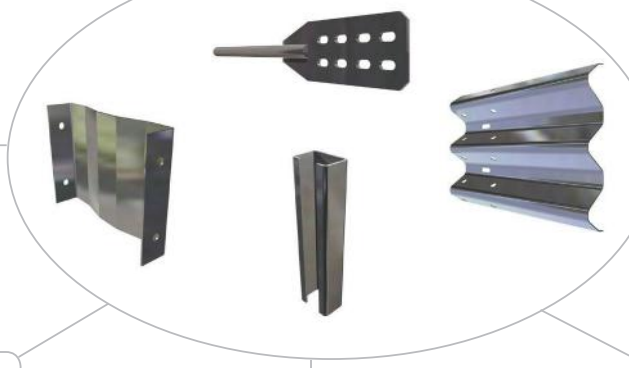
4safe®

4Safe H2 W4 A on Bridge

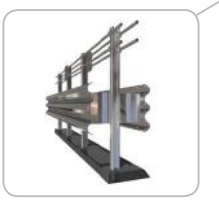
4Safe H2 W5 A on Ground

4Safe H4b W5 A on Ground

4Safe H2 W4 A on Ground

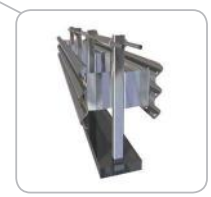


4Safe H4b W4 A on Bridge



4Safe H4b W5 A
Double sides

4Safe H4 W6 B on Ground



4Safe H2 W5 A
Double sides

4Safe

Designed to implement more secure and performing road barriers, Fracasso Spa has created the new family: 4 Safe, the only modular road safety barriers system which combines a limited number of elements, high standard of safety, flexibility of use and assembly.

Strengths

- Same components for all barrier configurations
- Easy assembly
- Unique concept tested in class H4 and extended to all products belonging to the same family
- Easy replacement, warehousing and handling
- Limited number of components
- Safe solutions for all road systems
- No dangerous spots thanks to the homogeneity of connections
- No contact between dummy's head and safety barriers during crash tests

Specifications

- Guardrails produced and certified according to EN 1317
- The 4Safe family is designed and developed according to the most severe road specifications (RPS 2009) issued by German Ministry of Transport and approved by European Community
- Steel quality S235-S275-S355JR complying with EN 10025 and FeB44K
- Hot dip galvanization complying with EN 1461 : 2009
- Bolts and nuts produced according to EN ISO 898 - EN 20898 UNI 3740/6

Fracasso aims to develop combinable road safety systems - able to create excellent passive safety conditions on road and highway networks - rather than single systems that meet specific contingent needs.

Fracasso "4Safe" family consists of a group of safety road barriers including single or multiple longitudinal elements with the same cross section, even if of different height and mounting different additional parts. Characteristic of this "4Safe" family is the 3n beam, the common element against which a vehicle crashes during a TB11 test.

The "4Safe" family barriers are all made with the same components according to the "4E" design line (4 elements), except for additional parts. Their working mechanism is the same for single components and for the whole system.

FRACASSO "4Safe" BARRIER COMPONENTS

The concept of Fracasso "4Safe" family means that design and production are based on the "4E" principle (4 elements) that is the use of only 4 main components: post, spacer, beam, bar.

- ***3n Beam***

The 3n three-wave beam has the same cross section and same position height off the road surface in all Fracasso "4Safe" family systems. The 3n beam is the element always coming into contact with the TB11 test vehicle.
The 3n beam is wide enough to restrain both light and heavy vehicles. In case of crash, the beam works mainly by traction and deflection.

- ***Preformed spacer***

The spacer is directly placed between the 3n beam and the post. Its shape optimises behaviour during energy absorption.

- ***Post***

The "C" section post is designed to combine a geometry with no sharp corners and a dynamic performance, especially in the side exposed to the traffic.

- ***Bar***

The bar is the element - along with the 3n beam - designed to restrain heavy vehicles.
This element can be installed both as single and double element in case of barrier of higher restraint levels. It also limits cross barrier deformations.

"4SAFE" SYSTEM LOGISTICS

The barrier family concept has been used by Fracasso since the 80's for "3n" type systems. These systems are still highly efficient and successful due to their significant performance and the principle of reduction of the basic components.
Fracasso new family is an evolution of the previous systems - keeping the high performance and use versatility - with a limited number of components.
This provides benefits for all bodies using the "4Safe" system:

- Same components for all configurations
- Easy assembly
- Unique concept tested in class H4 and extended to all the products' family
- Cheap replacements, warehousing and handling
- Limited number of spare parts
- Safe solutions for all road systems
- Elimination of dangerous spots due to homogeneity of the connected systems
- No contact between dummy's head and safety barriers during the crash test

Production regulations

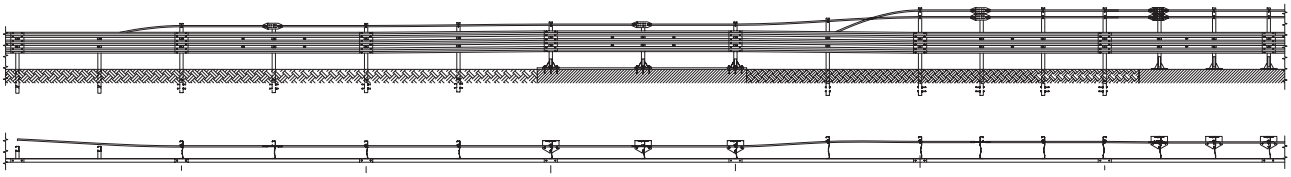
Produced in accordance with European regulations
EN 1317

TRANSITIONS/TERMINALS/CRASH CUSHIONS

The 4Safe family also includes the following special structures: terminals, transitions and crash cushions.

TRANSITIONS

The 4Safe barrier family includes fully compatible sections for the various containment levels preventing the use of special parts. As this is a progressive reinforcement system, the moving from one containment level to the next is carried on by the addition of a containment bar.



Moving between the different levels is carried on by progressively reinforcing the barrier of lower restraint level or progressively softening the barrier of higher restraint level. Gap between barriers of non-consecutive level is not allowed. Transitions between systems with highly different reinforcements and performances is achieved by means of the mandatory transition through all intermediate levels.

The “4Safe” family completes the range through transitions of the main systems which are present in the market, anyway with behaviours and performance compatible with the 4Safe system, even if with different sections. Fracasso has developed progressive transitions complete with special connection pieces for these cases.

All Fracasso transitions are designed to guarantee the complete transmission of longitudinal forces and behaviour similar to that of two connected barriers. Tests are carried on according to EN 1317-4 norms using simulations with computational mechanics and FEM models that guarantee high adherence in real conditions.

SPECIAL BARRIERS

Together with the standard configurations: on ground, on bridge, and double sides, the 4Safe family is completed by special safety barriers like:

- Removable barriers, which use the same configuration of the barriers on bridge, but include special elements which permit the installation on asphalt.
- Special Barriers suitable for obstacle protection, which mix high rigidity, restraint capacity and progressive deflection (specially for the TB11 test).
- Upgrade kits, specific for the protection of pedestrians, cyclists and bikers

These special barriers have been developed according with the higher restrictions required from the markets.
All of these new barriers are tested according with the EN1317, or simulated by FEM which can guarantee the behavior of the system during the crash.

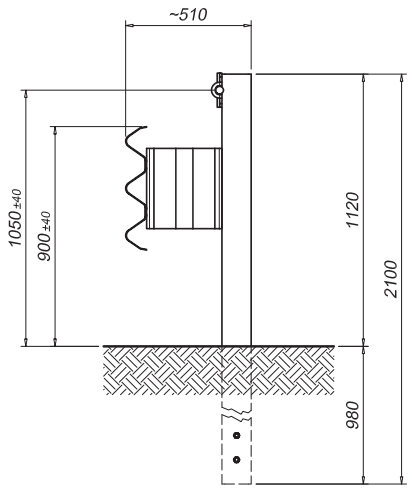
4safe®

engineered by

FRACASSO holdings

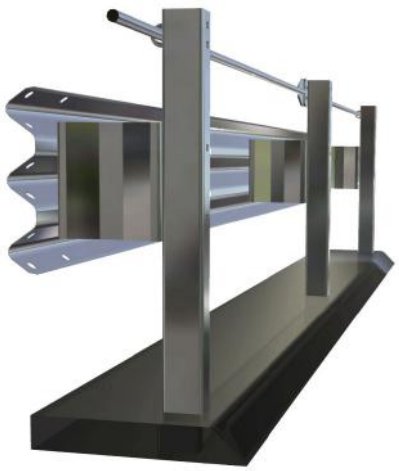
4safe® SINGLE SIDED SAFETY BARRIER ON GROUND

H2-A-W4 (3n32312)



Performance	
Containment level	H2
Acceleration Severity Index "ASI"	A
Working width	W4 (1,30 m)
Extreme lateral position of the vehicle	1,20 m
Dynamic deflection	0,90 m

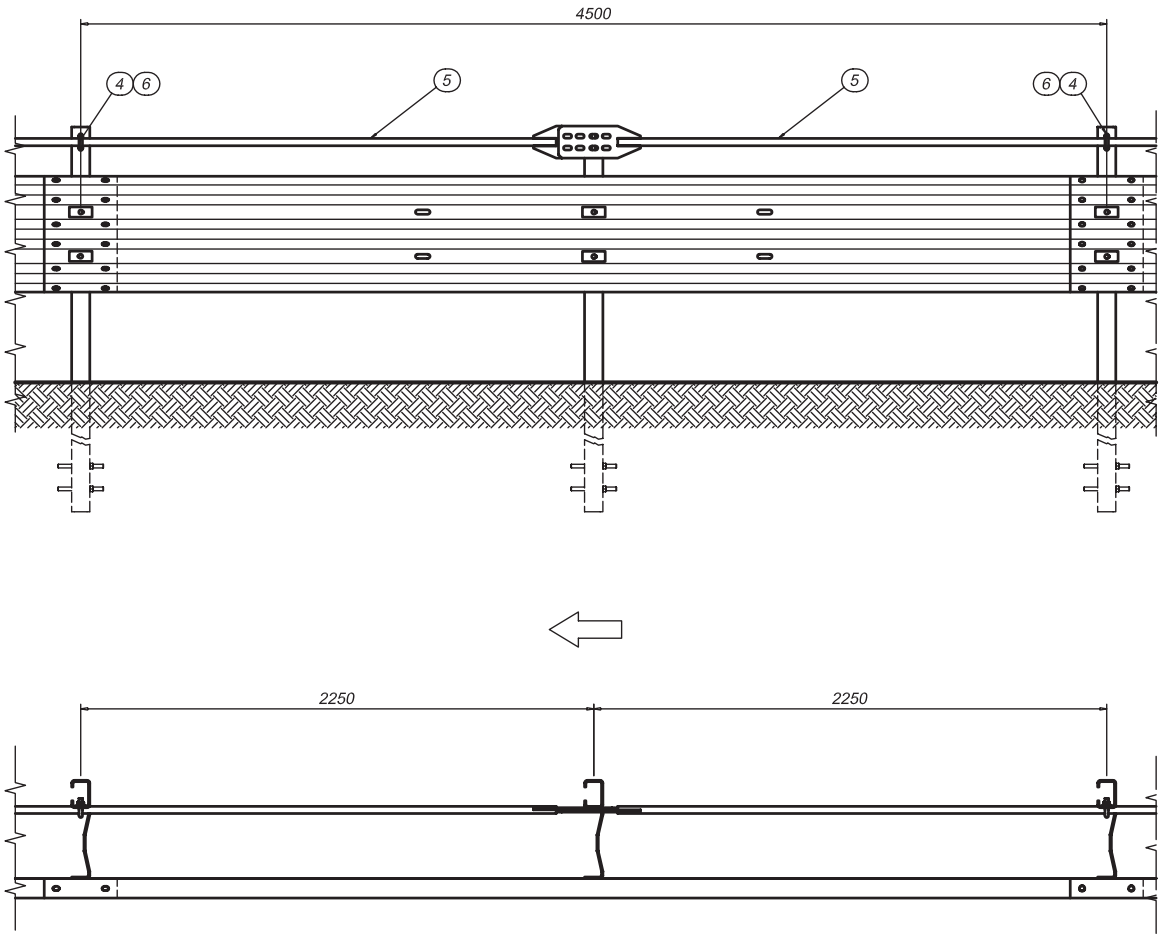
Characteristics	
Height out of ground	1050 mm / 900 mm
Transversal overall dimensions	510 mm
Centre to centre between posts	2250 mm
Tested minimum length (without terminal end)	78 m



Description

Supply and installation of a 3-wave safety barrier, thickness 2,5 mm, C posts 120x80x30 mm thk. 5,9 mm, H=2100 mm, fixed to ground every 2250 mm; spacers 310x80x5,9 mm, with an upper threaded retaining bars Ø 32 mm, assembled with nuts and bolts and provided with reflectors.
S235JR-S355JR steel quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

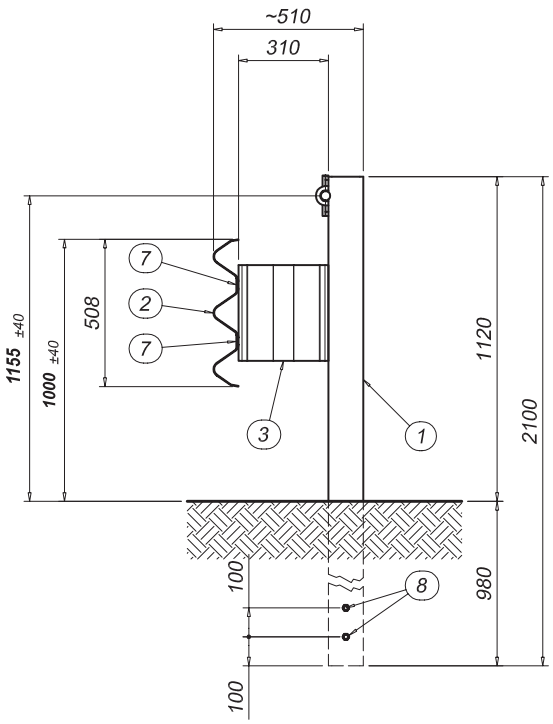
Elevation



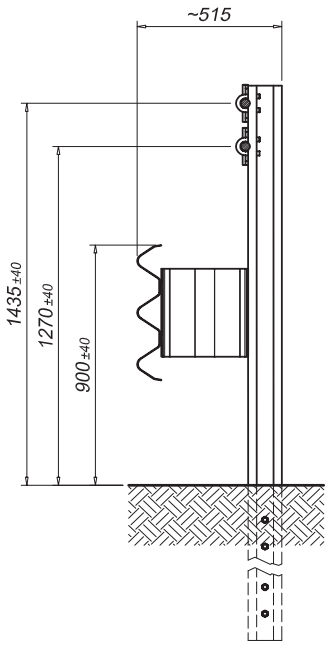
Section

	Description
1	C posts 120x80x30 mm th.5,9 mm, H= 2100 mm
2	“3n” Beam c/c 4500 mm th. 2,5 mm
3	Spacers 310x80x5,9 mm L=330 mm
4	Clamp M16
5	Upper thr. ret. bars Ø 32 mm, with welded plate
6	Plate 100x40x5 mm
7	Cover plate 100x45x5 mm
8	Threated bars diam. 16 mm L=200 mm

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
M16	5 Nm



4safe® SINGLE SIDED SAFETY BARRIER ON GROUND
L4b-W4-A (3n34352)



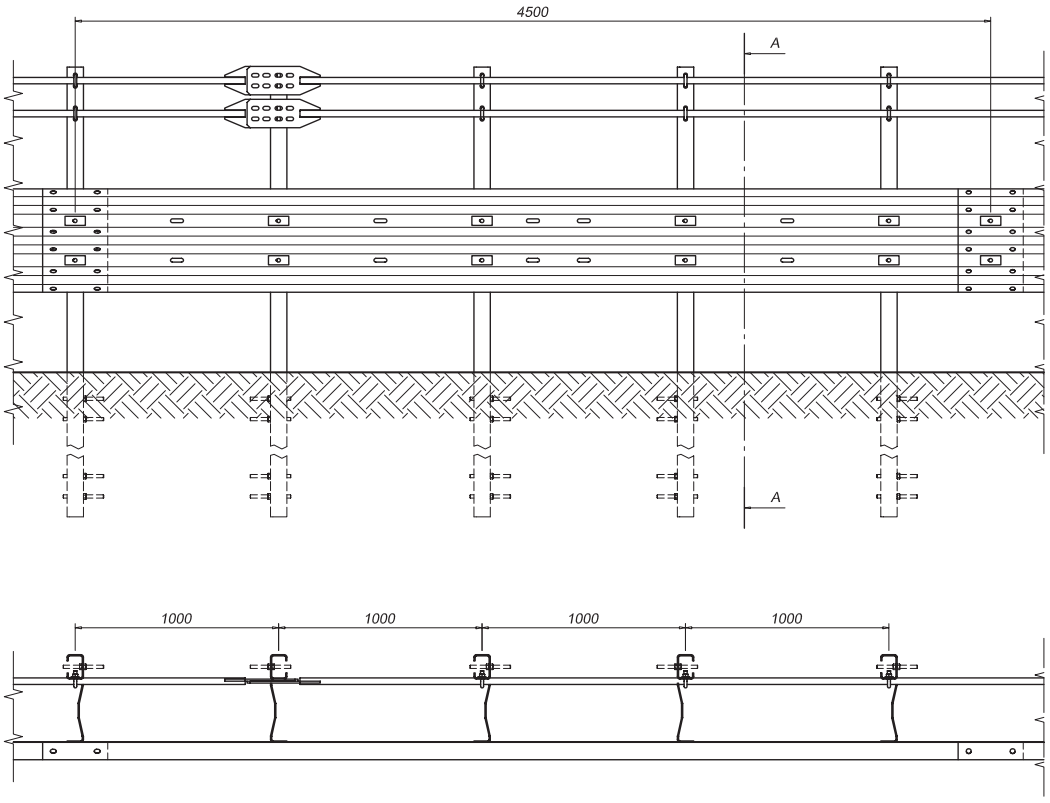
Performance	
Containment level	H4b
Acceleration Severity Index "ASI"	A
Working width	W4 (1,30 m)
Extreme lateral position of the vehicle	2,0 m
Dynamic deflection	1,2 m

Characteristics	
Height out of ground	1435 mm/1270 mm/900 mm
Transversal overall dimensions	515 mm
Centre to centre between posts	1000 mm
Tested minimum length	90 m

Description

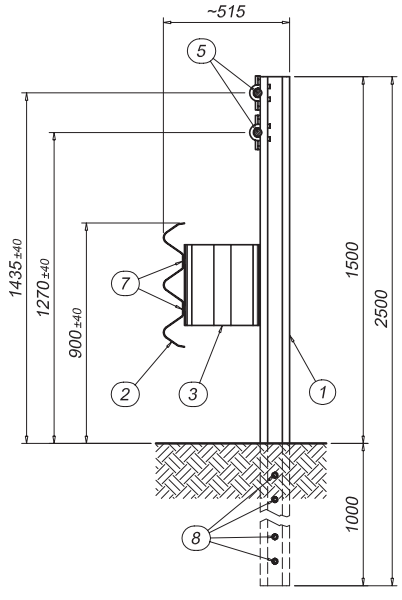
Supply and installation of 3-waves safety barrier, thickness 2.5 mm,C posts 120x80x30x5.9 mm; H=2500 mm the posts are driven into the ground every 1000 mm, spacers 310x80x5.9 mm, with double upper threaded retaining bars diam. 32 mm, assembled with nuts and bolts and provided with reflectors.
S235JR-S355JR steel in quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation

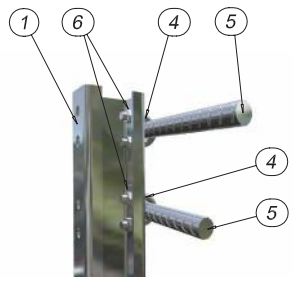


Section

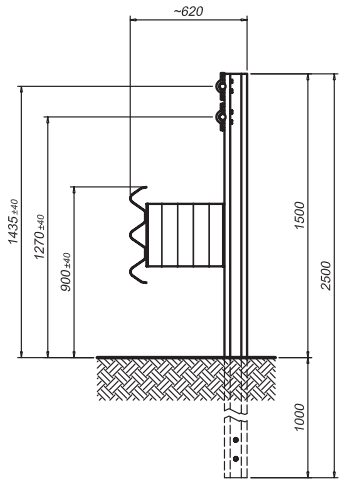
	Description
1	C post 120x80x30x5.9 mm; H=2500 mm
2	“3n” Beam c/c 4500 mm; thk. 2.5 mm
3	“3n” Spacer 310x80x5.9 mm; L=330 mm
4	Clamp M16
5	Upper threaded retaining bars Ø 32 mm L=9250 mm with welded plate
6	Plate with hole 100x40x5 mm
7	Cover plate 100x45x5 mm
8	Threaded Bar M16 L=200 mm



Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
Threaded Bar	5 Nm

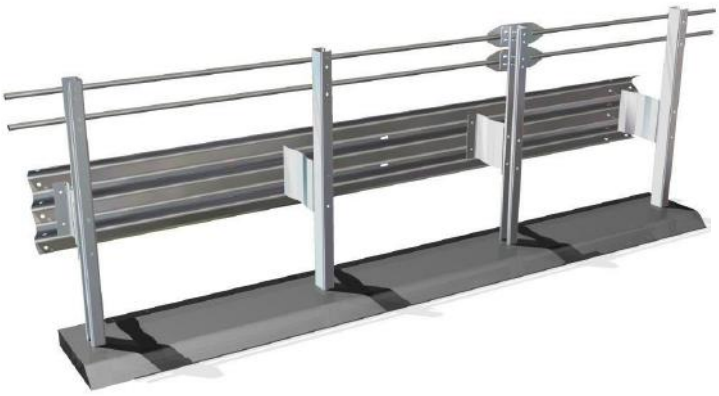


4safe® SINGLE SIDED SAFETY BARRIER ON GROUND
H4b-A-W5 (3n31679)



Performance	
Containment level	H4b
Acceleration Severity Index "ASI"	A
Working width	W5 (1.70 m)
Extreme lateral position of the vehicle	1,60 m
Dynamic deflection	1,10 m

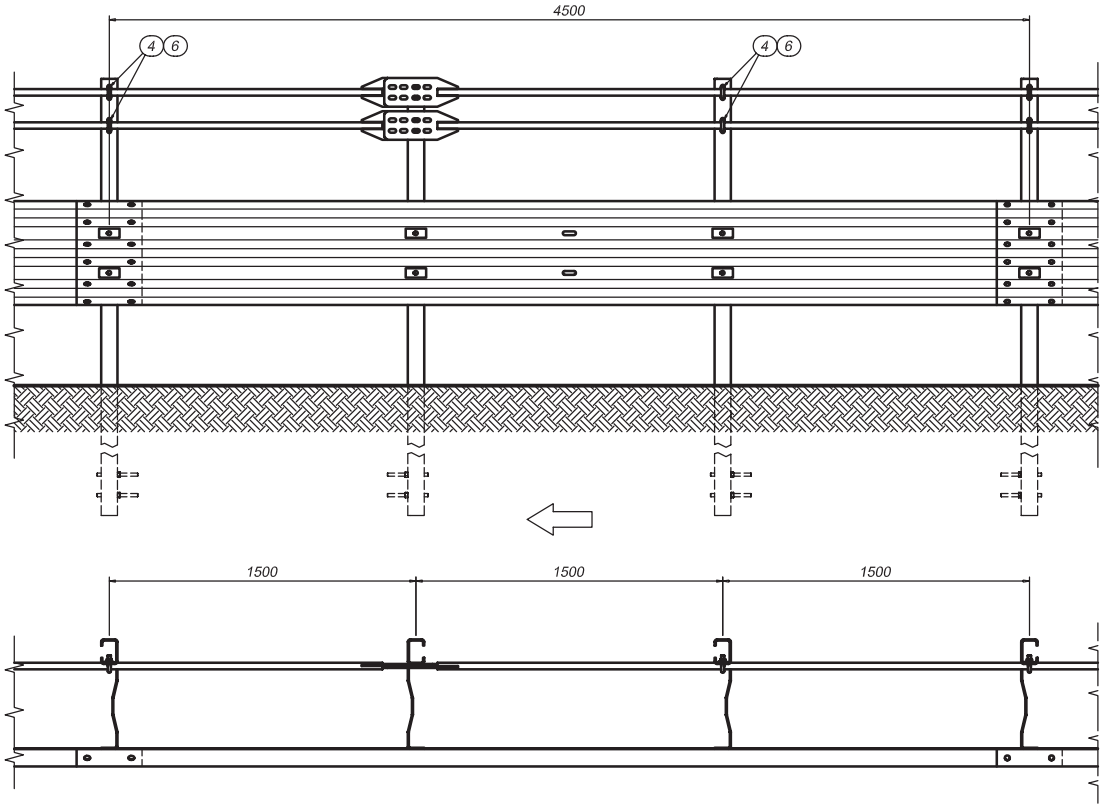
Characteristics	
Height out of ground	900 mm / 1270 mm / 1435 mm
Transversal overall dimensions	620 mm
Centre to centre between posts	1,50 m
Tested minimum length	81 m



Description

Supply and installation of a 3-wave safety barrier, thickness 2,5 mm, C post 120x80x30 mm th.5,9 mm, H= 2500 mm, fixed to ground every 1500 mm, spacers 415x80x5 mm, with an upper threaded retaining bars Ø 32 mm with welded plates, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR-S355JR steel quality according to EN 10025 EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

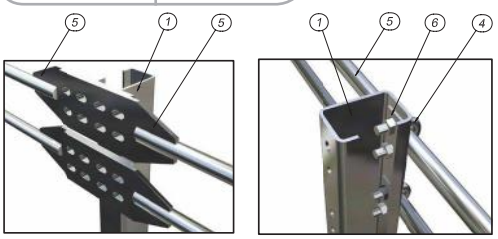
Elevation

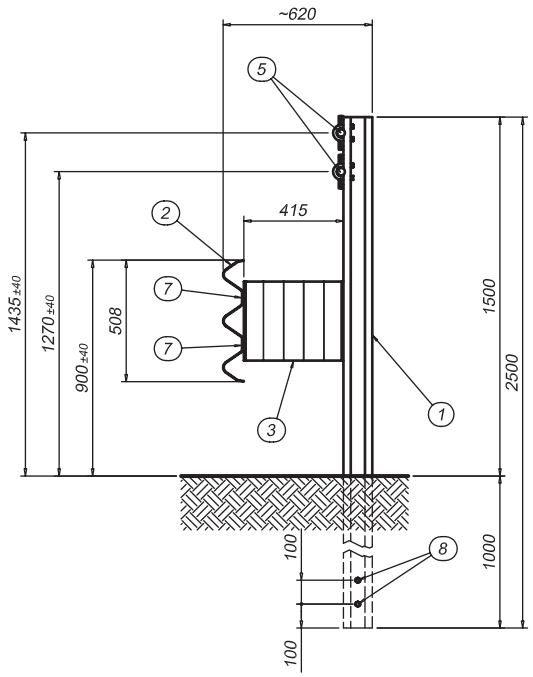


Section

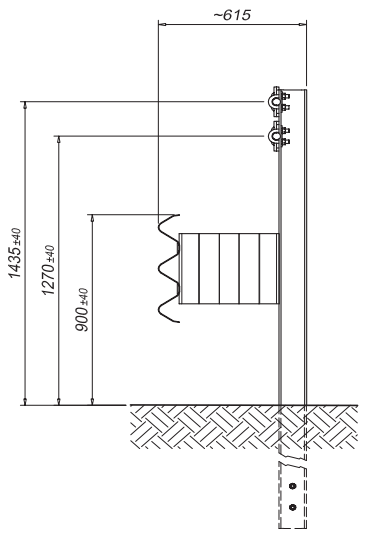
	Description
1	C post 120x80x30 mm th. 5,9 mm H= 2500 mm
2	“3n” Beam c/c 4500 mm th. 2,5 mm
3	Spacers 415x80 mm L =339 mm
4	Clamp M16
5	Upper thr. ret. bars Ø 32 mm L=9250 mm with welded plate
6	Plate 100x40x5 mm
7	Cover plate 100x45x5 mm
8	Threated bars M16 L=200 mm

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
M16	5 Nm



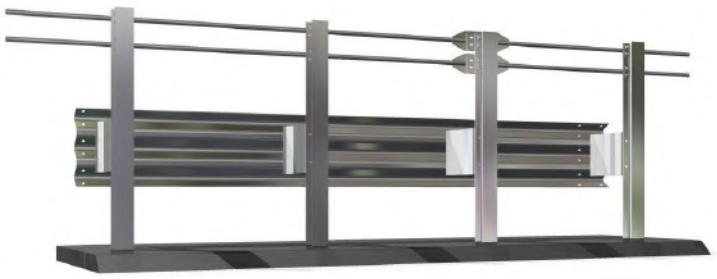


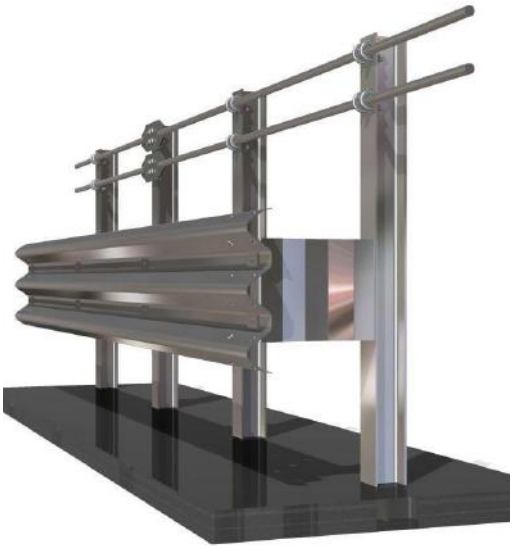
4safe® SINGLE SIDED SAFETY BARRIER ON GROUND
H4b-B-W5 (3n31862)



Performance	
Containment level	H4b
Acceleration Severity Index “ASI”	B
Working width	W5 (1,50 m)
Extreme lateral position of the vehicle	1,50 m
Dynamic deflection	1,00 m

Characteristics	
Height out of ground	1435 mm/1270 mm/900 mm
Transversal overall dimensions	615 mm
Centre to centre between posts	1333mm
Tested minimum length	81 m

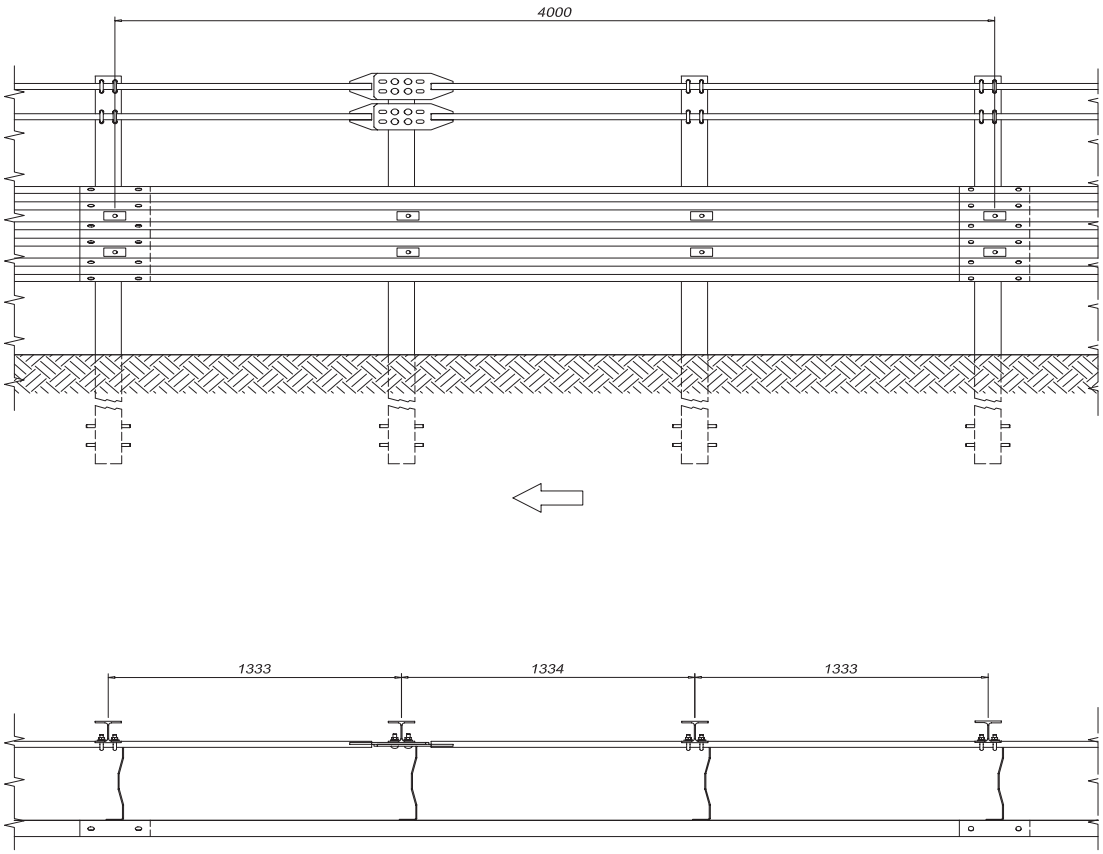




Description

Supply and installation of a 3-wave safety barrier, thickness 3,0 mm, HEA 120 posts, h=2500 mm driven into ground every 1333 mm, spacers 415x80x5 mm, with 2 threaded bars diam. 32 mm as upper retaining rails, assembled with nuts and bolts and connections and provided with reflectors.
S235JR-S275JR steel quality according to EN 10025 EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

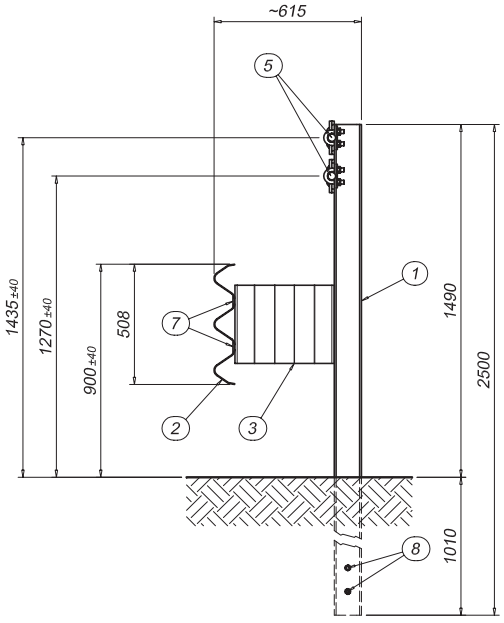
Elevation

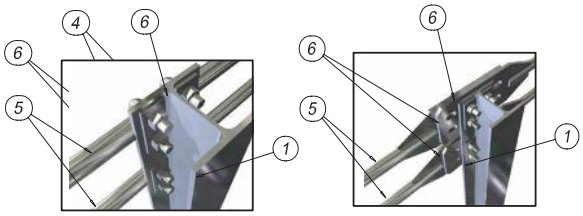


Section

	Description
1	Post HEA120 H=2500 mm
2	“3n” beam c/c 4000 mm th. 3 mm
3	“3n” spacer 415x80x5 mm L=330 mm
4	Clamp M16, partially threated
5	Bar Ø32 mm L=8248 mm with welded plates
6	Small plate 100x40x5 mm
7	Cover plate 100x40x5 mm
8	Threated bars M16, L=200 mm

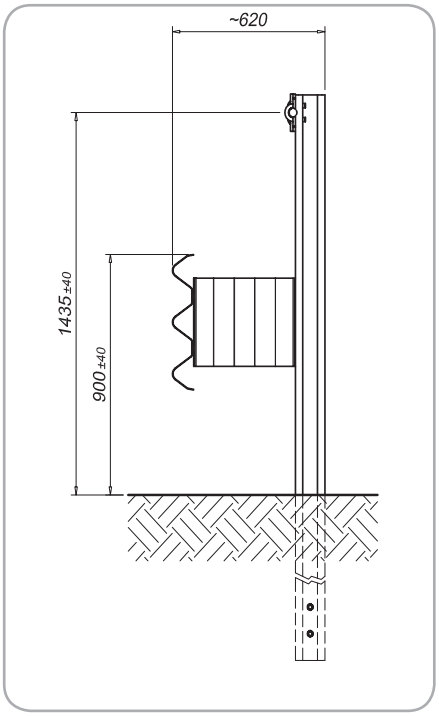
Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
Threated bars	5 Nm





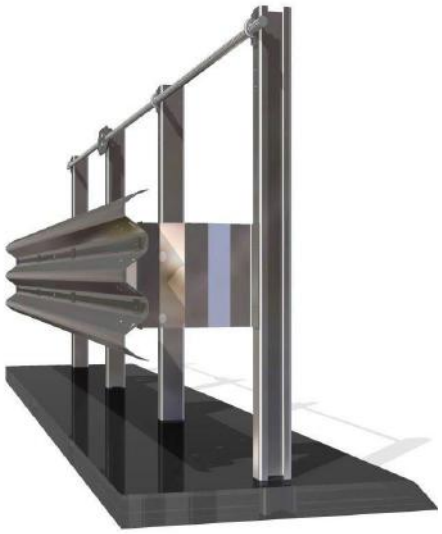
4safe® SINGLE SIDED SAFETY BARRIER ON GROUND

H4b-A-W6 (3n32818)



Performance	
Containment level	H4b
Acceleration Severity Index “ASI”	A
Working width	W6 (2,00 m)
Extreme lateral position of the vehicle	2,10 m
Dynamic deflection	1,60 m

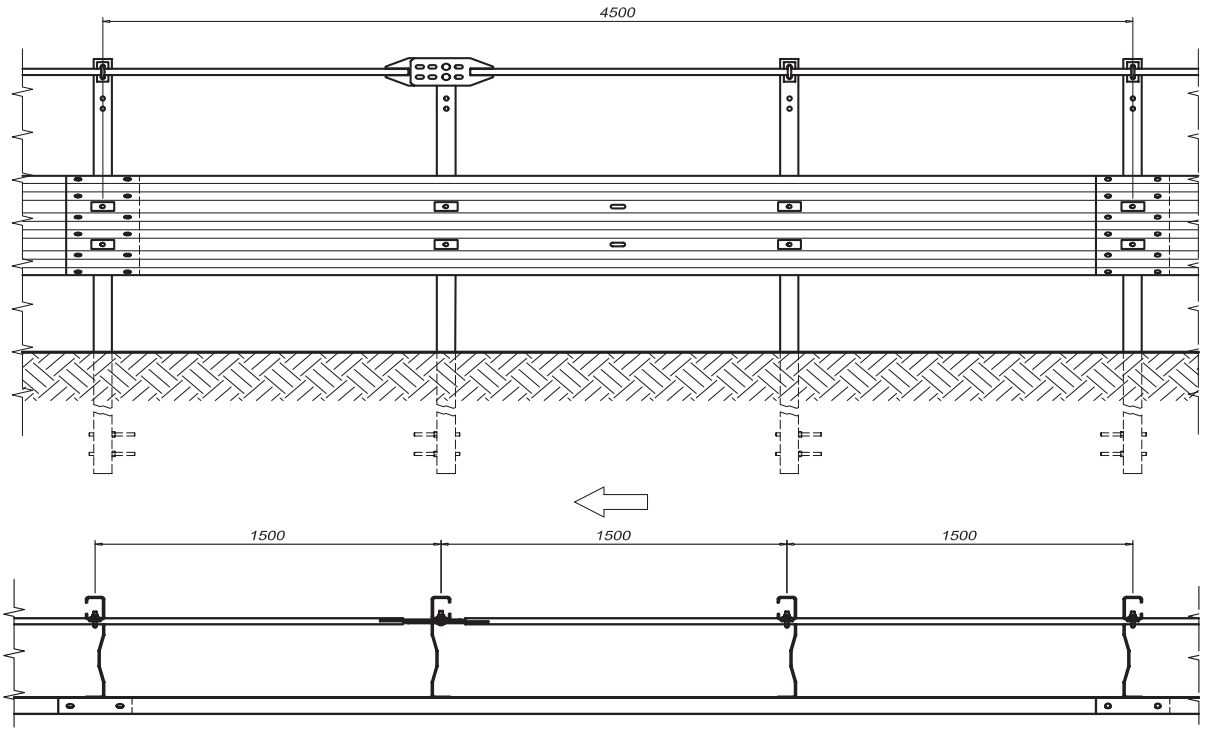
Characteristics	
Height out of ground	1435 mm /900 mm
Transversal overall dimensions	620 mm
Centre to centre between posts	1500mm
Tested minimum length	75,5 m



Description

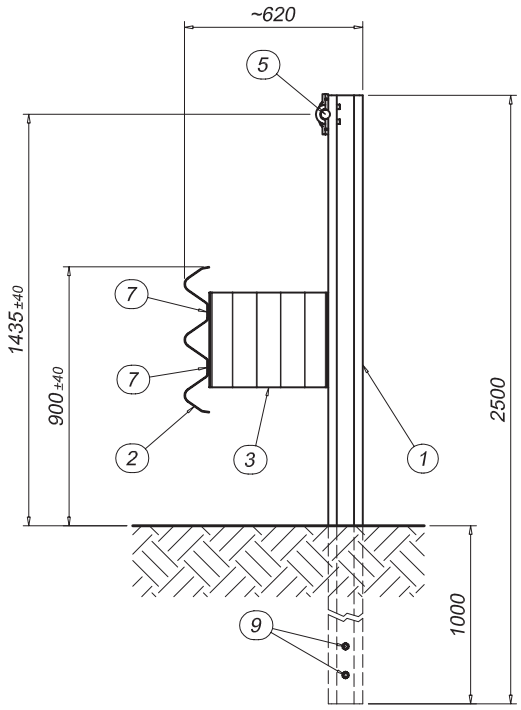
Supply and installation of 3-waves safety barrier, thickness 2.5 mm, posts type C120x80x30x5,9 H=2500 mm fixed to the ground every 1500 mm, spacers 415x80x5mm L=330mm, upper rail threaded bars Ø 32 mm with welded plates, nuts and bolts and reflectors.
S235JR-S275JR-S355JR steel in quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation

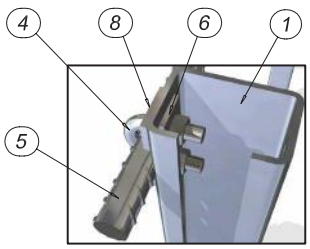


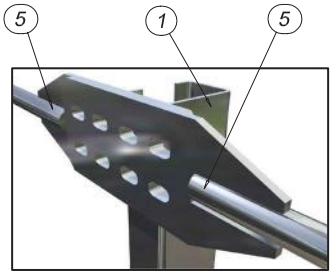
Section

	Description
1	Posts type C 120x80x30 mm th. 5,9 mm H= 2500 mm
2	„3n“ beam c/c 4500 mm, th. 2,5 mm
3	Spacers 415x80x5 mm L =330 mm
4	Clamp M16
5	Upper rail Ø 32 mm, L=9250 mm with welded plate
6	plate with holes 100x40x5 mm
7	Cover plate 100x45x5 mm
8	Shaped plate
9	Threated bars diam. 16 L=200 mm

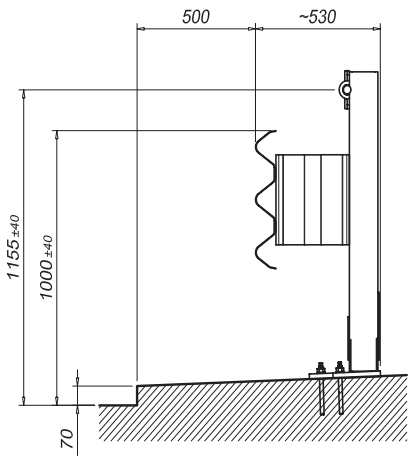


Torque values	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
M16	5 Nm



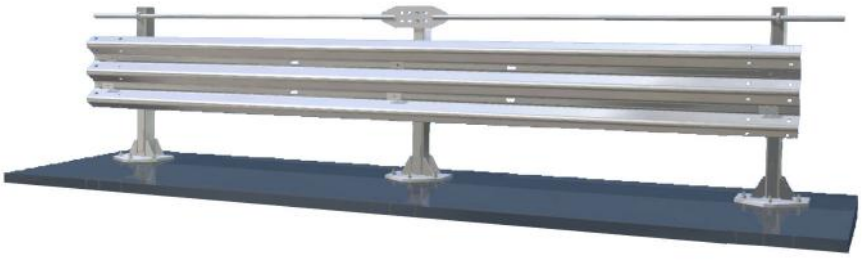


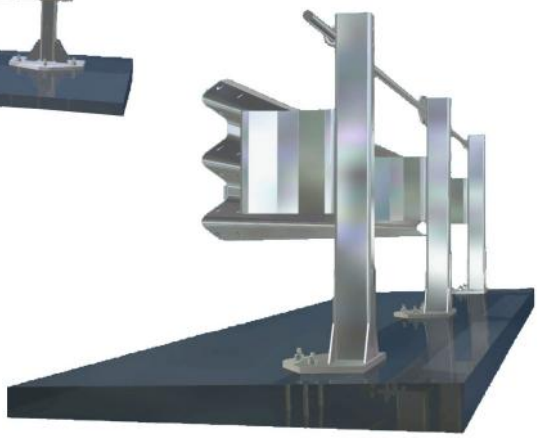
4safe® SINGLE SIDED SAFETY BARRIER ON BRIDGE
H2-W4-A (3n32122)



Performance	
Containment level	H2
Acceleration Severity Index "ASI"	A
Working width	W4 (1,10 m)
Extreme lateral position of the vehicle	1,20 m
Dynamic deflection	0,80 m

Characteristics	
Height out of ground	1155 mm / 900 mm
Transversal overall dimensions	530 mm
Centre to centre between posts	2250 mm
Tested minimum length (without terminal end)	78 m

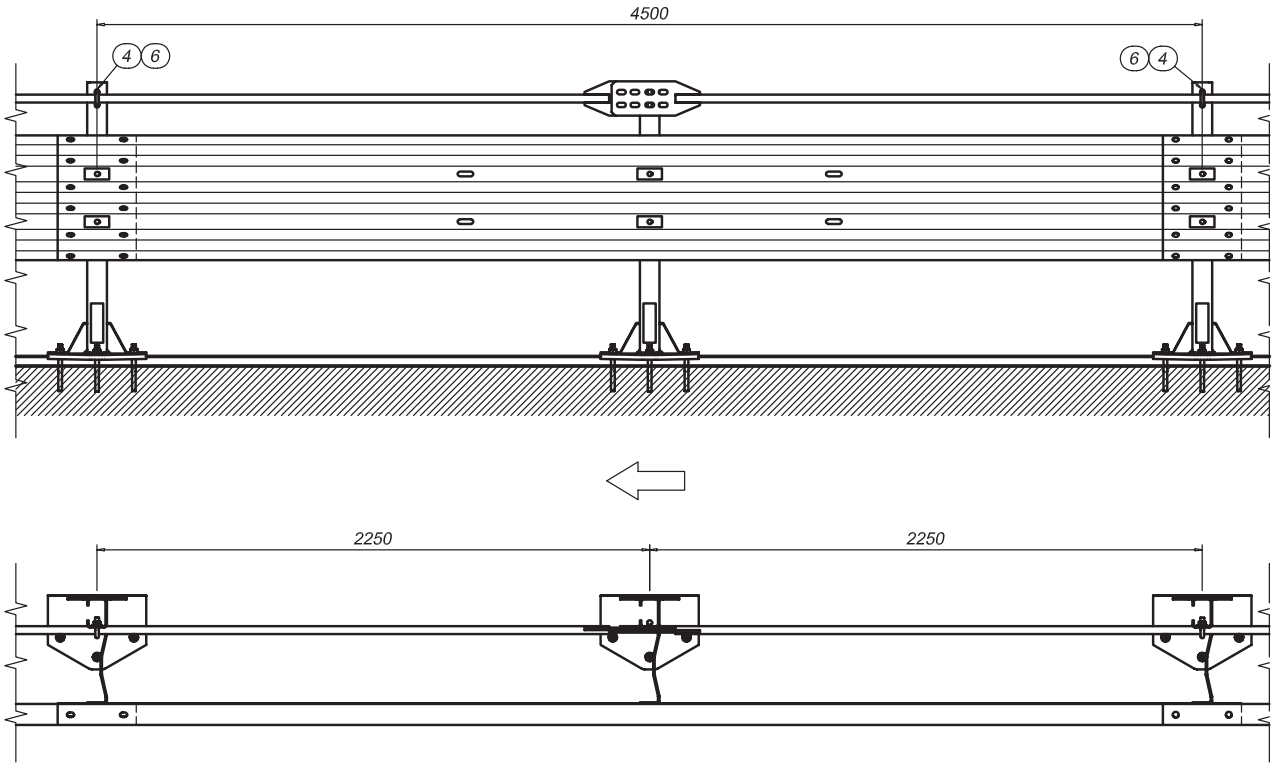




Description

Supply and installation of a 3-wave safety barrier, thickness 2,5 mm, C post 120x80x30 mm th.5,9 mm, H= 1100 mm, fixed to concrete every 2250 mm by anchor bolts, spacers 310x80x5,9 mm, with an upper threaded retaining bars Ø 32 mm with welded plates, assembled with nuts and bolts and provided with reflectors.
S235JR-S355JR steel quality according to EN 10025 EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

