since1968... we've gone a long way

Index

IMEVA founded in 1968 by Pellegrino Varricchio who was formerly the owner-manager of an important company specialized in the installation of air and underground medium and high tension electric lines.

IMEVA founded to produce steel items: pylons, hooks, clamps, brackets and so on…

In the 70's that active, farsighted and rich of ideas businessman, foresaw the important potentialities of the market concerning the construction of the great road networks, thus creating new production ranges such as steel road security guard rail, culverts and pipes.

Generation process has never stifled the passion, the seriousness and the devotion to work which have always been faithful to founder's spirit.

The high quality standard IMEVA has reached is due to the uninterrupted and stubborn commitment to search and propose to the market more and more innovative, competitive and high quality solutions which grant security and efficiency of products.

IMEVA is today leader on national and international markets.

“intuition is the gift to perceive deeply the novelty and the innovation
It is the logic to be able to do well and with passion...

imeva

since 1968... we've gone a long way »

A reliable and qualified company image.

IMEVA has a united and skilled team always intent on reaching new aims of development.

Precise strategic choices add high quality, technology and a strong competitiveness to the products.

IMEVA satisfies all requirements of the market with timeliness, professionalism and competence.

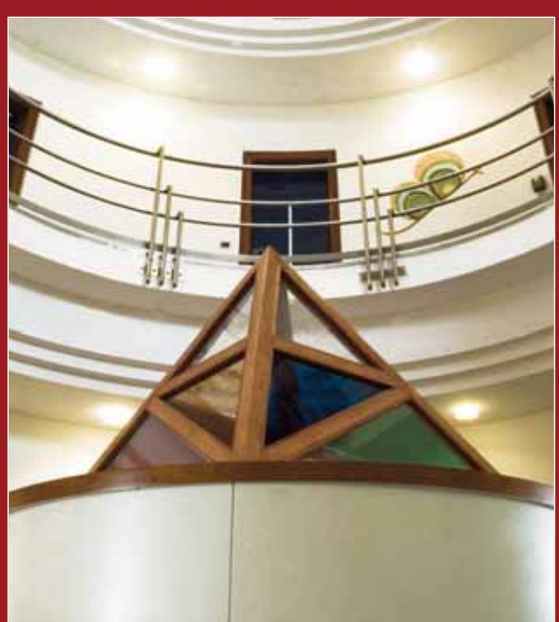
A new industrial settlement has been finished and started in 2000; it spreads out over an area of 12.000 sqm of which 40.000 sqm are covered thus investing in high technology and automation.

IMEVA has a modern technical office which assists designers and customers during the designing and after sale stages.

IMEVA has besides integrated into its own staff a new department to follow up and assist the customer even during the installation stage.

I live with the feeling that a new idea rises positive changes, and that what changes and becomes rises harmony and a great commitment

imeva today



Company Card

Foundation: 1968
Establishment: 14/12/1972
Legal status: joint stock-company
Social Stock: € 6.000.000 f.p.
Benevento Court: n° 820/73
C.C.I.A.A.: n° 48255
VAT N°: IT00041200627
Pos.INPS: 100229629 (Engineering Industry)
SOA: Cat. OS12 Class VIII (Certif. SOANC)

IMEVA is present today over national area with agents managed by area commercial and operative branches situated in Rome, Verona, Bari and Catania.

Foreign Department besides is constantly growing to market the products in European, Middle East, African and American countries.

Its know-how, acquired by a constant and intense research and development, allows IMEVA to boast a wide and recognized designing capacity in its field.

IMEVA is a company with:

- certified Quality System Management according UNI EN ISO 9001:2000 for *"Design, manufacturing and installation of metallic guardrails. Design, manufacturing and installation of products by use of corrugates steel structural plates".*
- certified Environmental System Management according ISO 14001/UNI EN ISO 14001:2004.

company organization

The company organization chart is constantly evolving: it is measured and in harmony with the needs of the continuous growth of commercial areas turnover .

Top management is made up of the shareholders who link together precise roles with prodigality of an utmost commitment about the care and the optimization of each stage of company activity, with the aim of increasing and prospering the demanding and stimulating paternal heritage.