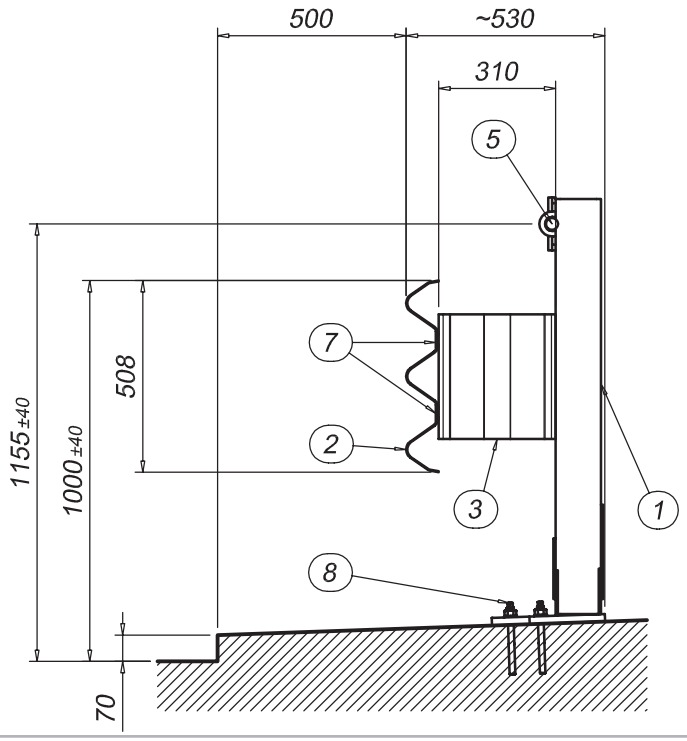
Elevation



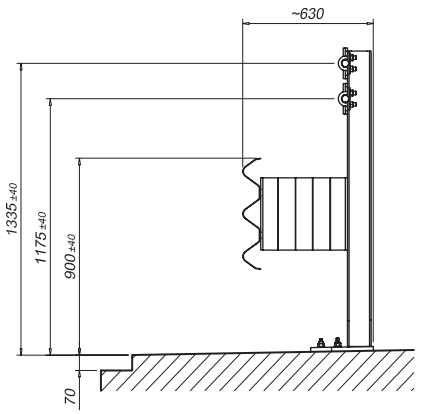
Section

	Description
1	C post 120X80X30 mm th. 5,9 mm H=1100 mm
2	“3n” Beam c/c 4500 mm th.2,5 mm
3	Spacers 310x80x5,9 mm L=330 mm
4	Clamp M16
5	upper thr. ret. bars Ø32 L=9250 mm with welded plate
6	Plate 100x40x5 mm
7	Plate cover 100x45x5 mm
8	Anchor bolts M18

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
M18	40 Nm

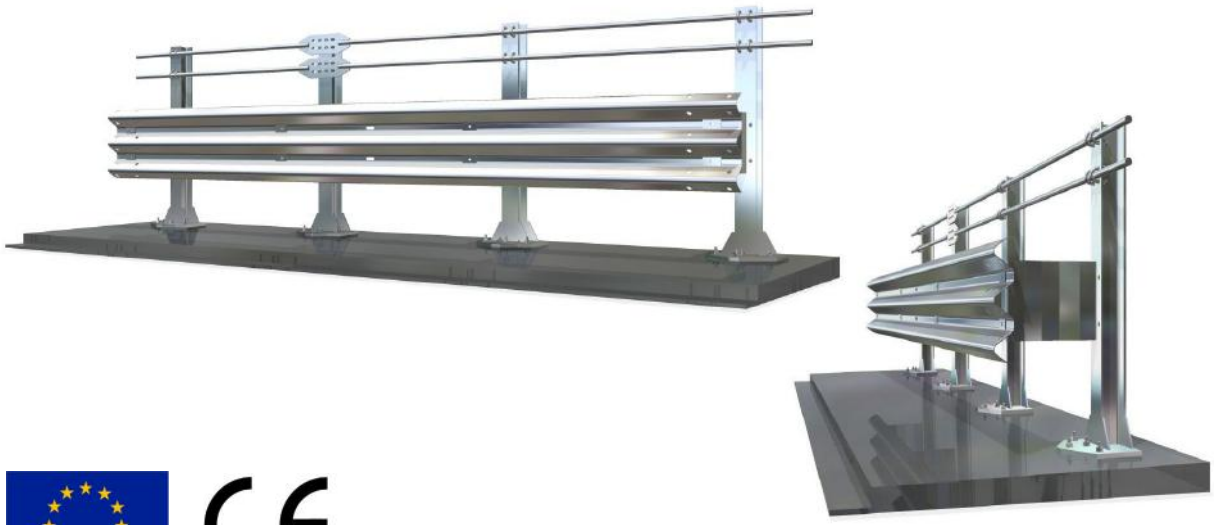


4safe® SINGLE SIDED SAFETY BARRIER ON BRIDGE
H4b-A-W6 (3n31622)



Performance	
Containment level	H4b
Acceleration Severity Index "ASI"	A
Working width	W6 (2,0 m)
Extreme lateral position of the vehicle	2,3 m
Dynamic deflection	1,50 m

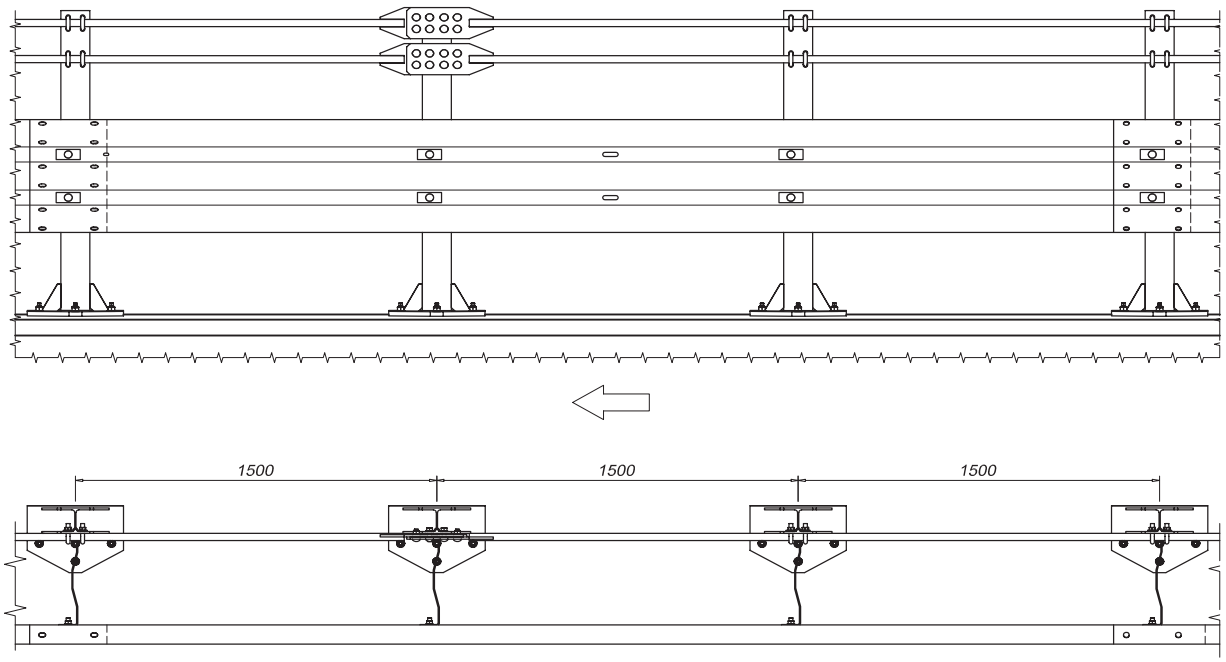
Characteristics	
Height out of ground	1335 mm/1175 mm/900 mm
Transversal overall dimensions	630 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminal end)	78 m



Description

Supply and installation of a 3-wave safety barrier, thickness 2.5 mm, HEA Posts 120 h. 1350 mm with plate 300x400x20 mm fixed to concrete every 1500 mm by anchor bolts, spacers 415x80x5 mm L=330 mm, with double upper threaded retaining bars Ø 32 mm with welded plates, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR steel quality according to EN 10025 EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

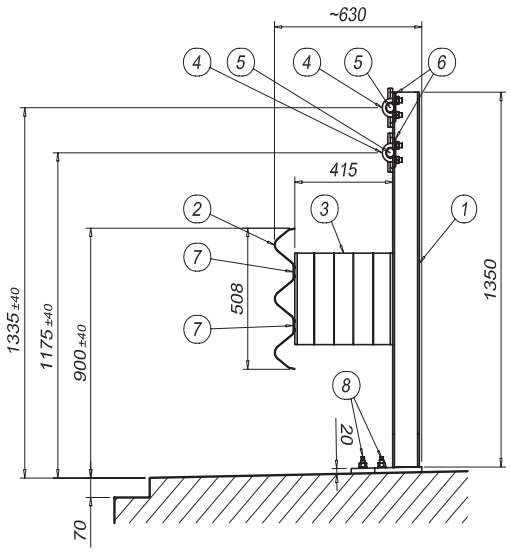
Elevation



Section

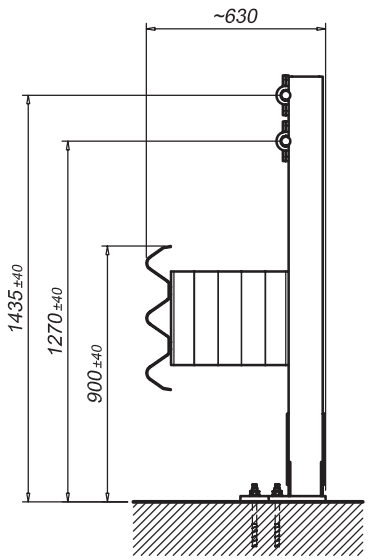
	Description
1	Post HEA120 h=1350 mm + welded plates
2	“3n” Beam c/c 4500 mm th. 2,5 mm
3	Spacers 415x80x5 mm L=330 mm
4	Clamp M16
5	Upper thr. ret. bars Ø 32 mm L=9250 mm with welded plate
6	Plate 100x40x5 mm
7	Cover plate 100x45x5 mm
8	Anchor bolts M18 TSM B16 cl.10.9 L=190 mm

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
M18	40 Nm



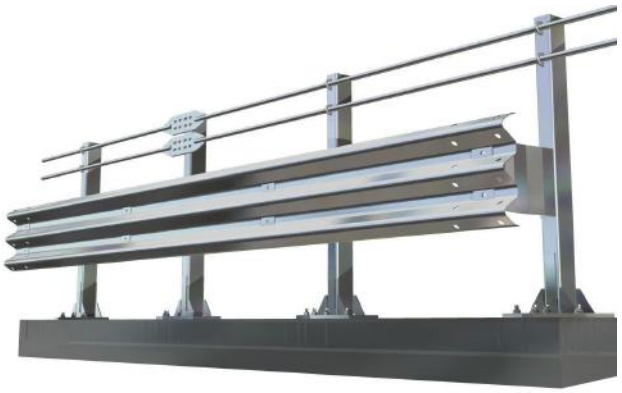
4safe® SINGLE SIDED SAFETY BARRIER ON BRIDGE

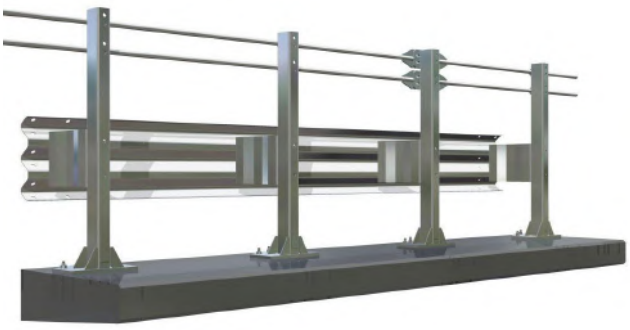
H4b-B-W4 (3n31857)



Performance	
Containment level	H4b
Acceleration Severity Index "ASI"	B
Working width	W4 (1,30 m)
Extreme lateral position of the vehicle	1,20 m
Dynamic deflection	0,80 m

Characteristics	
Height out of ground	900 mm / 1270 mm /1435 mm
Transversal overall dimensions	630 mm
Centre to centre between posts	1,33 m
Tested minimum length (without terminal end)	92 m

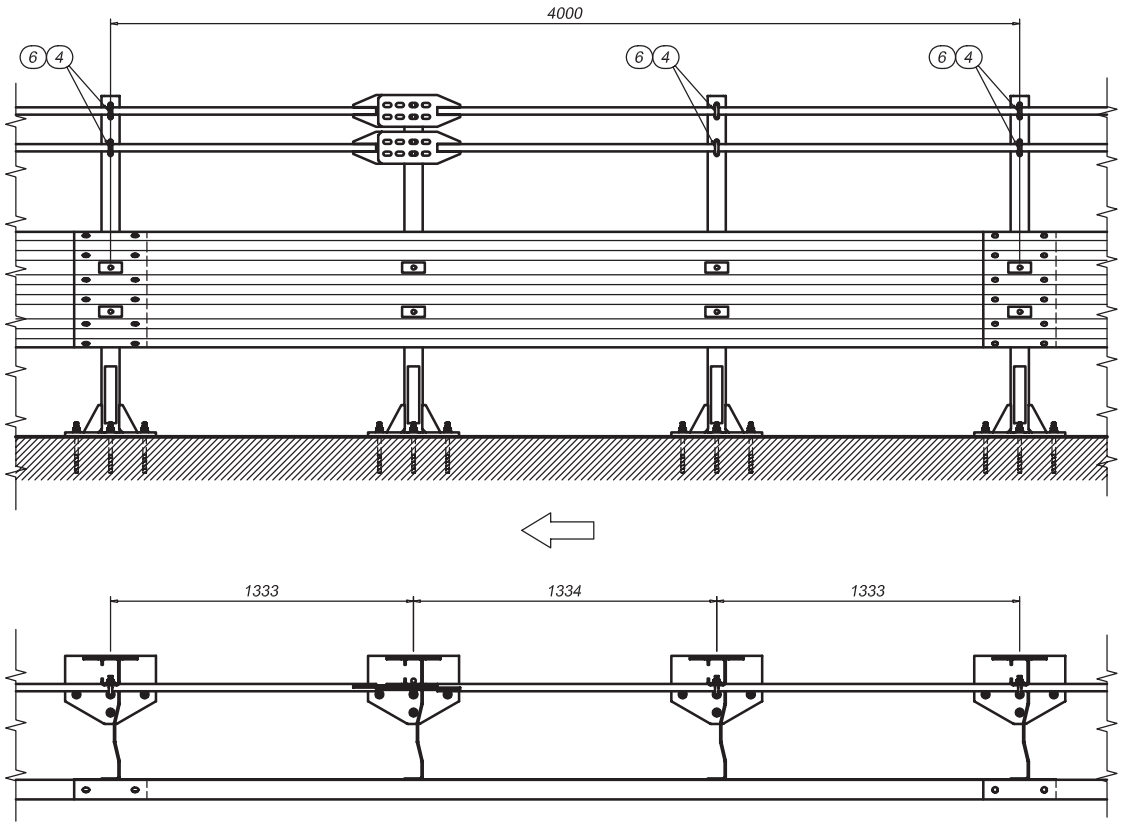




Description

Supply and installation of a 3-wave safety barrier, thickness 3 mm, C post 120x80x30 mm sp. 5,9 mm, H= 1480 mm fixed to concrete every 1333 mm by anchor bolts, spacers 415x80x5 mm L=330 mm, with double threaded retaining bars Ø 32 mm with welded plates, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR-S355JR steel quality according to EN 10025 EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

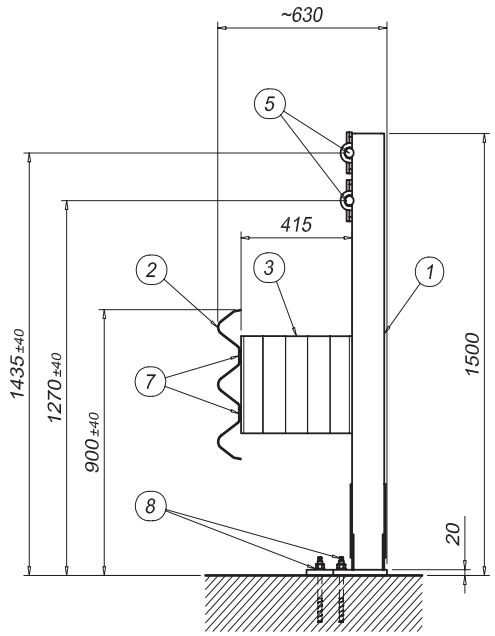
Elevation

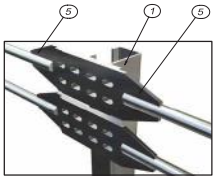


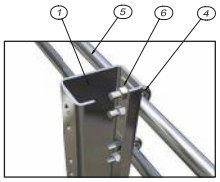
Section

	Description
1	C post C 120x80x30 mm sp. 5,9 mm H= 1480 mm
2	“3n” Beam c/c 4000 mm th. 3 mm
3	Spacers 415x80x5 mm L =339 mm
4	Clamp M16
5	Upper thr. ret. bars Ø 32 mm, with welded plate
6	Plate 100x40x5 mm
7	Cover plate 100x45x4 mm
8	Anchor bolts M18

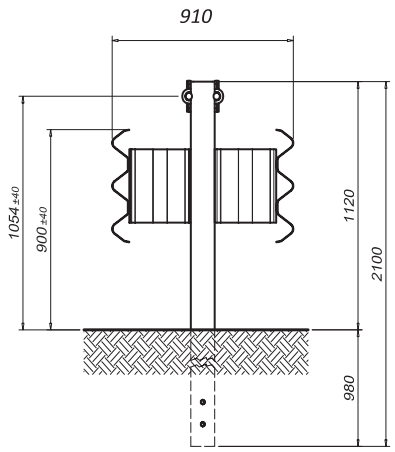
Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
M18	40 Nm







4safe® DOUBLE SIDED SAFETY BARRIER ON GROUND
H2-W4-A (3n32773)



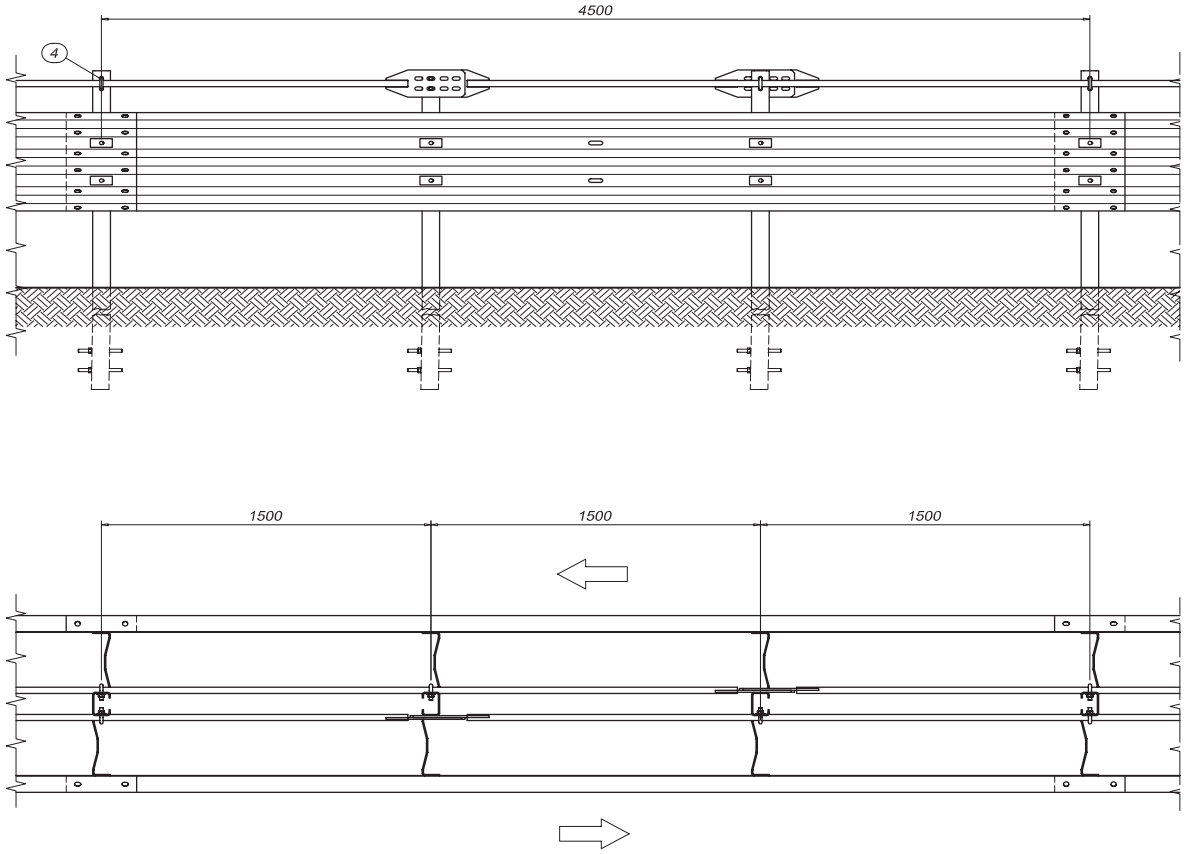
Performance	
Containment level	H2
Acceleration Severity Index "ASI"	A
Working width	W4 (1,30 m)
Extreme lateral position of the vehicle	1,30 m
Dynamic deflection	0,90 m

Characteristics	
Height out of ground	900 / 1054 mm
Transversal overall dimensions	910 mm
Centre to centre between posts	1500 mm
Tested minimum length (Terminals included)	76,5 m

Description

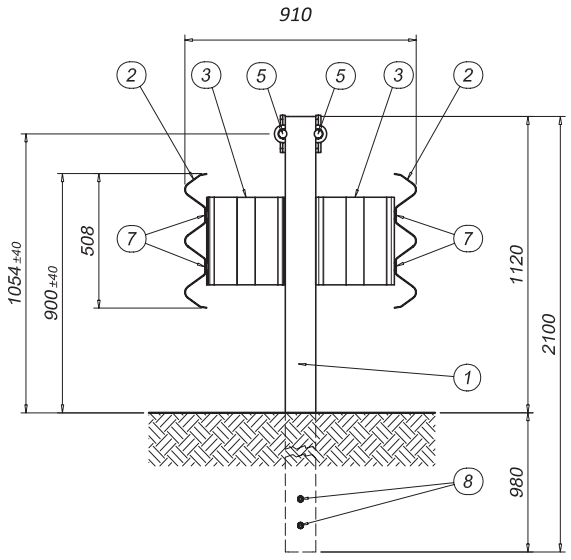
Supply and installation of 3-waves safety barrier, thickness 2.5 mm, posts C 120x80x30 mm, H= 2100, fixed to ground every 1500 mm, spacers 310x80x5,9 mm, with two upper threaded retaining bars Ø 32 mm, with welded plates, assembled with nuts and bolts and provided with reflectors.
S235JR-S355JR steel in quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

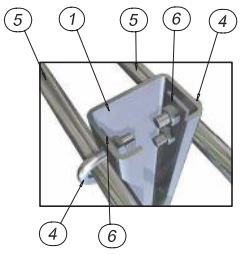
Elevation

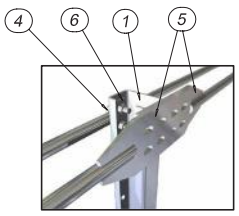


Section

	Description
1	C post 120x80x30x5.9, h. 2100 mm with plate
2	“3n” Beam c/c 4500 mm th.2,5 mm
3	Spacers 310x80X5,9 mm L=330 mm
4	Clamp M16
5	upper thr. ret. bars Ø32 L=9250 mm with welded plate
6	Plate 100x40x5 mm
7	Plate cover 100x40x5 mm
8	Threated bar M16 L=200 mm



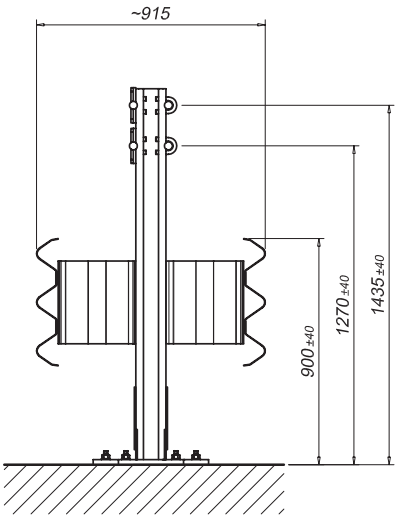




Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
Threated bar	5 Nm

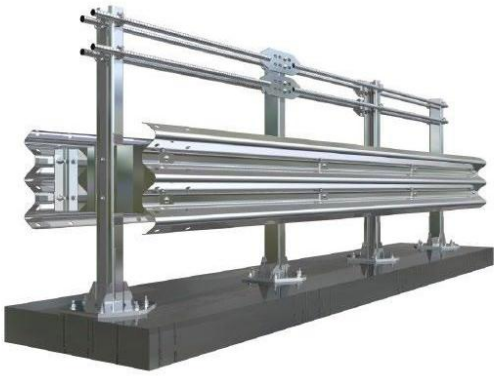
4safe® DOUBLE SIDED SAFETY BARRIER ON BRIDGE

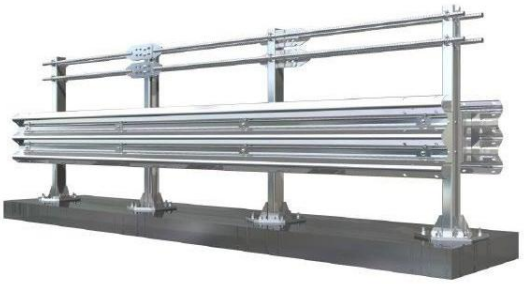
L4b-W4-B (3n34650)



Performance	
Containment level	L4b
Acceleration Severity Index “ASI”	B
Working width	W4 (1.30 m)
Extreme lateral position of the vehicle	2.30 m
Dynamic deflection	0.8 m

Characteristics	
Height out of ground	900 mm / 1270 mm / 1435 mm
Transversal overall dimensions	915 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminals)	89.0 m

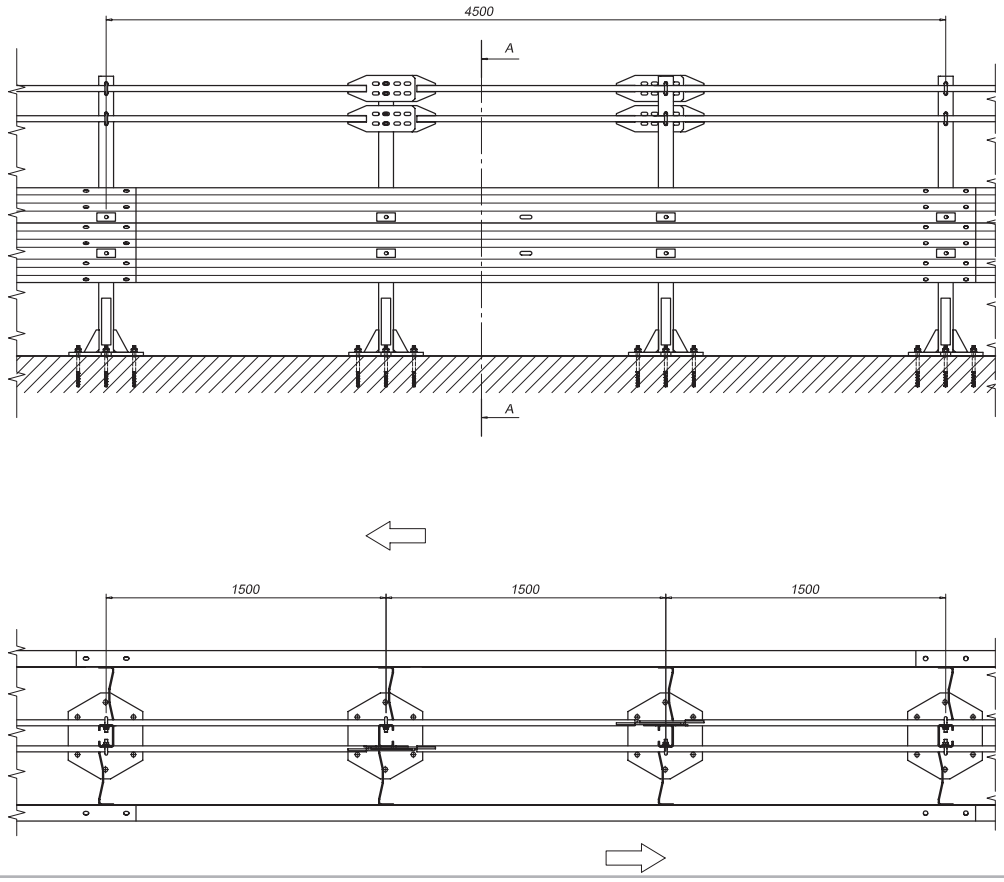




Description

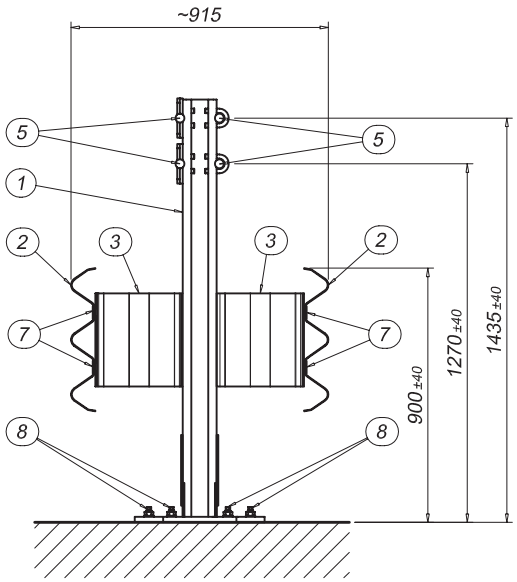
Supply and installation of 3-waves safety barrier, thickness 3.0 mm, posts C 120x80x30 mm thk. 5,9 mm; H= 1480 mm, fixed to ground every 1500 mm by anchor bolts; spacers 310x80x5,9 mm, with four upper threaded retaining bars Ø 32 mm with welded plates, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR-S355JR steel in quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

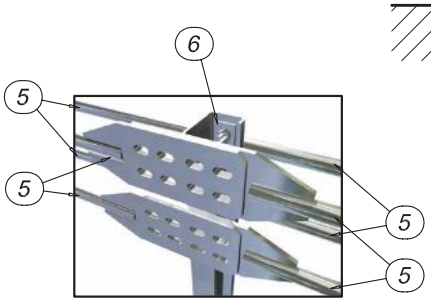
Elevation



Section

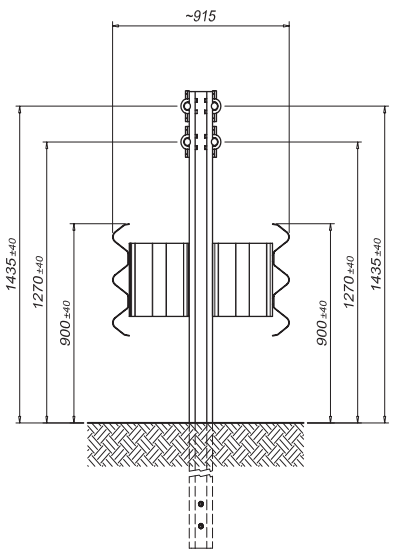
	Description
1	C post 120x80x30x5.9, h. 1480 mm with plate
2	“3n” Beam c/c 4500 mm thk 3,0 mm
3	Spacer 330x80x5,9 mm L =330 mm
4	Clamp M16
5	upper thr. ret. bars Ø32 L=9250 mm with welded plate
6	Plate 100x40x5 mm
7	Plate cover 100x40x5 mm
8	Anchor bolts M18 TSM B16 L=190 mm





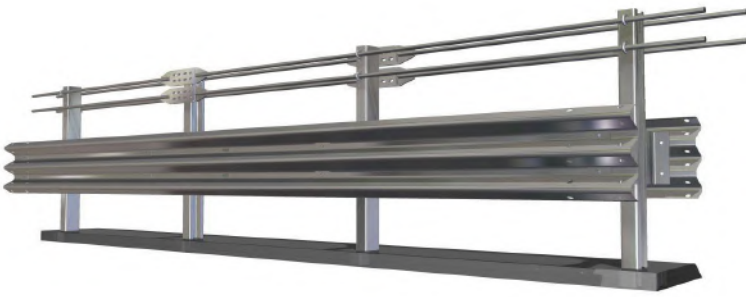
Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
Anchor bolts M18	40 Nm

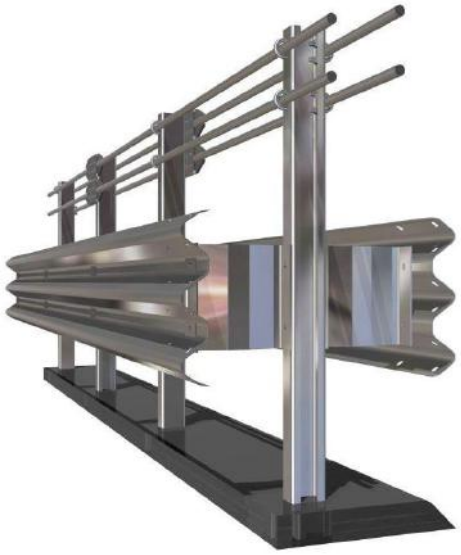
4safe® DOUBLE SIDED SAFETY BARRIER ON GROUND
H4b-B-W5 (3n32795)



Performance	
Containment level	H4b
Acceleration Severity Index "ASI"	B
Working width	W5 (1,70 m)
Extreme lateral position of the vehicle	1,60 m
Dynamic deflection	1,40 m

Characteristics	
Height out of ground	900 mm / 1270 mm / 1435 mm
Transversal overall dimensions	915 mm
Centre to centre between posts	1500 mm
Tested minimum length	89 m

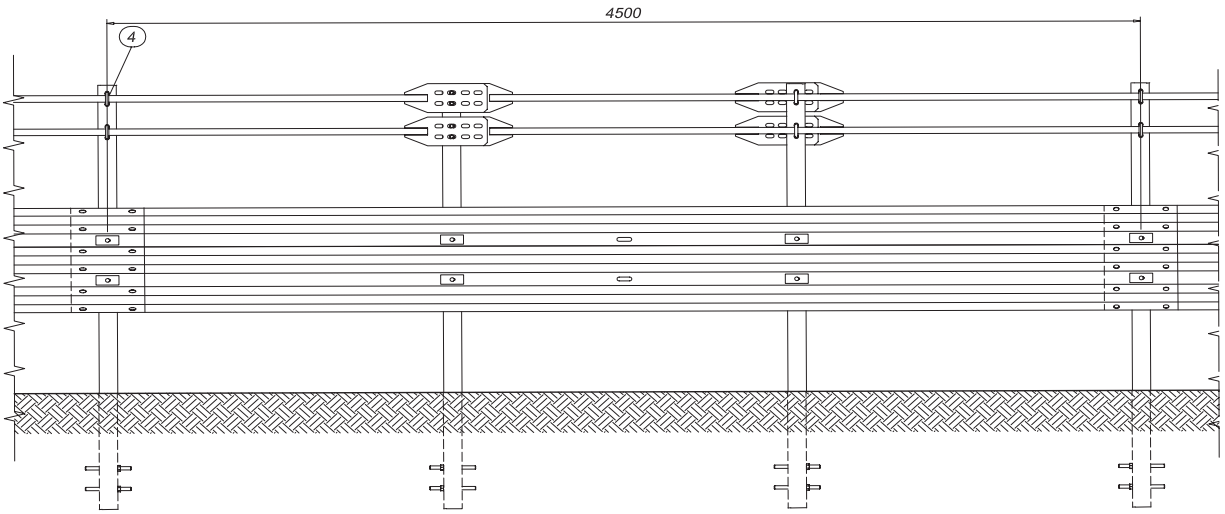


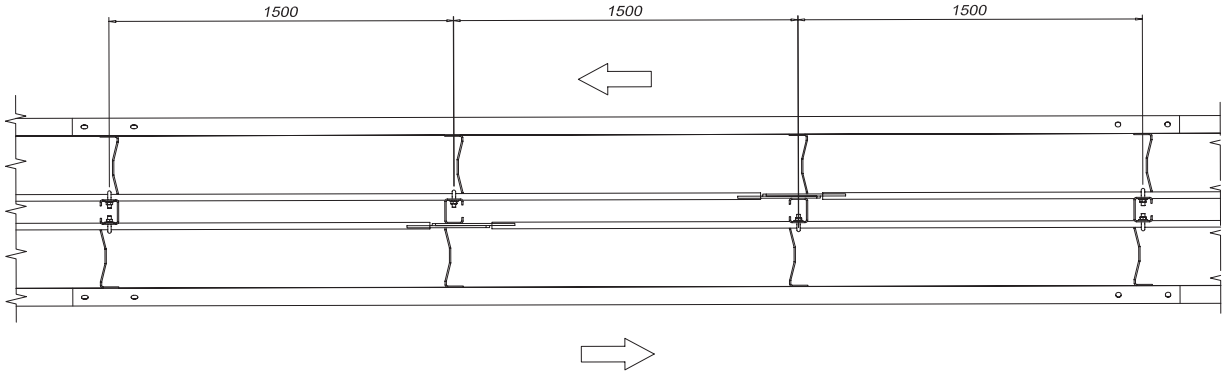


Description

Supply and installation of a 3-wave safety barrier, thickness 2,5 mm, C post 120x80x30 mm, H= 2500, fixed to ground every 1500 mm; spacers 310x80x5,9 mm, with an upper threaded retaining bars Ø 32 mm, with welded plates, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR-S355JR steel in quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

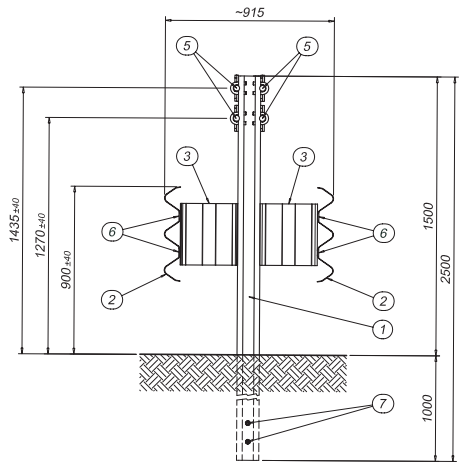
Elevation





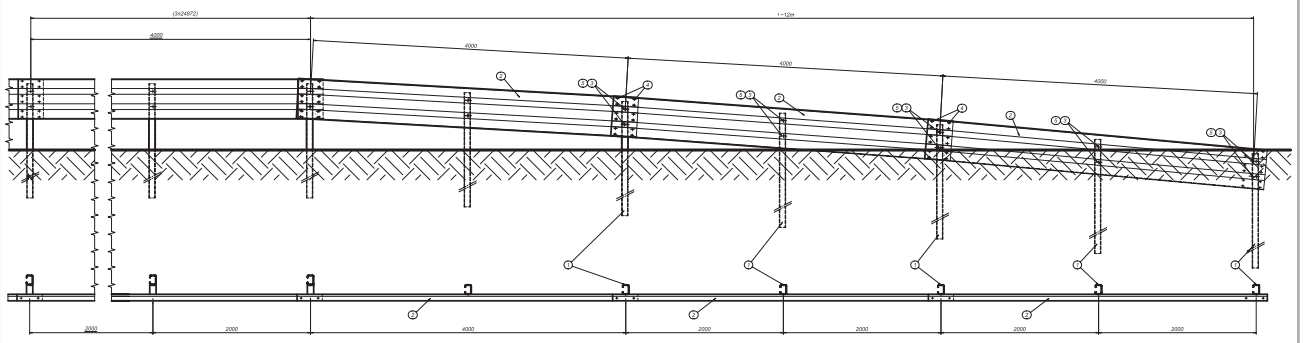
Section

	Description
1	C post 120x80x30 mm th. 5,9 mm H= 2500 mm
2	“3n” Beam c/c 4500 mm, th. 2,5 mm
3	Spacers 310x80 mm L =330 mm
4	Clamp M16
5	Upper thr. ret. bars Ø 32 mm L=9250 mm with welded plate
6	Cover plate 100x45x5 mm
7	Threated bars M16 L=200 mm

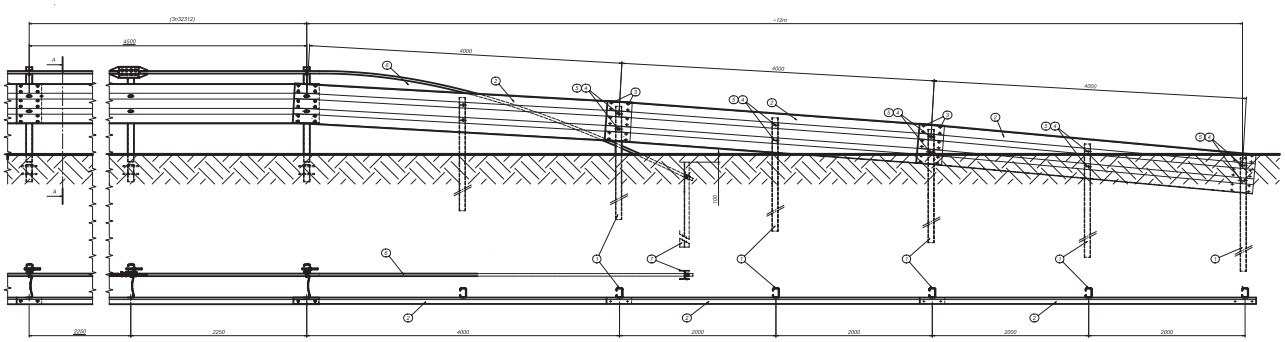


Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16	5 Nm

Terminal ends for guardrail 4Safe H2-W5-A



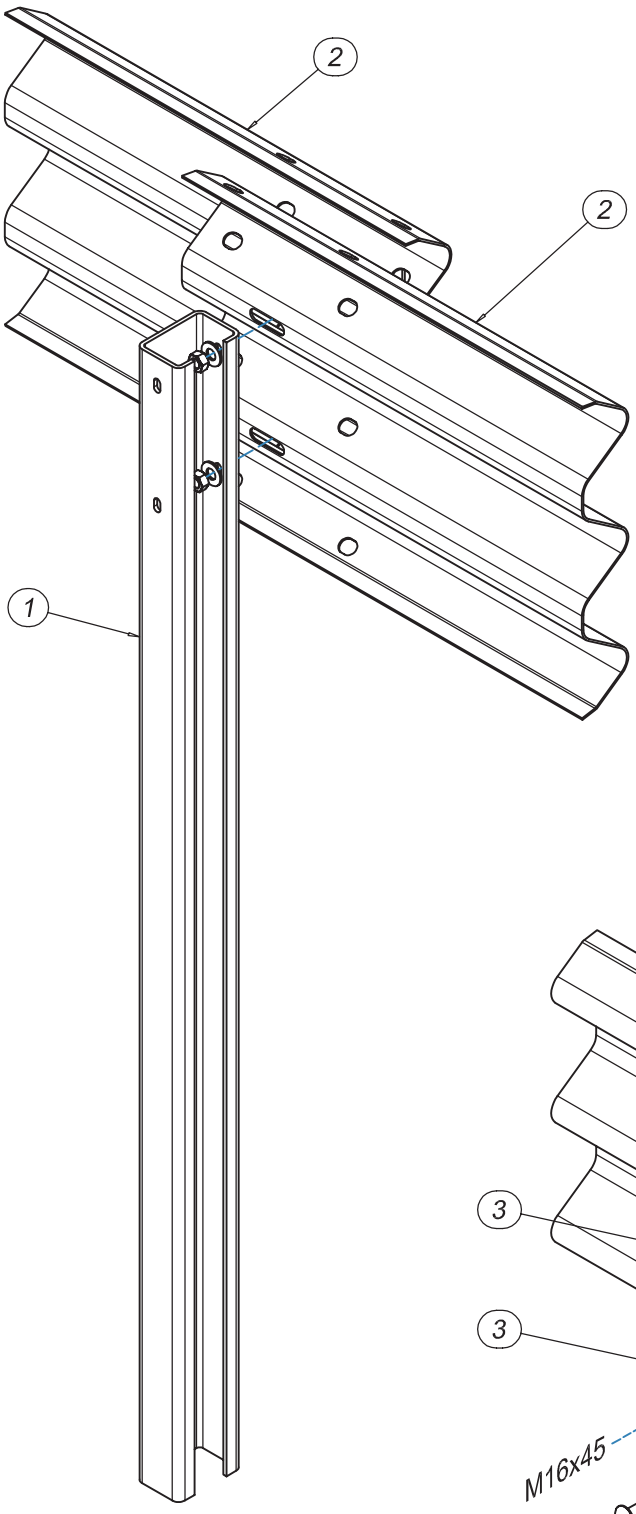
Terminal ends for guardrail 4Safe H2-W4-A

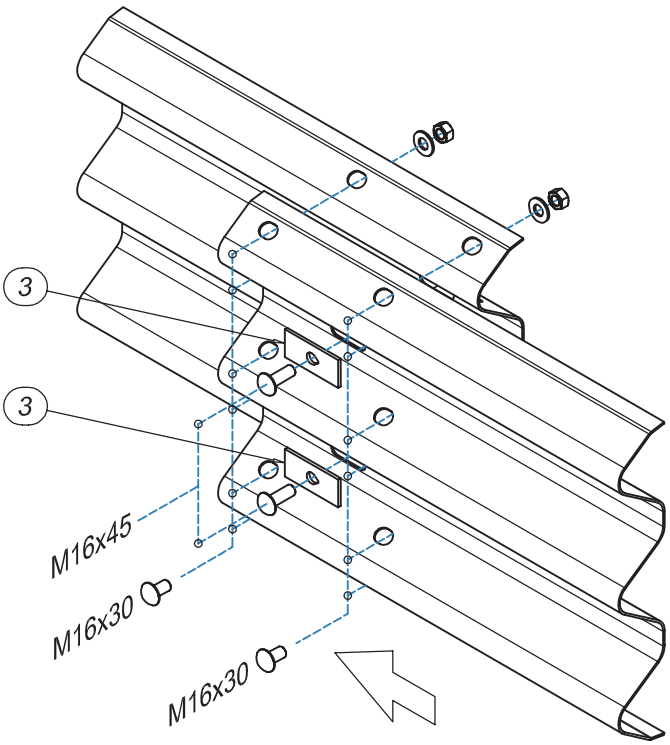


Description

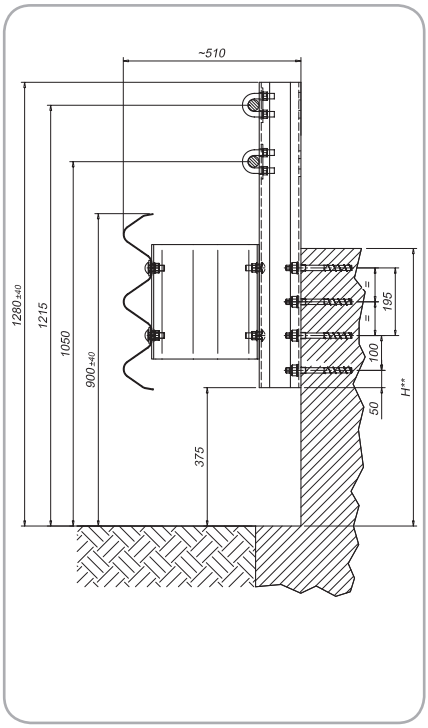
Supply and erection of guardrail terminal ends type 4Safe L=12m starting guardrail- ending guardrail
S235JR-S275JR-S355JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 4
All the elements are in accordance with crash tests requirements.

4safe® TERMINAL ENDS (3n32840)



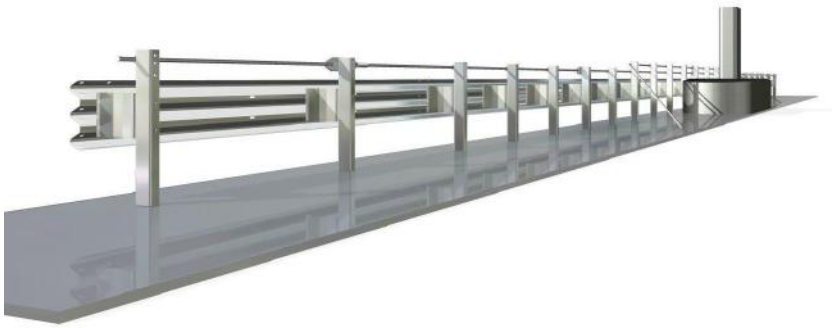


4safe® HF H2-W3-B (3n33666) CE



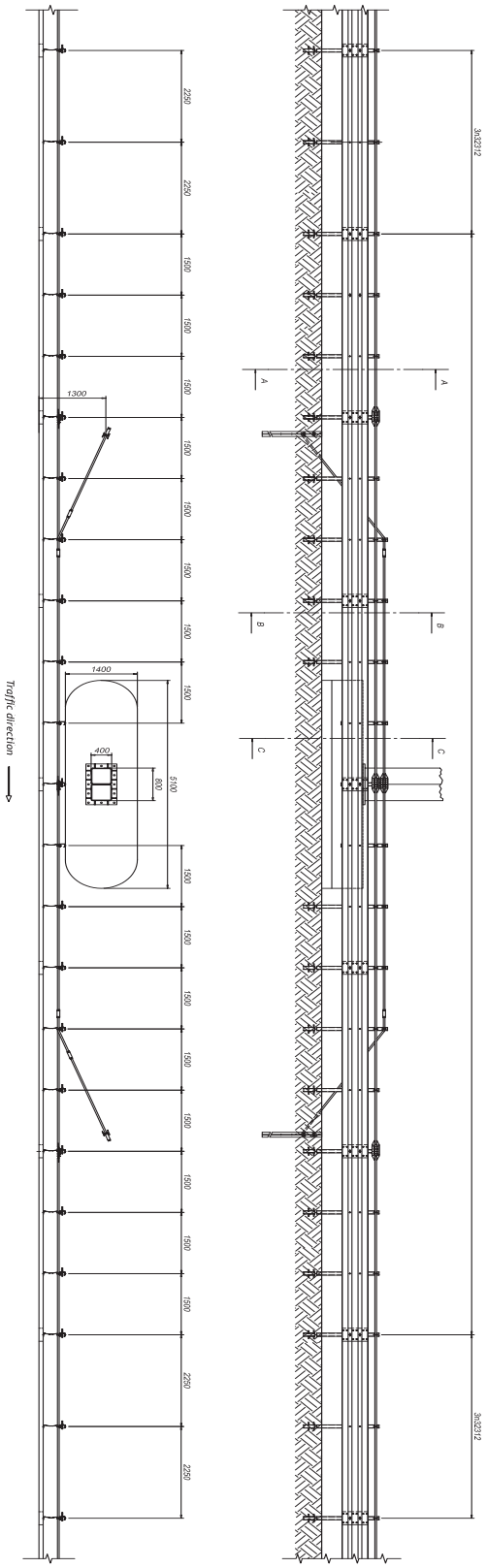
Performance	
Containment level	H2
Acceleration Severity Index “ASI”	B
Working width	W3 (0.9 m)
Extreme lateral position of the vehicle	0.9 m
Dynamic deflection	0.6 m

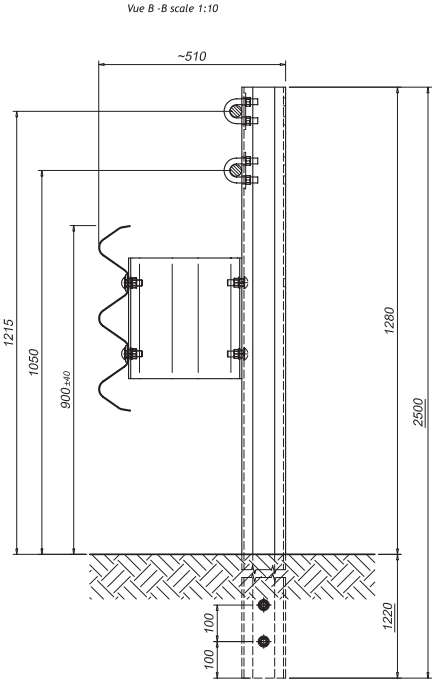
Characteristics	
Height out of ground	900 / 1215 / 1280 mm
Transversal overall dimensions	510 mm
Centre to centre between posts	1500 mm
Tested minimum length	27 m

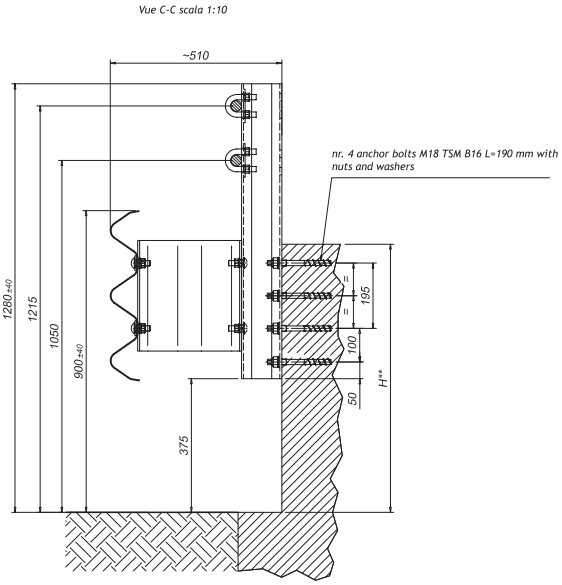


Description

Supply and installation of 3-waves safety barrier, thickness 2.5 mm, utilized like of pylon and concrete basements protection. Posts C 120x80x30 mm thk. 5,9 mm; fixed to ground every 1500 mm (for the external parts outside the concrete basements area), 1000 mm (for the part of the pylon protection).
The C 120 (L= 1070 mm) posts are fixed through bolts and nuts to the concrete structure.
Spacers 415x80x5.9 mm, with two upper threaded retaining bars Ø 32 mm with welded plates, assembled with nuts and bolts and provided with reflectors.
S235JR-S355JR steel in quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 4







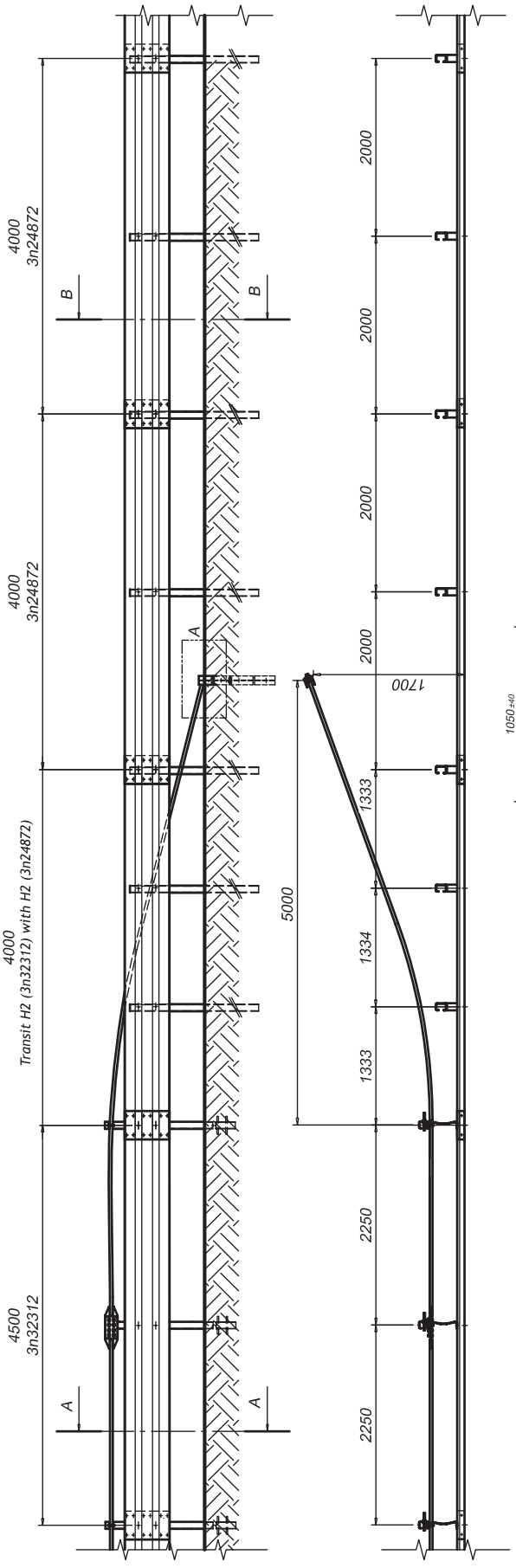
Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
Threaded Bars	5 Nm
Connectors	30 Nm

	Description
1	C post 120x80x30x5.9, H=2500 mm
2	C post 120x80x30x5.9, H=1070 mm
3	“3n” Beam c/c 4500 mm thk 2,5 mm
4	Upper thr. ret. bars Ø32 L=9250 mm with welded plate
5	Spacers 415x80 mm L =339 mm
6	Plate cover 100x45x5 mm
7	Threaded bars Ø16 mm L=200 mm
8	Clamp M16
9	Plate 100x40x5 mm

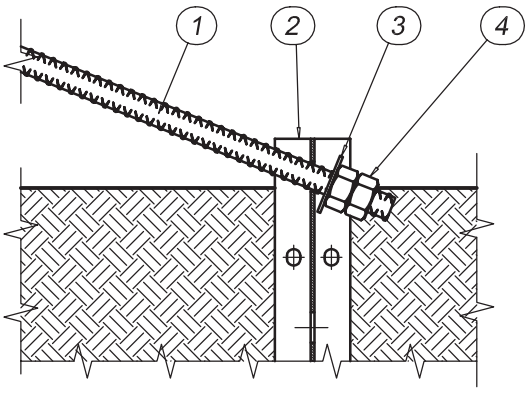
4safe® *TRANSIT H2-A-W5 / H2-A-W4 (3n32539)*

Description

Supply and installation of transits between guardrail 4Safe H2 W5 3n24872 and H2 W4 3n32312.
The 4Safe guardrail, thanks to the extreme flexibility, permits the transit (in this case containment level H2) from one working width to another one, only using/removing a single threaded bar diam. 32 mm.
S235JR-S355JR steel in quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 4

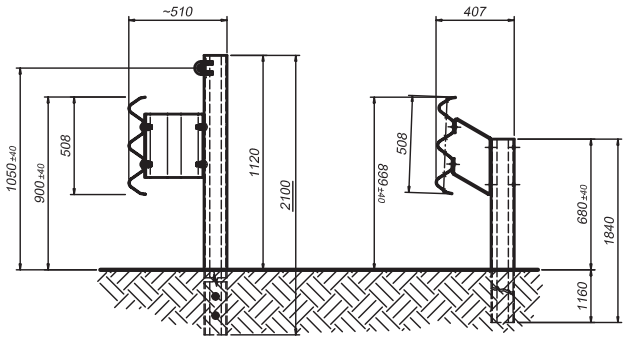


Detail A
Scale 1:10



Detail A-A
Scale 1:20

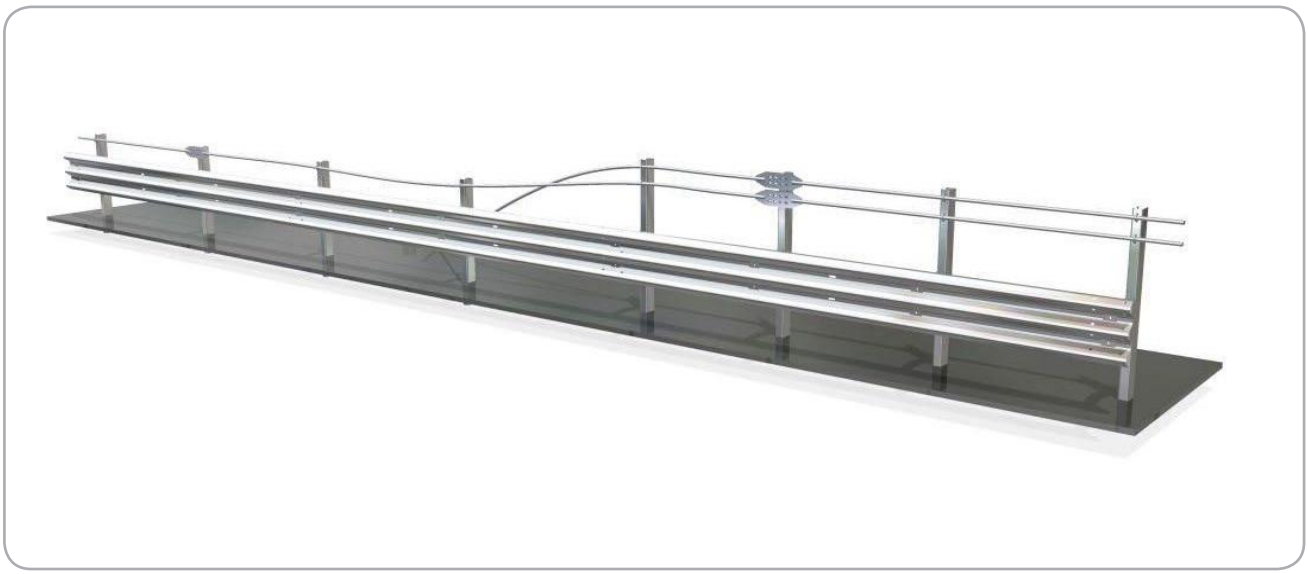
Detail B-B
Scale 1:20

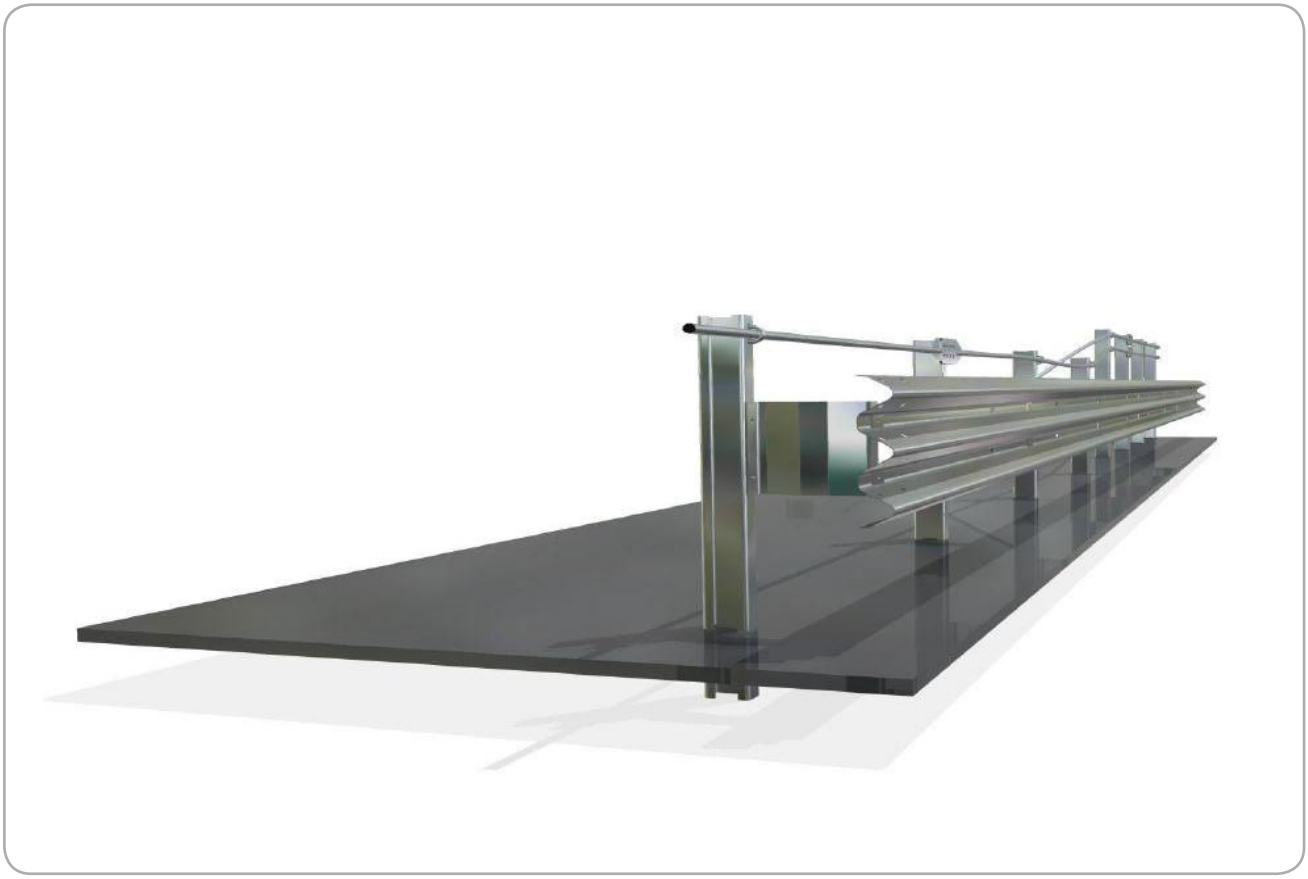


	Description
1	Threaded bars diam. Ø 32 mm
2	Posts HE100A H = 2000 mm
3	Washers Ø 35 mm
4	Nuts Ø 32 mm

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
Connectors	30 Nm
Threaded bars M16	5 Nm

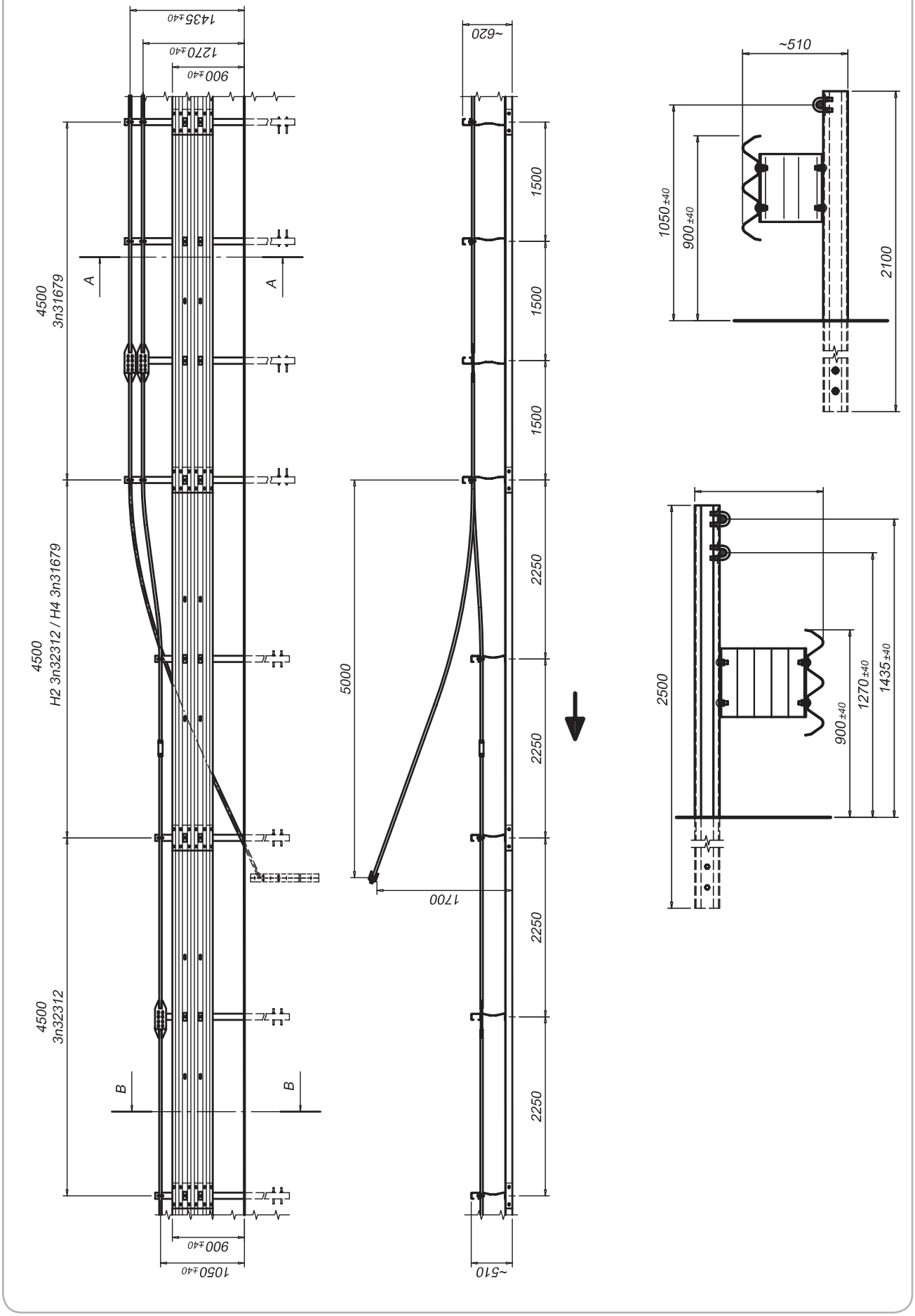
4Safe® TRANSIT H2-A-W4 / H4b-A-W5 (3n32842)





Description

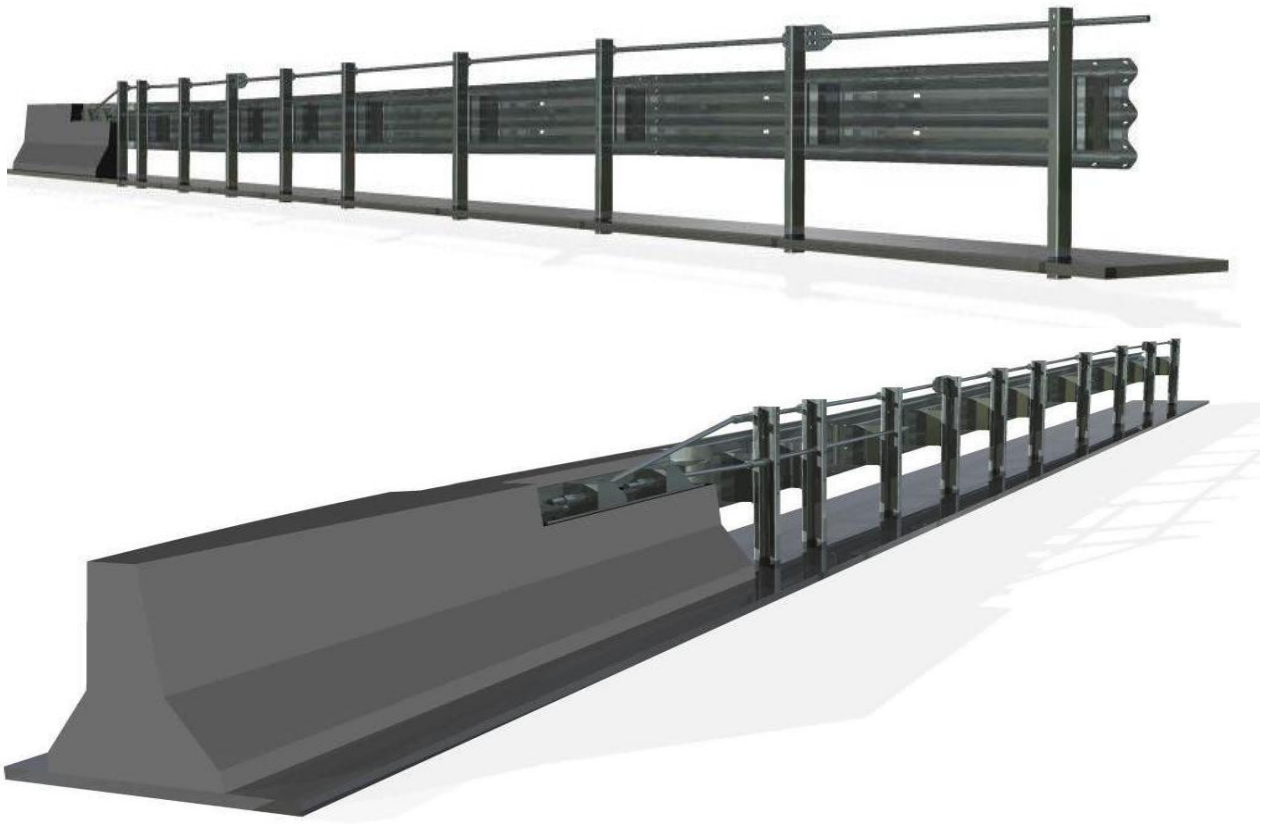
Supply and installation of transits between guardrail 4Safe H2-W4-A (3n32312) and H4b-W5-A (3n31679).
The 4Safe guardrails, thanks to the extreme flexibility, permit the transit from one class to another one, only using/ removing a single threaded bar diam. 32 mm.
S235JR-S355JR steel quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 4.
All the elements are in accordance with crash tests requirements.


1435±40
1270±40
900±40
4500
3n31679
A
A
4500
H2 3n32312 / H4 3n31679
4500
3n32312
B
B
900±40
1050±40
~620
1500
1500
1500
2250
2250
2250
2250
5000
1700
~510
~510
1050±40
900±40
2100
2500
900±40
1270±40
1435±40

4safe® Transit SafeLink® H2 W4 A / NJ (3n34381)

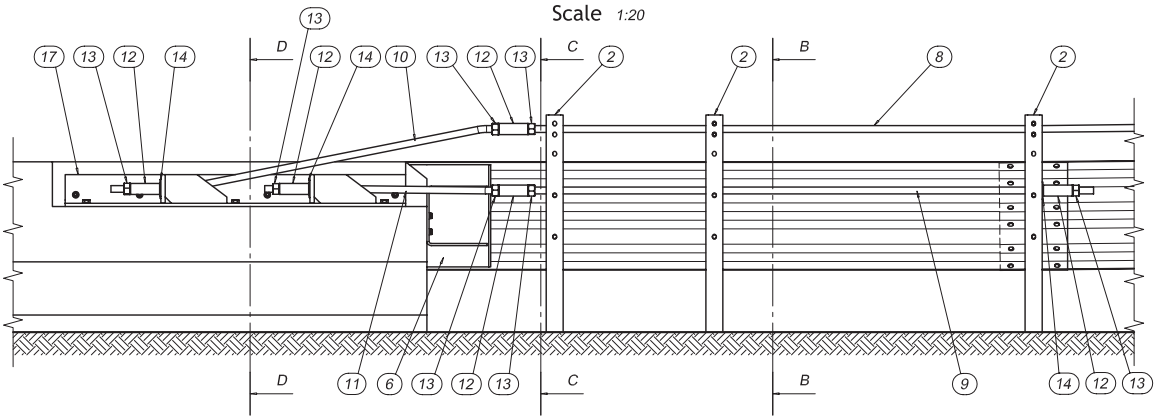
Performance	
Containment level	H2
Acceleration Severity Index “ASI”	B
Working width	W4 (1,10 m)
Extreme lateral position of the vehicle	1,30 m
Dynamic deflection	0,80 m

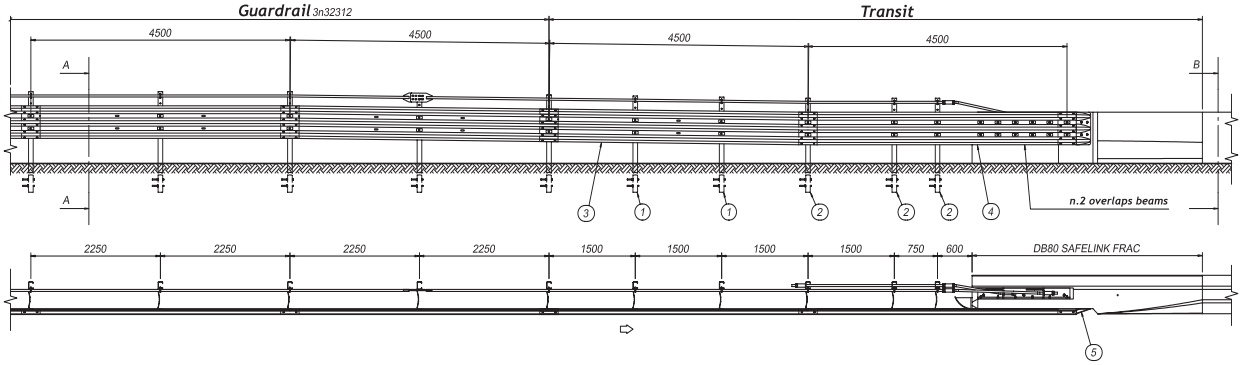
Characteristics	
Height out of ground	800 mm (Concrete) / 1120 mm (H2-W4-A in Steel)
Transversal overall dimensions	600 mm (Concrete) / 515 mm (H2-W4-A in Steel)
Tested minimum length	15,36 m



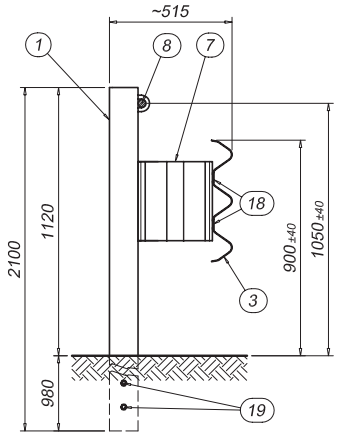
Description

Supply and installation of transit between metal safety barrier Fracasso H2-W4-A (3n32312) and concrete barrier Deltablock DB 80 F.
S235JR-S275JR-S355JR steel quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 4.

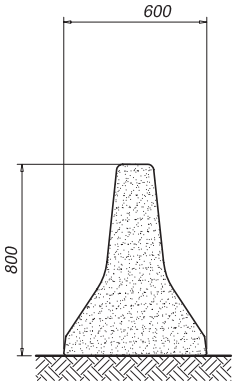




Section A-A



Section B-B



	Description
1	“C” posts 120x80x30 mm 5.9 mm; H= 2100 mm
2	“C” posts 120x80x30 mm 5.9 mm; H= 2100 mm with hole Ø 40 mm
3	“3n” beam c/c 4500 mm long; Thk= 2,5 mm
4	“3n” beam c/c 4500 mm long; Thk= 2,5 mm with 18 holes 19x64 mm
5	Flat terminal “3n” L=660 mm
6	Bumper Thk 10 mm for concrete wall
7	Spacers 415x80x5 mm L=330 mm
8	Threaded bar Ø32 mm L=9250 mm long with welded plate
9	Threaded bar Ø32 mm L=9000 mm long
10	Threaded bar Ø32 mm top shaped
11	Threaded bar Ø32 mm low shaped
12	Connector for threaded bar Ø32 mm
13	Lock nut for threaded bar Ø32 mm
14	Square washer 80x80 mm Thk= 4 mm with Ø35 mm
15	Clamp M16 partially threaded cl.8.8
16	Drilled plate 100x40x5 mm
17	Profile “L” 170x150x10 L=1600 mm with plate for bars Ø32 mm
18	Cover plate 100x45x5 mm
19	Threaded bars M16 L=200 mm

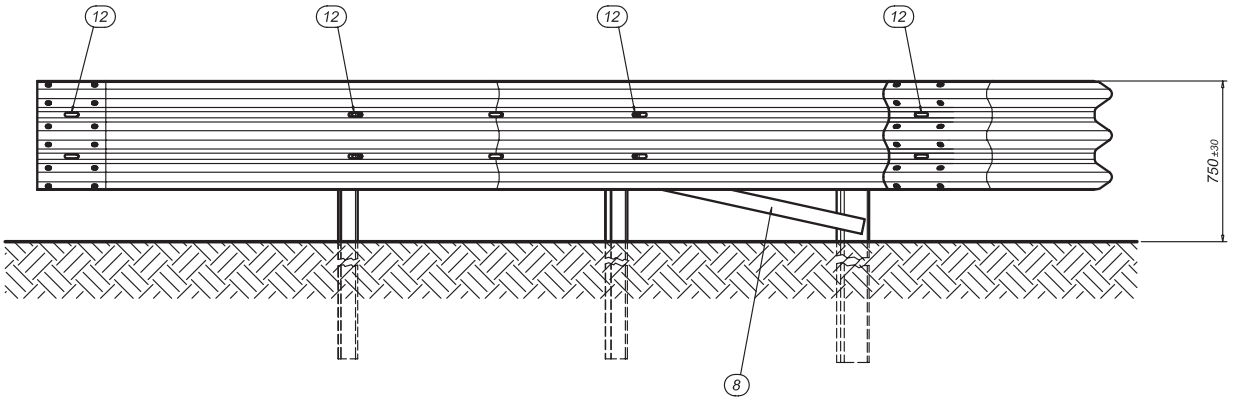
4safe® *Twinsafe (3n23996)*

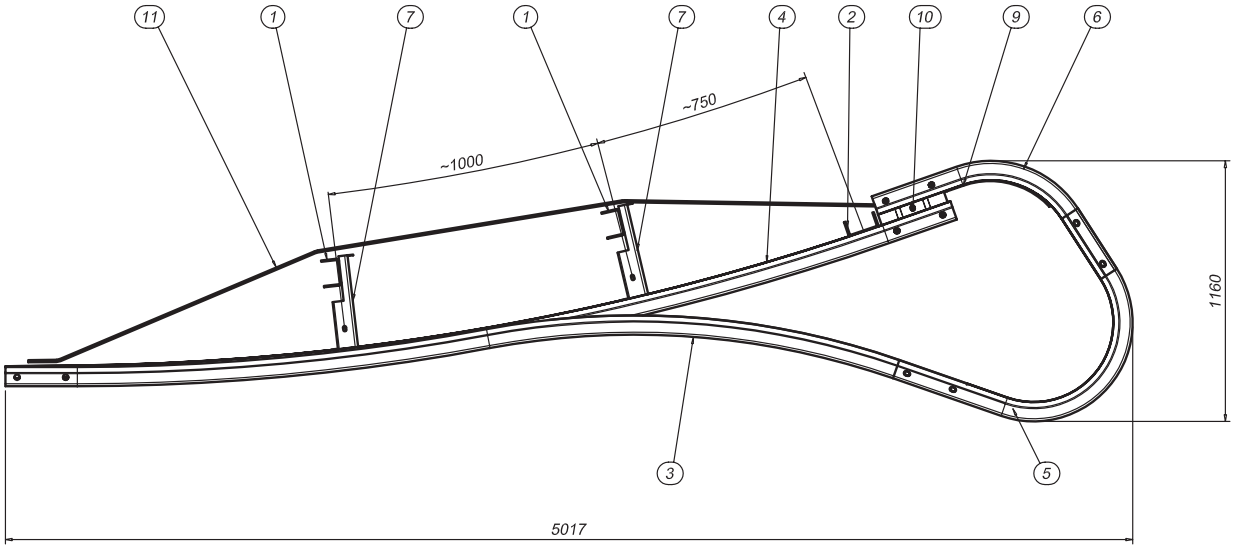
Performance	
Containment level	P2
Acceleration Severity Index “ASI”	A
Working width	X1;Y1
Exit box	Z1
Dynamic deflection	0,56 m

Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	1160 mm
Tested minimum length	5017 mm

Description

Supply and installation of 3-waves safety barrier, thickness 2.5 mm,”U” posts 120x80x5,9 mm and 140x70x7 mm fixed to the ground every 4 - 2- 1- 0.75 m;
Reinforcement plate 7 mm thk; Spacers 105x204x3 mm
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 4.





	Description
1	“U” posts 120x80x5,9 mm; L= 1850 mm
2	“U” posts 140x70x7 mm; L= 1850 mm
3	“3n” beam c/c int. L = 4000 mm, Thk 1,5 mm
4	“3n” beam c/c int. L = 4000 mm, Thk 3,0 mm
5	“3n” bended beam L = 1510 mm, Thk 2,5 mm
6	“3n” bended beam L = 1100 mm, Thk 2,5 mm
7	Spacers 460x392 mm
8	Tensioner 70x5 mm; L= 2070 mm
9	Plate 658x480 mm; Thk 7 mm
10	Spacers 105x204 mm; Thk 3 mm; L = 310 mm
11	Tensioner 70x5 mm; L = 4140 mm
12	Cover plate 100x45x5 mm

The “3n” typology represents a significant evolution in the performance of safety barrier systems.
Designed during the preparation of EN 1317, and developed during the application of parts 1 and 2, this kind of barrier can be classified according to its performance : containment level, ASI, working width.
Safety barriers “3n” are characterized by Acceleration Severity Index “A”, that means high safety for the occupants of the car which is obtained through patented devices which can gradually reduce the speed of the vehicle.
The particular shape of the spacer enables the automatic rise of the beam during the hardest impacts, especially in the case of impacts with heavier vehicles. In these circumstances the speed of the lorry is highly reduced and the vehicle is held back in the guardrail side.

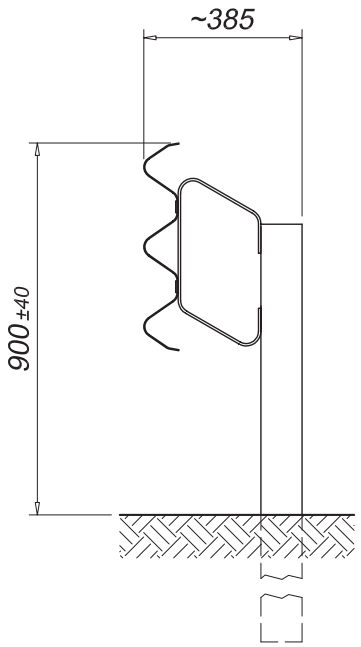
Safety barriers “3n”

Safety barriers on ground

Safety barriers on bridge

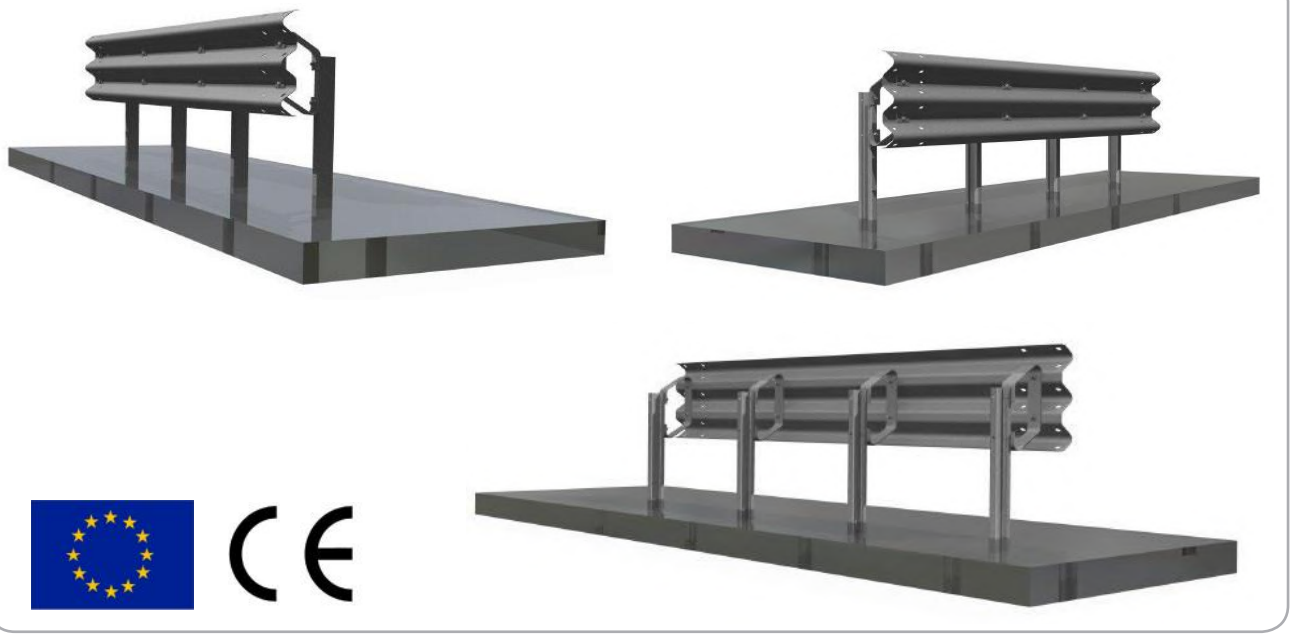
Double side safety barriers

SINGLE SIDED SAFETY BARRIER ON GROUND
H2-W3-A (3n36060)



Performance	
Containment level	H2
Acceleration Severity Index “ASI”	A
Working width	W3 (1.00 m)
Extreme lateral position of the vehicle	m
Dynamic deflection	m

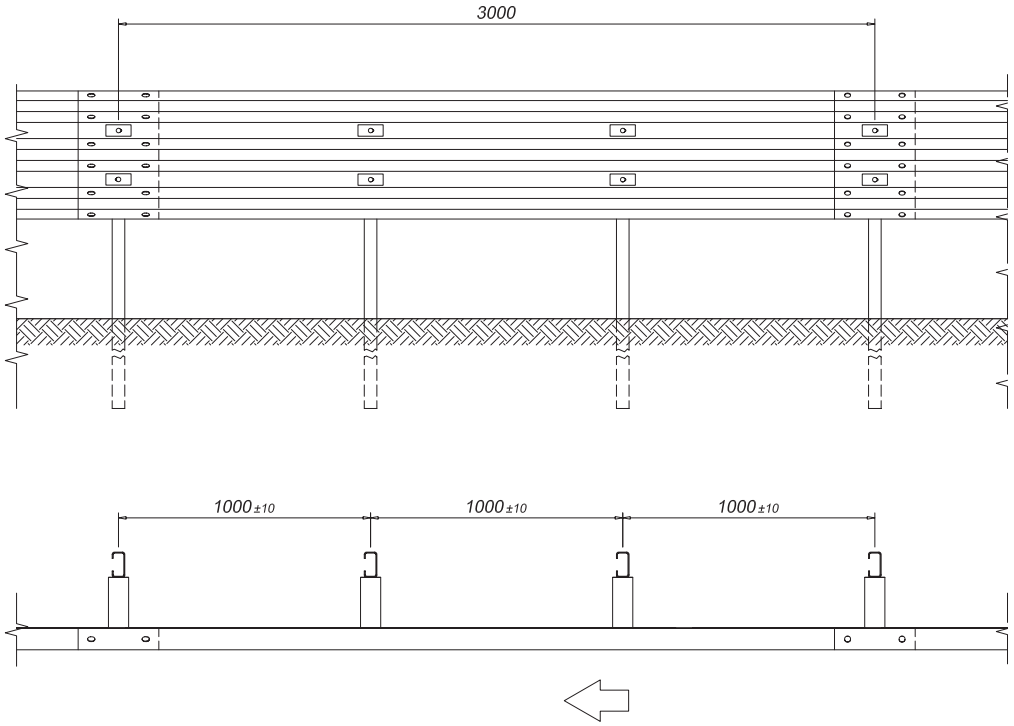
Characteristics	
Height out of ground	900 mm
Transversal overall dimensions	385 mm
Centre to centre between posts	1000 mm
Tested minimum length (without terminal ends)	66 m



Description

Supply and installation of a 3-wave safety barrier, thickness 4,0 mm, C100x50x25x4,0 mm H= 1700 mm, fixed to ground every 1000 mm; spacers 407x201x5.9 mm L=80 mm, assembled with nuts and bolts and provided with reflectors.
S235JR-S355JR steel quality according to EN 10025 EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

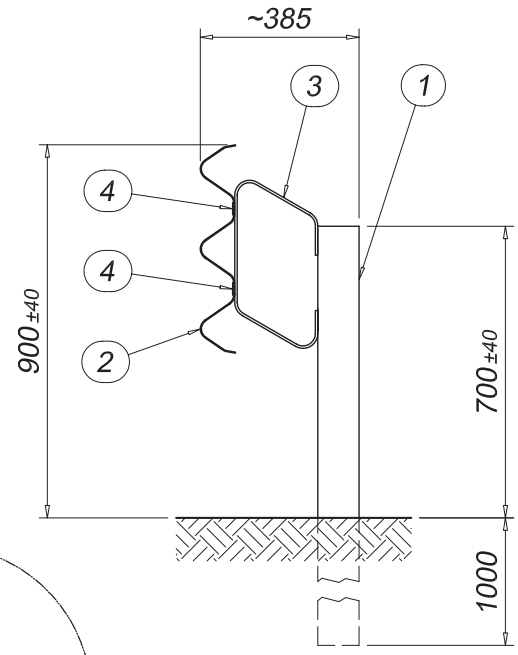
Elevation

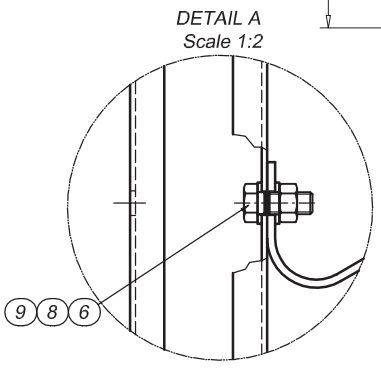


Section

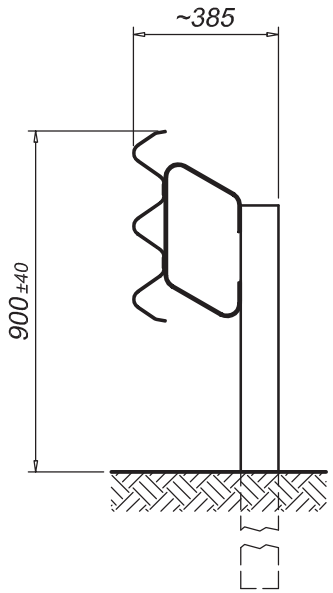
	Description
1	C post 100x50x25x4,0mm; H= 1700 mm
2	“3n” Beam c/c 3000 mm th. 4,0 mm
3	Spacers 407x201x5.9 mm L=80 mm
4	Plate 100x45x5 mm

Torque value	
M10 x 30	30 Nm
M16 x 30	90 Nm
M16 x 45	90 Nm





SINGLE SIDED SAFETY BARRIER ON GROUND H2-W4-A (3n35975)



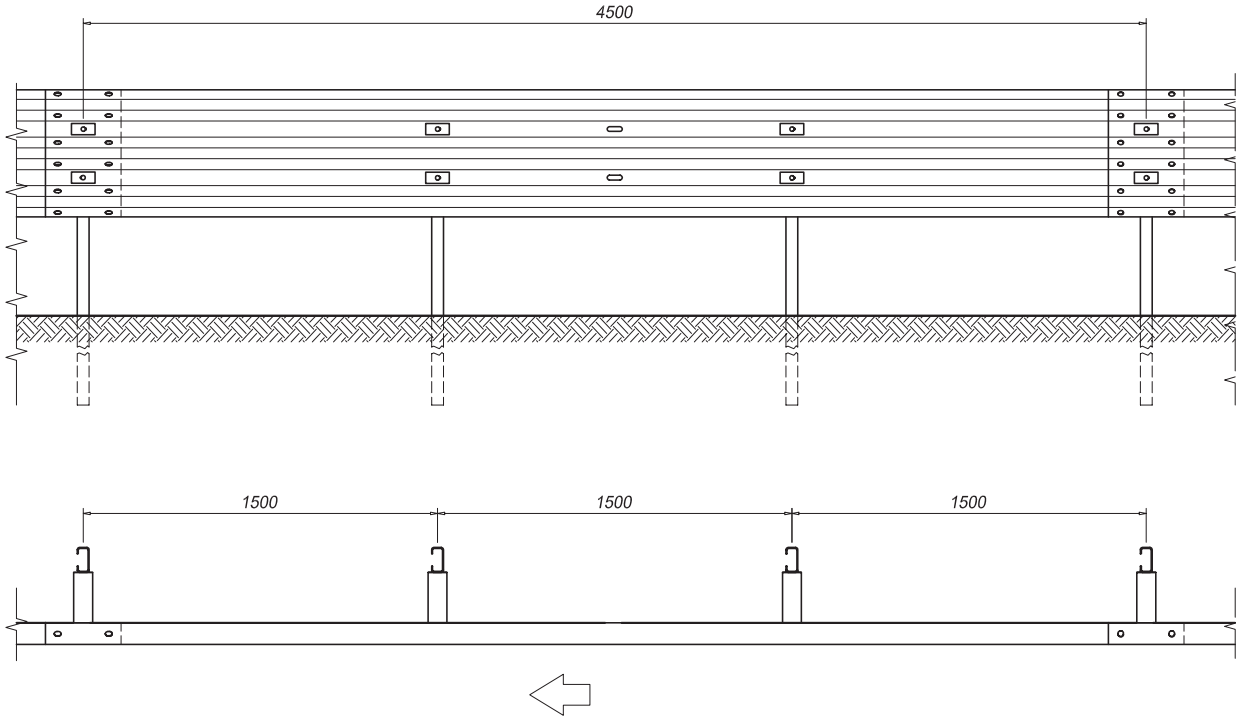
Performance	
Containment level	H2
Acceleration Severity Index “ASI”	A
Working width	W4 (1.30 m)
Extreme lateral position of the vehicle	1.70 m
Dynamic deflection	1.20 m

Characteristics	
Height out of ground	900 mm
Transversal overall dimensions	385 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminals)	49.5 m

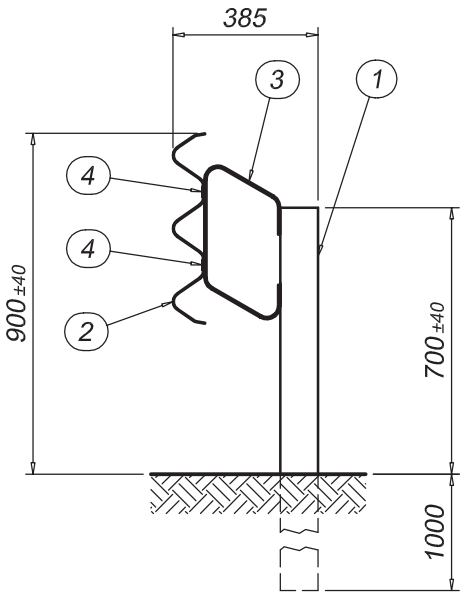
Description

Supply and installation of a 3-wave safety barrier, thickness 2,5 mm, C100x50x25x4,0 mm H= 1700 mm, fixed to ground every 1500 mm; spacers 407x201x5.9 mm L=80 mm, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR-S355JR steel quality according to EN 10025 EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation



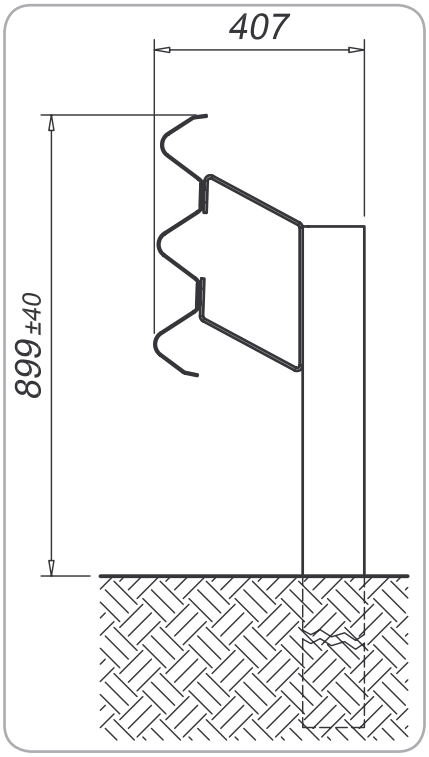
Section



	Description
1	C post 100x50x25x4,0mm; H= 1700 mm
2	“3n” Beam c/c 4500 mm th. 2,5 mm
3	Spacers 407x201x5.9 mm L=80 mm
4	Plate 100x45x5 mm