Management base works in team with the technical, commercial and administrative direction.

Each collaborator has a precise qualification and sectorial competence.

“modern conception and working style, efficacious siynergies, no-stop research and quality as a path of a clever growth...

imeva today

commercial branches

IMEVA covers the whole national territory through agents managed by commercial and operative branches. The territory is divided therefore in North, Middle and Sardegna, South and Siciliy branches.

Foreign commercial business is firmly structured in European, Middle East and African countries, and it is in expansion in the rest of the world.

- Nord Italy
- Middle Italy
- South Italy
- Sicily
- Europe
- African
- Middle East

Company production range includes the following items:

GUARD RAILS

It is the most important product of the Company with an incidence of 80% on the total turnover.
It is a product with a non-stop technical evolution: in 1987 (Ministerial memorandum n° 2337) and later in 1990 (Decree dated May 4th), this product has been subject to modifications which have raised its impact resistance by increasing sections and thickness of the components with a consequent weight increasing per linear meter of more 30 and 50% than the former typologies.
This is due to the increased needs of traffic security, to the higher speed and number of the vehicles on the roads and to the need to be in harmony with some international norms in common with other European countries.

The Decree n° 223 of February 1992, its following revisions and their corresponding European norm impose the respect of more innovative and onerous parameters.
They compel besides the manufacturers to homologate the product and the road operators to adopt such structures for all new road plants, besides adjusting progressively all existing road protections.

IMEVA is working on particulars projects about impact typologies which are not provided for by national law in force. Such choice meets the company spirit to consider the defence of all road consumers as a priority and conditional target apart from law obligations.

H3 barrier

H3 side barrier
for embankment

H4 barrier

H4 barrier for bridges (ASI1)

H4 barrier

H4 barrier for bridges (ASI1)
including panels

SHEET CORRUGATED STRUCTURAL ELEMENTS

This is a relatively new and intelligent product; it is besides well allocated in the criteria of a modern road building and it has an incidence of 15% on the total turnover.
IMEVA is a leader on the national and international market thanks also to its capacity to exploit to the utmost the versatility of this product by proposing a lot of alternative utilizations.

culverts

circular section culvert
arranged in series
to lighten the embankment

culverts and barriers

example of coupled use
of culvert and barrier.
In the particular figure
it has been performed
a bevel cut

altimetrical elbow

example of a special piece:
“altimetrical elbow cut”
on a circular section culvert

COMPLEMENTARY PRODUCTS

Always in the field of road security steel items, IMEVA produces and installs too complementary safety products which are the remaining 5% of the total turnover.
They are items that follow the development of road network and its adjustment to the criteria of traffic security. They are:

- **Minor products** such as protective nets for flyovers, fencings and parapets;
- **Soundproof barriers** to knock down road, highway and railway noise. Such structures are in different RAL colours and they are made of both iron and aluminium sandwich panel covers with a rockwool inside, and PMMA sheets. They adjust themselves to the most different installation needs thanks to the long term experience in the field of compound installations.

panels

"full mesh" prefabricated panels with upper climbing over proof protections.
Self-supporting structure

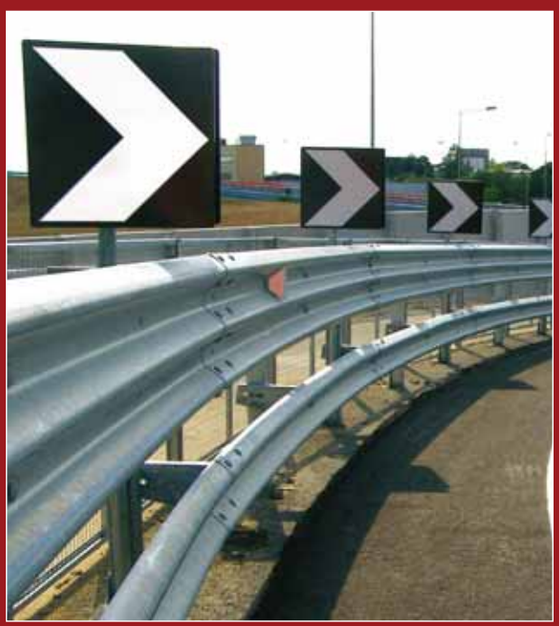
pedestrian parapets type 1

parapet fencing with grid panel made of vertical plates and horizontal "U" section channels

pedestrian parapets type 2

parapet fencing with three horizontal rails.
Bridge security installation

guard rails



“I drive along never ending roads, I disappear in striking and free views and I can feel secure in my travel...

imeva

Development of the regulations

Up to 80's and over, the technical specifications about road security barriers in Italy were defined by Management Bodies and/or by the owners of the roads making reference essentially to the directions of American Norm AASHTO about such matter.