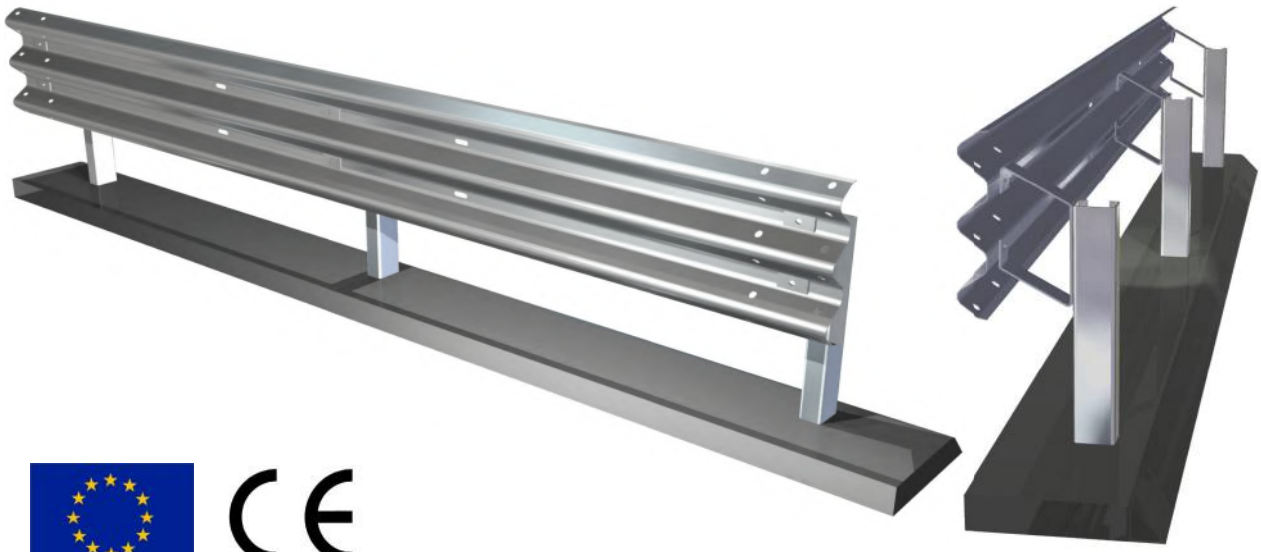
Torque value	
M10 x 30	30 Nm
M16 x 30	90 Nm
M16 x 45	90 Nm

SINGLE SIDED SAFETY BARRIER ON GROUND H2-W5-A (3n24872)



Performance	
Containment level	H2
Acceleration Severity Index “ASI”	A
Working width	W5 (1,70m)
Extreme lateral position of the vehicle	2,20 m
Dynamic deflection	1,60 m

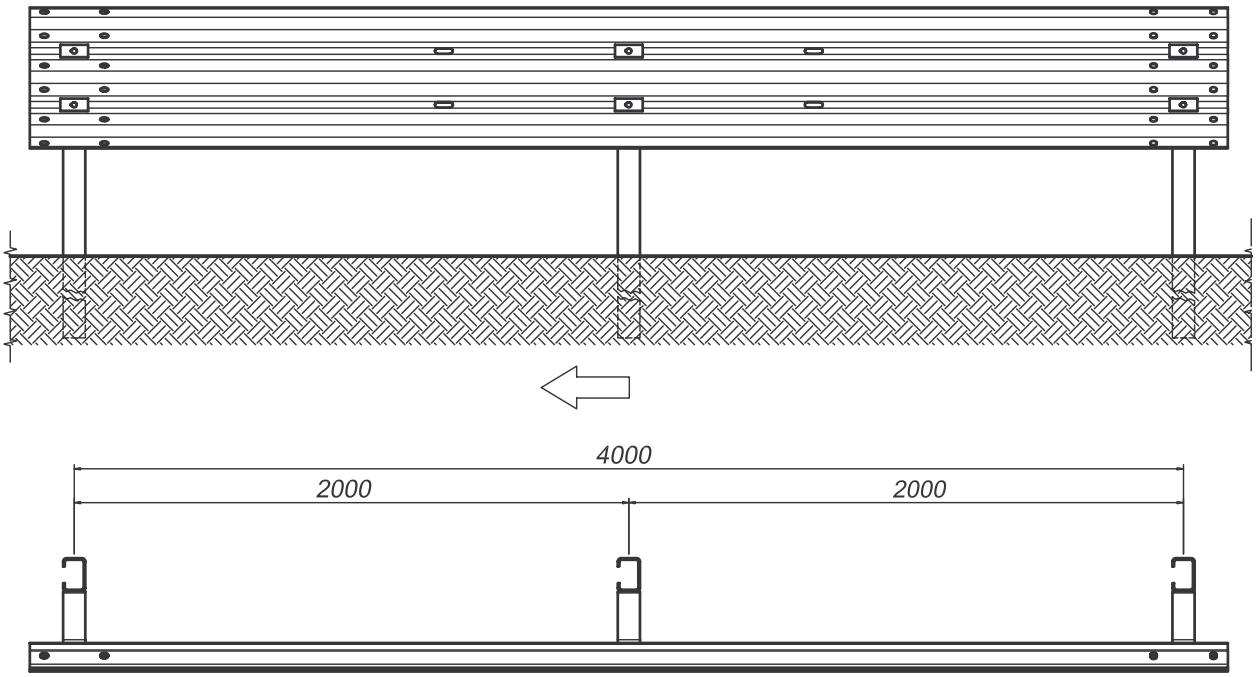
Characteristics	
Height out of ground	899 mm
Transversal overall dimensions	407 mm
Centre to centre between posts	2000 mm
Tested minimum length	48 m



Description

Supply and installation of a 3-wave safety barrier, thickness 3,0 mm, C post 120x80x30x5.9, H= 1840, fixed to ground every 2000 mm; spacers 80x5.9 mm, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR-S355JR steel quality according to EN 10025 EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

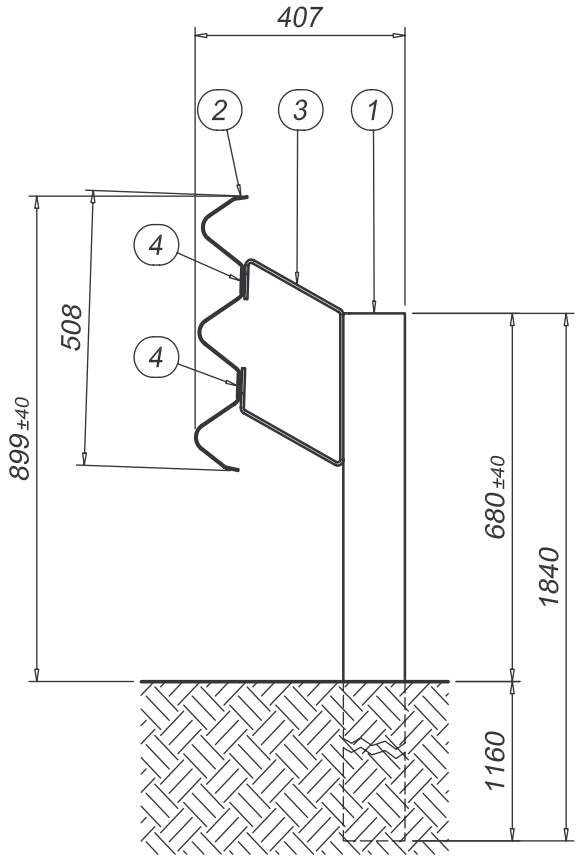
Elevation



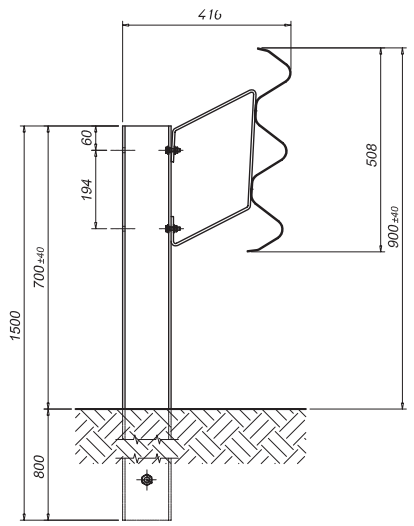
Section

	Description
1	C post 120x80x30x5,9 H=1840 mm
2	“3n” Beam c/c 4000 mm th. 3,0 mm
3	Spacers 80 x 5,9 L=860 mm
4	Plate 100x45x5 mm

Torque value	
M10 x 30	20 Nm
M16 x 30	90 Nm
M16 x 45	90 Nm



SINGLE SIDED SAFETY BARRIER ON GROUND H2-W6-A (3n33880)



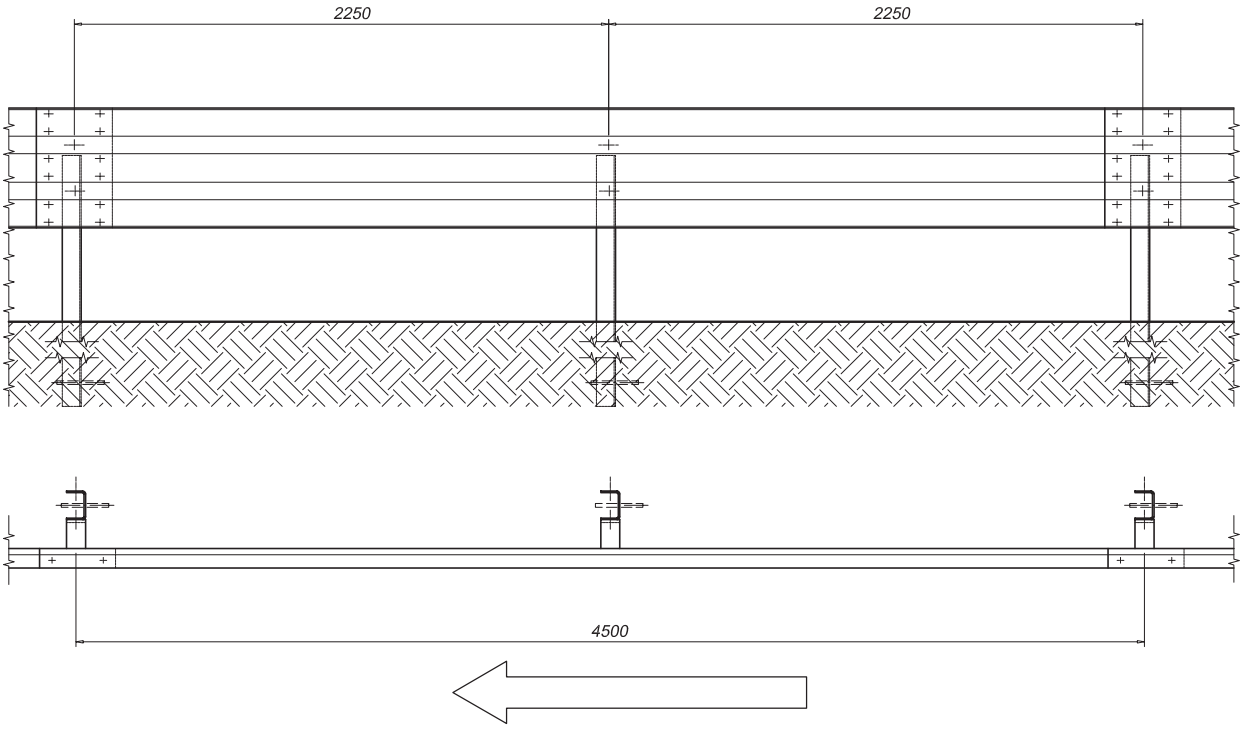
Performance	
Containment level	H2
Acceleration Severity Index "ASI"	A
Working width	W6 (2,10 m)
Extreme lateral position of the vehicle	2,00 m
Dynamic deflection	2,10 m

Characteristics	
Height out of ground	900 mm
Transversal overall dimensions	416 mm
Centre to centre between posts	2250 mm
Tested minimum length (without terminal ends)	88,5 m

Description

Supply and installation of 3-waves safety barrier, thickness 2,5 mm, U posts 120x80 mm thk 5 mm, h= 1500 mm the posts are driven into the ground every 2250 mm, spacers 395x201x5,9 mm L=80 mm, assembled with nuts and bolts and provided with reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

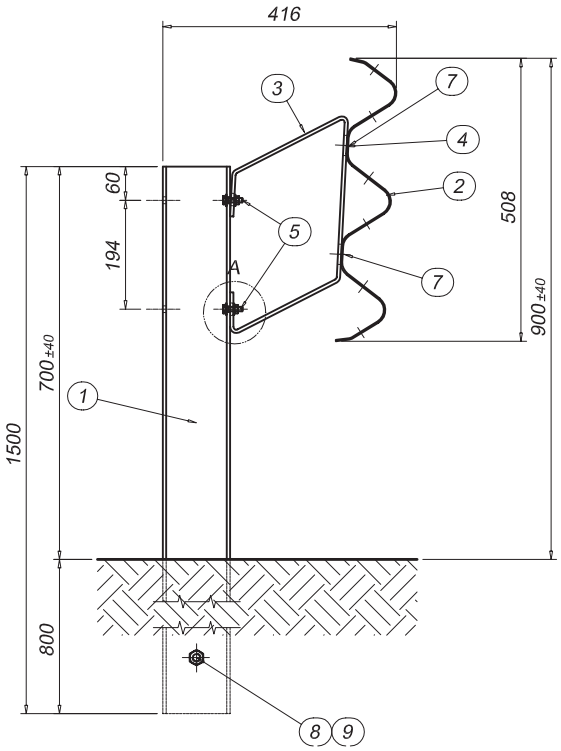
Elevation



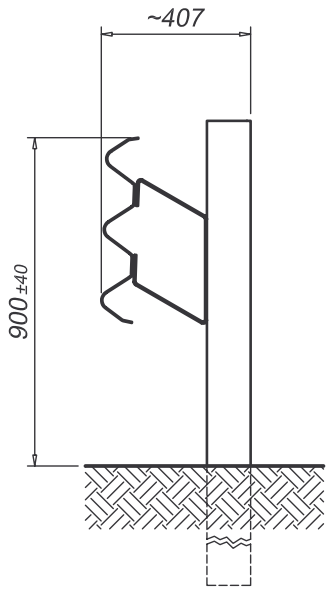
Section

	Description
1	“3n” Posts U 120x80 mm thk 5 mm, L=1500 mm
2	“3n” Beams c/c 4500 mm thk 2,5 mm
3	“3n” spacers 395x201 L=80 mm thk 5,9 mm
4	Plates 100x45x5 mm
5	Bolts M8x30 TE
6	Bolts M16x30 TT
7	Bolts M16x45 TT
8	Antiunthreading bar M16 L=200 mm
9	Nuts M16 UNI 5588 - 8ZC

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M8 x 30	20 Nm
Threated bars M16	5 Nm



SINGLE SIDED SAFETY BARRIER ON GROUND H2-A-W6 (3n24341)



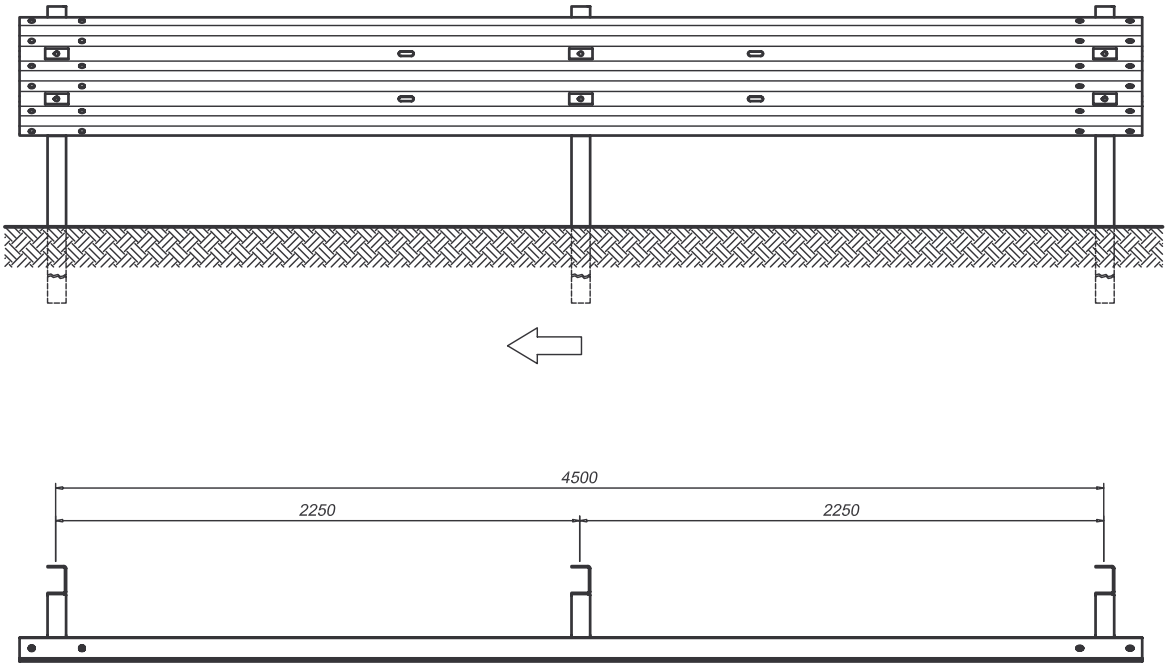
Performance	
Containment level	H2
Acceleration Severity Index “ASI”	A
Working width	W6 (2.07m)
Extreme lateral position of the vehicle	2,55 m
Dynamic deflection	2,00 m

Characteristics	
Height out of ground	900 mm
Transversal overall dimensions	407 mm
Centre to centre between posts	2250 mm
Tested minimum length	94,5 m

Description

Supply and installation of 3-waves safety barrier, thickness 3,0 mm, U posts 120x80x5, h. 1750 mm, the posts are driven into the ground every 2250 mm, spacers 80x5.9 mm, nuts and bolts and reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

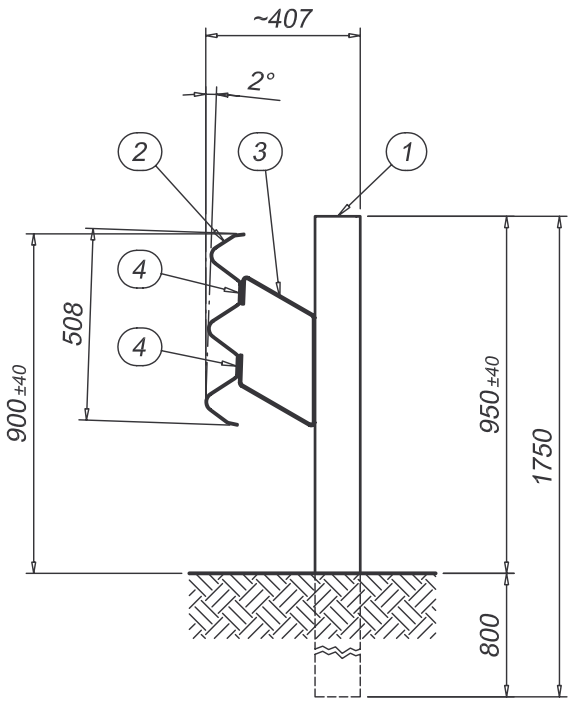
Elevation



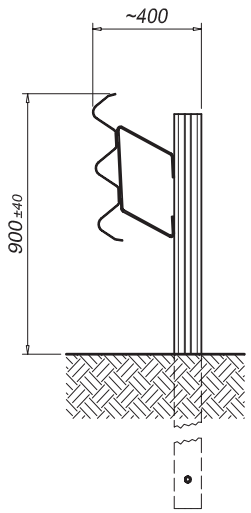
Section

	Description
1	U 3n post 120x80x5 mm H=1750 mm
2	3n beam c/c 4500 mm th. 3,00 mm
3	3n spacer 80x5,9 mm L=860 mm
4	Plate 100x45x5 mm

Torque value	
Bolts M16	90 Nm
Bolts M10	20 Nm

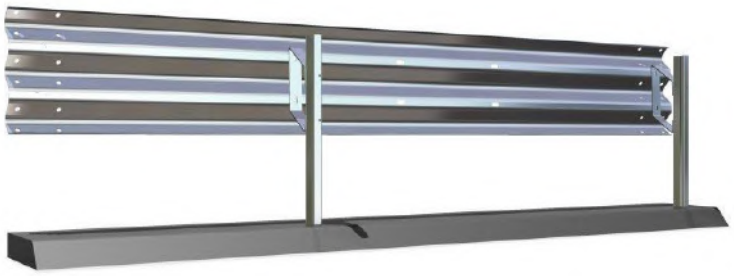


SINGLE SIDED SAFETY BARRIER ON GROUND H2-A-W8 (3n31382)



Performance	
Containment level	H2
Acceleration Severity Index “ASI”	A
Working width	W8 (2,80 m)
Extreme lateral position of the vehicle	3,40 m
Dynamic deflection	2,60 m

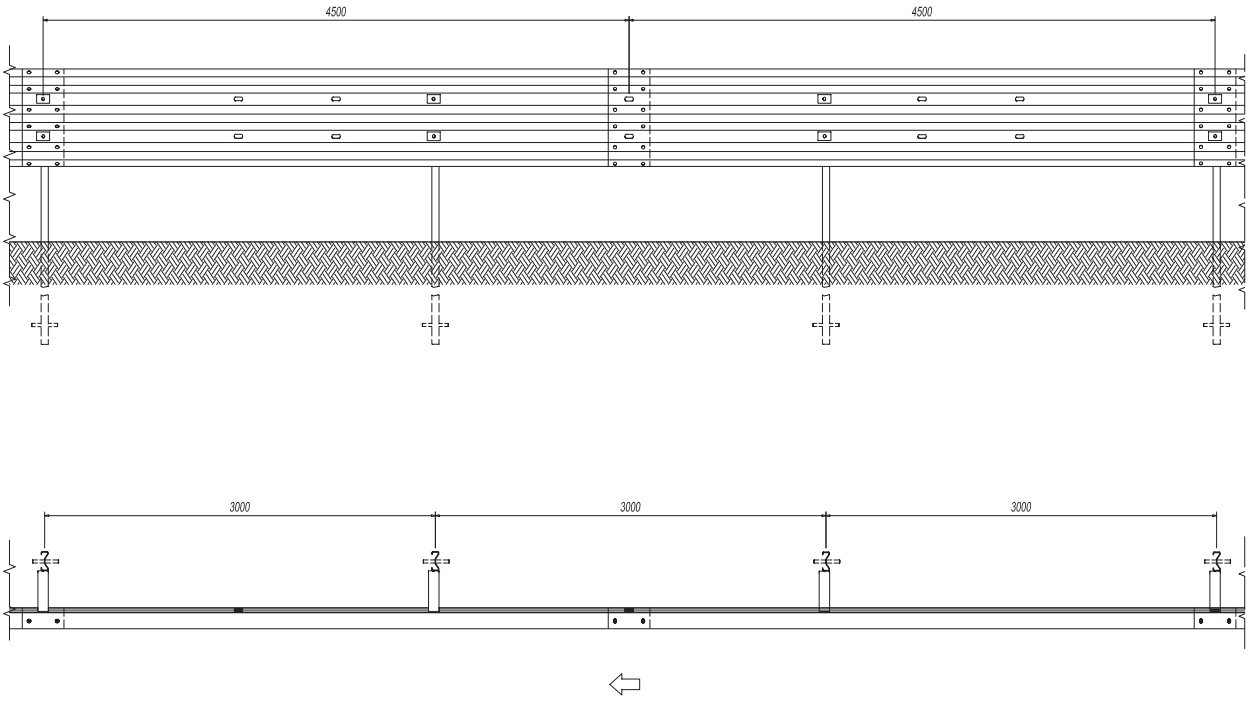
Characteristics	
Height out of ground	900 mm
Transversal overall dimensions	400 mm
Centre to centre between posts	3000 mm
Tested minimum length (without terminal end)	72 m



Description

Supply and installation of a 3-wave safety barrier, thickness 2,5 mm, Sigma posts 100x55 mm, h. 1900 mm, driven into ground every 3000 mm, spacers 395x201x80x5.9 mm, assembled with nuts and bolts and provided with reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

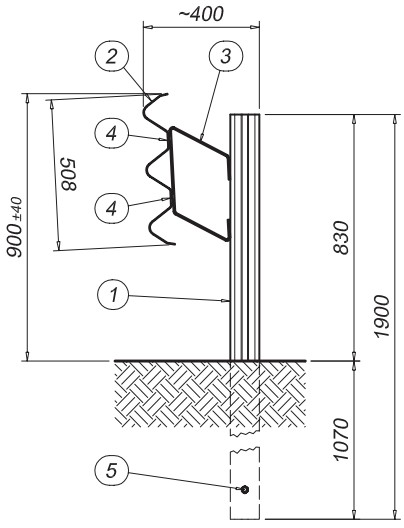
Elevation



Section

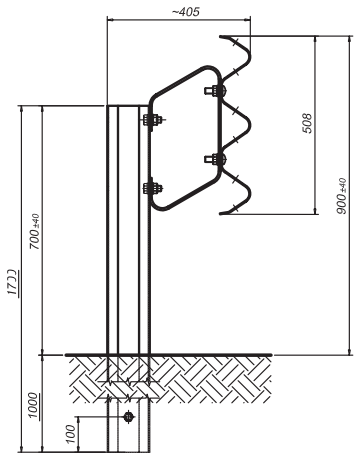
	Description
1	Sigma Post 100x55 mm H=1900 mm
2	“3n” beam c/c 4500 mm, th 2,5 mm
3	“3n” spacer 395x201 mm, th. 5,9 mm, L=80 mm
4	Small plate 100x45x5 mm
5	Antiunthreading bar M16, L=200 mm

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M8 x 30	20 Nm
Threated bars	5 Nm



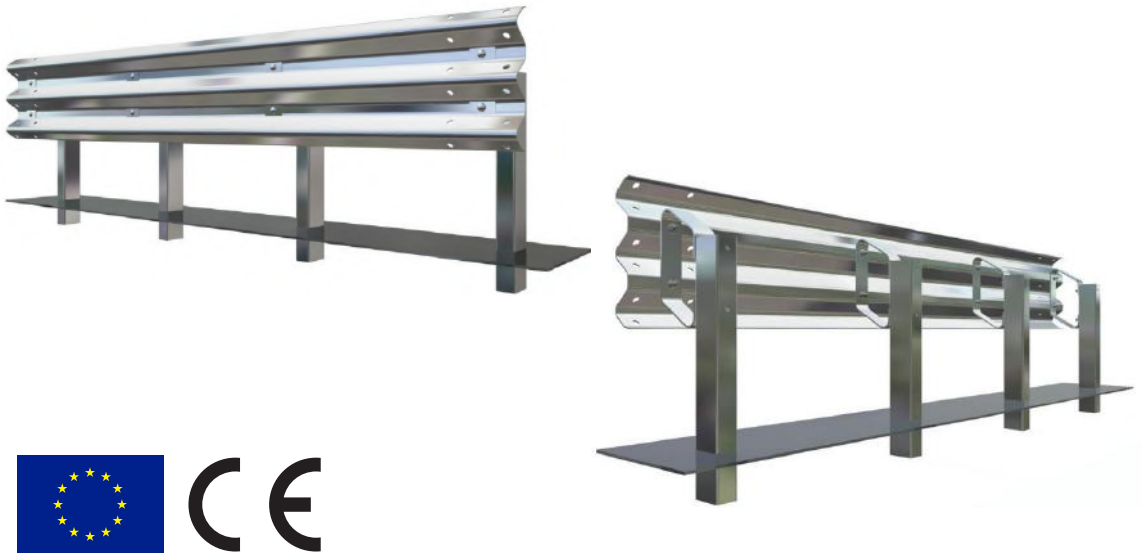
SINGLE SIDED SAFETY BARRIER ON GROUND

H3-W5-A (3n36450)



Performance	
Containment level	H3
Acceleration Severity Index “ASI”	A
Working width	W5 (1,70 m)
Extreme lateral position of the vehicle	2,10 m
Dynamic detection	1,40 m

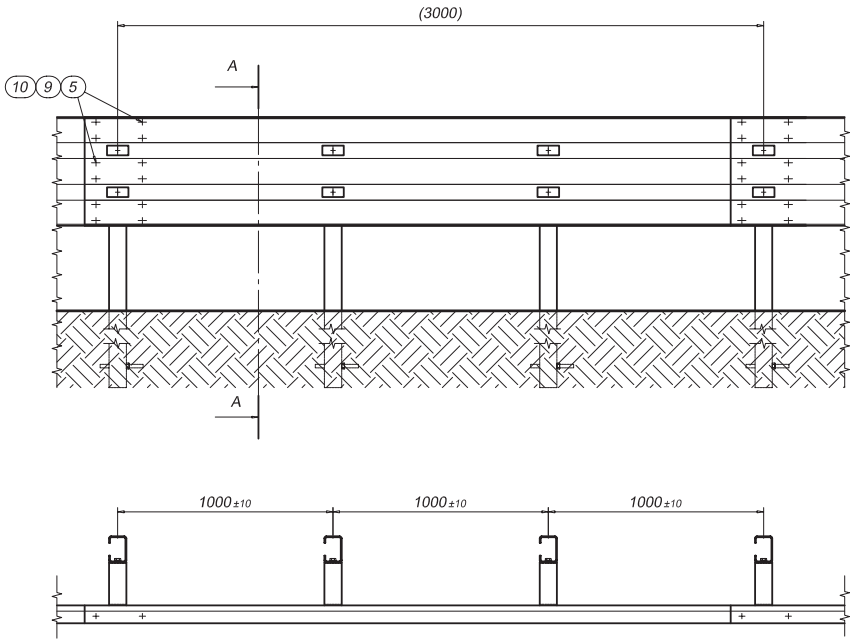
Characteristics	
Height out of ground	900 mm
Transversal overall dimensions	405 mm
Centre to centre between posts	1000 mm
Tested minimum length (without terminal ends)	54 m



Description

Supply and installation of a 3-wave safety barrier, thickness 4,0 mm, C120 x 80 x 30 x 4,0 mm H = 1700 mm, xed to ground every 1000 mm; spacers 407 x 201 x 5.9 mm L = 80 mm, assembled with nuts and bolts and provided with re ectors.
S235JR - S355JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

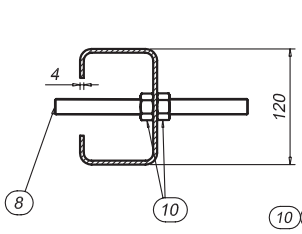
Elevation

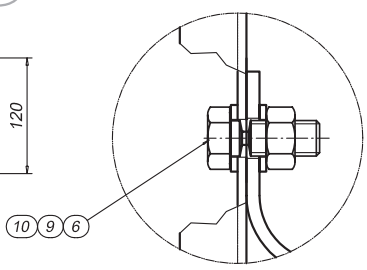


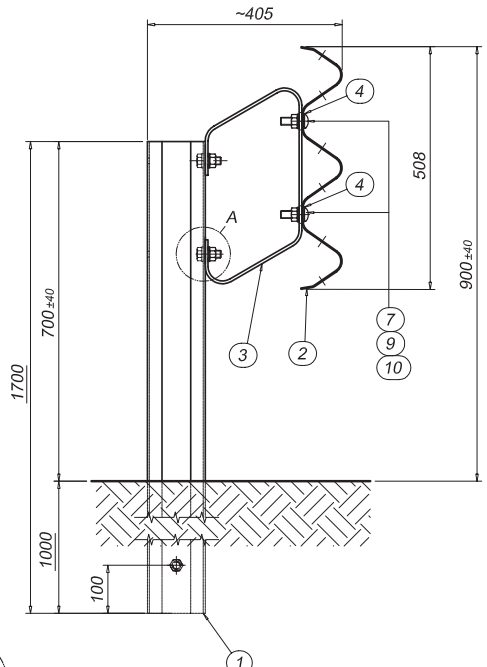
Section

	escription
1	C post 100x50x25x4,0mm; H= 1700 mm
2	“3n” Beam c c 3000 mm th. 4,0 mm
3	Spacers 407x201x5.9 mm L=80 mm
4	late 100x45x5 mm
5	Bolts M16x30 TT
6	Bolts M16x30 TE
7	Bolts M16x50 TT
8	Antiunthreading bar M16 L=200 mm
9	Washer
10	Nuts M16 UNI 5588 - 8ZC

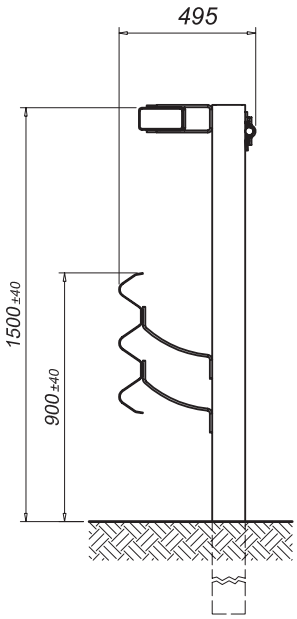
Torque value	
M10 x 30	30 Nm
M16 x 30	90 Nm
M16 x 45	90 Nm







SINGLE SIDED SAFETY BARRIER ON GROUND H3-W6-A (3n33568)



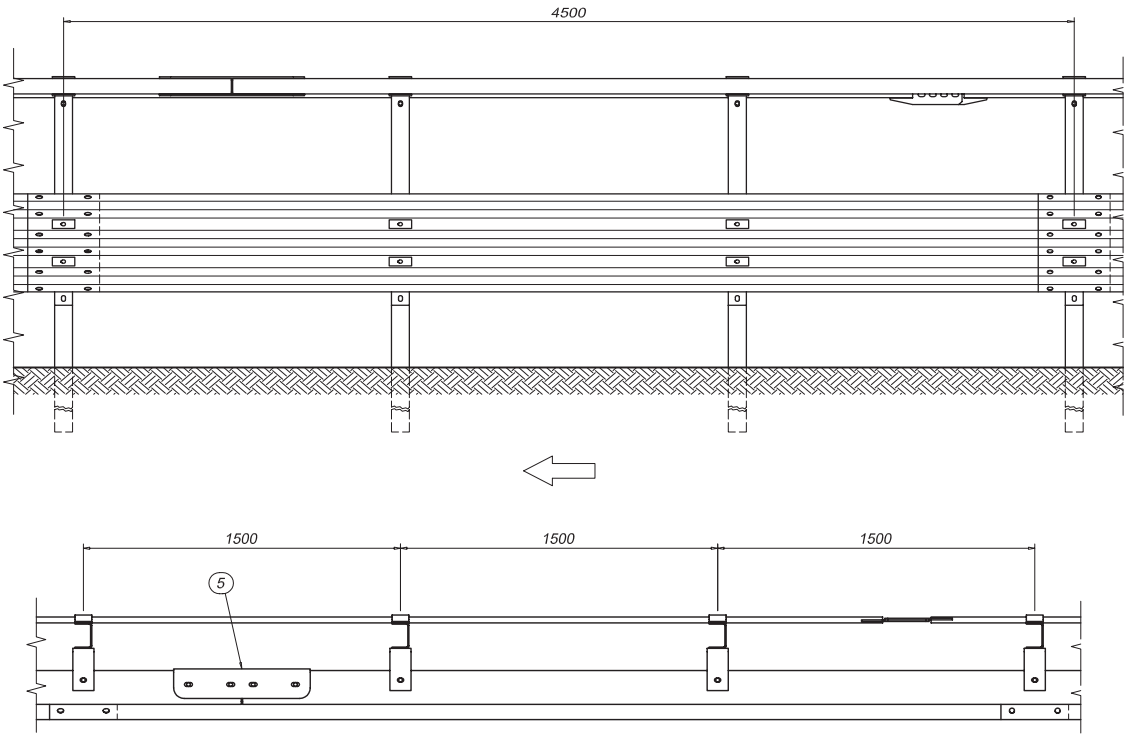
Performance	
Containment level	H3
Acceleration Severity Index "ASI"	A
Working width	W6 (1.97)
Extreme lateral position of the vehicle	1,50 m
Dynamic deflection	1,52 m

Characteristics	
Height out of ground	900 mm / 1500 mm
Transversal overall dimensions	385 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminal end)	94,50 m

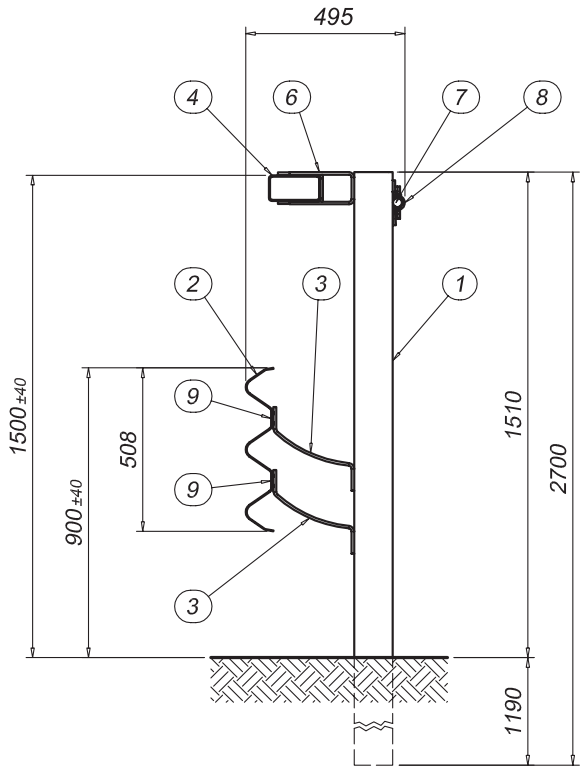
Description

Supply and installation of 3-waves safety barrier, thickness 3,0 mm, U posts 120x80x5.9 mm H=2700 mm are driven into the ground every 1500 mm, spacers 250x260x8 mm, upper rail 160x80x4 mm, rear rail diam. 28 mm with supports, nuts and bolts and reflectors.
S235JR-S275JR steel in quality according to EN 10025 and FeB44k according to (D.M. 09/01/1996)
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation



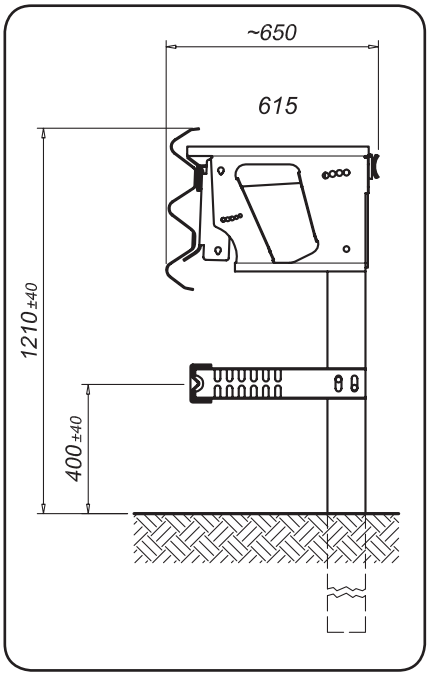
Section



	Description
1	“3n” Post U120x80x5,9 mm H=2700 mm
2	“3n” Beam c/c 4500 mm thk 3,0 mm
3	“3n” Spacer 250x260x8 mm L=80 mm
4	Upper rail 160x80x4 mm L=5994 mm
5	Sleeve U140x94x6 mm L=646 mm
6	Support U200x100x8 mm L=100 mm
7	Rear rail Ø28 mm; L=6210 mm
8	Clamp 80x141x35 m; thk 7 mm
9	Plate 100x45x5 mm

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm

SINGLE SIDED SAFETY BARRIER ON GROUND H3-W7-A (3n21756)



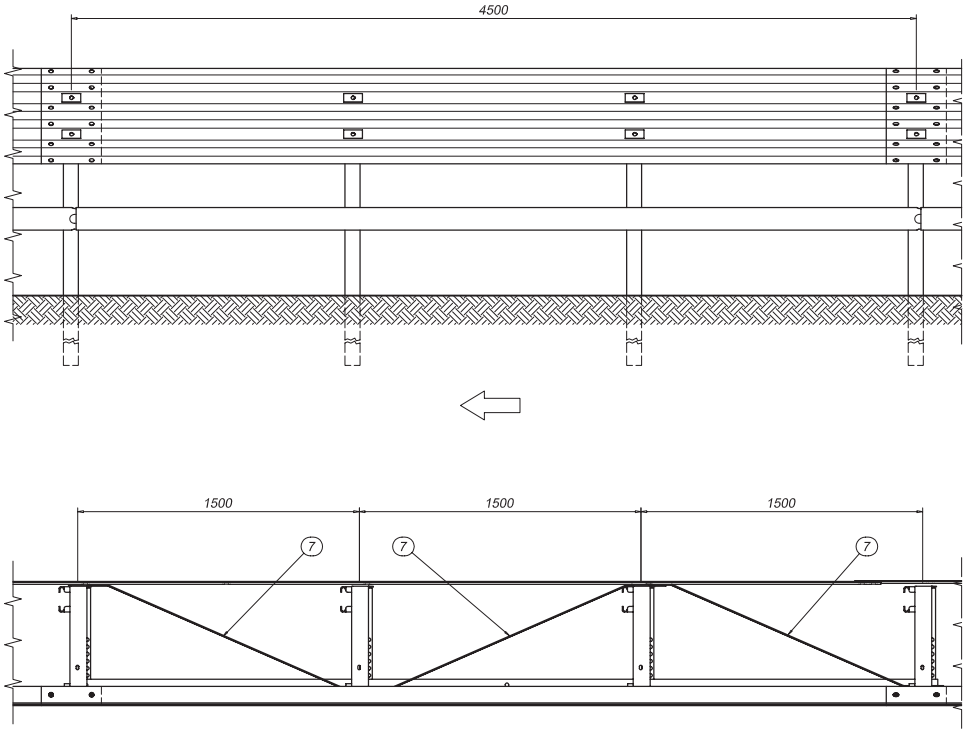
Performance	
Containment level	H3
Acceleration Severity Index "ASI"	A
Working width	W7 (2,50 m)
Extreme lateral position of the vehicle	2,50 m
Dynamic deflection	2,11 m

Characteristics	
Height out of ground	400 mm / 1210 mm
Transversal overall dimensions	615 mm
Centre to centre between posts	1500 mm
Tested minimum length	90,30 m

Description

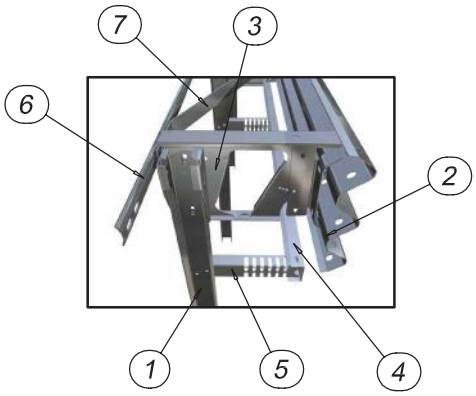
Supply and installation of 3-waves safety barrier, thickness 3,0 mm, U posts 120x80x5, h. 2200 mm, the posts are driven into the ground every 1500 mm, spacers 570x392x3mm with energy releaser-brace system, diagonal plate 70x5 mm, U 120x65x4 mm lower rail with supports, rear rail 70x5 mm, nuts and bolts and reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

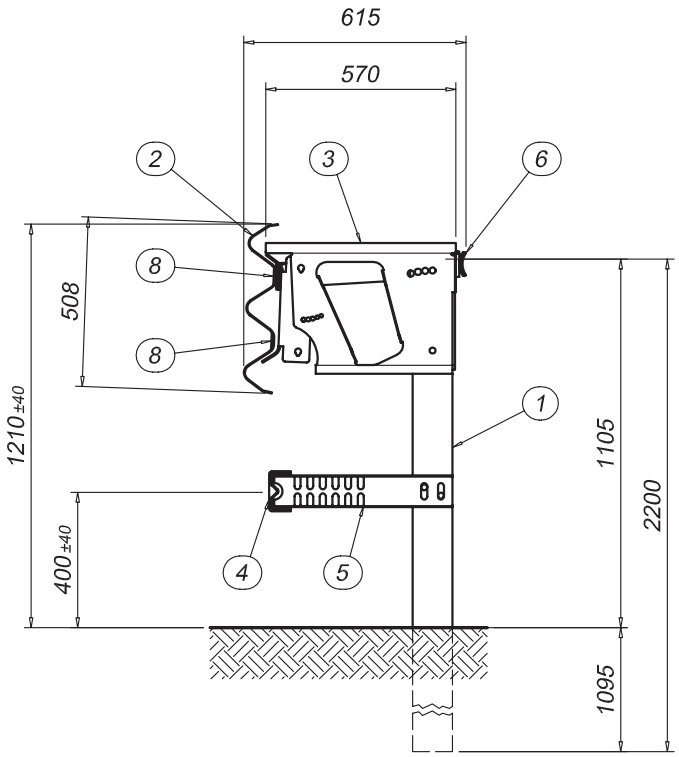
Elevation



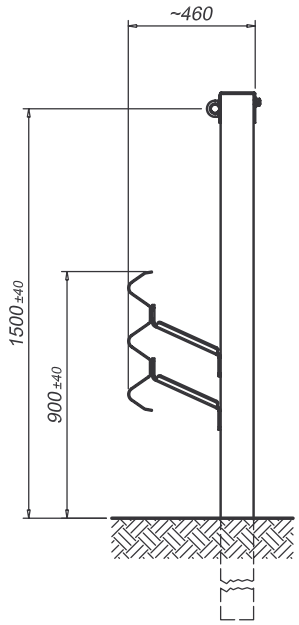
Section

	Description
1	“3n” Post U120x80x5 mm H=2200 mm
2	“3n” beam c/c 4500 mm th. 3,0 mm
3	“3n” spacer 570x392 mm with releaser and sleeve
4	“3n” Lower rail U120x65x4 mm c/c 4500 mm
5	“3n” support U95x65x3 mm L=535 mm
6	“3n” rear rail 70x5 mm L=4640 mm
7	“3n” diagonal plate 70x5 mm L=1660 mm
8	Plate 100x45x5 mm



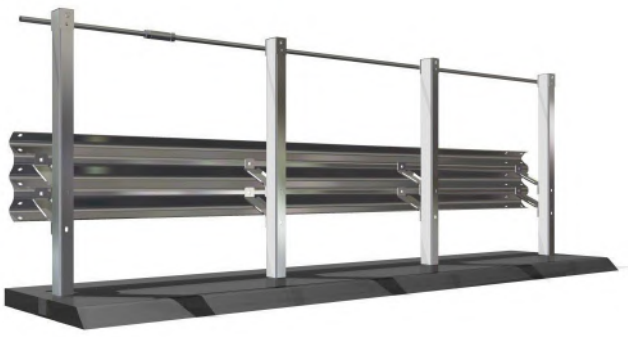


SINGLE SIDED SAFETY BARRIER ON GROUND H3-W8-A (3n28079)



Performance	
Containment level	H3
Acceleration Severity Index “ASI”	A
Working width	W8 (2,85m)
Extreme lateral position of the vehicle	3,14 m
Dynamic deflection	2,40 m

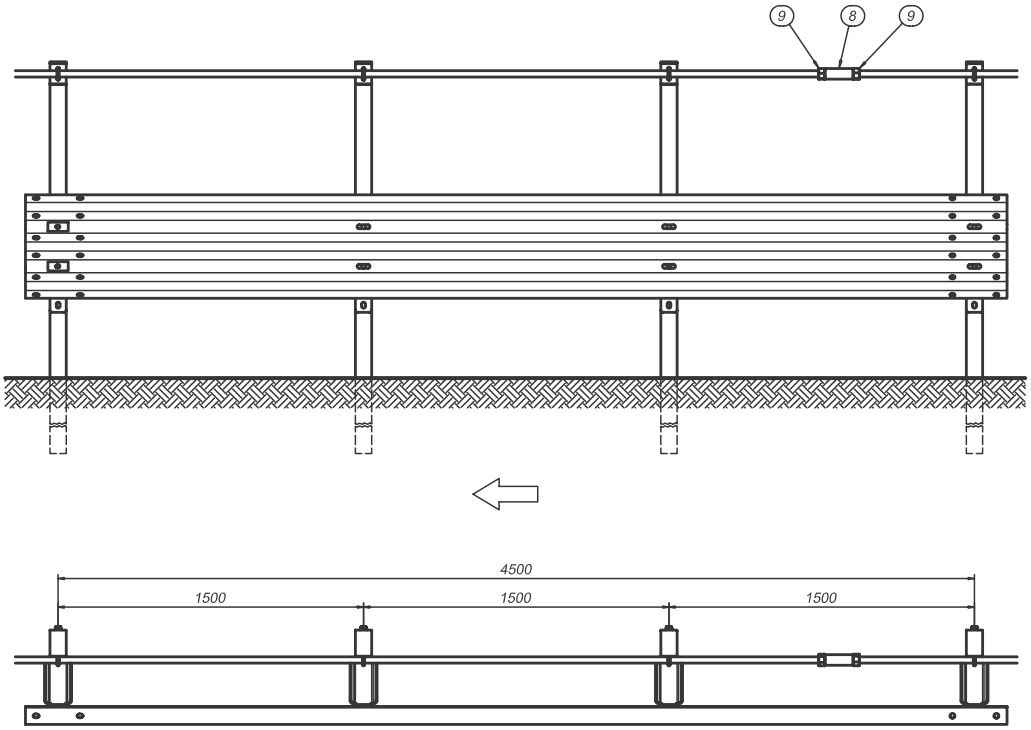
Characteristics	
Height out of ground	900 mm / 1500 mm
Transversal overall dimensions	460 mm
Centre to centre between posts	1500 mm
Tested minimum length	90 m