Though giving the geometrical details of the W beam and of some other structural components of road barriers, such norm didn't give any direction about the expected performance and/or a possible verification method of the final product. Acceptance tests provided only for mechanical tests on the most important structural components such as: tensile and flexure stress on an entire and jointed beam, flexure stress on a post and deflection stress on the spacer.

The increasing of security needs due to the development of the traffic and to the technological improvement of transportation means (there was greater power and greater speed at stake), have made out-of-date the barriers of the period because they were obviously inadequate to contain the vehicles.

In 1987

It was laid what we can define "the foundation stone" of the regulations about such matter by a methodical approach and the issuing of the:

"Memorandum of Public Works Ministry dated July 1987, n. 2337:
Road Security Provisions. Road Barriers. Specifications about the use of steel barriers".

Such document defines the minimum structural features of road security barriers and the foundation concepts for the development of a technical project:

- destination of the barrier;
- classification of the vehicles;
- capacity of the barrier to contain heavy vehicles within the carriageway and, at the same time, not to give rise to dangerous decelerations for people inside the car.

In 1990

It is added another important piece to the under construction norm by the issuing of the:

"Ministerial Decree of May 04th 1990. (G.U. n. 24 of 29.01.91)
Revision of the technical norms about planning, execution and test of road bridge"

In 1992

They give start to a new generation of road barriers, the so called "Crah Tested Barriers" by the issuing of the:

"Ministerial Decree of February 18th 1992, n. 223. (G.U. n. 63 of 16.3.92)
Regulations about technical directions for the planning, the approbation and the use of road security barriers"

The important novelty of such regulation is the introduction of the technical pass certificate (the so called Homologation certificate) which was essential to make use of a certain pattern of barrier.

The achieving of such certificate is the result of an articulate planning and research process which provides for the execution of crash tests to verify the validity of the project and its conformity to the regulations in force. Such tests consist of reproducing the real conditions of exercise of road security barriers according the directions of the norm.

Other important elements contained into the above Decree are:
- subdivision of the barriers in two different typologies according their
- destination and location;
- definition of the severity index as kinetic power of the vehicle at the moment of the impact and according some specific parameters;
- further classification of road security barriers according the severity index and therefore their performance features;
- traffic classification according the prevalence of the vehicle typology;
- definition of the criteria regulating the choice of road barriers according the possible combinations of the above parameters (road typology; traffic typology).

In 1996

The "Ministerial Decree of October 15th 1996 (G.U. n. 283 of 3.12.96)
Revision of Ministerial Decree dated February 18th 1992, n. 223 about technical directions for the planning, the approbation and the use of road security barriers"

It updates and replaces, with new instructions and technical prescriptions, those of the former Decree following up either what had been provided for into the primary Decree (recurring revision of the instructions in relation to the experience matured and to the state or the art) or the modification proposal worked out by the European Commission UNI; find here the most important modifications:

- Classifying road barriers according the Severity Index, it is found out the increasing, for each class of containment, of the minimum value of such Index;
- It is modified the table containing the choosing criteria of road barriers and it is added the road type A (Highways and so on); such modification concerns the addition of the "Destination" parameter besides the already provided for "Road typology" and "Traffic typology", with the following increasing of combinations and new attributions of "Resistance class" in relation to the Severity Index.

In 1998

The "Ministerial Decree of June 3rd 1998 (G.U. n. 253 of 29.10.98)
Further updating of the technical instructions about planning, approbation and use of road security barriers and about the technical prescriptions about crash-tests for the approbation".

Such Decree, following up the opinion of the "Fifth Division of the Supreme Council of Public Work" , updates the former Decree of 1996 as follows:

- It points out the areas to be protected:
  - It is specifically indicated the median barrier;
  - As concerns the side verge, they are defined the parameters according to which it is necessary a protection;
  - As concerns the fixed obstacles, if where they are not removable, it is introduced the concept of "security distance" and it is prescribed the protection of such obstacles if they are at a lower distance than the security one;
- The former term "IS–Severity Index" expressed in KNm is replaced by "Lc-Level of containment" expressed in kJ;
- It is defined the "A.S.I. – Acceleration Severity Index" which measures the severity of the impact on the occupants inside the car;
- It is imposed on the manufacturer the issuing of the Production Conformity Declaration;
- It is imposed on the installer the issuing of the Installation Conformity Declaration;
- It is changed the former classification of road barriers according the "Severity Index" in relation to "Lc-Level of containment".

In 1999

The "Ministerial Decree of June 11th 1999 (G.U. n. 184 of 7.8.99):
"Supplements and modifications of the Ministerial Decree of June 3rd 1998 about the revision of the of the technical instructions about planning, approbation and use of road security barriers".

After different considerations and mistaken interpretations coming from the application of former provisions, this Decree prescribes and specifies the following:

- After having fixed the correspondence between the barrier classes as per D.M. 15.10.96 and the ones as per D.M. of 3.06.98, and after having defined some conditions, it temporarily provides the acceptability of the barriers as per D.M. of 15.10.96;
- As concerns the "A.S.I.", it defines the components of the acceleration and specifies the measurement method of the barycentre;
- It imposes to all barriers manufacturers to be "specialized" and "quality certified according the norms EN ISO 9001 o 9002";
- It is modified, by the attachment 1 of D.M. 11.06.99., the table "A" of D.M. 15.10.96 concerning the prescriptions about the vehicles to be used during the crash-tests.

In 2004

They are updated the technical instructions about the planning, the approbation and the use of containment devices in road building, with the acknowledgment of European Norm UNI EN 1317 parts 1-2-3-4, with the issuing of the:

"Ministerial Decree of June. 21st 2004 (G.U. n. 182 of 05.08.04)
Revision of the technical instructions about the planning, the approbation and the use of road security barriers".

Some indications about the methods to adapt the containment devices to road seat, (it is granted the modification of some elements, uprights in particular and anchorage systems in transition areas between different devices) are given with the:

"Instruction of August 25th 2004 (G.U. n. 209 of 09.09.04)
About planning, installation, verification and maintenance criteria of containment devices in roads building".

This is a matter particularly interesting for management bodies and owners of roads who work for those bodies (Installation designers).

REGULATIONS ABOUT GUARD-RAILS

- **Ministerial Memorandum n. 2337 of July 11th**
  Road security provisions. Guard-rails. Specifications about the use of steel guard-rails.

- **Ministerial Decree of May 04 th 1990 (G.U. n° 24 29/01/91).**
  Technical provisions about updating of planning, performance and testing road bridge.

- **Ministerial Memorandum n. 223 of February 18th 1992, (G.U. n.63 16/03/92)**
  Provisions about technical instructions about planning, homologation and utilization of road security guard-rails.

- **Ministerial Decree of October 15th 1996 (G.U. n. 283 03/12/96)**
  Updating of the Ministerial Decree n. 223 of February 18th 1992 containing technical instructions about planning, homologation and utilization of road security guard-rails.

- **Ministerial Decree of June 3rd 1998 (G.U. n.253 29/10/98)**
  Further updating of the technical instructions planning, homologation and utilization of road security guard-rails and of technical regulations about crash tests aiming to homologation

- **Ministerial Decree of June 11 th 1999 (G.U. n.184 07/08/99)**
  Integrations and modifications of the M.D. June 3rd 1998 concerning : "Technical updating of the instructions about planning, homologation and utilization of road security guard-rails".

- **Ministerial Decree of June 21st 2004 (G.U. n.182 05/08/04)**
  Technical updating of the instructions about planning, homologation and utilization of road security guard-rails and technical regulations about crash-testing of road security guard-rails.