Description

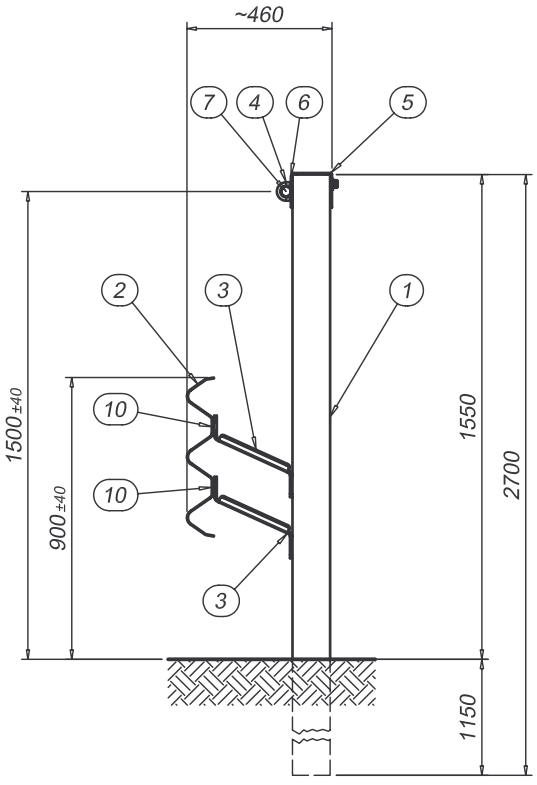
Supply and installation of 3-waves safety barrier, thickness 3,0 mm, U posts 120x80x5.9, h. 2700 mm, the posts are driven into the ground every 1500 mm, spacers 250x260x8 mm, upper rail with threaded bar with connectors and supports, nuts and bolts and reflectors.
S235JR-S3555JR steel in quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

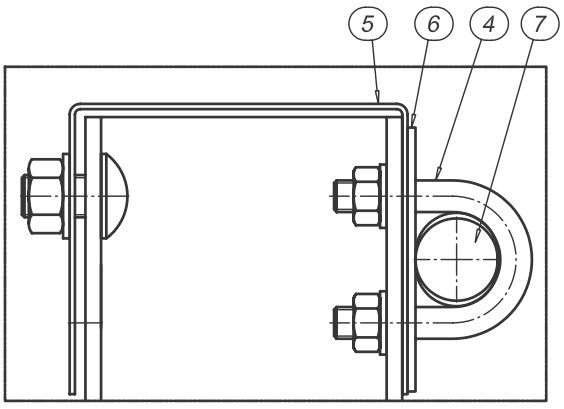
Elevation



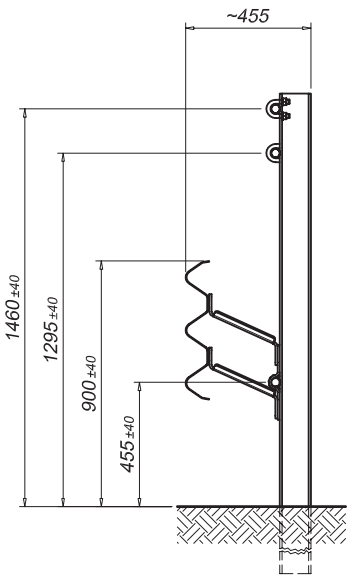
Section

	Description
1	U post 120x80x5,9 mm H=2700 mm
2	“3n” beam c/c 4500 mm th. 3,0 mm
3	Spacer 250x260x8 mm L=80 mm
4	Clamp ø10,9 partially threaded M12
5	Cap 110x128x80 mm th. 2 mm for U post 120x80x5,9
6	Plate 100x80 mm sp.3 mm
7	Threaded bar ø32mm L=9,00 m
8	Connector
9	Lock nut
10	Plate 100x45x5 mm





SINGLE SIDED SAFETY BARRIER ON GROUND H4b-W5-B (3n33567)



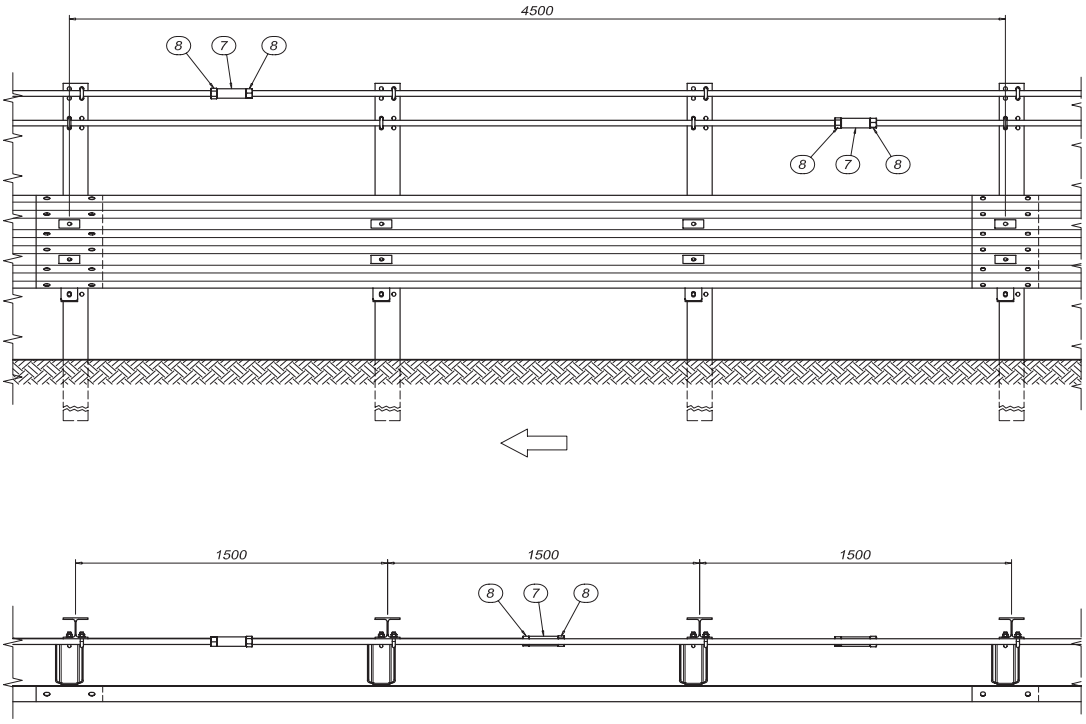
Performance	
Containment level	H4b
Acceleration Severity Index “ASI”	B
Working width	W5 (1,40m)
Extreme lateral position of the vehicle	1,40 m
Dynamic deflection	1,40 m

Characteristics	
Height out of ground	900mm / 1460mm
Transversal overall dimensions	455 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminal ends)	90 m

Description

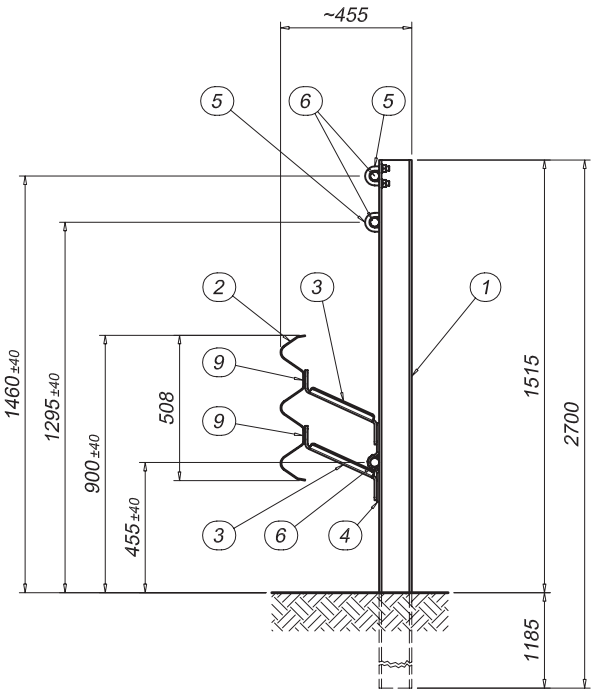
Supply and installation of 3-waves safety barrier, thickness 3,0 mm, HEA posts 120, h=2700 mm, the posts are driven into the ground every 1500 mm, spacers 250x260x8mm, double upper rail and lower rail threaded bars Ø 32 mm with connectors, nuts and bolts and reflectors.
S235JR-S275JR-S355JR steel in quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation



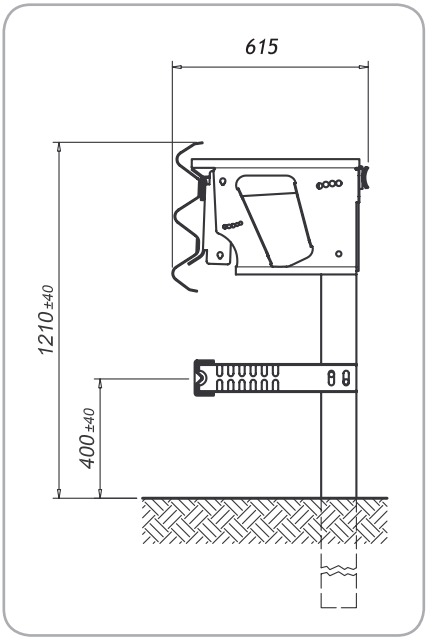
Section

	Description
1	HEA post 120 H=2700 mm
2	“3n” beam c/c 4500 mm th. 3,0 mm
3	Spacer 250x260x8 mm L=80 mm
4	Omega plate 80x275 mm th. 8 mm
5	Clamp ø14,7 partially threaded M16
6	Threaded bar ø32 L=9,00 m
7	Connector
8	Lock nut
9	Plate 100x45x5 mm



Torque Value	
Bolts M16	90 Nm
Connectors	30 Nm

SINGLE SIDED SAFETY BARRIER ON GROUND H4a-W8-A (3n21610)



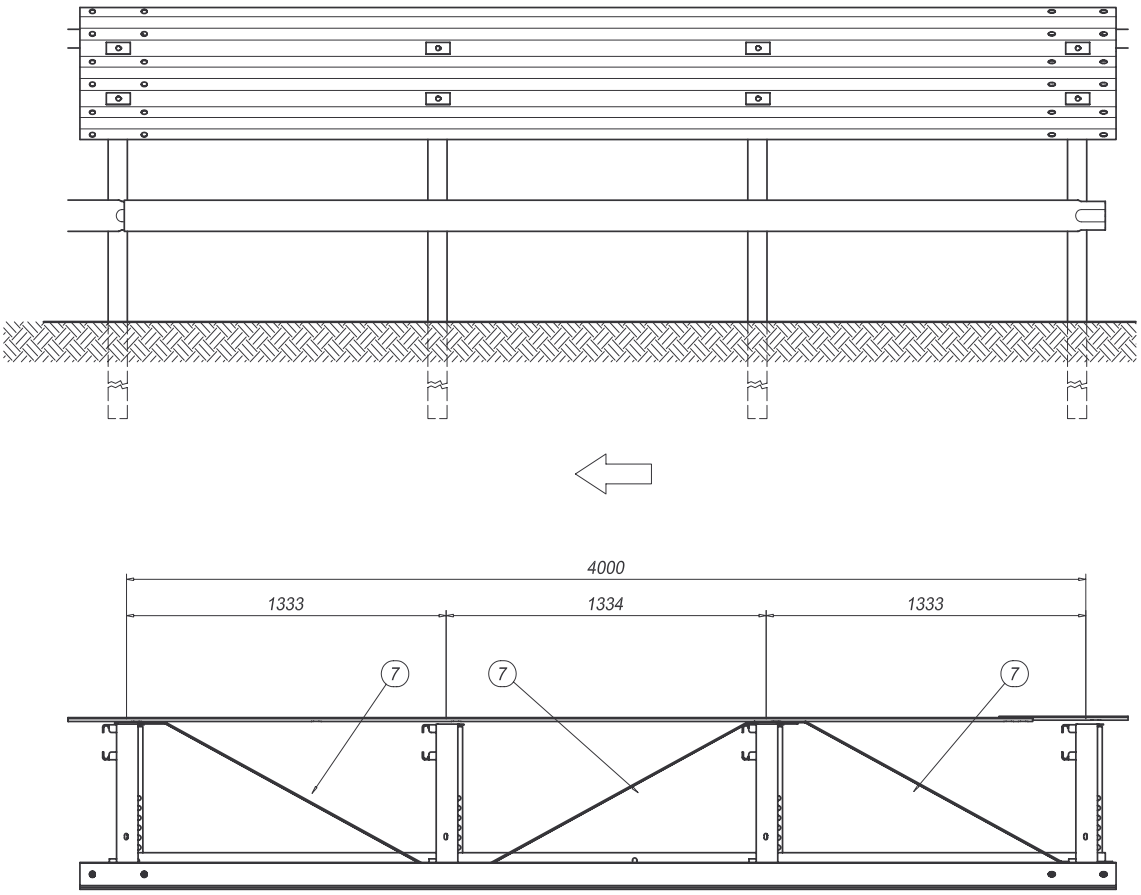
Performance	
Containment level	H4a
Acceleration Severity Index "ASI"	A
Working width	W8 (2,90m)
Extreme lateral position of the vehicle	3,25 m
Dynamic deflection	2,60 m

Characteristics	
Height out of ground	400 mm / 1210 mm
Transversal overall dimensions	615 mm
Centre to centre between posts	1333 mm
Tested minimum length	132,00 m

Description

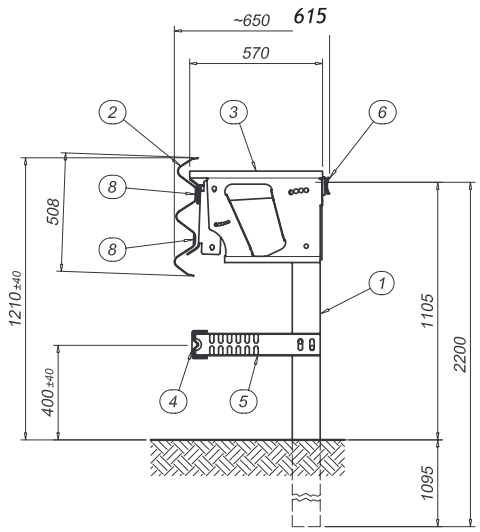
Supply and installation of 3-waves safety barrier, thickness 3,0 mm, U posts 120x80x6, h. 2200 mm, the posts are driven into the ground every 1333 mm, spacers 570x392x3mm with energy releaser-brace system, diagonal plate 70x5 mm, U 120x65x4 mm lower rail with supports, rear rail 70x5 mm, nuts and bolts and reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation

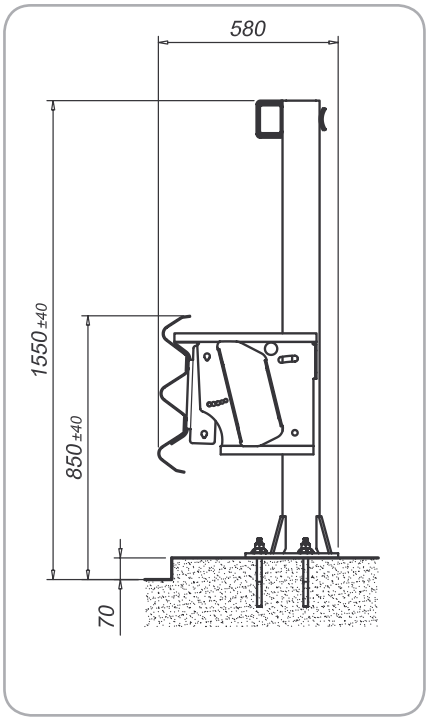


Section

	Description
1	“3n” Post U120x80x6 mm H=2200 mm
2	“3n” Beam c/c 4000 mm th. 3,0 mm
3	“3n” Spacer 570x392 mm with releaser and sleeve
4	“3n” Lower rail U120x65x4 mm c/c 4000 mm
5	“3n” Rear rail 70x5 mm L=4140 mm
6	“3n” Support U95x65x3 mm L=535 mm
7	“3n” Diagonal plate 70x5 L.1540
8	Plate100x45x5 mm

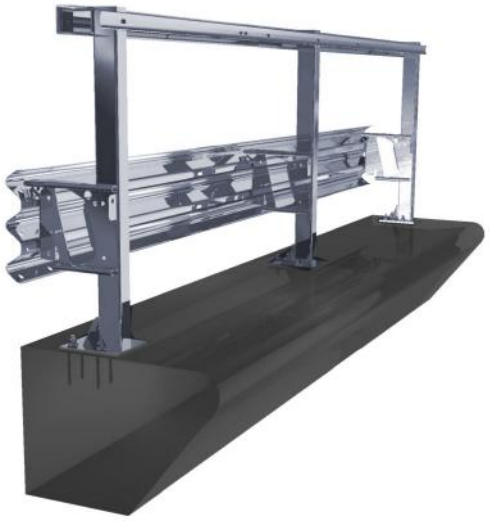


SINGLE SIDED SAFETY BARRIER ON BRIDGE H2-W5-B (3n24335)



Performance	
Containment level	H2
Acceleration Severity Index “ASI”	B
Working width	W5 (1,65m)
Extreme lateral position of the vehicle	-
Dynamic deflection	1,08 m

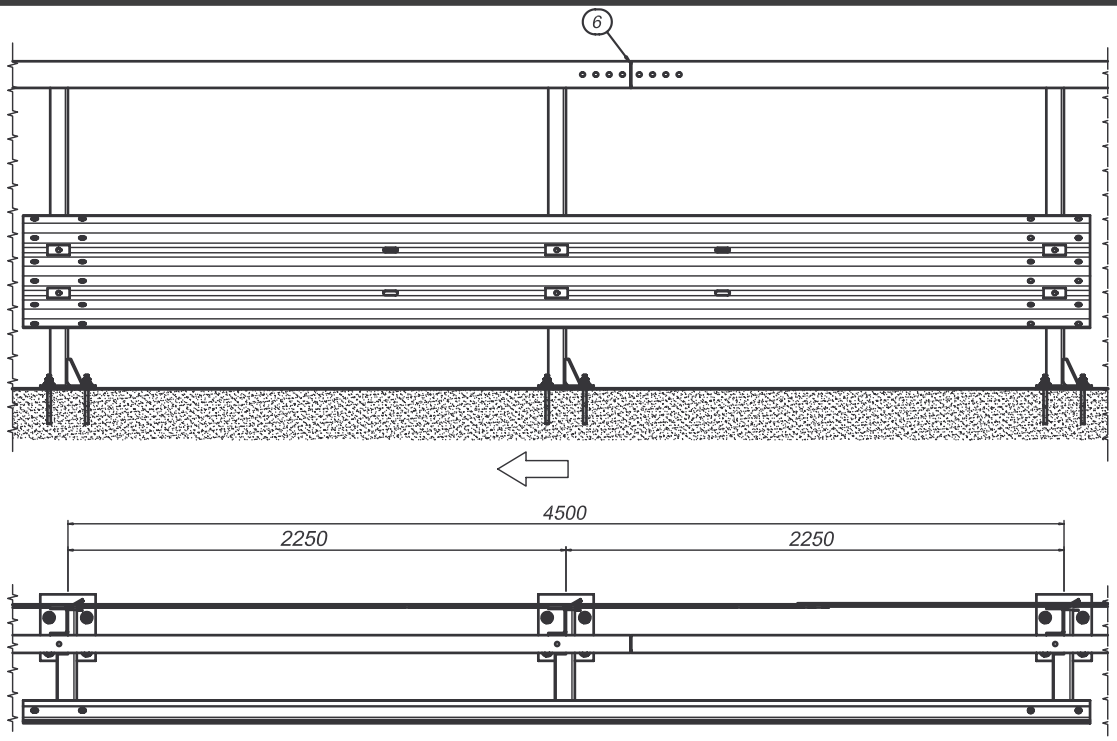
Characteristics	
Height out of ground	1550 mm / 850 mm
Transversal overall dimensions	580 mm
Centre to centre between posts	2250 mm
Tested minimum length	81 m



Description

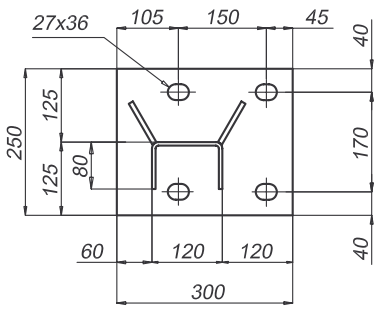
Supply and installation of 3-waves safety barrier, thickness 3,0 mm, U posts 120x80x5.9, h. 1465 mm with plate 250x300x15 mm fixed to the concrete every 2250 mm by anchor bolts, spacers 460x392 mm, thickness 3 mm, energy releaser-bracer, U upper rail 120x80x5.9 with supports, rear rail 70x5 mm, nuts and bolts and reflectors.
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

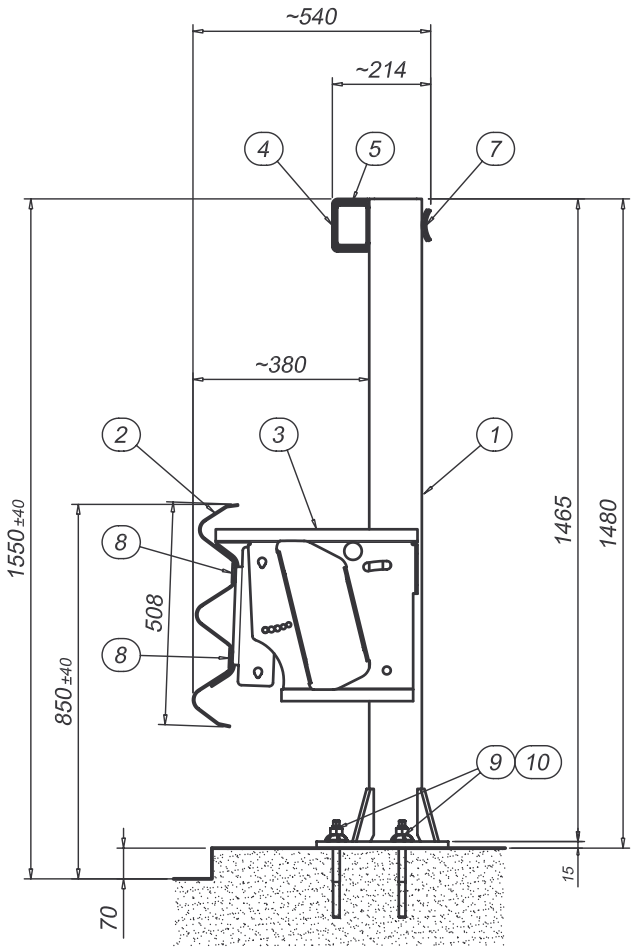
Elevation



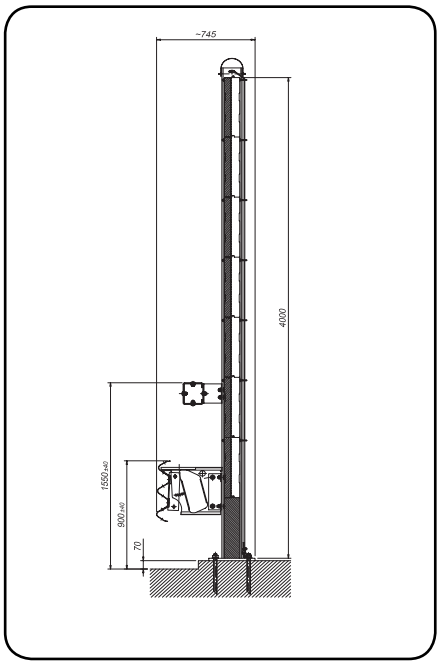
Section

	Description
1	“3n” Post U120x80x5,9 H.1465 + plate th.15 mm
2	“3n” Beam c/c 4500 th.3,0 mm
3	“3n” Special Spacer 460x392 mm + releaser - bracer th. 5 mm
4	“3n” Rail U120x80 th.5,9 L.4496 mm
5	Support Rail 104x70 th.5,9 mm
6	Sleeve U102x70 th.5,9 L.520 mm
7	“3n” Rear rail 70x5 L.4640 mm
8	Plate 100x45x5 mm
9	Anchor bolts M18 TSM B16
10	Washer M18



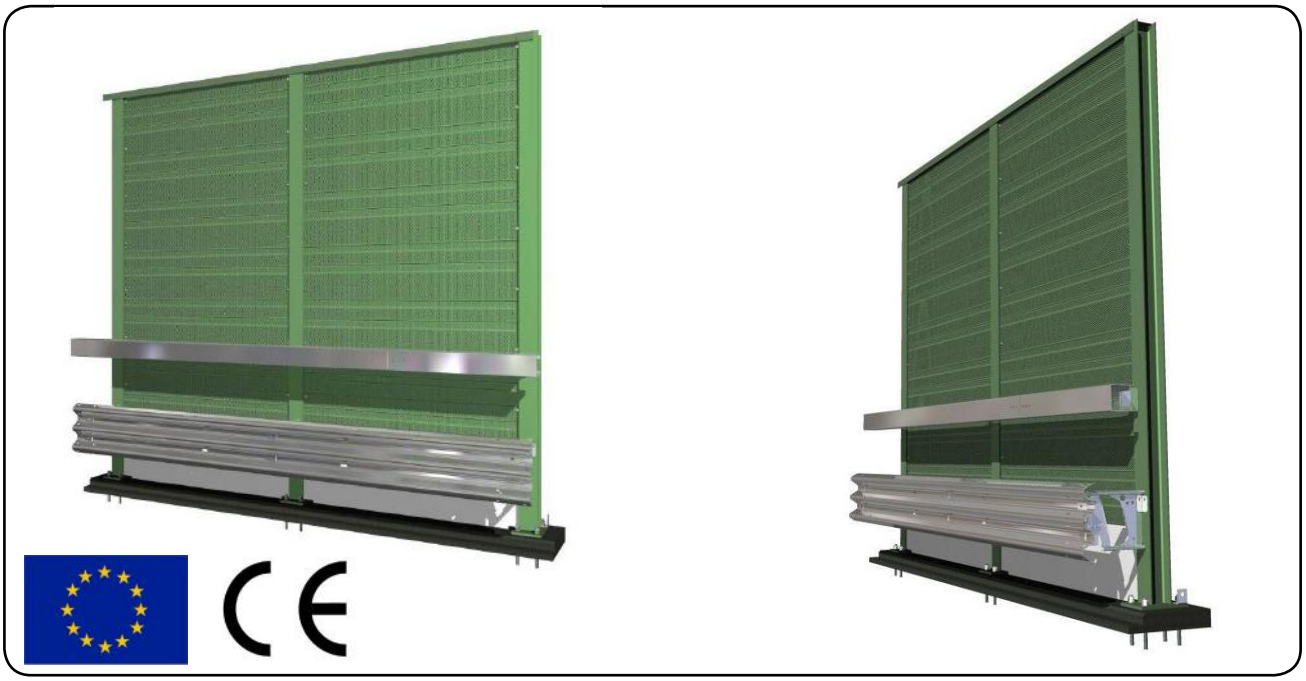


SAFETY BARRIER COMBINED SINGLE SIDE FOR BRIDGE
H2-W8-B (ISB26482)



Performance	
Containment level	H2
Acceleration Severity Index “ASI”	B
Working width	W8 (2,90 m)
Extreme lateral position of the vehicle	-
Dynamic deflection	0,70 m

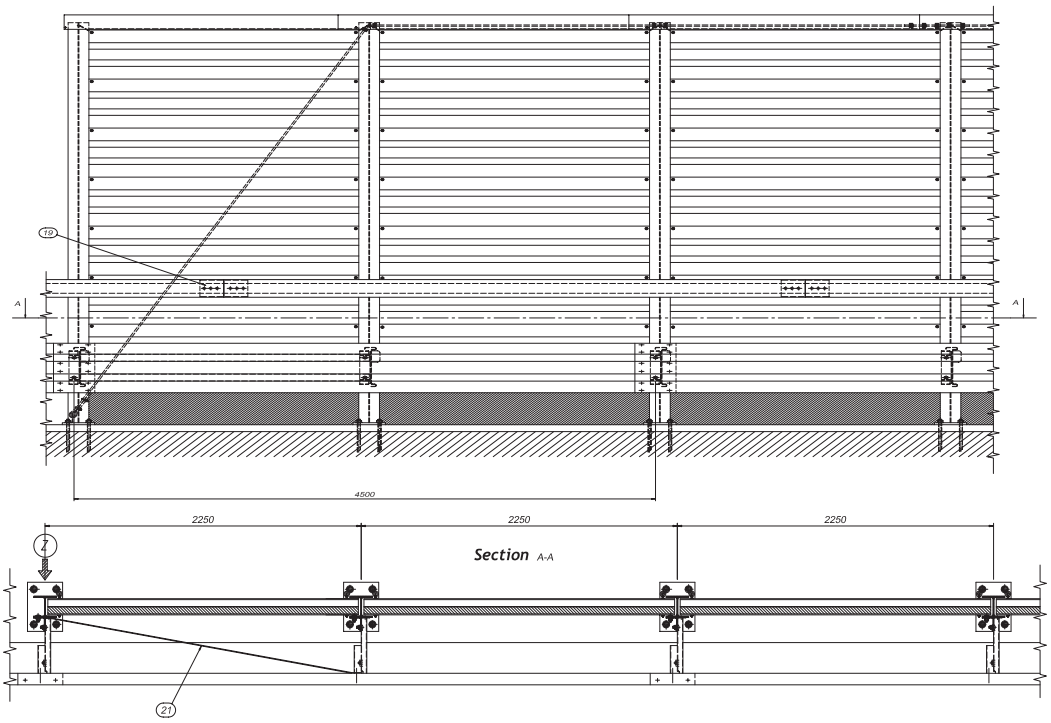
Characteristics	
Height out of ground	900 mm / 1550 mm / 4100 mm
Transversal overall dimensions	745 mm
Centre to centre between posts	2250 mm
Tested minimum length	72,0 m



Description

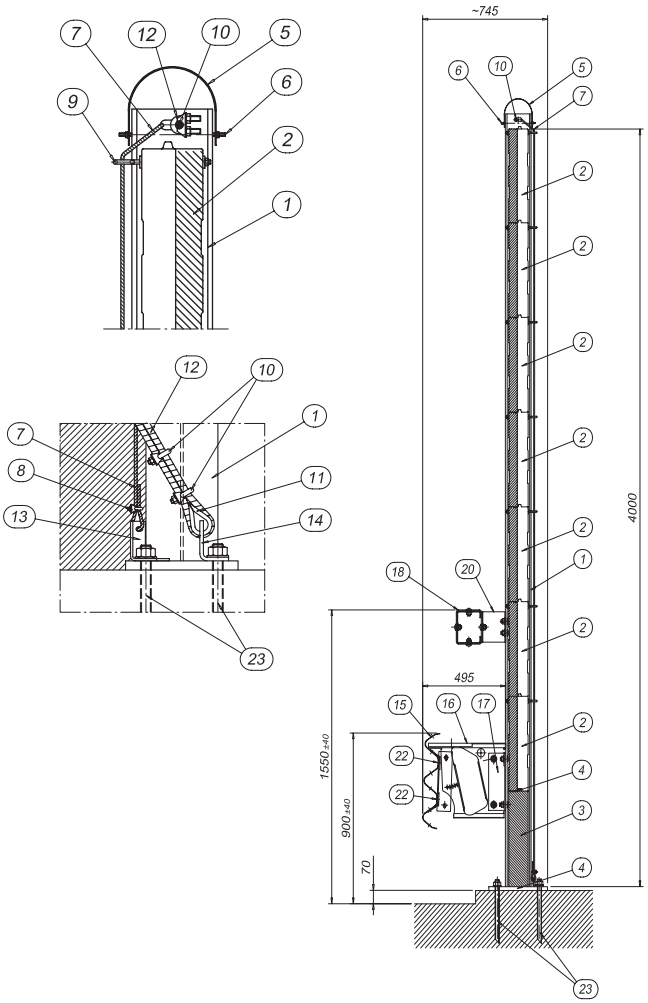
Supply and installation of combined safety barrier, having 3-waves beams th. 3,0 mm, posts HEA 160 H 4080 mm. with base plate 350x350x20 mm and anchor bolts M24x330 c/c 2250 mm., spacers 460x329x3 with energy absorber, upper beam C180x150x3 mm with supports, bolts and reflectors.
S235JR-S275JR-S355JR steel quality according to EN 10025
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
Between HEA posts, there are soundproofing panels, made of a concrete panel H 500 mm at the base, then aluminium panels th. 1,2 mm. dim. 115x500 C7C 2250 mm, up to the top of the posts. Inside the panels, a cushion of mineral wool th. 50 mm. and density of 90 kg/m3 and a protective coating on the side exposed to the traffic. Panels are fixed one another by means of steel ropes diam. 6-14 mm with clamps to avoid their falling down in case of crash.
The treatment of the panel surface is provided by a powdered coating with a fixing by fire on a high-temperature oven. The standard RAL colour is 6021.
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation

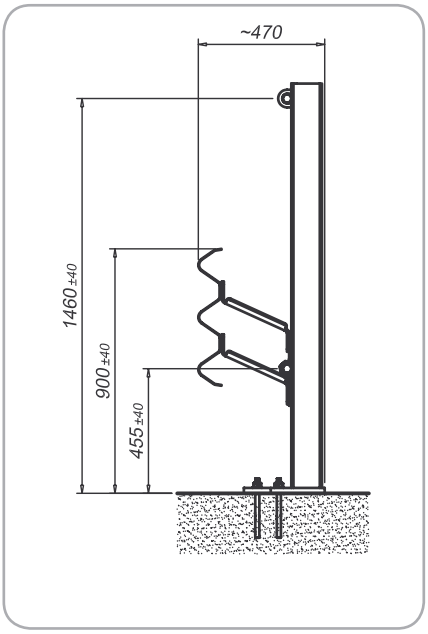


Section

	Description
1	HEA 160 posts H=4080 mm with basis plate
2	Alluminium Double side soundproofing panel 2210x500x115 mm thk 1,2 mm
3	Concrete panel L=2200 mm
4	Lip seal “giuntoplasto” 30x30 mm
5	Bar with “O-shaped” end with nuts and washers
6	Alluminium U Support 165x120 thk 1,5 mm, L=2500 mm
7	Threaded bar M6 L=200 mm with nuts and washers
8	L profile 85x100x5 mm L=70 mm
9	L profile 85x100x8 mm L=70 mm
10	Steel cable Ø14 mm
11	Cable Ø6 mm
12	Holdfast for safety cable Ø14 mm
13	Holdfast for safety cable Ø6 mm
14	Thimble for safety cable Ø14 mm
15	Cover plate 100x45x5 mm
16	3n beam c/c 4500 mm thk 3,0 mm
17	Spacers 460x392 mm thk 3,0 mm
18	SupportL80x100x5 mm H=300 mm
19	3n Trave C180x150x3,0 mm L=4500 mm
20	U spacer 140x70x4 mm L=160 mm
21	Interior diagonal 70x5 mm
22	Sleeve 170x140x35 mm thk 4,0 mm L=370 mm
23	Ancor bolts M24x330 with nuts and washers

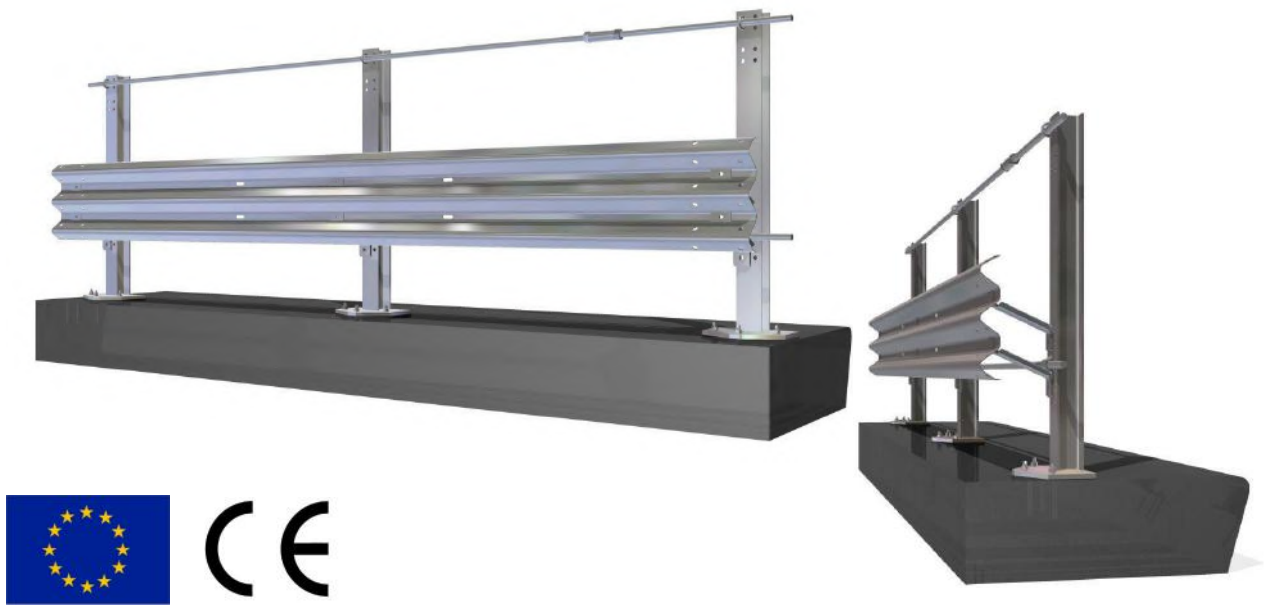


SINGLE SIDED SAFETY BARRIER ON BRIDGE H3-A-W6 (3n28361)



Performances	
Containment level	H3
Acceleration Severity Index "ASI"	A
Working width	W6 (1,80m) *
Extreme lateral position of the vehicle	2,0 m *
Dynamic deflection	1,60 m

Characteristics	
Height out of ground	1460 mm/900 mm/455 mm
Transversal overall dimensions	470 mm
Centre to centre between posts	2250 mm
Tested minimum length	108 m

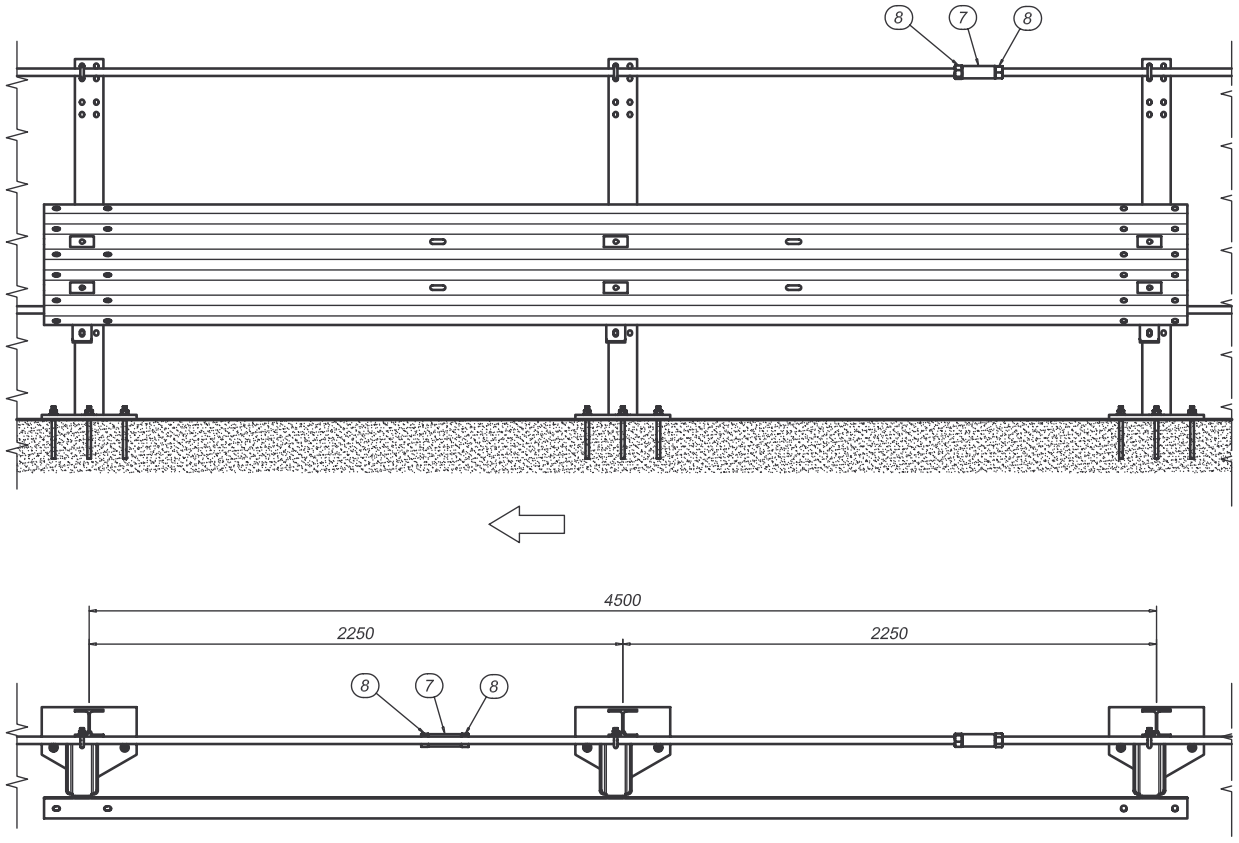


Description

Supply and installation of 3-waves safety barrier, thickness 3,0 mm, HEA posts 120, h. 1520 mm with plate 300x400x20 mm fixed to the concrete every 2250 mm by anchor bolts, spacers 250x260X8 mm with upper rail and lower rail threaded bars Ø 32 mm with clamps, nuts and bolts and reflectors.
S235JR-S275JR-S355JR steel in quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

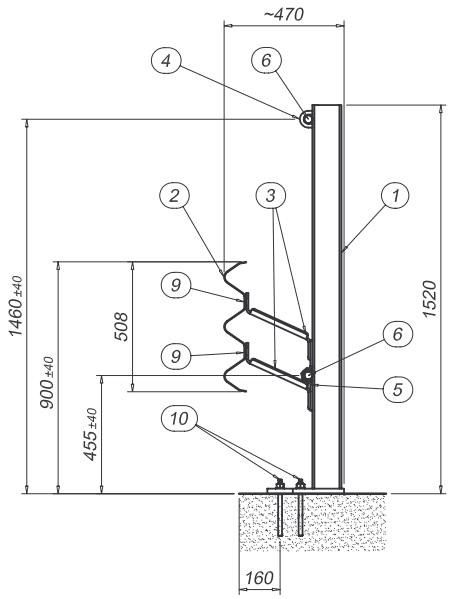
* The safety barrier 3n28361 has been tested according with test TB61 by Tüv Institute of Munich (Germany) for the force measurements, Test n. X49.01.H01
the performance are following described:
Working width= W5 (1,60 m)
Extreme lateral position of the vehicle = 1,70 m

Elevation



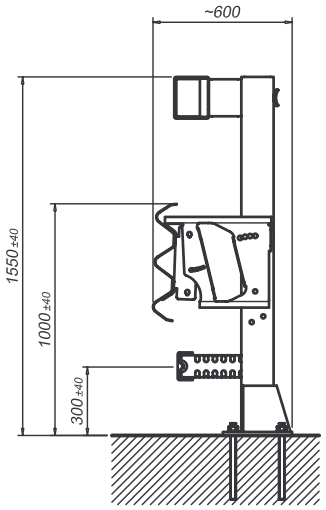
Section

	Description
1	HE120A post H=1500 mm + plate 300x400x20 mm
2	“3n” beam c/c.4500 mm th.3,0 mm
3	Spacer 250x260x8 mm L=80 mm
4	Clamp ø14,7 partially threaded M16
5	Omega plate 80x275 mm th. 8 mm
6	Threaded bar ø32 L=9,00 m
7	Connector
8	Nuts
9	Cover plate 100x45x5 mm
10	M18 TSM B16 anchor bolts L=220 mm + nut and washer



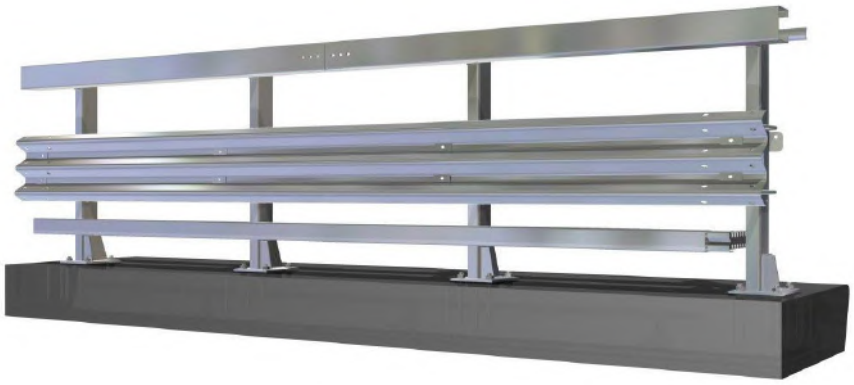
Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
M16 x 65	90 Nm
M18	40 Nm

SINGLE SIDED SAFETY BARRIER ON BRIDGE H3-B-W6 (3n22490)



Performance	
Containment level	H3
Acceleration Severity Index “ASI”	B
Working width	W6 (1,91m)
Extreme lateral position of the vehicle	1,91 m
Dynamic deflection	1,71 m

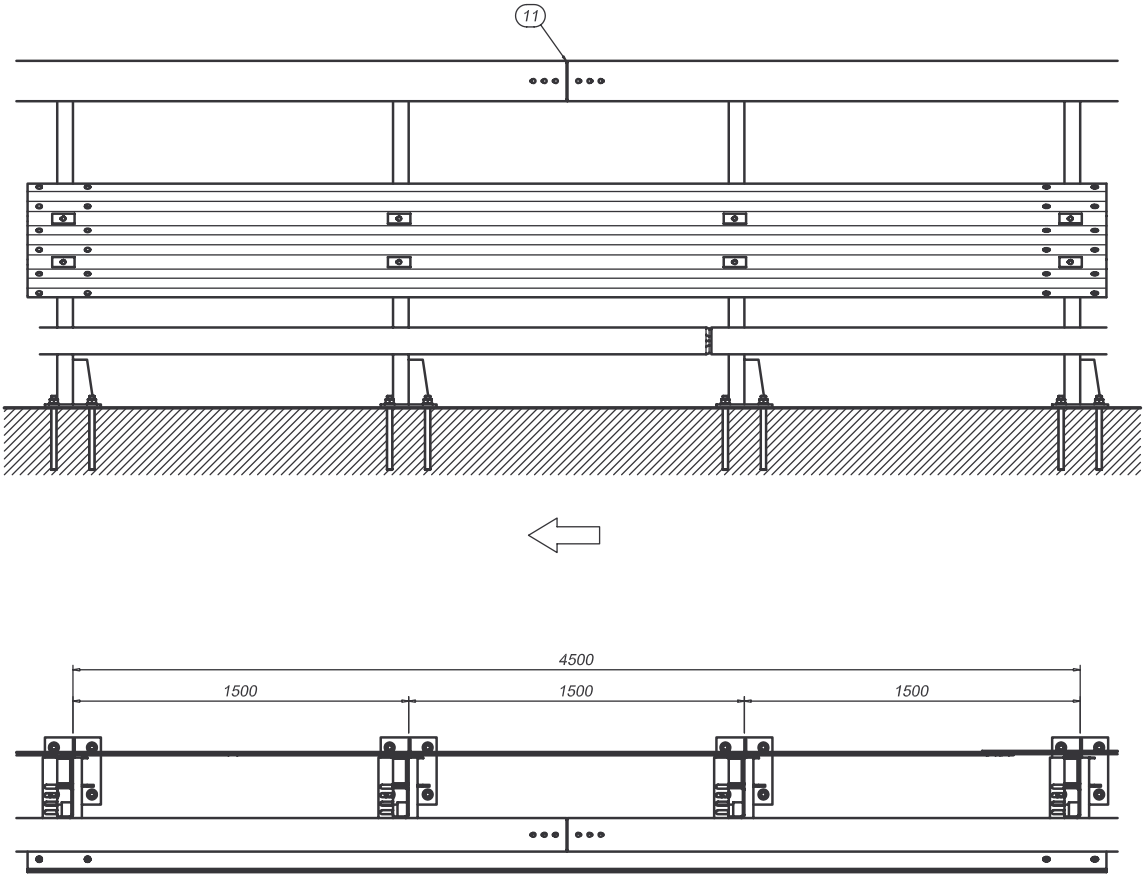
Characteristics	
Height out of ground	1550 /1000 /300 mm
Transversal overall dimensions	600 mm
Centre to centre between posts	1500 mm
Tested minimum length	85,80 m



Description

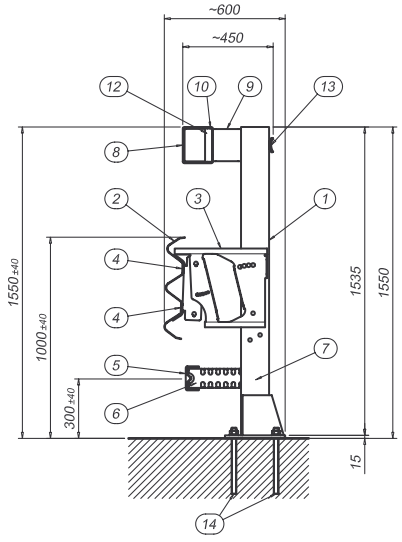
Supply and installation of 3-waves safety barrier, thickness 3,0 mm, U posts 140x70x7, h. 1535 mm with plate 250x300x15 mm fixed to the concrete every 1535 mm by anchor bolts M24x330, spacers 460x392x3mm, energy releaser-bracer, upper rail C180x150x4x3mm with supports, U120x65x4 section lower rail with bored spacers, rear rail 70x5 mm, nuts and bolts and reflectors.
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

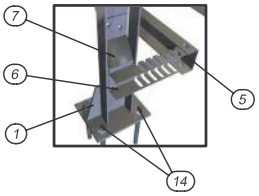
Elevation

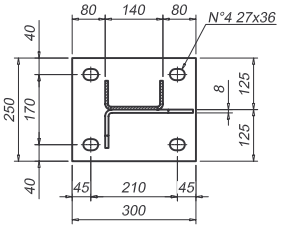


Section

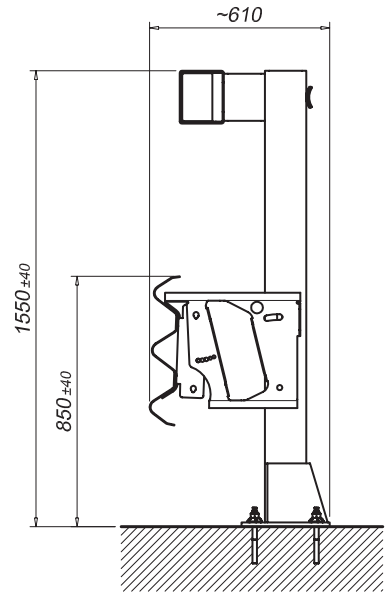
	Description
1	Posts U140x70x7 mm H=1535 mm + plate th. 15 mm
2	“3n” beam int. 4500 th. 3,0 mm
3	“3n” spacers 460x392x3 mm energy releaser-bracer
4	Cover plate 100x45x5 mm
5	“3n” lower rail U120x65x4 int. 4500 mm
6	“3n” supports of upper rail U95x65x3 L=390 mm
7	“3n” supports Z270x110x5 mm
8	“3n” beam C180x150x40 mm th. 3,0 mm L=4496 mm
9	“3n” spacers U140x70x7 mm H=160 mm
10	Clamp C140x170x35 mm sp. 4 mm L=370 mm
11	plate with holes 200x70x4 mm
12	ClampL60x35x5 mm H=166 mm
13	“3n” bended plates 70x5 L=4640 mm
14	Anchor boolts M24x330 with bolts and nuts





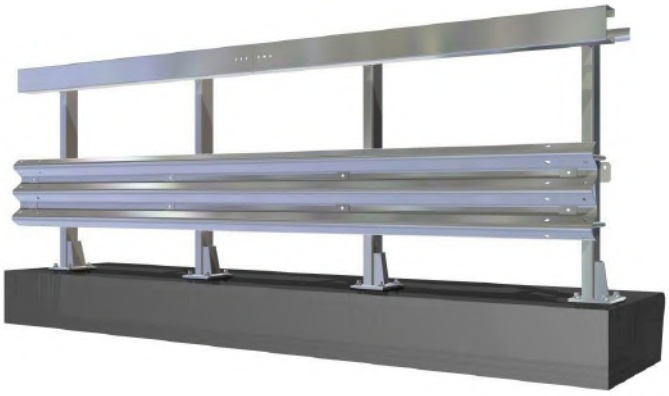


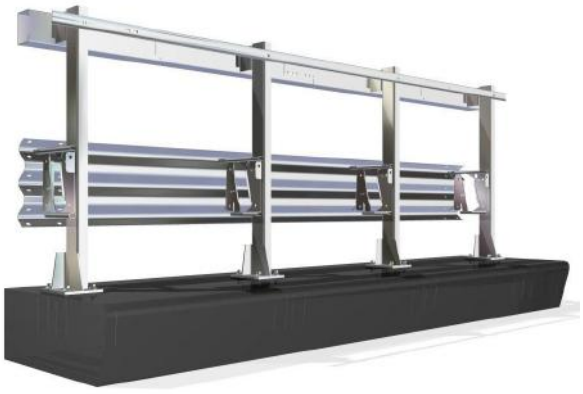
SINGLE SIDED SAFETY BARRIER ON BRIDGE H3-W8-B (3n24409)



Performances	
Containment level	H3
Acceleration Severity Index "ASI"	B
Working width	W8 (2,80m)
Extreme lateral position of the vehicle	2,80m
Dynamic deflection	2,10 m

Characteristics	
Height out of ground	850 mm / 1550 mm
Transversal overall dimensions	610 mm
Centre to centre between posts	1500 mm
Tested minimum length	94.80 m

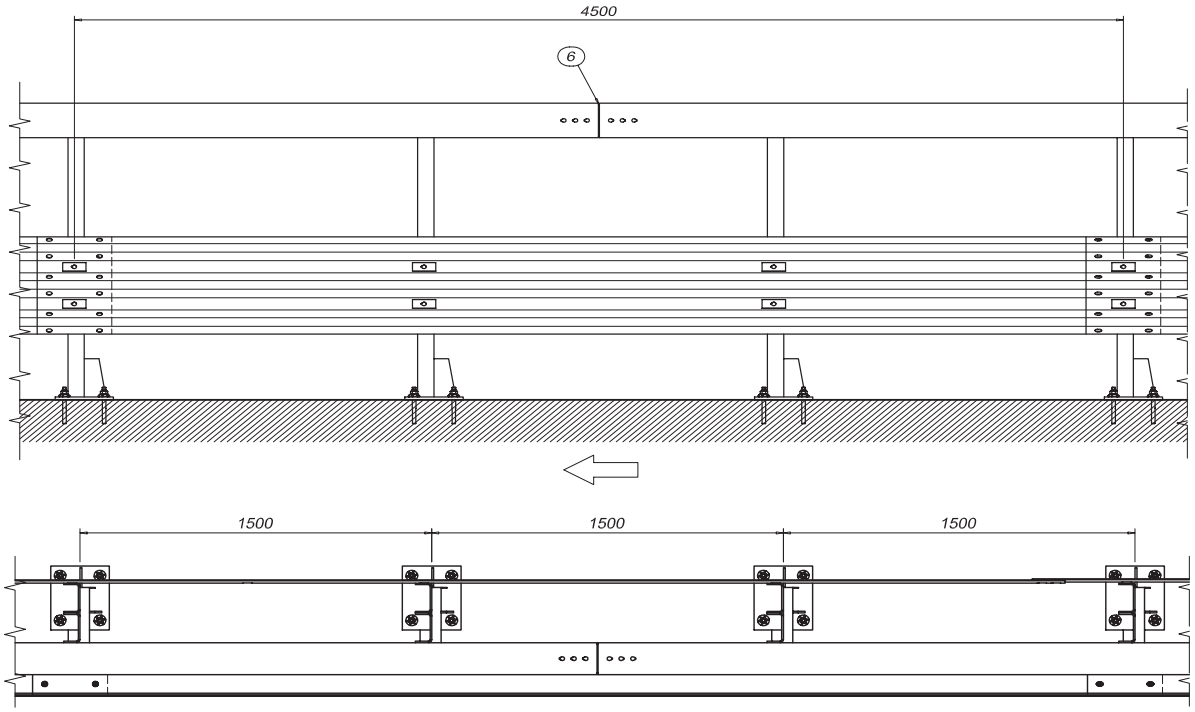




Description

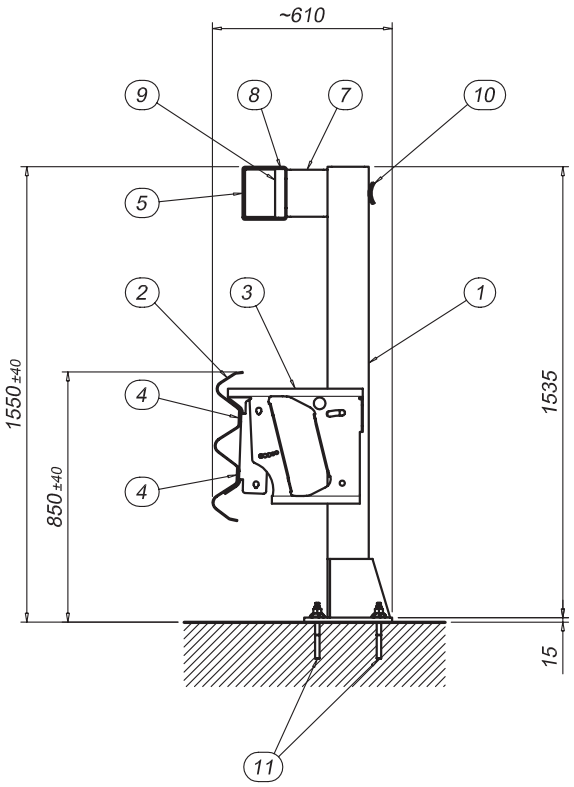
Supply and installation of 3-waves safety barrier, thickness 3,0 mm, U posts 140x70x7 mm h=1535 mm with plate 250x300x15 mm fixed to the concrete every 1500 mm by anchor bolts, spacers 460x392x3 mm with energy absorption, box upper rail C-shaped 180x150x40x3 mm with supports, and box-shaped tension rail 70x5 mm, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

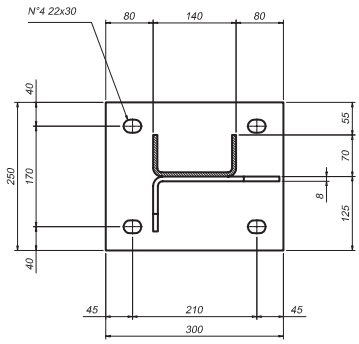
Elevation



Section

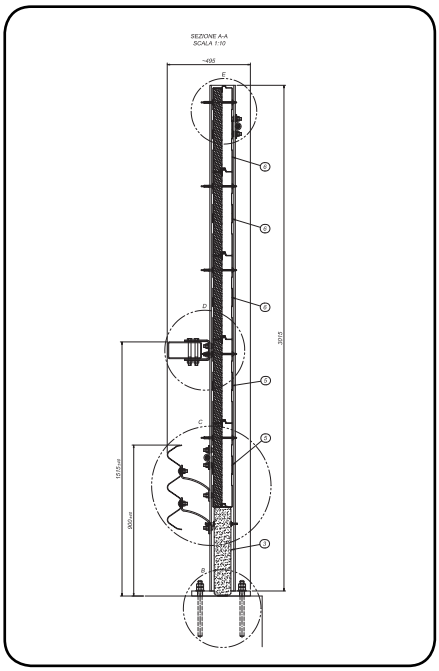
	Description
1	Post U140x70x7 mm H=1535 mm + Plate th.15 mm
2	“3n” Beam c/c 4500 mm th.3,0 mm
3	“3n” Spacer 460x392 with dissipator th. 5 mm
4	Plate 100x45x5 mm
5	“3n” beam C180x150x40 mm th. 3,0 mm L=4496 mm
6	Sleeve C140x170x35 mm th. 4,0 mm L=370 mm
7	“3n” Spacer U140x70x7 mm H=160 mm
8	Plate 200x70x4 mm
9	Clamp L60x35x5 mm H=166 mm
10	“3n” rear rail 70x5 mm L=4640 mm
11	Anchor bolts M18 TSM B16





“3n” CLASS COMBINED SINGLE SIDE FOR BRIDGE

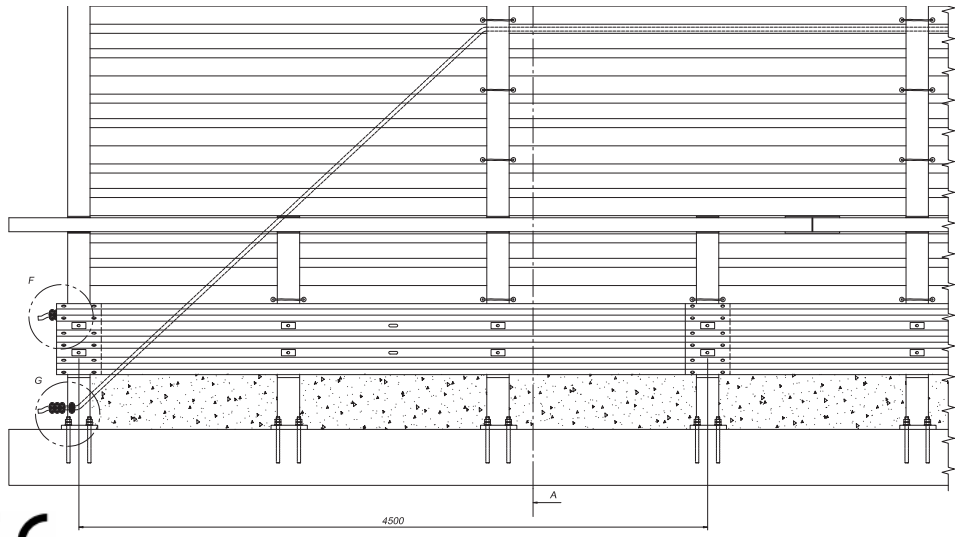
H4b-A-W4/W5 (ISB36234 3M / ISB36358 4M / ISB35931 5M)



Performance	
Containment level	H4b
Acceleration Severity Index “ASI”	A
Working width	W4 (1,2m)/W5 (1,4m)
Extreme lateral position of the vehicle	-
Dynamic deflection	0,8 m / 0,9 m

Characteristics	
Height out of ground	900mm/1515mm/3000mm/ 4000mm/5000
Transversal overall dimensions	-
Centre to centre between posts	1500 mm
Tested minimum length	90 m

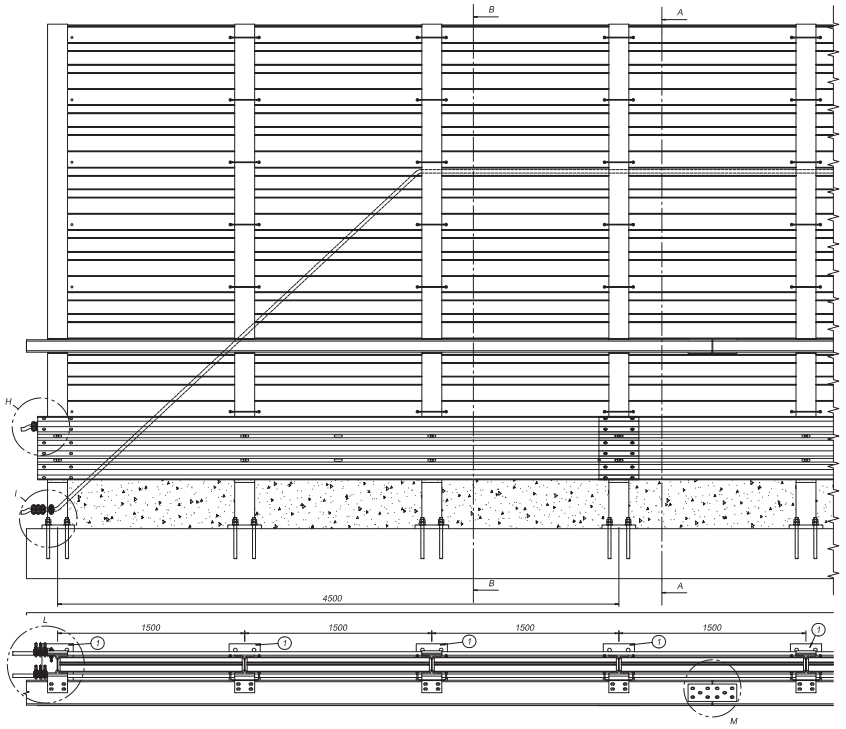
ISB36234



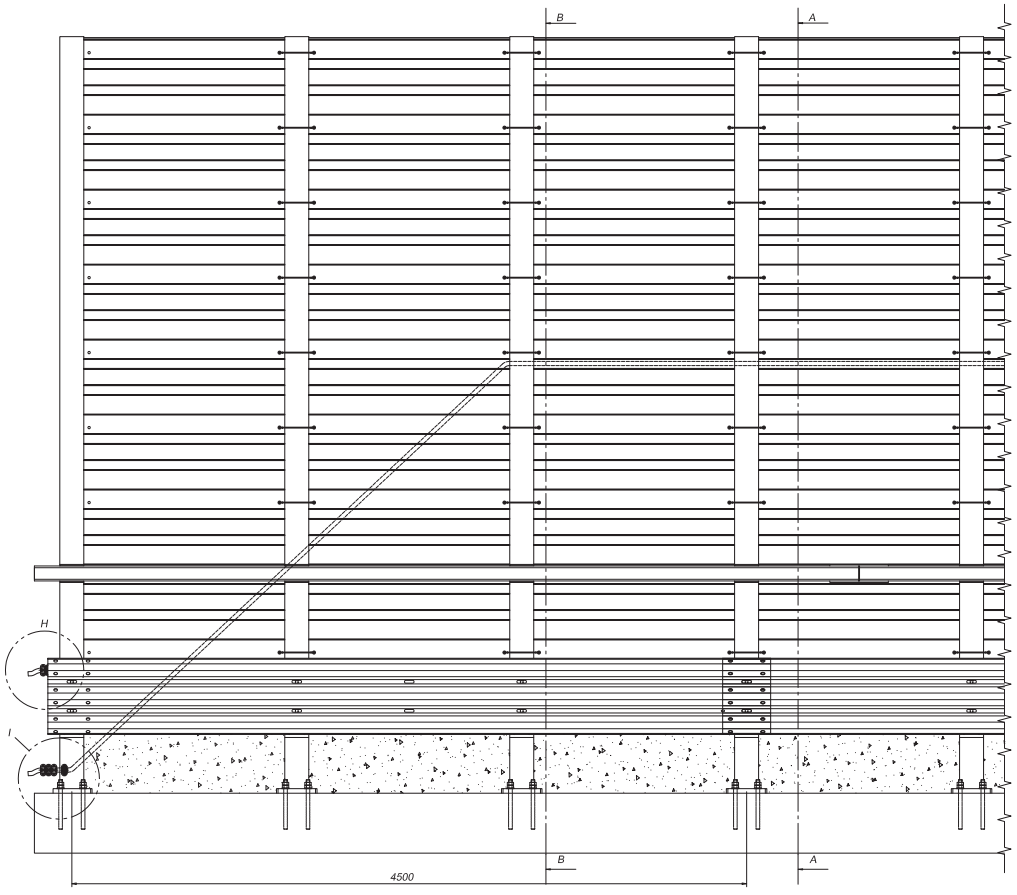
Description

Supply and installation of combined safety barrier, having 3-waves beams th. 3,0 mm, posts HEA 160 H 4080 mm. with base plate 350x350x20 mm and anchor bolts M24x330 c/c 2250 mm., spacers 460x329x3 with energy absorber, upper beam C180x150x3 mm with supports, bolts and reflectors.
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
Between HEA posts, there are soundproofing panels, made of a concrete panel H 500 mm at the base, then aluminium panels th. 1,2 mm. dim. 115x500 C7C 2250 mm, up to the top of the posts. Inside the panels, a cushion of mineral wool th. 50 mm. and density of 90 kg/m3 and a protective coating on the side exposed to the traffic. Panels are fixed one another by means of steel ropes diam. 6-14 mm with clamps to avoid their falling down in case of crash.
The treatment of the panel surface is provided by a powdered coating with a fixing by fire on a high-temperature oven. The standard RAL colour is 6021.
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

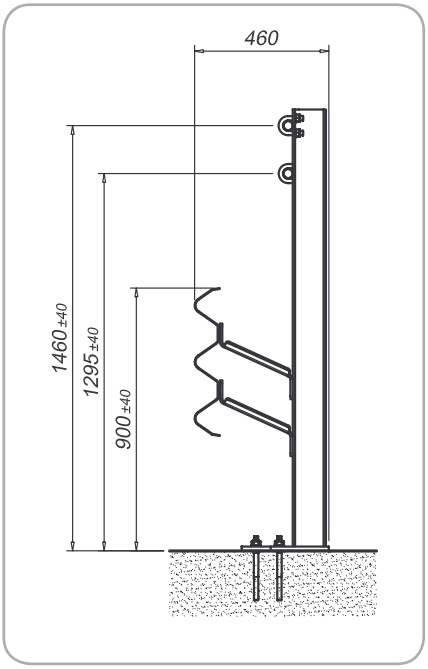
ISB36358 4m



ISB35931 5m

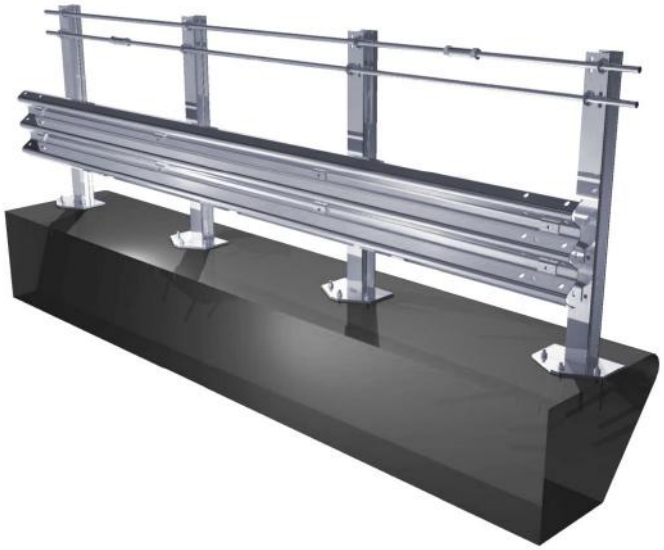


SINGLE SIDED SAFETY BARRIER ON BRIDGE H4b-W8-B (3n28236)



Performance	
Containment level	H4b
Acceleration Severity Index "ASI"	B
Working width	W8 (2,80m)
Extreme lateral position of the vehicle	1,80 m
Dynamic deflection	2,60 m

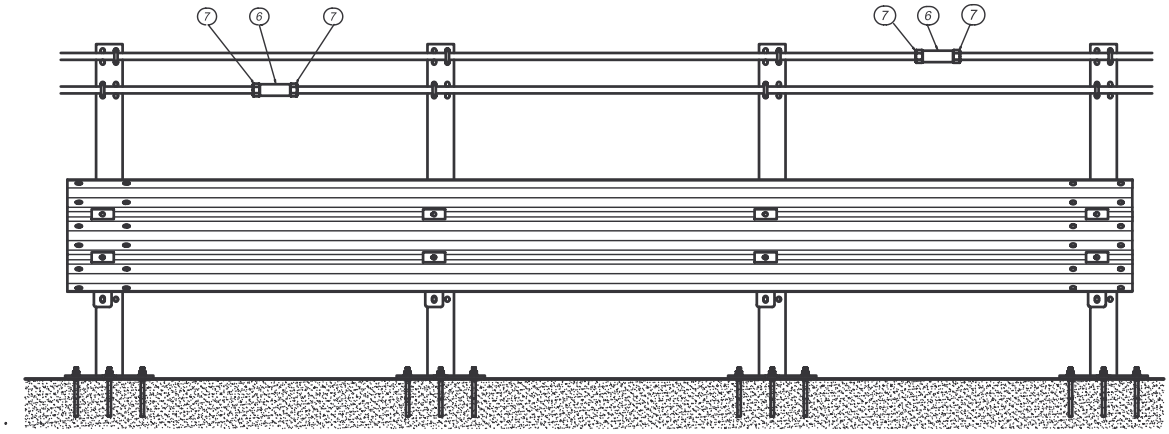
Characteristics	
Height out of ground	1460 /1295/ 900mm
Transversal overall dimensions	460 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminal ends)	108 m

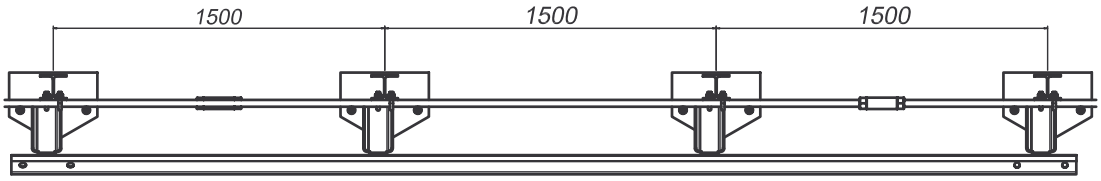


Description

Supply and installation of 3-waves safety barrier, thickness 3,0 mm, HEA posts 120, h. 1600 mm with plate 300x400x15 mm fixed to the concrete every 1500 mm by anchor bolts, spacers 250x260X8 mm, no. 2 threaded bars Ø 32 mm with upper rear and clamps, nuts and bolts and reflectors.
S235JR-S275JR-S355JR steel in quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation

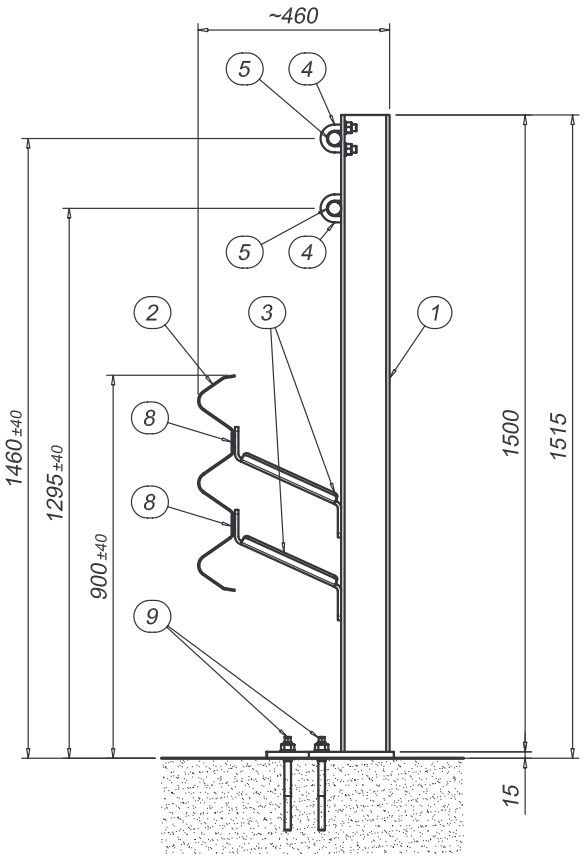




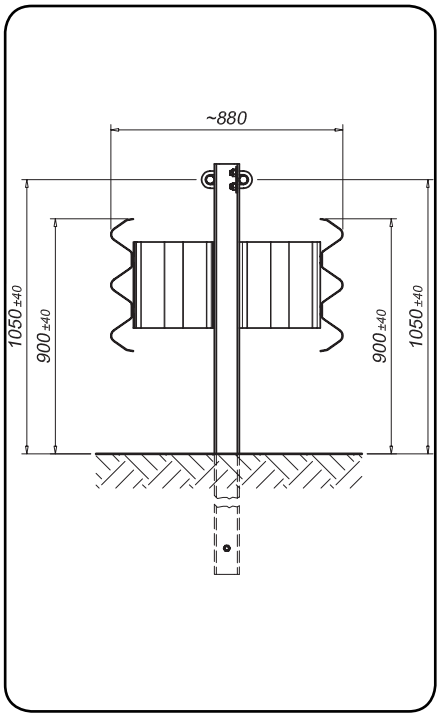
Section

	Description
1	HEA120 post H=1500 mm + plate 300x400x15 mm
2	“3n” beam c/c 4500 th.3,0 mm
3	Spacer 250x260x8 mm L=80 mm
4	Clamp ø14,7 partially filleted M16
5	Threaded bars ø32mm L=9,00 m
6	Connector threaded bar
7	Lock nut
8	Plate 100x45x5 mm
9	Anchor bolts M18 TSM B16 L=220 mm with nut / washer

Torque value	
M16 x 30	90 Nm
M16 x 45	90 Nm
Anchor bolt M18	40 Nm
Connettors	30 Nm

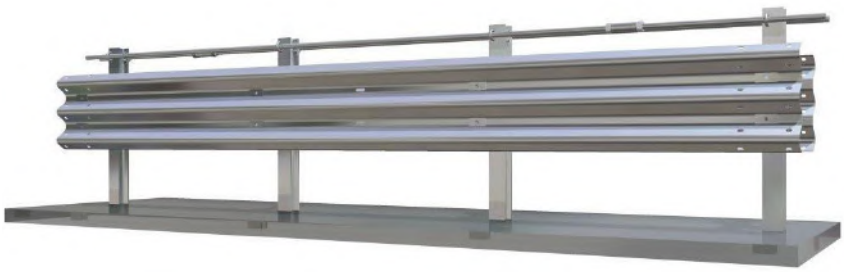


SINGLE-LINE MEDIAN STEEL SAFETY BARRIER ON GROUND TO BE USED IN AREAS OF TRAFFIC CIRCULATION *H2-W4-B (3n30401)*



Performance	
Containment level	H2
Acceleration Severity Index “ASI”	B
Working width	W4 (1,3 m)
Extreme lateral position of the vehicle	1,30 m
Dynamic deflection	0,70 m

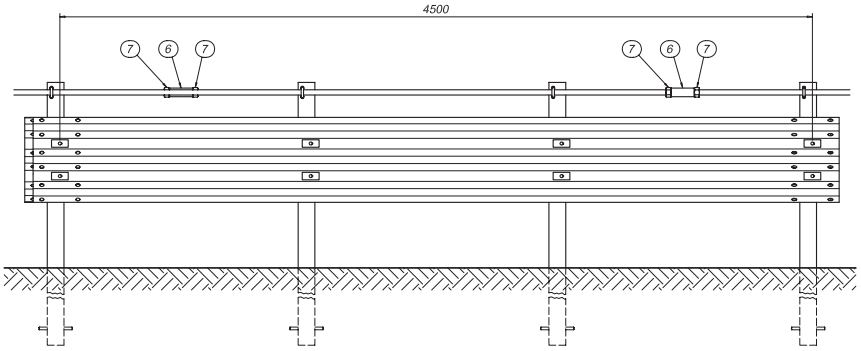
Characteristics	
Height out of ground	1050 mm / 900 mm
Transversal overall dimensions	880 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminal ends)	81 m

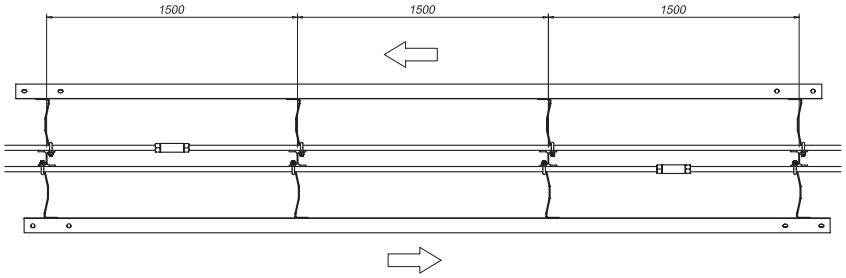


Description

Supply and installation of a 3-wave safety barrier with 2 beams, thickness 2,5 mm, HEA 100 posts, h. 2400 mm, driven into ground every 1500 mm, with an anti-extracting bar at the lower end of each post, spacers 310x80x5,9 mm with energy releaser-brace system, threaded bar Ø 32 mm, assembled with clamps, connectors, nuts and bolts and provided with reflectors.
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation

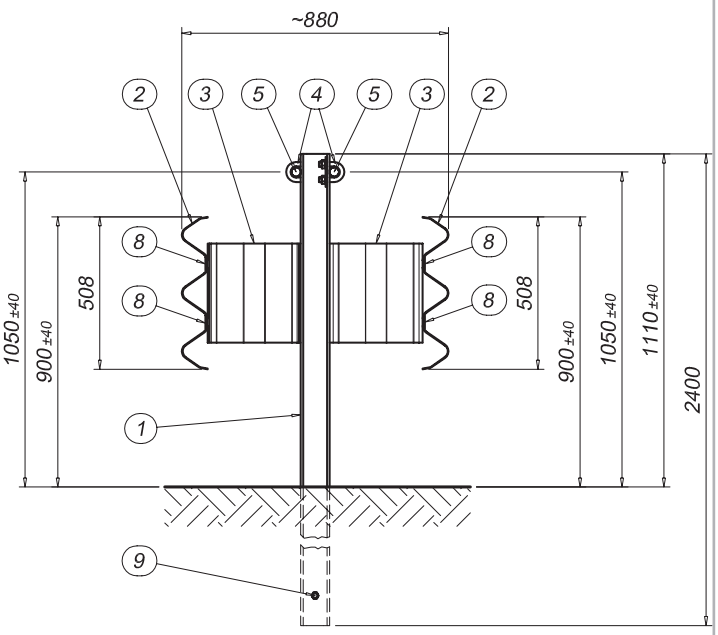


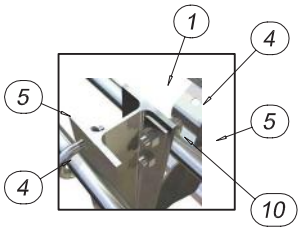


Section

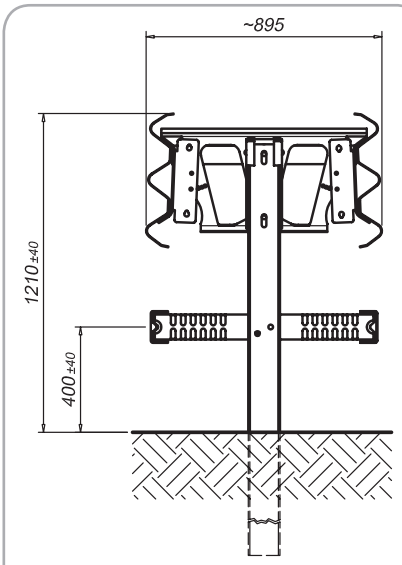
	Description
1	“3n” Posts HE100A H=2400 mm
2	“3n” beam 4500 mm th. 2,5 mm
3	“3n” spacers 310x80x5,9 mm L=330 mm
4	Clamp Ø14,7 partially threaded M16 cl. 8.8
5	Threaded bars Ø32 L=9000 mm
6	Connectors Ø32 mm
7	Nuts
8	Cover plate100x45x5 mm
9	Antiunthreading bar M16, L=200 mm
10	plate 100x40x5 mm

Torque values	
M10 x 30	20 Nm
M16 x 30	90 Nm
M16 x 45	90 Nm





SINGLE-LINE MEDIAN STEEL SAFETY BARRIER ON GROUND TO BE USED IN AREAS OF TRAFFIC CIRCULATION H3-A-W8 (3n22051)



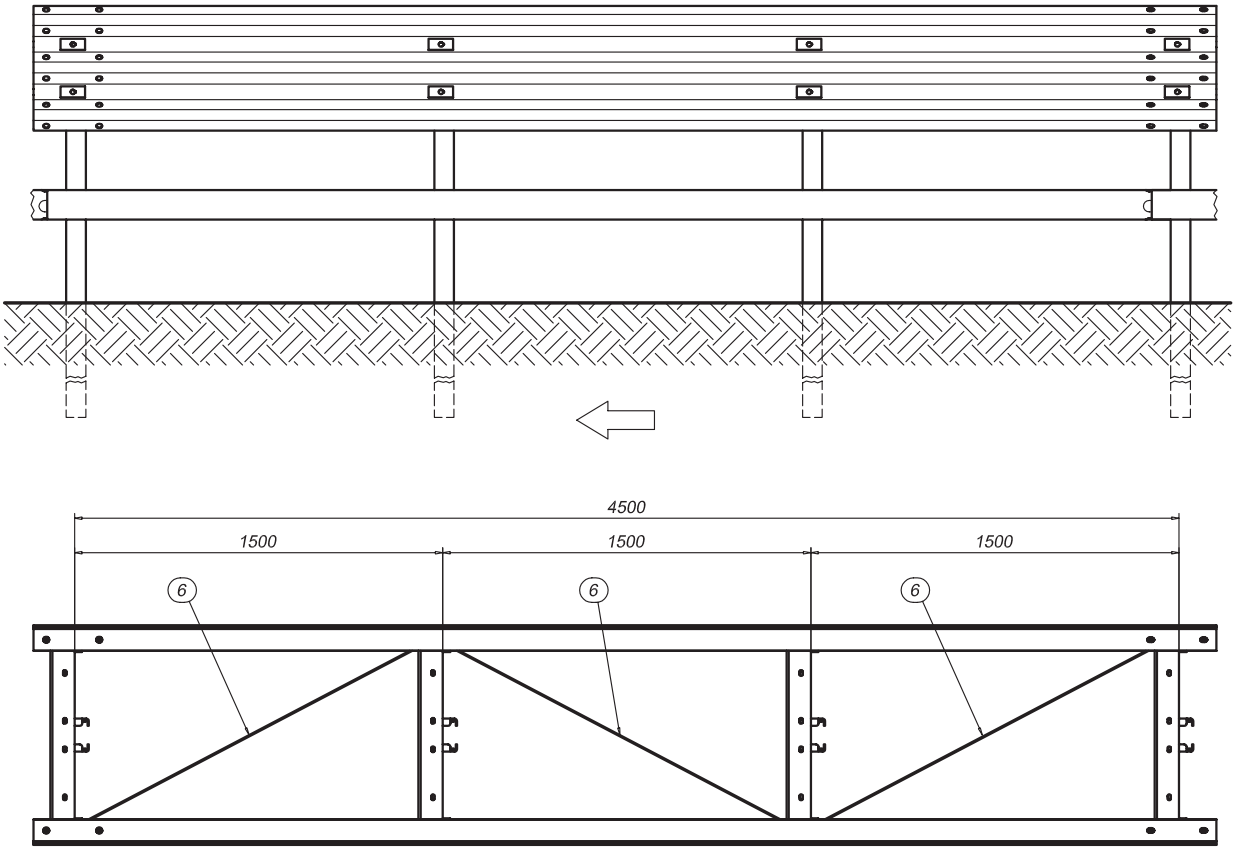
Performances	
Containment level	H3
Acceleration Severity Index "ASI"	A
Working width	W8 (2,78m)
Extreme lateral position of the vehicle	2,20 m
Dynamic deflection	2,78 m

Characteristics	
Height out of ground	1210 mm
Transversal overall dimensions	895 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminal ends)	80 m

Description

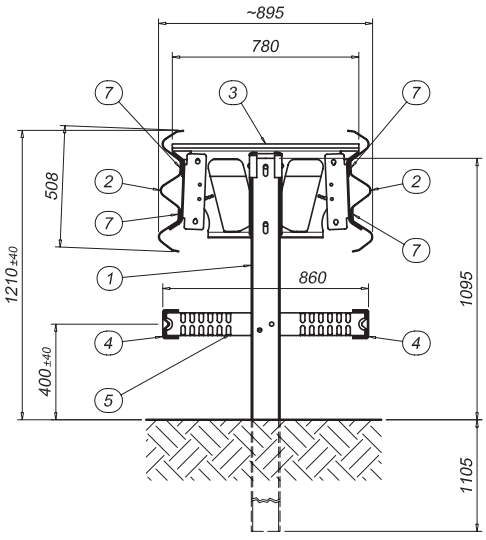
Supply and installation of 3-waves safety barrier with 2 beams, thickness 3,0 mm, U posts 120x80x6 mm, h. 2200 mm, the posts are driven into the ground every 1500 mm, spacers 780x392x3mm with energy releaser-brace system, diagonal plate 70x5 mm, double lower rails U 120x65x4 mm with supports, nuts and bolts and reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

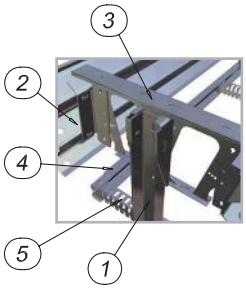
Elevation



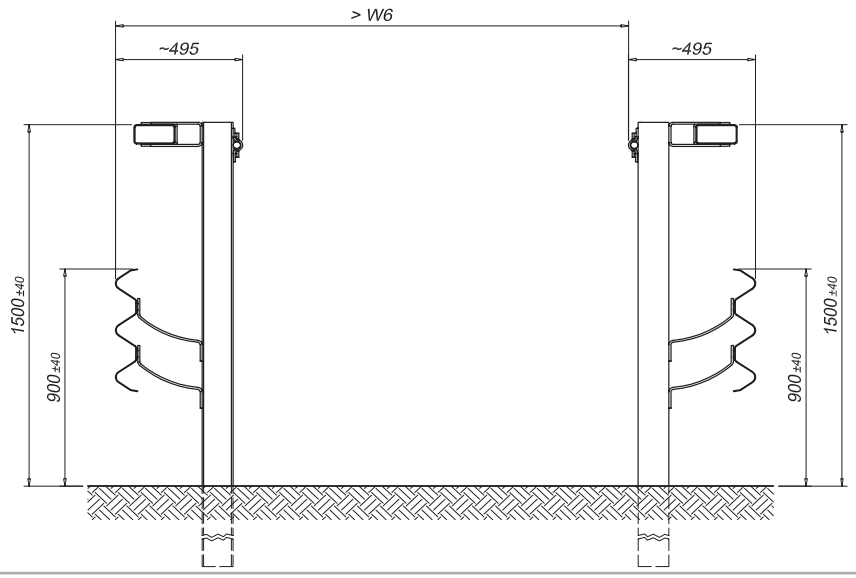
Section

	Description
1	“3n” Post U120x80x6 mm H=2200 mm
2	“3n” beam c/c 4500 mm th. 3,0 mm
3	“3n” spacer 780x392 mm with releaser and sleeve
4	“3n” Lower rail U120x65x4 mm c/c 4500 mm
5	“3n” Support U95x65x3 mm L=830 mm
6	“3n” diagonal plate 70x5 mm L=1900 mm
7	Plate 100x45x5 mm





DOUBLE-LINE MEDIAN STEEL SAFETY BARRIER ON GROUND TO BE USED IN AREAS OF TRAFFIC CIRCULATION H3-A-W8 (3n27839)



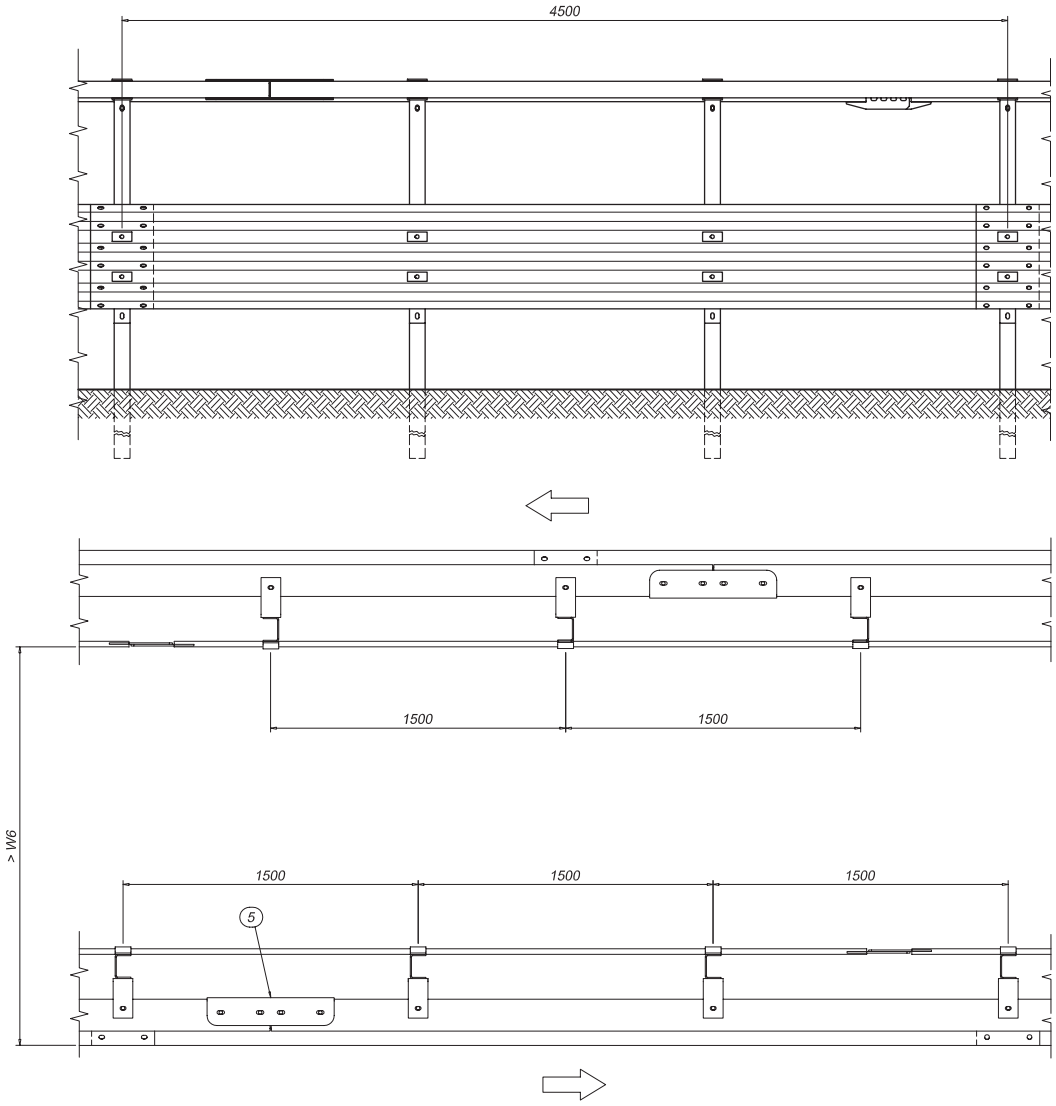
Performance	
Containment level	H3
Acceleration Severity Index “ASI”	A
Working width	W8 (2,60 m)
Extreme lateral position of the vehicle	1,50 m
Dynamic deflection	1,52 m

Characteristics	
Height out of ground	900 mm/1500 mm
Transversal overall dimensions	385 mm
Centre to centre between posts	1500 mm
Tested minimum length	94.50 m

Description

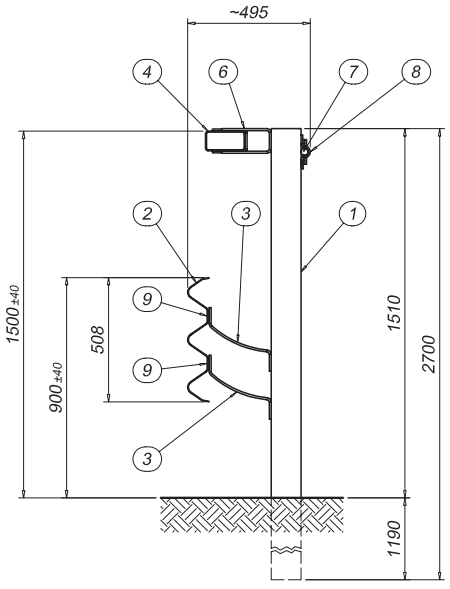
Supply and installation of 3-wave safety barrier, thickness 3,0 mm, U posts 120x80x5,9 mm, h=2700, the posts are driven into ground every 1500 mm, spacers 250x260x8mm L=80mm, box-shaped upper rail 160x80x4 mm and tubular tension rail Ø 28 mm with stands, assembled with nuts and bolts and provided with reflectors.
S235JR-S275JR-S355JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation

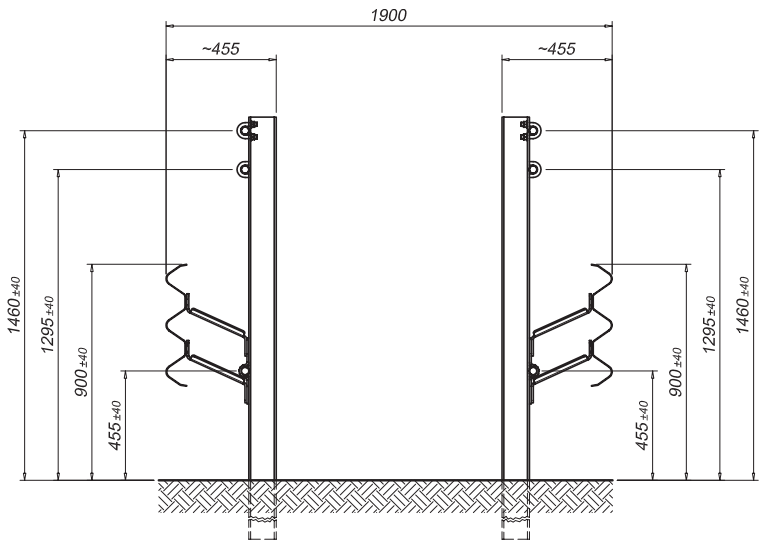


Section

	Description
1	“3n” post U120x80x5,9 mm H=2700 mm
2	“3n” beam c/c 4500 mm th. 3,0 mm
3	“3n” spacer 250x260x8 mm L=80 mm
4	Box-shaped upper rail 160x80x4 mm L=5994 mm
5	Connection sleeve for upper rail U140x94x6 mm L=646 mm
6	Bracket U200x100x8 mm L=100 mm
7	Tubolar tension rail Ø28 L=6210 mm
8	Rope-lock plate 80x141x35 mm th 7 mm
9	Small Plate 100x45x5 mm

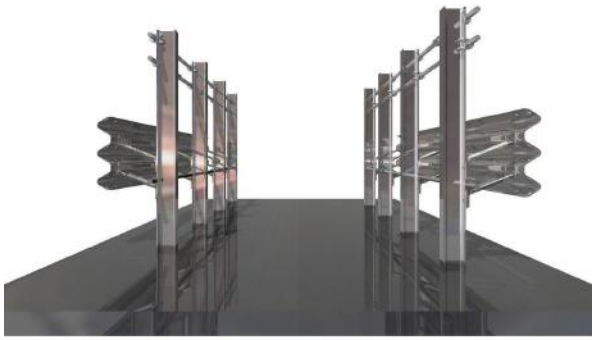


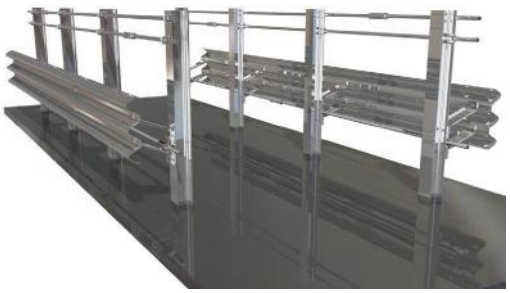
DOUBLE-LINE MEDIAN STEEL SAFETY BARRIER ON GROUND TO BE USED IN AREAS OF TRAFFIC CIRCULATION H4b-B-W6 (3n28428)



Performance	
Containment level	H4b
Acceleration Severity Index "ASI"	B
Working width	W6 (1,90m)
Extreme lateral position of the vehicle	1,40 m
Dynamic deflection	1,40 m

Characteristics	
Height out of ground	900 mm / 1295 mm /1460 mm
Transversal overall dimensions	1900 mm
Centre to centre between posts	1500 mm
Tested minimum length (without terminal ends)	90 m

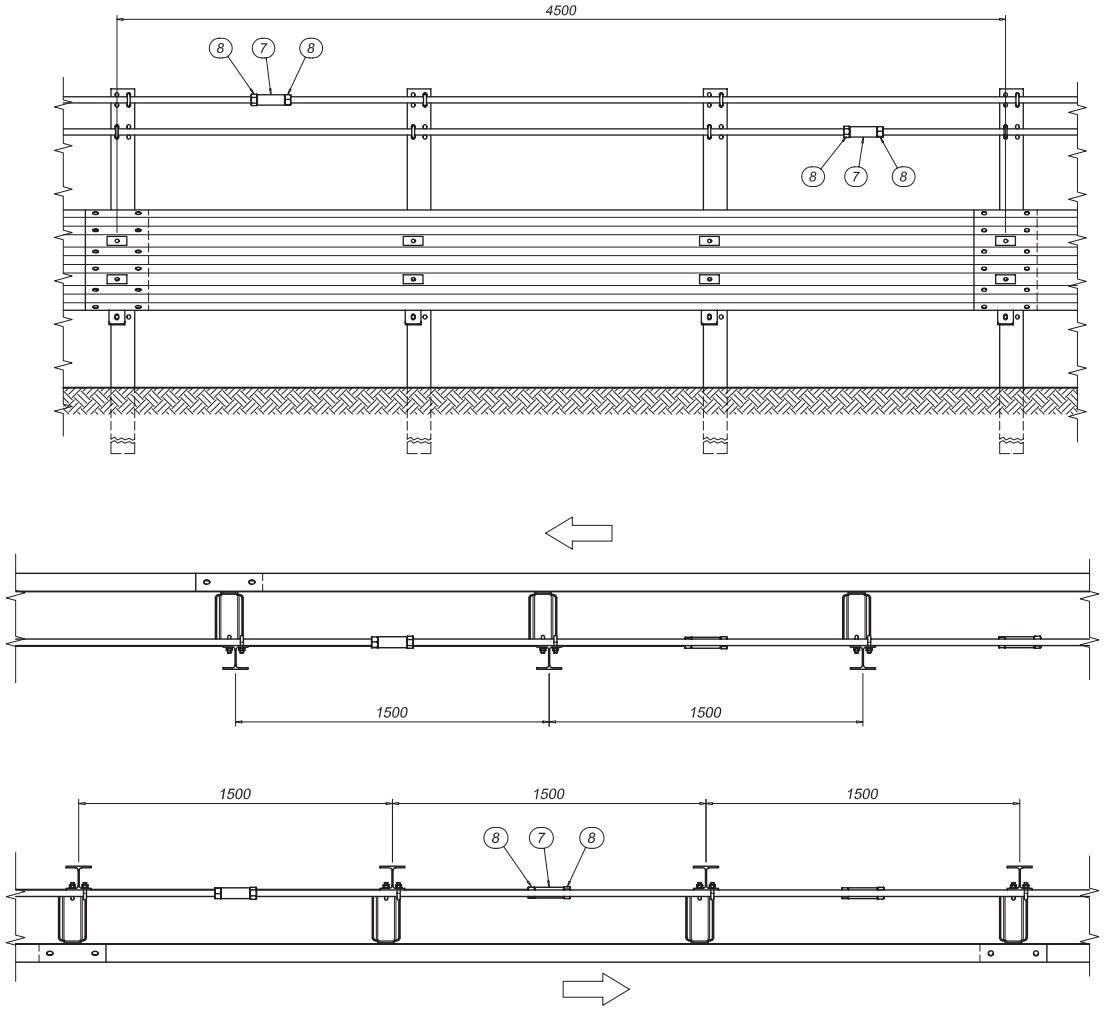




Description

Supply and installation of 3-waves safety barrier, thickness 3,0 mm, HEA posts 120, h. 2700 mm, the posts are driven into the ground every 1500 mm, spacers 250x260x8mm, double upper rail and lower rail threaded bars Ø 32 mm with connectors, nuts and bolts and reflectors.
S235JR-S275JR-S355JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

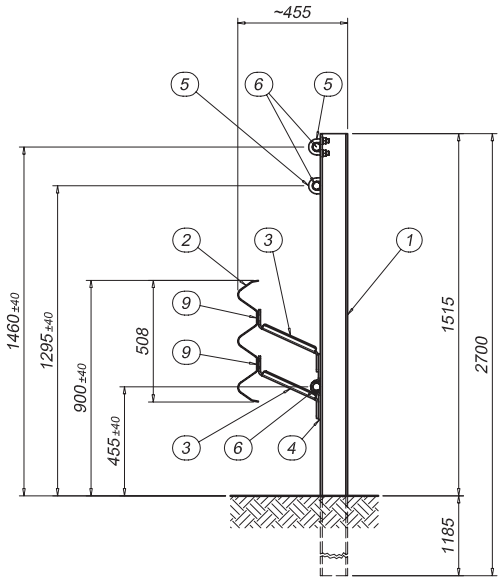
Elevation



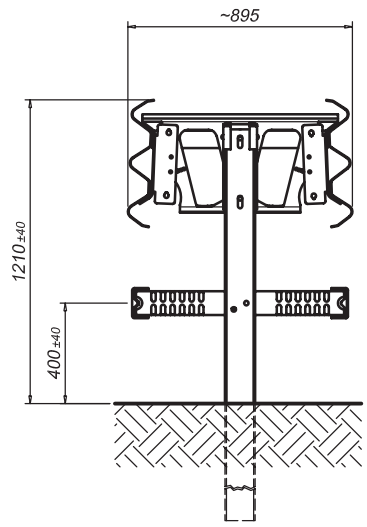
Section

	Description
1	HEA post 120 H=2700 mm
2	“3n” beam c/c 4500 mm th. 3,0 mm
3	Spacer 250x260x8 mm L=80 mm
4	Omega plate 80x275 mm th. 8 mm
5	Clamp ø14,7 partially threaded M16
6	Threaded bar ø32 L=9,00 m
7	Connector
8	Lock nut
9	Plate 100x45x5 mm

Torque value	
M16	90 Nm
Connectors	30 Nm



SINGLE-LINE MEDIAN STEEL SAFETY BARRIER ON GROUND TO BE USED IN AREAS OF TRAFFIC CIRCULATION *H4a-A-W8 (3n22053)*



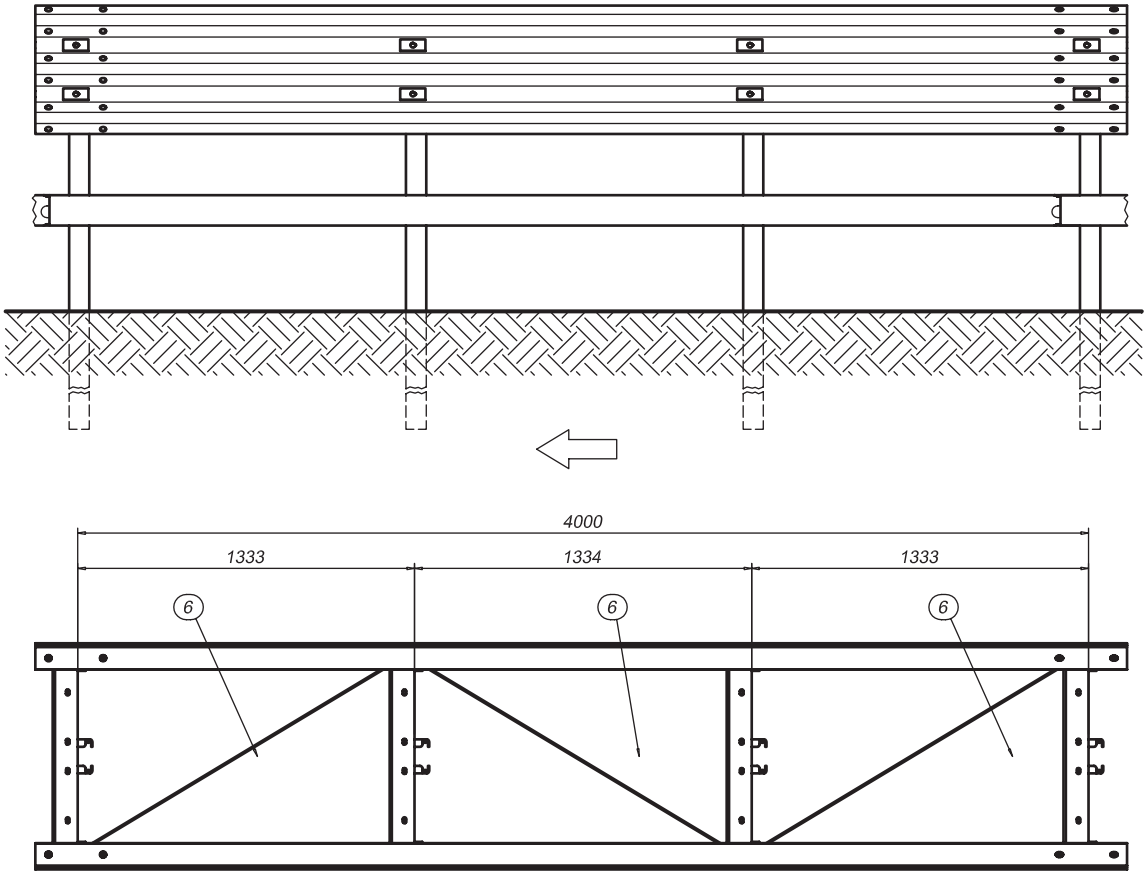
Performances	
Containment level	H4a
Acceleration Severity Index “ASI”	A
Working width	W8 (2,58m)
Extreme lateral position of the vehicle	1,60
Dynamic deflection	2,53

Characteristics	
Height out of ground	400 mm / 1210 mm
Transversal overall dimensions	895 mm
Centre to centre between posts	1333 mm
Tested minimum length (without terminal ends)	80 m

Description

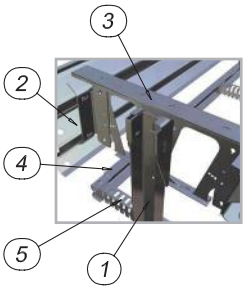
Supply and installation of 3-waves safety barrier with 2 beams, thickness 3,0 mm, U posts 120x80x6, h. 2200 mm, the posts are driven into the ground every 1333 mm, spacers 7800x392x3mm with energy releaser-brace system, double lower rails U 120x65x4 mm with supports, diagonal plate 70x5 mm, nuts and bolts and reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

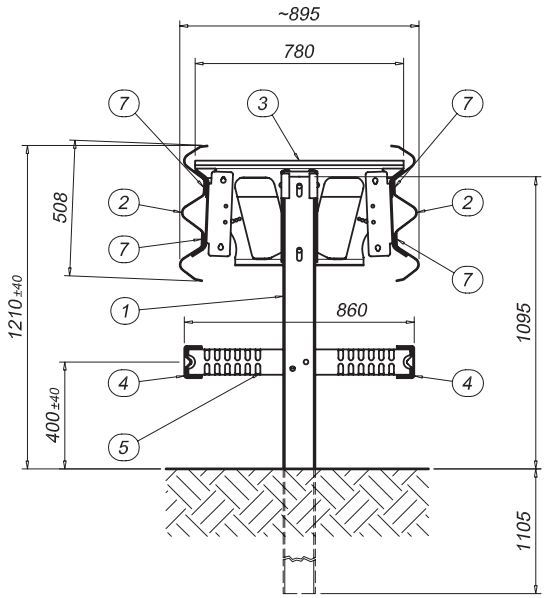
Elevation



Section

	Description
1	“3n” Posts U120x80x6 mm H=2200 mm
2	“3n” Beam int. 4500 mm th.3,0 mm
3	“3n” spacers 780x392x3 mm with releaser and sleeve
4	“3n” lower rail U120x65x4 mm int. 4500 mm
5	“3n” support lower rail corrente inferiore U95x65x3 mm L=830 mm
6	“3n” plate 70x5 mm L=1710 mm for diagonal
7	Cover plate 100x45x5 mm





The “2 waves” guardrails are one of the first application of the road safety barriers. Thanks to their configuration they are suitable for roads planned for light vehicles and with reduced traffic levels.
These barriers have showed good performance results in the crash absorption. Thanks to the reduced height of these safety systems, during the crash test the dummies did not suffer any damage and their head did not bang against any part of the guardrail.
For this kind of safety barrier family the transversal deformation is quite strategic because of the reduced sizes of the systems and the small level of the required working width. For this reason in the “ 2 waves” systems the dynamic deflection “D” is of great importance.

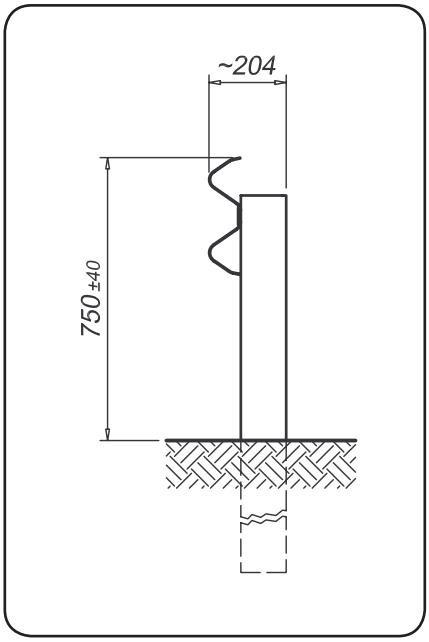
Safety barriers “2 waves”

Safety barriers on ground

Safety barriers on bridge

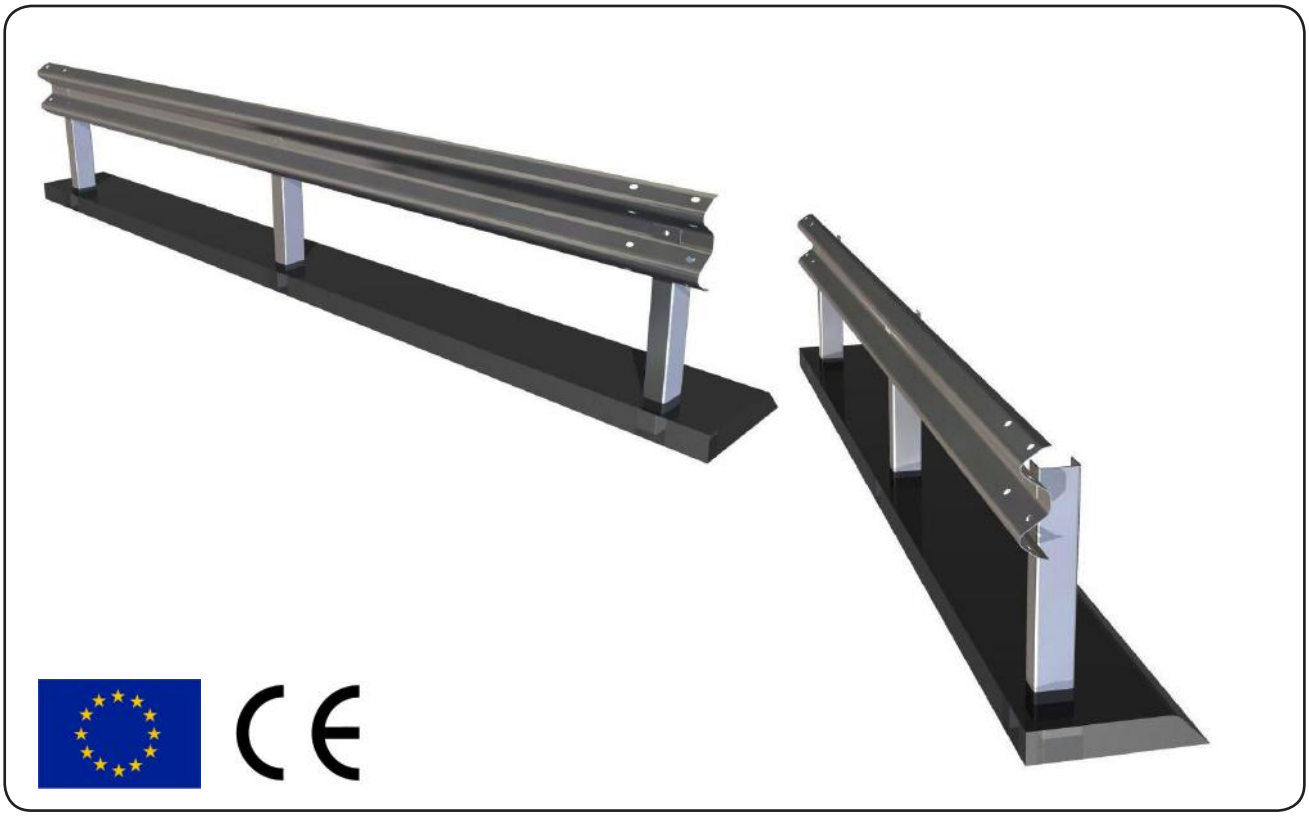
Double side safety barriers

SINGLE SIDED SAFETY BARRIER ON GROUND N2-W2-B (B29707)



Performance	
Containment level	N2
Acceleration Severity Index "ASI"	B
Working width	W2 (0,80m)
Extreme lateral position of the vehicle	-
Dynamic deflection	0,70 m

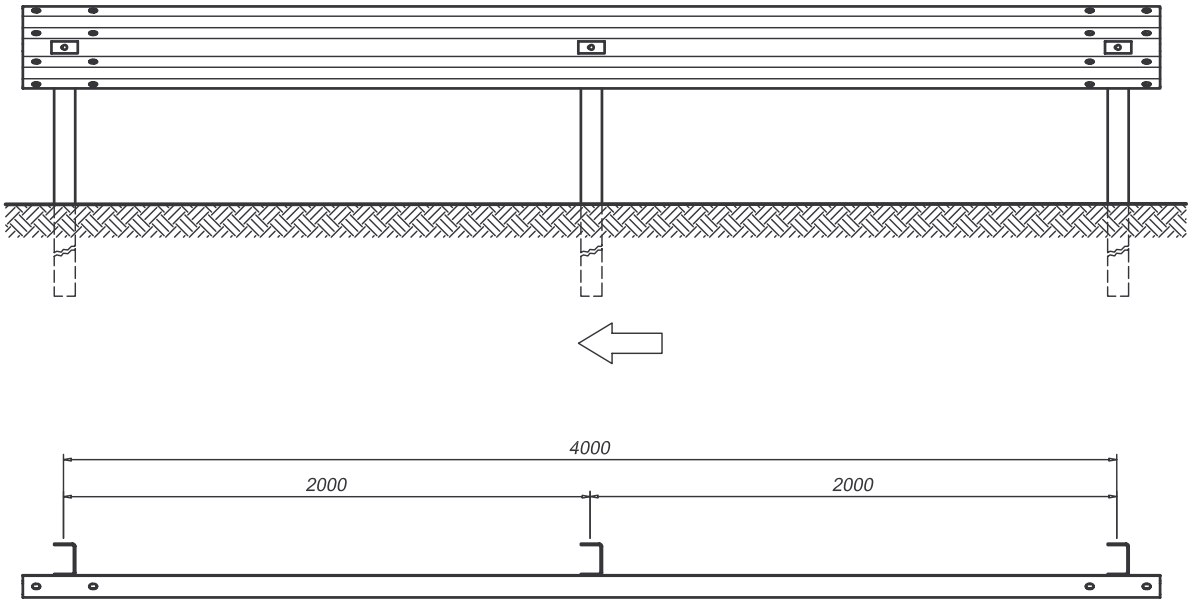
Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	204 mm
Centre to centre between posts	2000 mm
Tested minimum length	54 m



Description

Supply and installation of 2-waves safety barrier, thickness 2.5 mm, U posts 120x80x5.0, h. 1500 mm, driven into the ground every 2000 mm, nuts and bolts and reflectors.
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

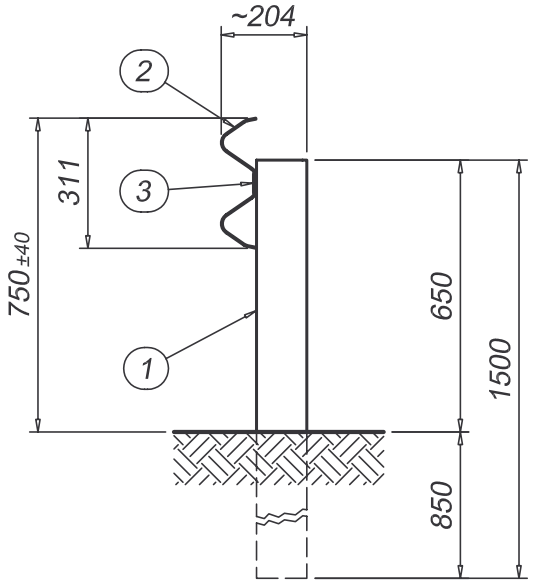
Elevation



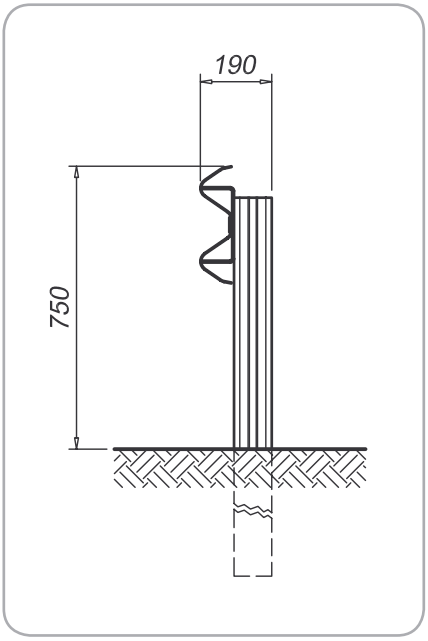
Section

	Description
1	U Post 120x80x5 mm H=1500 mm
2	Aashto beam c/c 4000 mm th. 2,5 mm with central hole
3	Plate 100x45x5 mm

Torque value	
Bolts M16	90 Nm

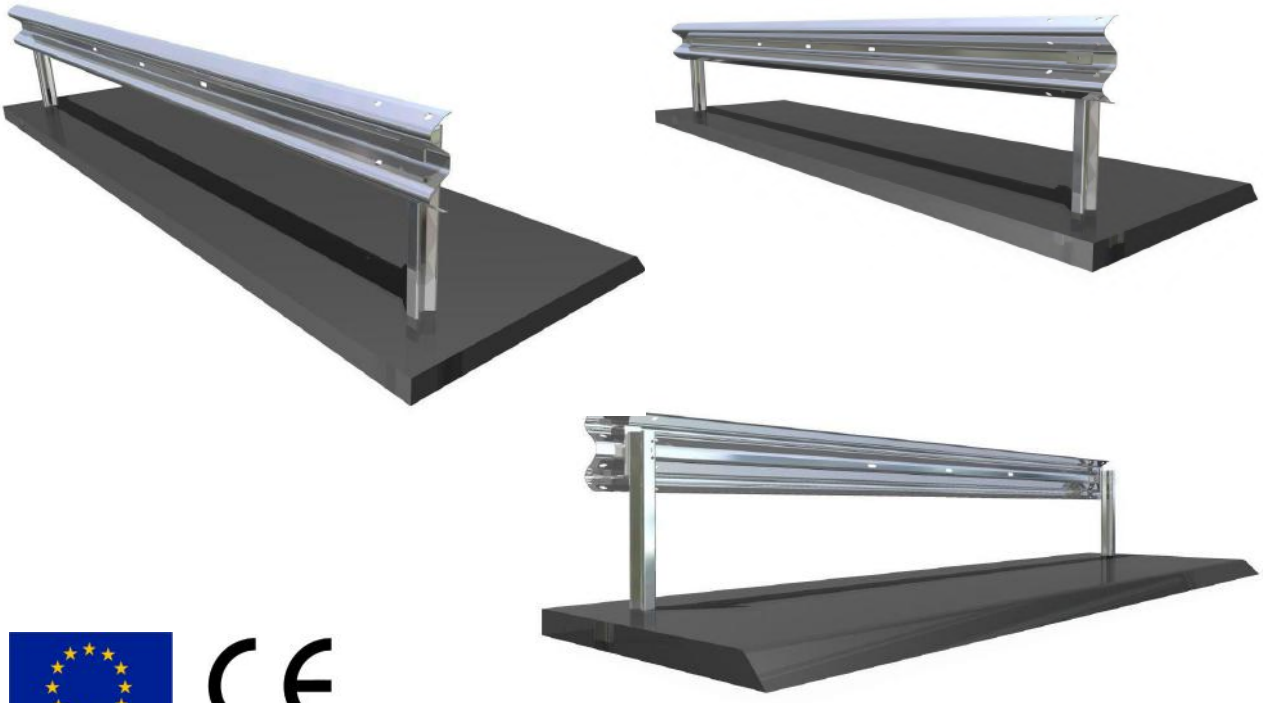


SINGLE SIDED SAFETY BARRIER ON GROUND N2-A-W6 (B22435)



Performance	
Containment level	N2
Acceleration Severity Index “ASI”	A
Working width	W6 (2,09m)
Extreme lateral position of the vehicle	-
Dynamic deflection	2,02 m

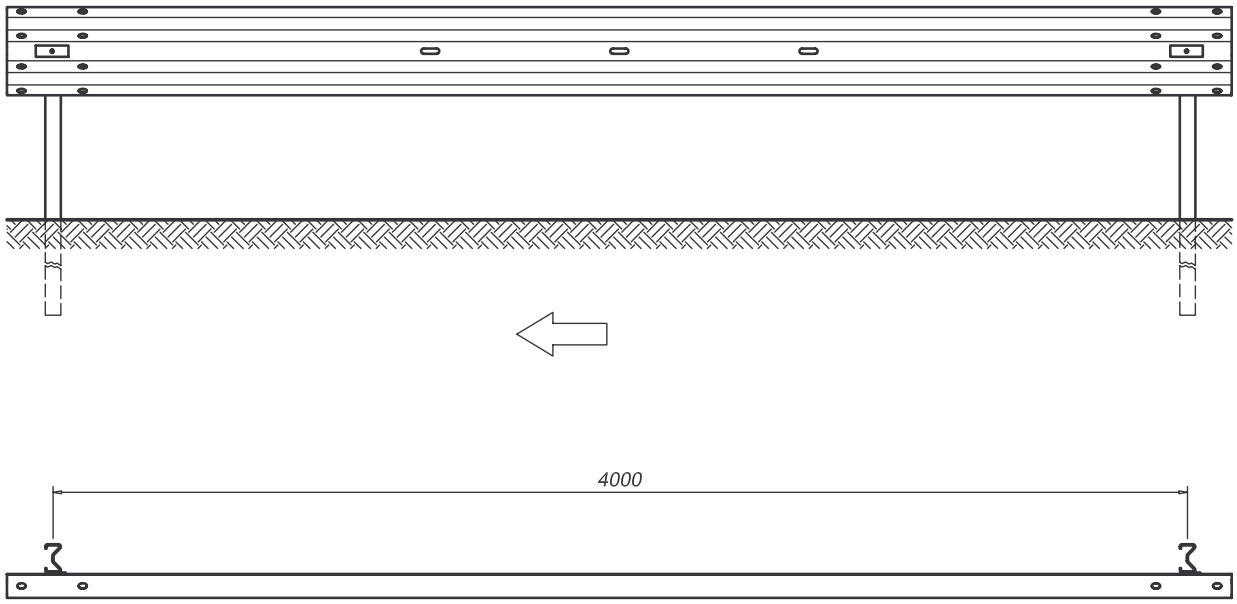
Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	190 mm
Centre to centre between posts	4000 mm
Tested minimum length	100 m



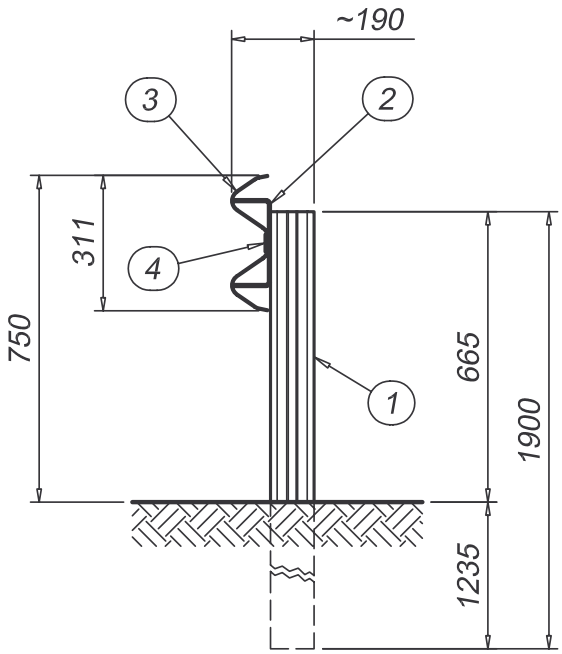
Description

Supply and installation of 2-waves safety barrier, thickness 3.0 mm, SIGMA posts 100x55x4.2, h. 1900 mm, driven into the ground every 4000 mm, U spacers 200x85x5 mm, nuts and bolts and reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation



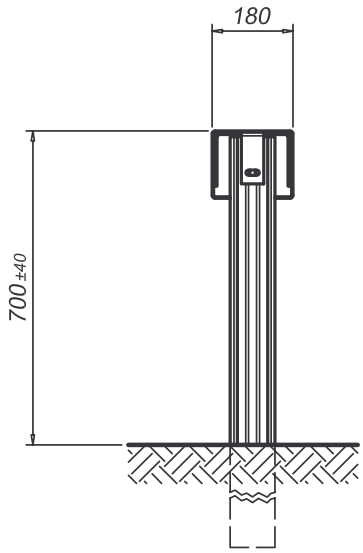
Section



	Description
1	SIGMA post 100x55x4,2 mm H=1900 mm
2	Aashto beam c/c 4000 mm th. 3,0 mm
3	U Spacer 200x84x5 mm L=70 mm
4	Plate 115x40x5 mm

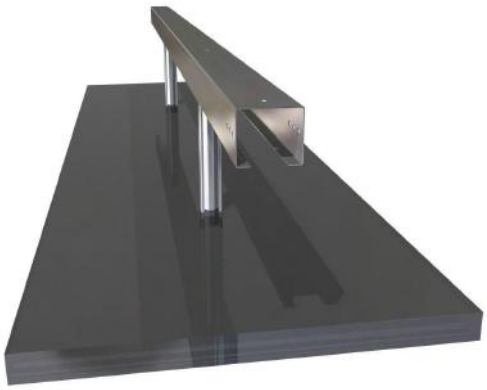
Torque value	
Bolts M16	90 Nm
Bolts M10	20 Nm

DOUBLE SIDED SAFETY BARRIER ON GROUND N2-A-W6 (B25635)



Performance	
Containment level	N2
Acceleration Severity Index “ASI”	A
Working width	W6 (2,10m)
Extreme lateral position of the vehicle	-
Dynamic deflection	1,90 m

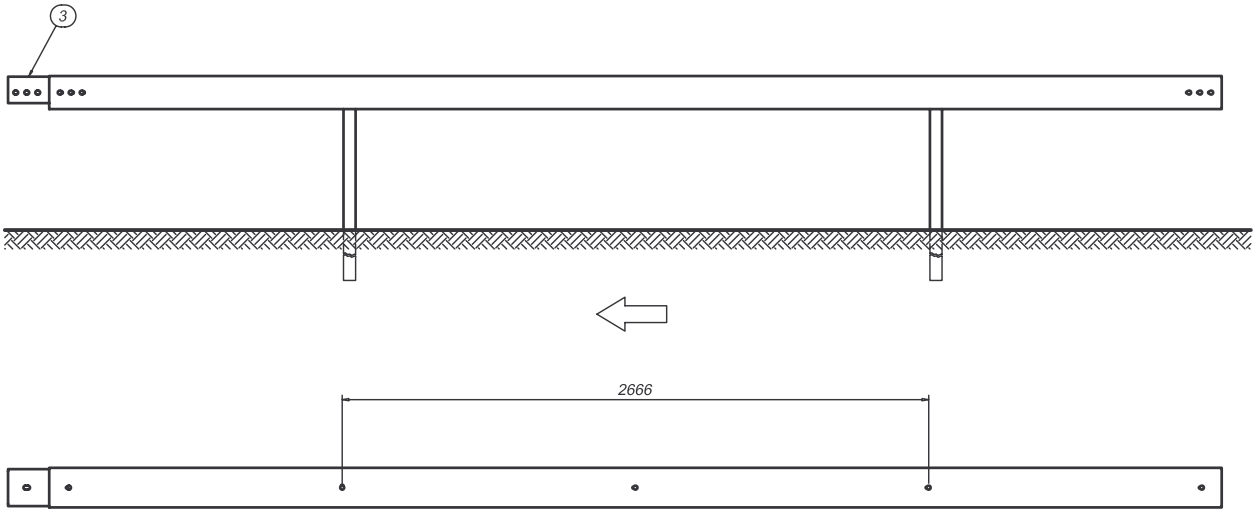
Characteristics	
Height out of ground	700 mm
Transversal overall dimensions	180 mm
Centre to centre between posts	2666 mm
Tested minimum length	42,64 m



Description

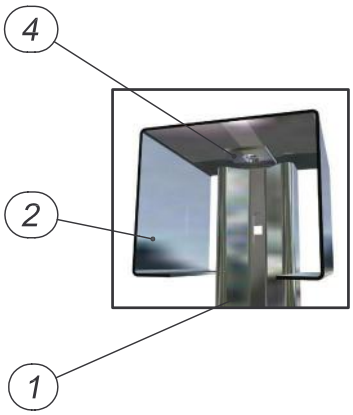
Supply and installation of safety barrier consisting of C beam 180x150x25x3.5 mm with sleeve, SIGMA posts 100x55x4.2, h. 1550 mm, driven into the ground every 2666 mm, L section Ø 115x75x4 mm beam-post connection, nuts and bolts and reflectors.
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

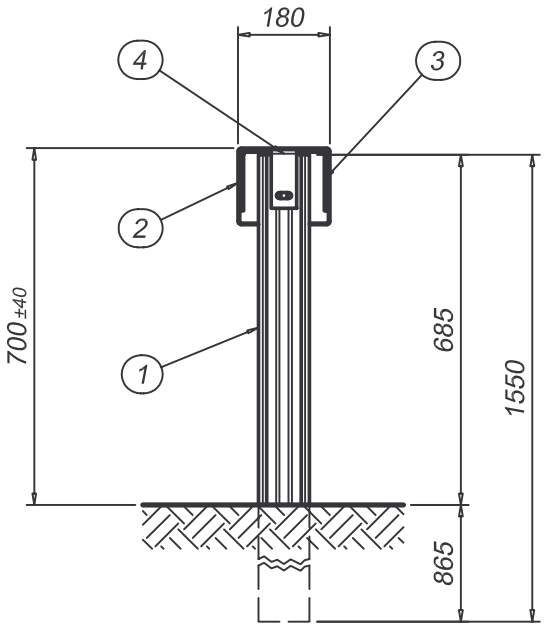
Elevation



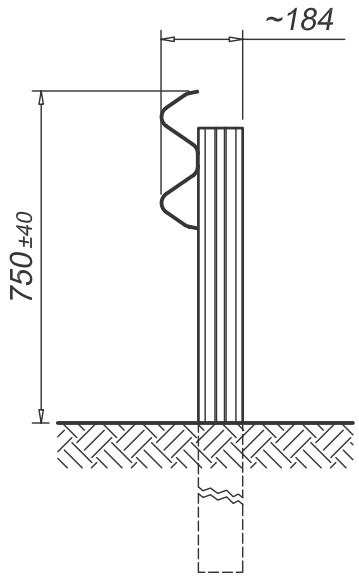
Section

	Description
1	SIGMA post 100x55x4,0 mm H=1550 mm
2	Beam 180x150x25x3,5 mm L=5330 mm
3	U section 168x120x5 mm L=370 mm
4	Plate L115x75x4 mm L=50 mm





SINGLE SIDED SAFETY BARRIER ON GROUND N2-W7-A (B29711)



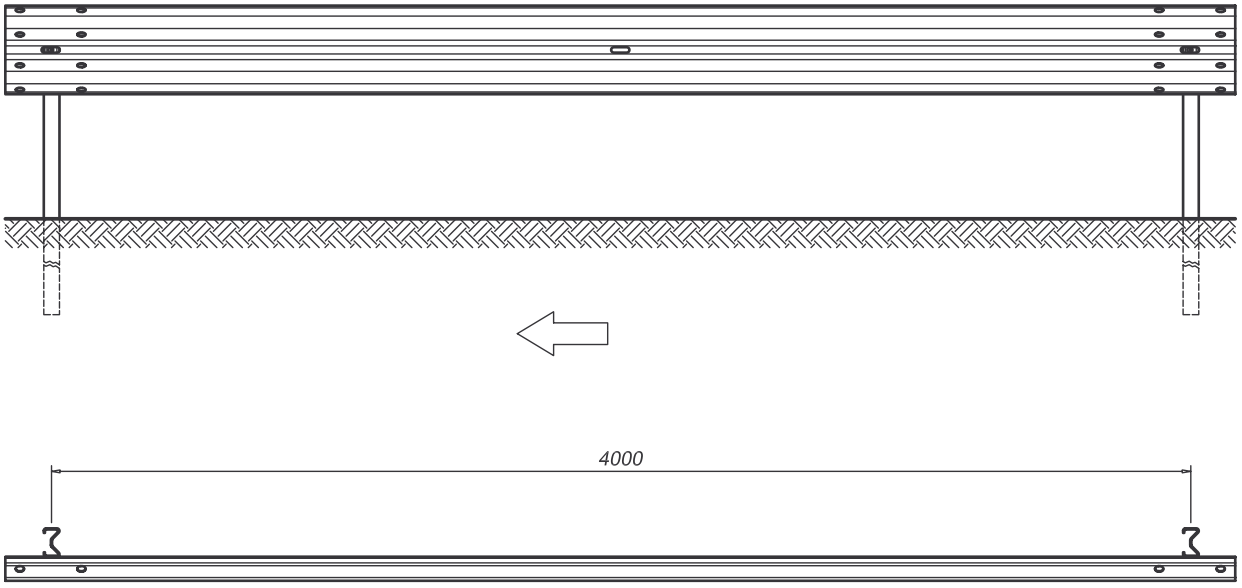
Performance	
Containment level	N2
Acceleration Severity Index "ASI"	A
Working width	W7 (2,40m)
Extreme lateral position of the vehicle	-
Dynamic deflection	2,30 m

Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	184 mm
Centre to centre between posts	4000 mm
Tested minimum length	56 m

Description

Supply and installation of 2-waves safety barrier, thickness 2.5 mm, SIGMA posts 100x55x4,0 mm h. 1500 mm, driven into the ground every 4000 mm, nuts and bolts and reflectors.
S235JR-S275JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

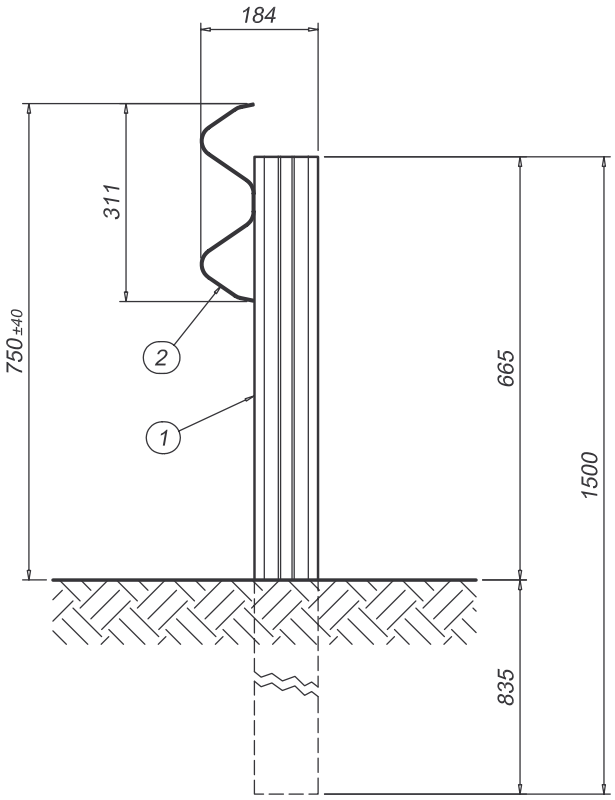
Elevation



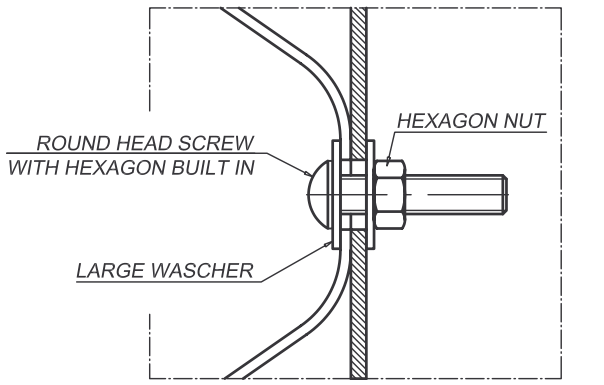
Section

	Description
1	SIGMA post 100x55x4,0 h.1500 mm
2	Aashto beam c/c 4000 th.2,5 mm with central hole

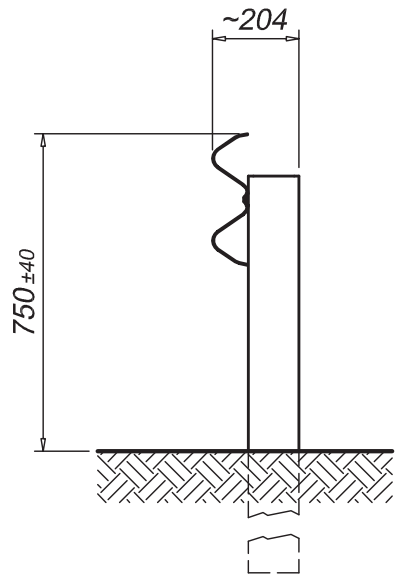
Torque value	
Bolts M16	90 Nm
Bolts M10	20 Nm



CONNECTION ELEMENT BETWEEN BEAM AND POST

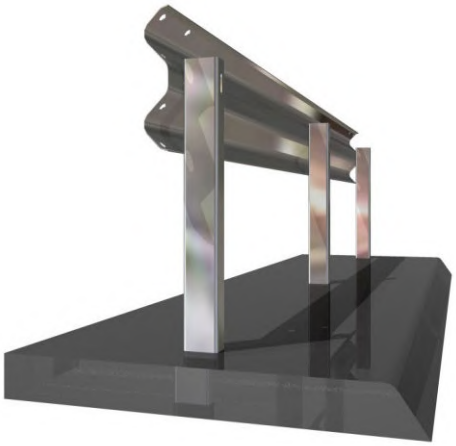


SINGLE SIDED SAFETY BARRIER ON GROUND H1-A-W4 (B33061)



Performance	
Containment level	H1
Acceleration Severity Index ASI	A
Working width	W4 (1,30 m)
Extreme lateral position of the vehicle	1,60 m
ynamic deflection	1,00 m

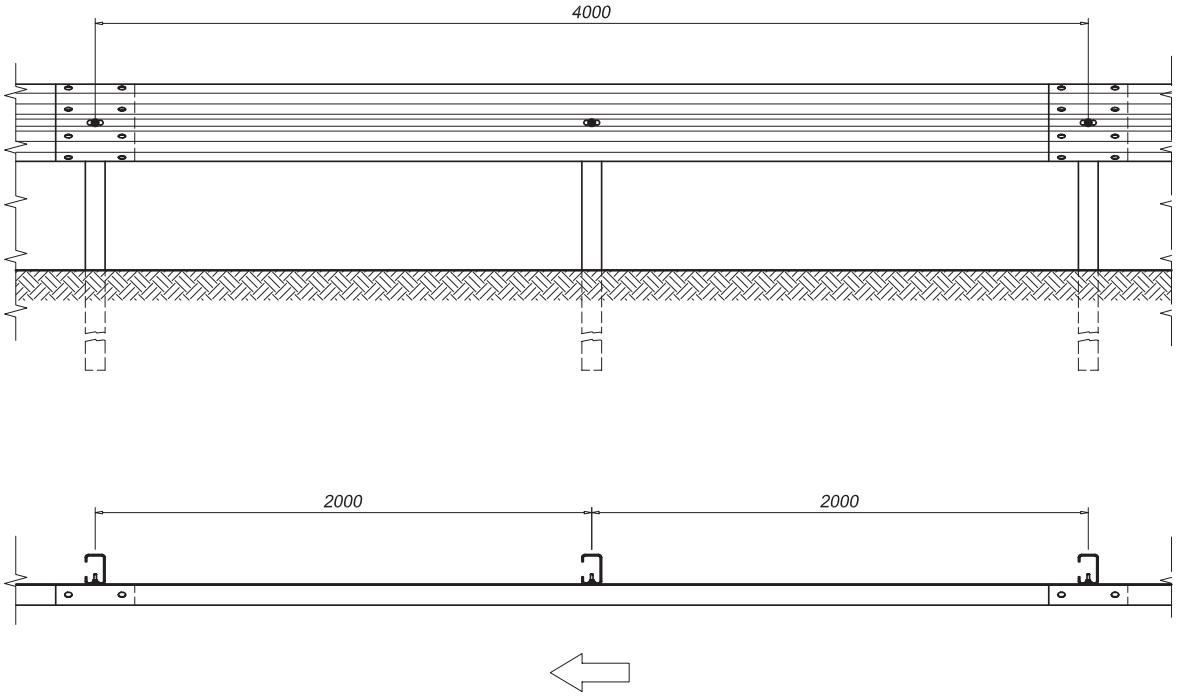
Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	204 mm
Centre to centre between posts	2000 mm
Tested minimum length	70 m



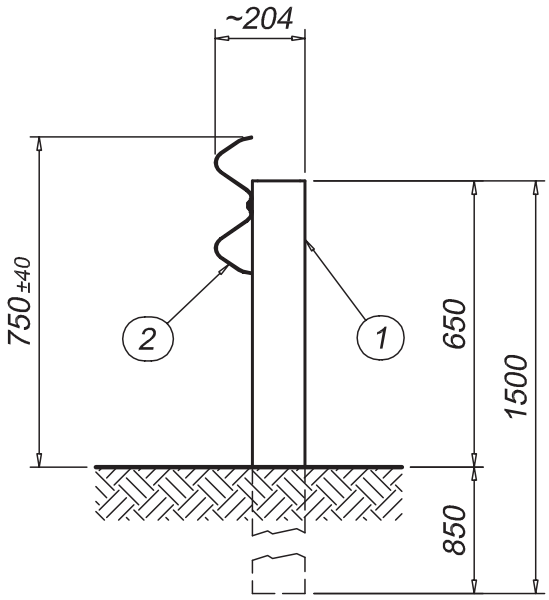
Description

Supply and installation of safety barrier, with 2-waves beam thickness 2,5 mm, posts C120x80x30x5 mm H 1500 mm. driven into the ground every 2000 mm, complete with assembly bolts and reflectors.
S275JR steel in quality-according EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation

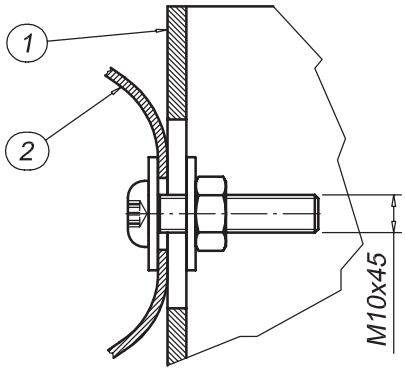


Section

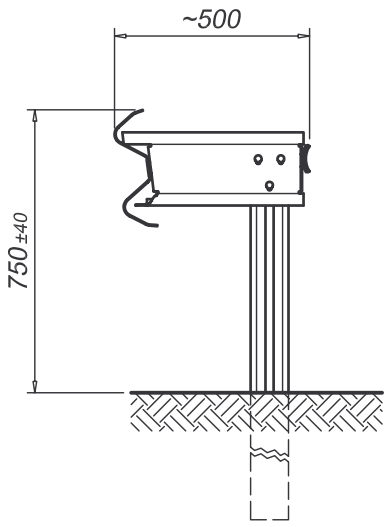


	Description
1	Post C 120x80x30 mm sp. 5 mm, H=1500 mm
2	2-waves beam thickness 2,5 mm c/c 4000 mm

Torque value	
Bolts M16	90 Nm
Bolts M10	20 Nm



SINGLE SIDED SAFETY BARRIER ON GROUND H1-A-W6 (B21300)



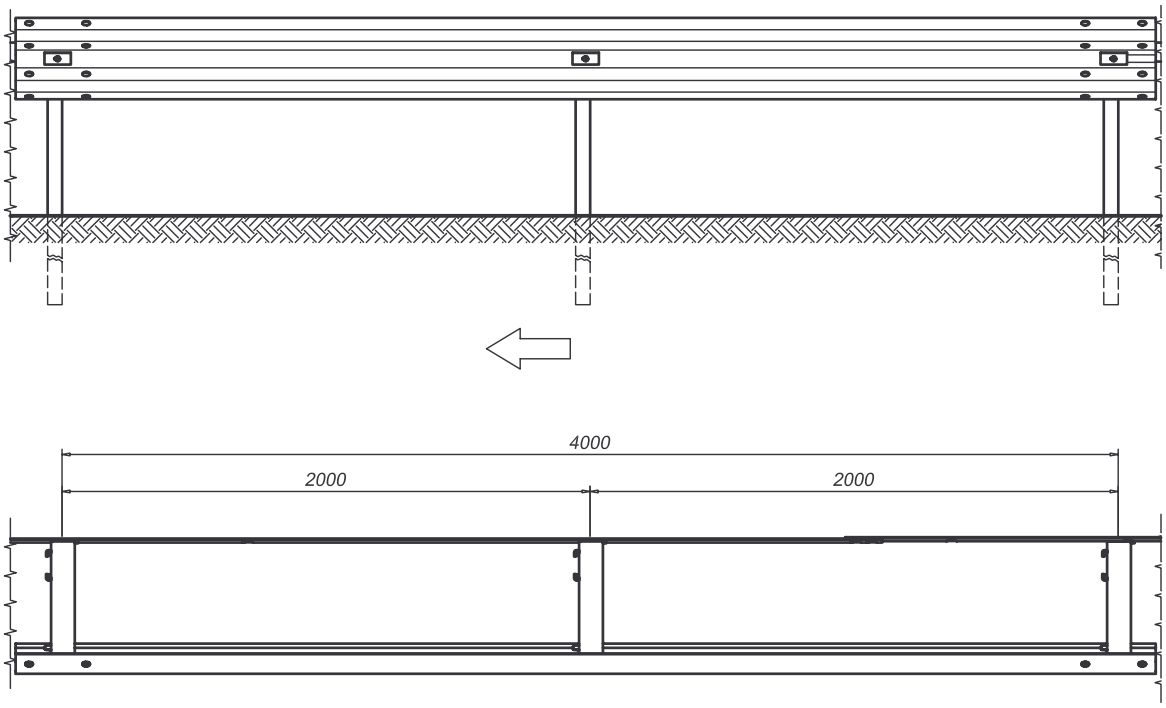
Performance	
Containment level	H1
Acceleration Severity Index “ASI”	A
Working width	W6 (2,08 m)
Extreme lateral position of the vehicle	2,08 m
Dynamic deflection	1,40 m

Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	500 mm
Centre to centre between posts	2000 mm
Tested minimum length	80,40 m

Description

Supply and installation of 2-waves safety barrier, thickness 3,0 mm, SIGMA posts 100x55x4,2 h. 1900 mm, the posts are driven into the ground every 2000 mm, RAL spacers 480x194x3mm, connection sleeve 114x69x4 rear rail 70x5 mm, nuts and bolts and reflectors.
S235JR steel in quality-according EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

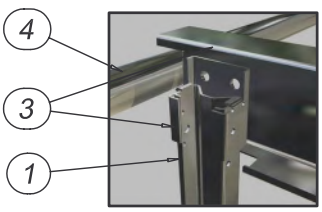
Elevation

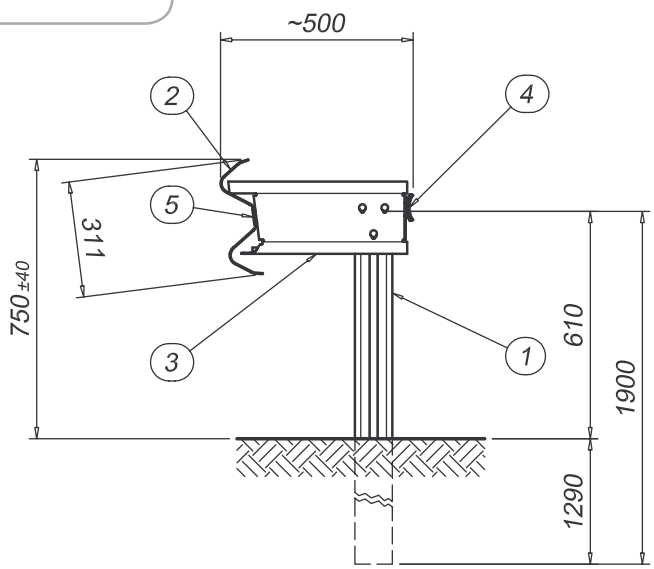


Section

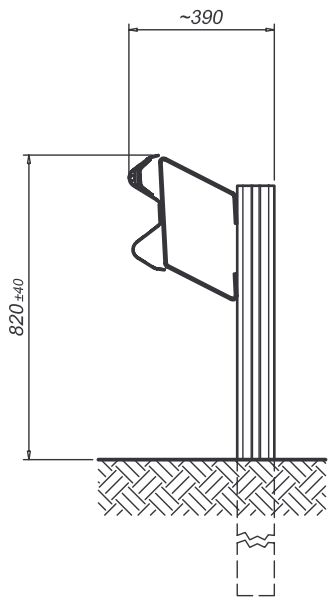
	Description
1	SIGMA post 100x55x4,2 mm H=1900 mm
2	Aashto beam c/c 4000 mm th. 3,0 mm
3	Spacer 480X194 mm th. 3 mm with sleeve C114x69x4 L=130 mm th. 4 mm
4	Rear rail 70x5 mm L=4140 mm
5	Plate 100x45x5 mm

Torque value	
Bolts M16	90 Nm
Bolts M10	20 Nm





SINGLE SIDED SAFETY BARRIER ON GROUND H2-A-W7 (B26825)



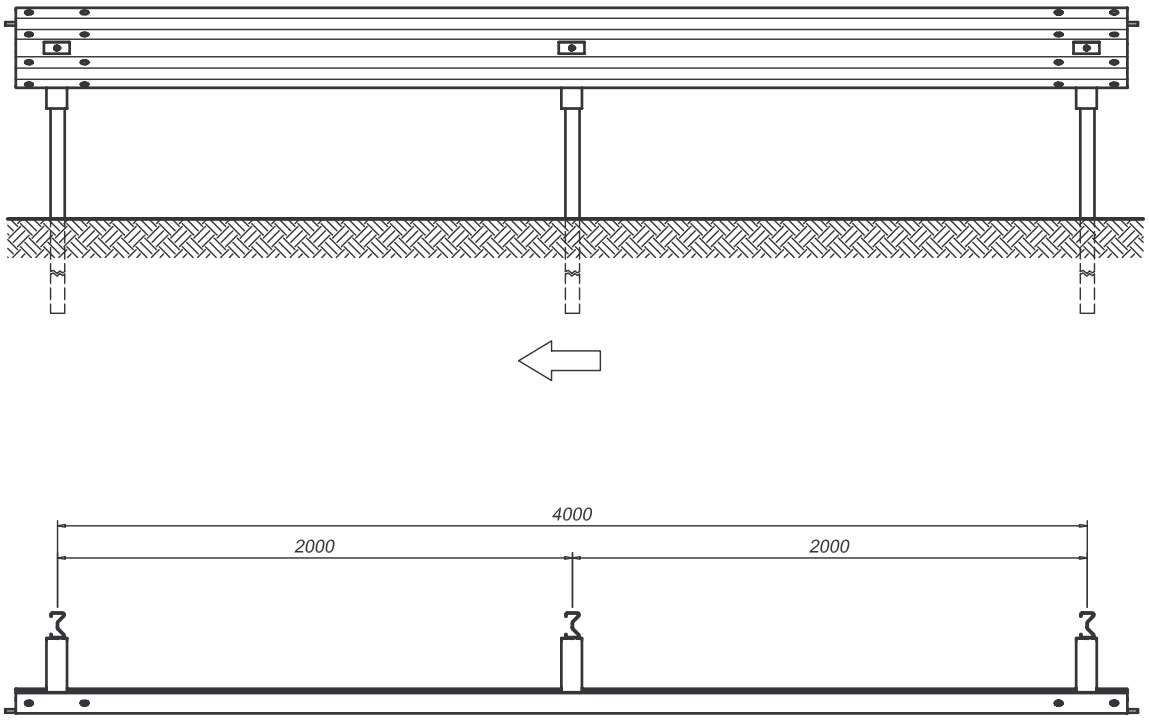
Performance	
Containment level	H2
Acceleration Severity Index “ASI”	A
Working width	W7 (2,28 m)
Extreme lateral position of the vehicle	3,25m
Dynamic deflection	2,10

Characteristics	
Height out of ground	820 mm
Transversal overall dimensions	390 mm
Centre to centre between posts	2000 mm
Tested minimum length	84.00 m

Description

Supply and installation of 2-waves safety barrier, thickness 2.5 mm, SIGMA posts 100x55x4.2, h. 1900 mm, driven into the ground every 2000 mm, spacers 395x201x5.9 mm, Ø 14 mm rope passing between girder and spacer connected to the extremity supports, nuts and bolts and reflectors.
S235JR-S275JR-S355JR steel in quality-according EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

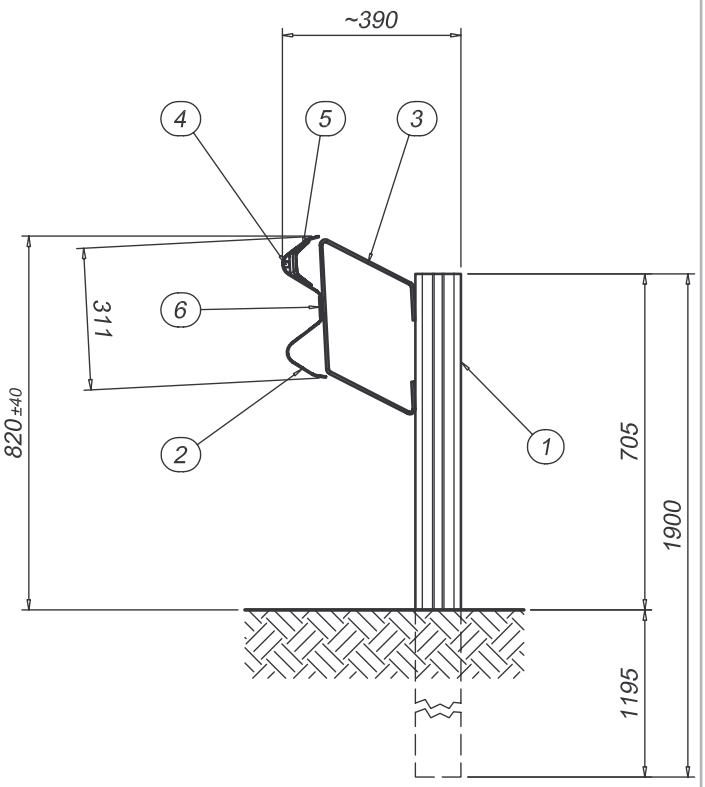
Elevation



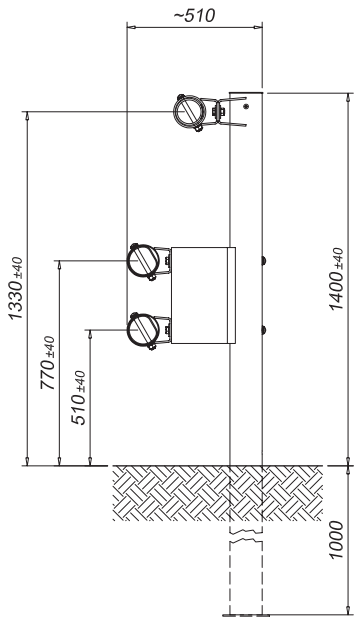
Section

	Description
1	SIGMA post 100x55x4,2 mm H=1900 mm
2	Aashto beam c/c 4000 th. 2,5 mm
3	Spacer 395x201 mm th. 5,9 mm L=80 mm
4	Rope Ø14 - BS 10 RTF type
5	Plate 102x40x50 mm th. 5 mm
6	Plate 100x45x5 mm

Torque Value	
M16	90 Nm
M10	20 Nm



SINGLE SIDED SAFETY BARRIER ON GROUND H4b-W6-B (B33820)



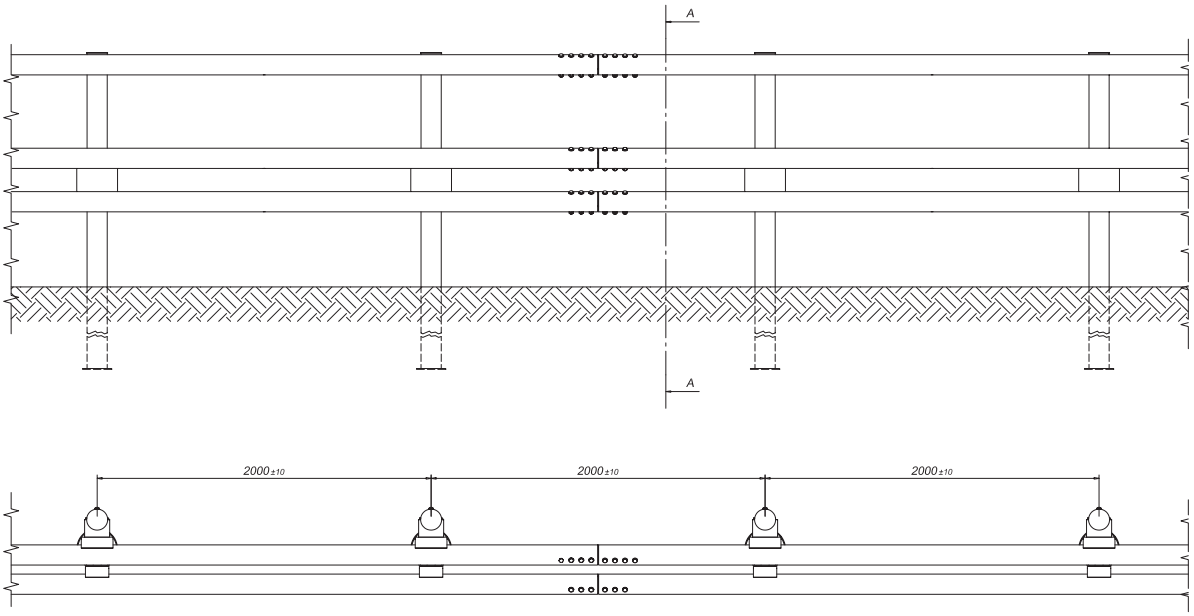
Performance	
Containment level	H4b
Acceleration Severity Index “ASI”	B
Working width	W6 (1,90 m)
Extreme lateral position of the vehicle	2,50 m
Dynamic deflection	1,70 m

Characteristics	
Height out of ground	510 mm / 770 mm / 1330 mm
Transversal overall dimensions	510 mm
Centre to centre between posts	2000 mm
Tested minimum length (without terminal end)	78 m

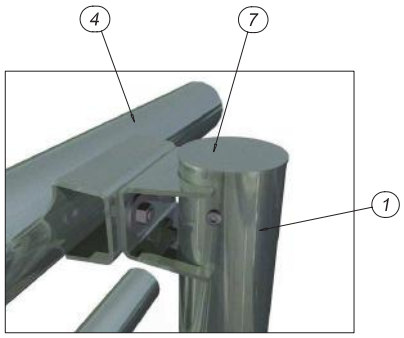
Description

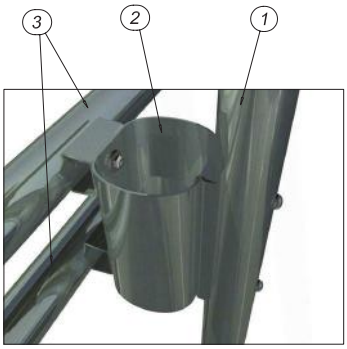
Supply and installation of safety barrier, arranged by welded pipes ø121 mm thicknesses 3,0 mm and 6,0 mm, tubular posts ø121 mm thk. 6,0 mm H= 2400; fixed to the ground every 2000 mm; spacers ø244 mm thk 5,0 mm, assembled with nuts and bolts and provided with reflectors.
S235JR-S355JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

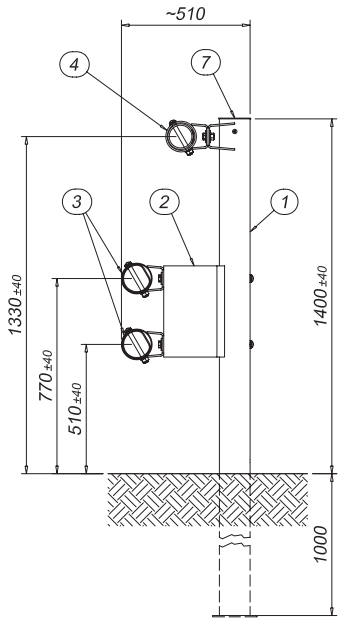
Elevation



Section



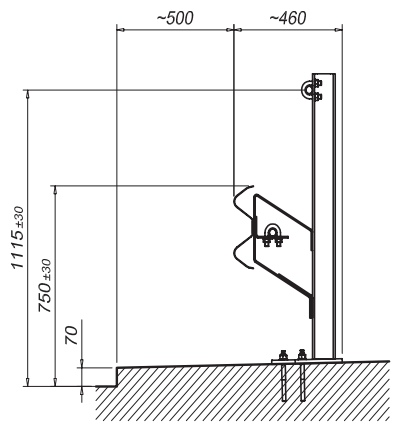




	Description
1	Posts ø121 mm Thk 6.0 mm; H= 2400 mm
2	Spacers ø244 mm Thk 5.0 mm; L=360 mm
3	Lower Rail ø121 mm Thk 3.0 mm; L= 5994 mm
4	Upper rail ø121 mm Thk 6.0 mm; L= 5994 mm
5	Sleeves ø108 mm Thk 4.0 mm; L=398 mm
6	Sleeves ø101,6 mm Thk 8,0 mm; L=518 mm
7	Post Caps

Torque value	
M16 x 160	90 Nm
M16 x 35	90 Nm
M16 x 145	50 Nm
M10 x 50	20 Nm

SINGLE SIDED SAFETY BARRIER ON BRIDGE *H2-B-W4 (B28736)*



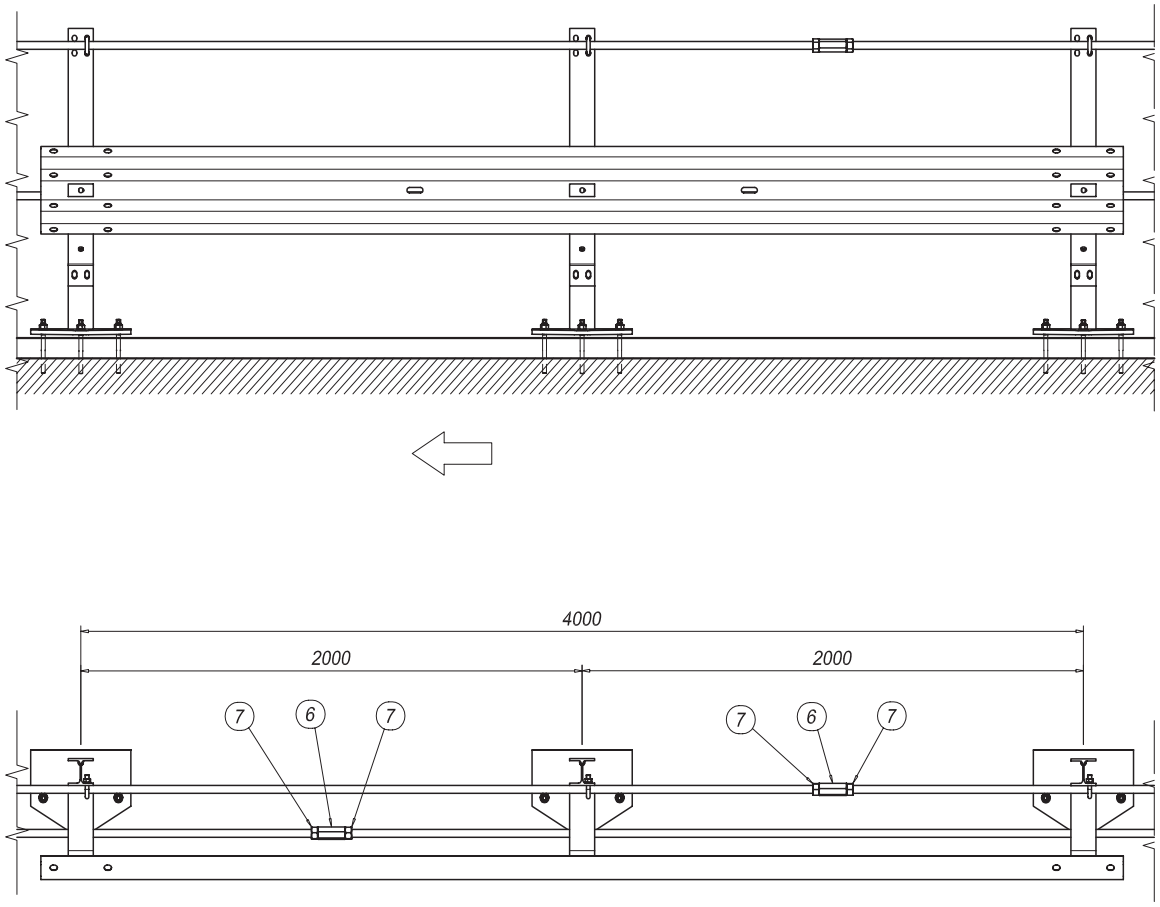
Performance	
Containment level	H2
Acceleration Severity Index “ASI”	B
Working width	W4 (1,30 m)
Extreme lateral position of the vehicle	1,30 m
Dynamic deflection	0,75 m

Characteristics	
Height out of ground	750 mm / 1115mm
Transversal overall dimensions	460mm
Centre to centre between posts	2000 mm
Tested minimum length (without terminal end)	68 m

Description

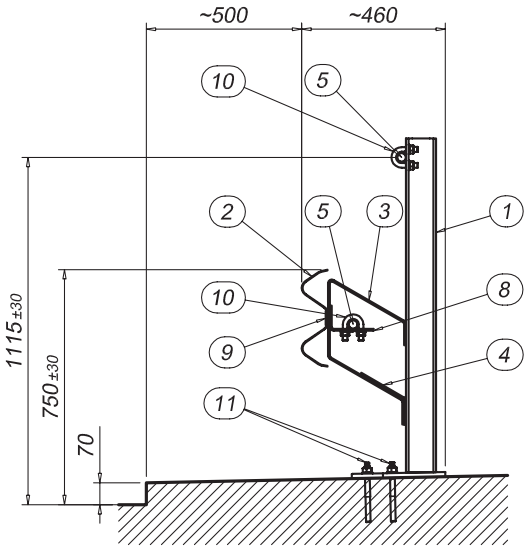
Supply and installation of 2-waves safety barrier, thickness 3,0 mm, HEA posts 100, h. 1070 mm with plate 400x300x15 mm fixed to the concrete every 2000 mm by anchor bolts, spacers 250x260X5.9 mm, upper rail and lower rail threaded bars Ø 28 mm, nuts and bolts and reflectors.
S235JR-S275JR-S355JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

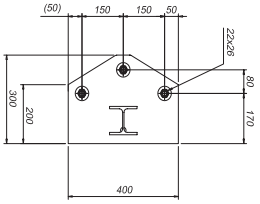
Elevation



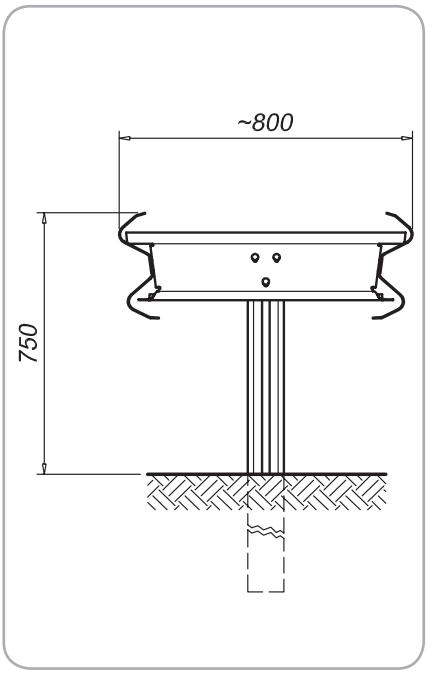
Section

	Description
1	Posts HEA100 h=1070 mm + P. 300x400x15 mm
2	Beam AASHTO int.4000 th.3,0 mm with 3 holes
3	Spacers 250x260 th.5,9 mm L=100 mm
4	Plate reinforcement L 165x146 th. 5,9 mm
5	Threated bars ø 28mm L=8 m
6	Connectors for threated bars ø 28mm
7	Nuts for threated bars ø 28mm
8	Plate L 140x80 th.5,9 mm L=70 mm with holes18x30
9	Cover plate 100x45x5 mm
10	Threated Clamp ø14.7 M16 class 8.8
11	Anchorbolts M18 TSM B16 cl.10.9 L=190 mm





SINGLE-LINE MEDIAN STEEL SAFETY BARRIER ON GROUND TO BE USED IN AREAS OF TRAFFIC CIRCULATION H1-A-W6 (B22478)



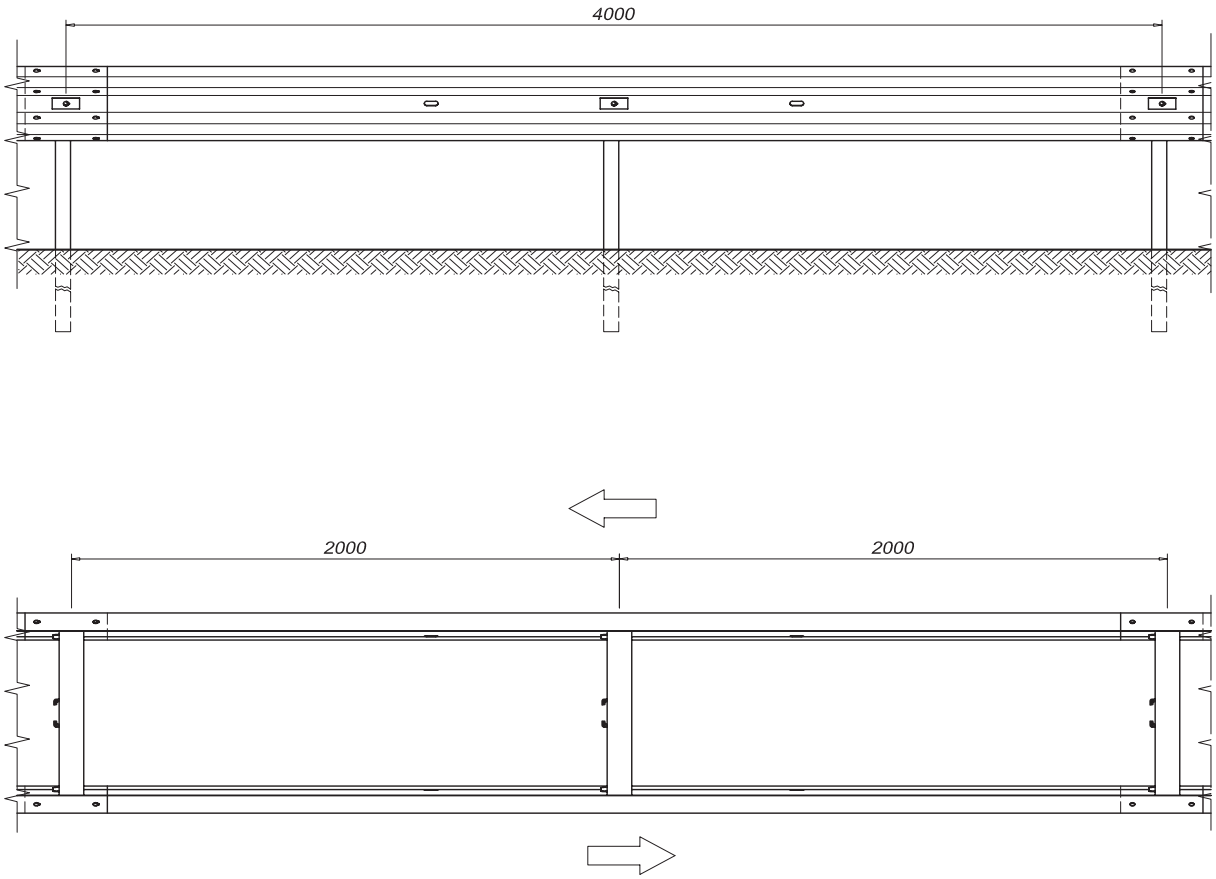
Performance	
Containment level	H1
Acceleration Severity Index “ASI”	A
Working width	W6 (1,95m)
Extreme lateral position of the vehicle	-
Dynamic deflection	1,50 m

Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	800 mm
Centre to centre between posts	2000 mm
Tested minimum length (with terminal ends)	120 m

Description

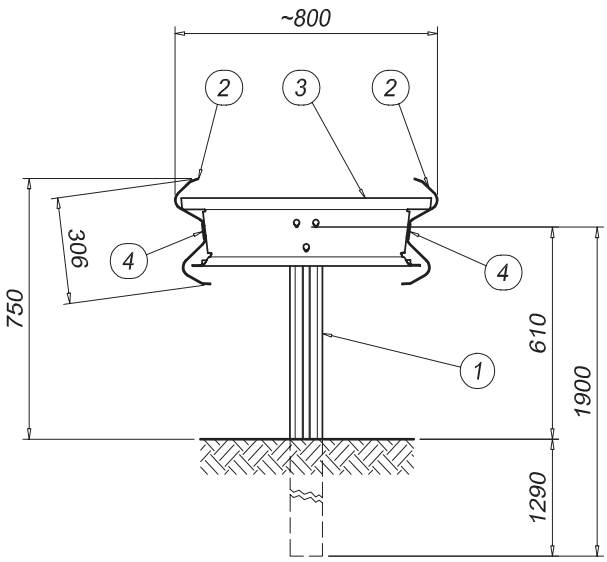
Supply and installation of 2-waves safety barrier with 2 beams, thickness 3.0 mm, SIGMA posts 100x55x4.2, h. 1900 mm, driven into the ground every 2000 mm, TL-SP spacers 780x194x3 mm, sleeve 113x68x4 mm, nuts and bolts and reflectors.
S235JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation



Section

	Description
1	Sigma post 100x55x4,2 mm H=1900 mm
2	A beam c/c. 4000 mm th. 3,0 mm
3	Spacer 780X194 mm th. 3 mm partially mounted with sleeve C114x69x24 L=130 mm th. 4 mm
4	Plate 100x45x5 mm



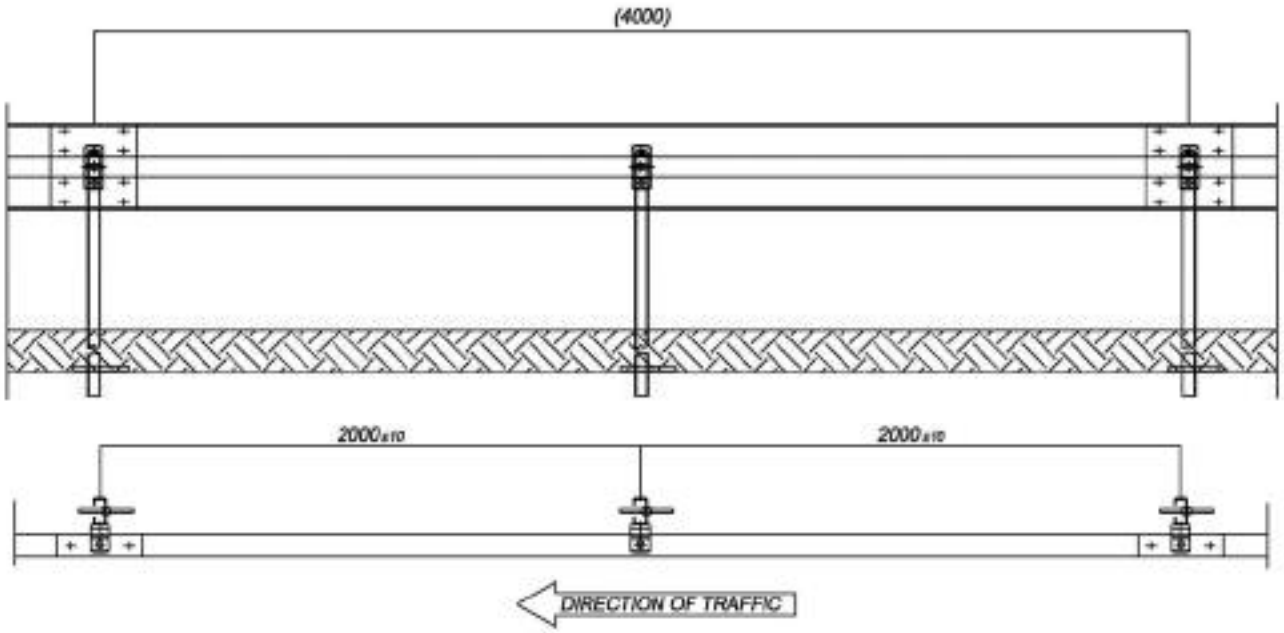
SINGLE SIDED SAFETY BARRIER ON GROUND N2-W2/H1-A-W3 (B30015)

Performance	
Containment level	N2/H1
Acceleration Severity Index “ASI”	A
Working width	W2 (0,8) W3(1,0)
Extreme lateral position of the vehicle	N.A./ 1,5 m
Dynamic deflection	0,7/0,9 m

Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	217 mm
Centre to centre between posts	2000 mm
Tested minimum length	70 m

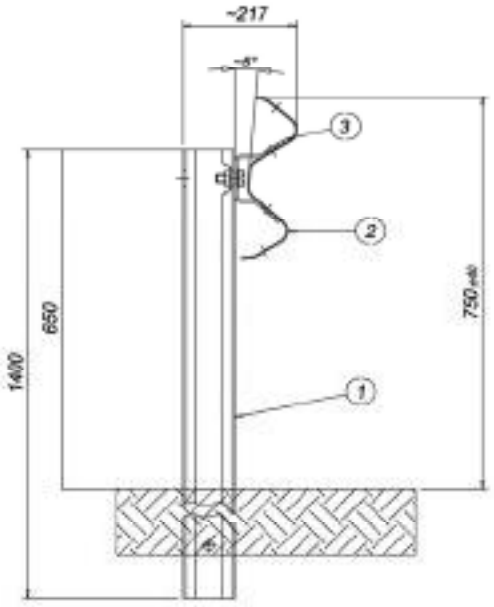
Description

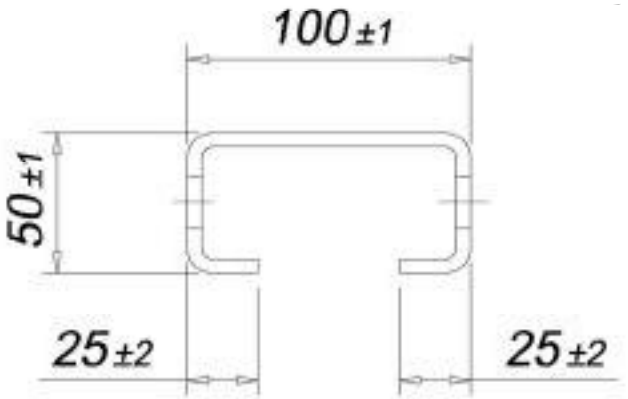
Supply and installation of safety barrier, with 2-waves beam thickness 2,5 mm, posts C100x50x25mm H 1400 mm. driven into the ground every 2000 mm, complete with assembly bolts and reflectors.
S355JR steel in quality-according EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.



NR	CODE	DESCRIPTION	MATERIAL	QTY per SET
1.	Z-FR379	HDG POST C100X50X25 H1400 T5mm S355	S355JR	2
2.	Z-FR381	HDG BLADE 4000 2W T2.5mm S355	S355JR	1
3.	Z-FR383	HDG SPACER 158X90X70X5 S355JR	S355JR	2
4.	LL-7-3N30162	THREADED ROD M16X200 DIN 976 HDG 4.8	4.8	2
5.	LL-M16.45.03	BOLTM16X45 DIN933HDG 8.8.	8.8	2
6.	LL-M16.30.06	BOLT M16X30 LARGE HEAD HDG 8.8 AM	8.8	12
7.	LL-N16.00	NUT M16 DIN 934 HDG 8	8	18
8.	LL-W16.03	WASHER M16X17X35X3 HDG		12
9.	LL-W16.01	WASHER A17 M16 DIN125A HDG		4

Tightening torque of nuts and bolts		
BOLTS	**TORQUE (Nm)**	
For connection Blade-Blade and Blade-spacer Blade-post (in end element)	**90**	+20 -10
Spacer-Post	**60**	+5 -5



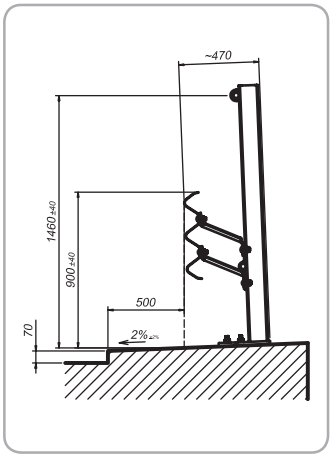


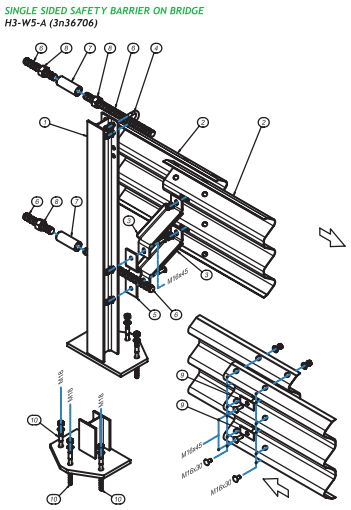
SINGLE SIDED SAFETY BARRIER ON BRIDGE H3-W5-A (3N36706)

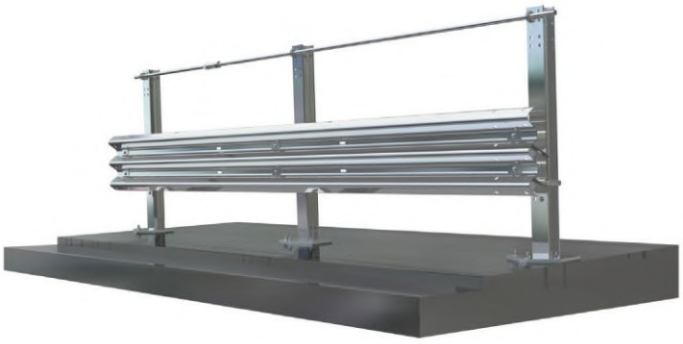
Performance	
Containment level	H3
Acceleration Severity Index “ASI”	A
Working width	W5 (1,60 m)
Extreme lateral position of the vehicle	-
ynamic de ection	1,50 m

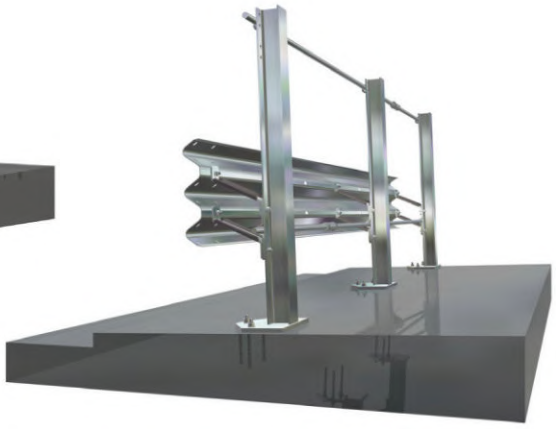
Characteristics	
Height out of ground	1460 mm
Transversal overall dimensions	470 mm
Centre to centre between posts	2250 mm
Tested minimum length (without terminal ends)	78 m

SINGLE SIDED SAFETY BARRIER ON BRIDGE
H3-W5-A (3n36706)





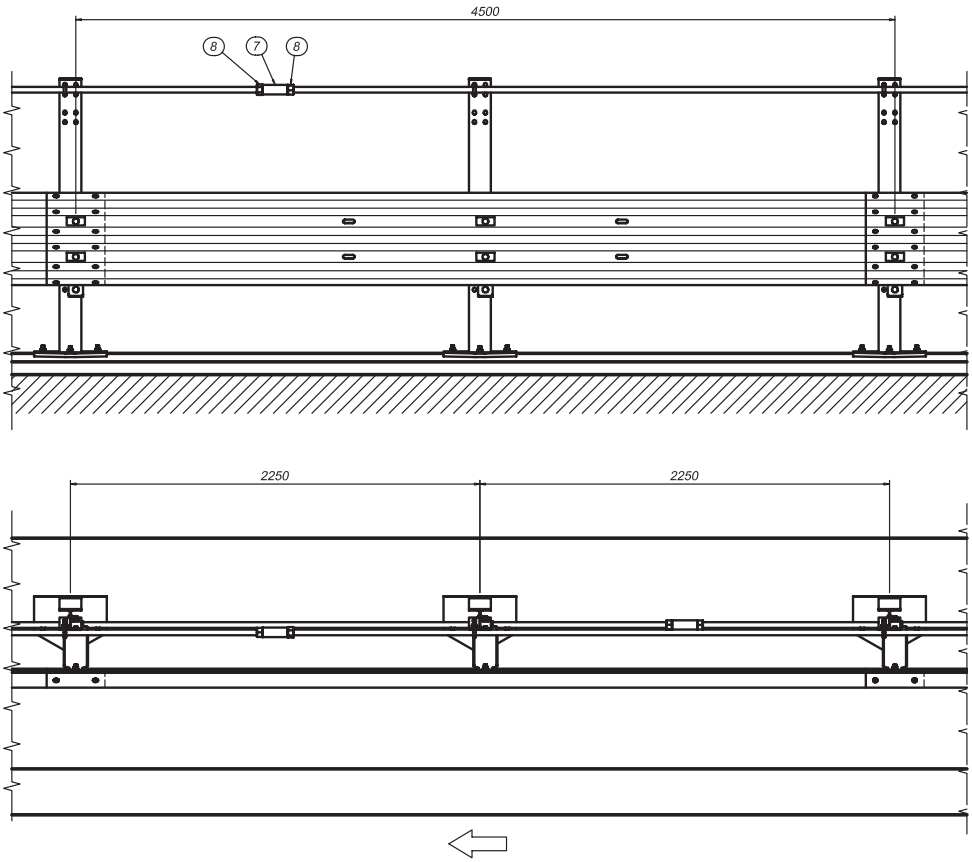




Description

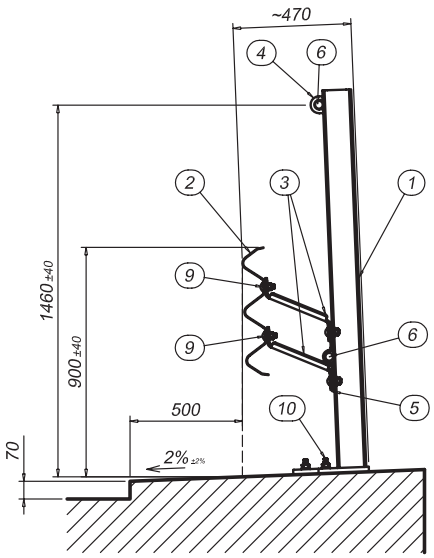
Supply and installation of a 3-wave safety barrier, thickness 4,0 mm, HE120A H =1500, xed to ground every 2250 mm spacers 250 x 260 x 8 mm L=80 mm, assembled with nuts and bolts and provided with re ectors.
S235JR - S355JR steel quality according to EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

Elevation



Section

	escrizione
1	HE120A post H=1500 mm + plate 300x400x20 mm
2	“3n” beam c c.4500 mm th.3,0 mm
3	Spacer 250x260x8 mm L=80 mm
4	Clamp ř14,7 partially threaded M16
5	Omega plate 80x275 mm th. 8 mm
6	Threaded bar ř32 L=9,00 m
7	Connector
8	Nuts
9	Cover plate 100x45x5 mm
10	M18 TSM B16 anchor bolts L=220 mm + nut and washer



SINGLE SIDED SAFETY BARRIER ON GROUND N2-W4-A (B18016)

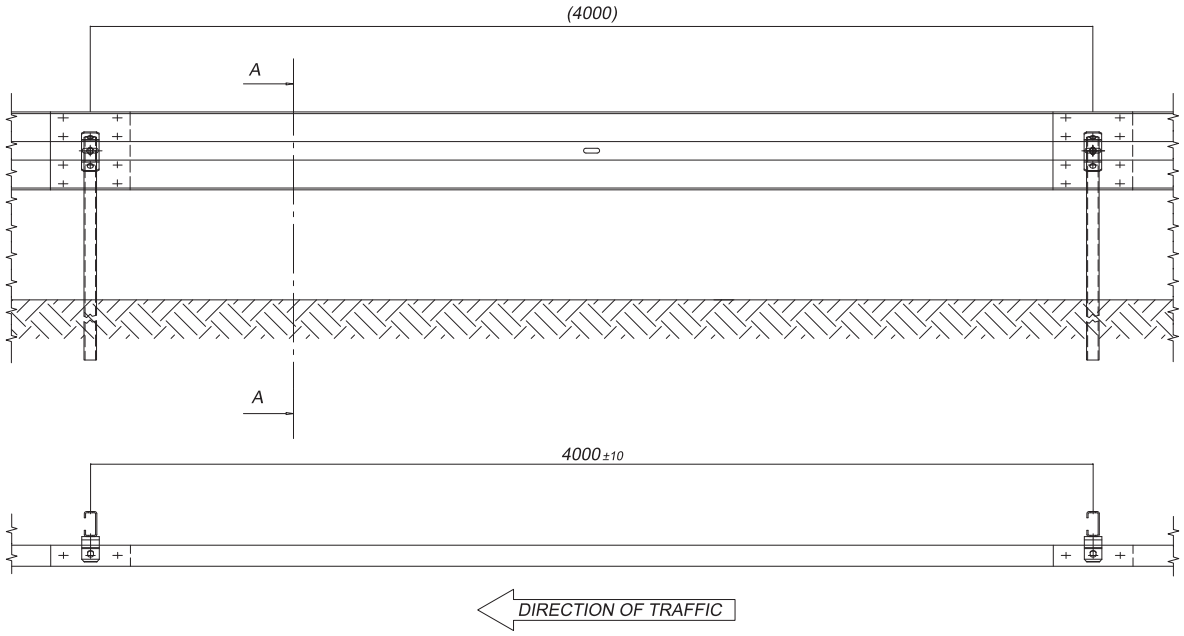
Performance	
Containment level	N2
Acceleration Severity Index “ASI”	A
Working width	W4 (1,2m)
Extreme lateral position of the vehicle	N.A.
Dynamic deflection	1,1 m

Characteristics	
Height out of ground	750 mm
Transversal overall dimensions	217 mm
Centre to centre between posts	4000 mm
Tested minimum length	70 m

Description

Supply and installation of safety barrier, with 2-waves beam thickness 2,5 mm, posts C100x50x25mm H 1400 mm. driven into the ground every 4 000 mm, complete with assembly bolts and reflectors.
S355JR steel in quality-according EN 10025
Hot dip galvanization according to UNI EN ISO 1461
Nuts and bolts according to UNI EN ISO 898-1, UNI EN 20898-2
The safety barrier has successfully passed the tests required by EN 1317, part 1 and 2.

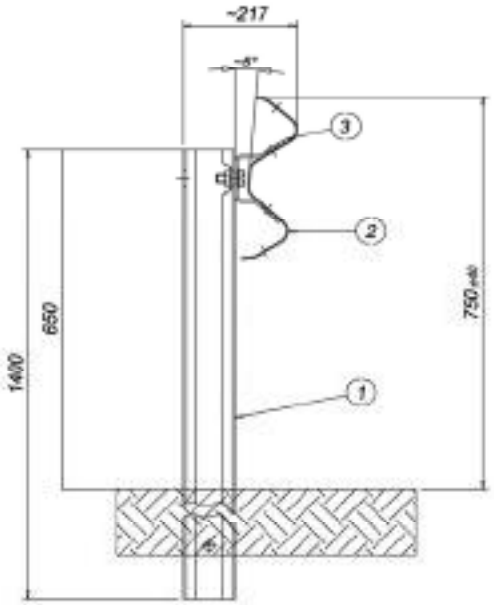
FRONT VIEW

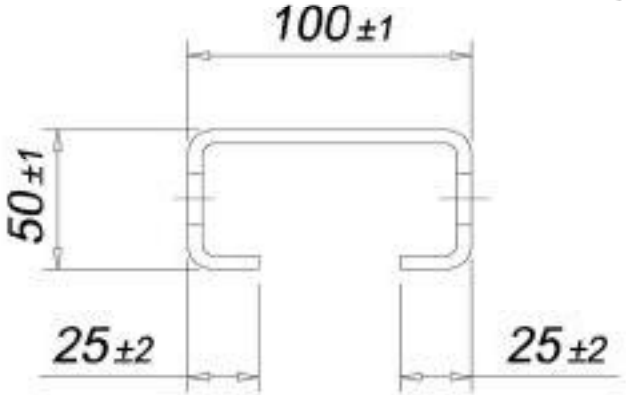


NR	CODE	DESCRIPTION	MATERIAL	QTY per SET
1.	Z-FR379	HDG POST C100X50X25 H1400 T5mm S355	S355JR	2
2.	Z-FR381	HDG BLADE 4000 2W T2.5mm S355	S355JR	1
3.	Z-FR383	HDG SPACER 158X90X70X5 S355JR	S355JR	2
4.	LL-7-3N30162	THREADED ROD M16X200 DIN 976 HDG 4.8	4.8	2
5.	LL-M16.45.03	BOLTM16X45 DIN933HDG 8.8.	8.8	2
6.	LL-M16.30.06	BOLT M16X30 LARGE HEAD HDG 8.8 AM	8.8	12
7.	LL-N16.00	NUT M16 DIN 934 HDG 8	8	18
8.	LL-W16.03	WASHER M16X17X35X3 HDG		12
9.	LL-W16.01	WASHER A17 M16 DIN125A HDG		4

Tightening torque of nuts and bolts

BOLTS	TORQUE (Nm)	
For connection Blade-Blade and Blade-spacer Blade-post (in end element)	90	+20 -10
Spacer-Post	60	+5 -5





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