- **Directive n. 3065 of August 25 th 2004 (G.U. n.209 06/09/04)**
  Directives about planning, installation, testing and maintenance criteria of containment devices in road construction.

Guard Rails

• Hard shoulder Barriers

Class N2

Class H1

Class H2

Class H3

Class H4

• Bridge Barriers

Class H2

Class H3

Class H4

• Median Barriers

Class H2

Class H4

• Median Barriers resulting from side barriers

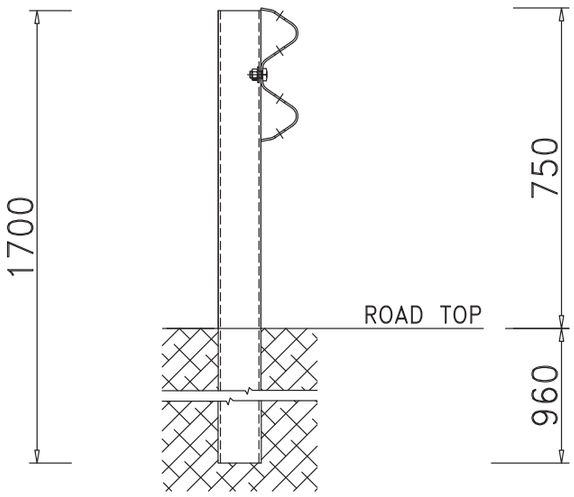
N2 hard shoulder
N2BL200

components

- W beam 4500 mm th. 2,5 mm;
- "U" section post 80x100x80 mm th. 5,0 mm
  H= 1700 mm c/c 3375 mm;
- Bolts and nuts;
- Reflectors (1 every 13,5 m)

This barrier provides Approach/Escape End Sections of 27,0 m (13,5 for approach + 13,5 for escape)

section



- **Dwg. n.: N2BL200**
  c/c distance between the posts: **3.375 mm**

performance

Car 900 kg

Test:	IME/BSI-31/C688
ASI:	0,8
W:	0,80 m (W2≤0,8)
WCDI:	LS0122101
THIV:	26,0 km/h
PHD:	15,0 g

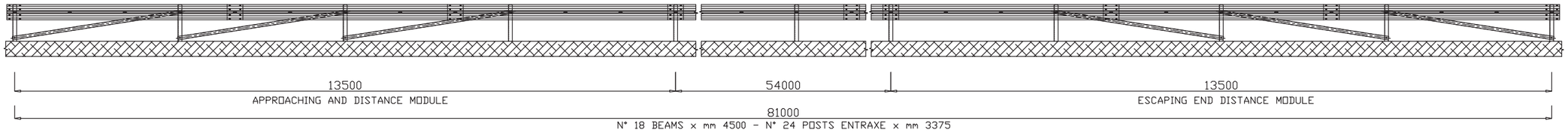
- CE Certificate
  n. 1835-CPD-0008/1

Car 1.500 kg

Test:	IME/BSI-32/C689
W:	1,50 m (W5≤1,7)

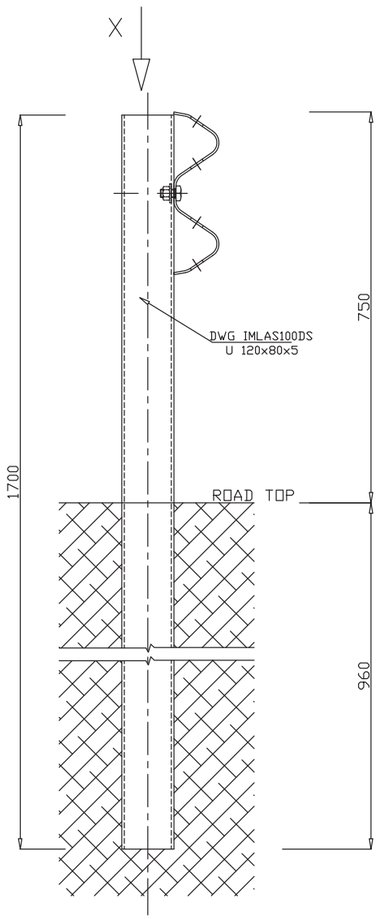
FRONT VIEW

SCALE 1:120



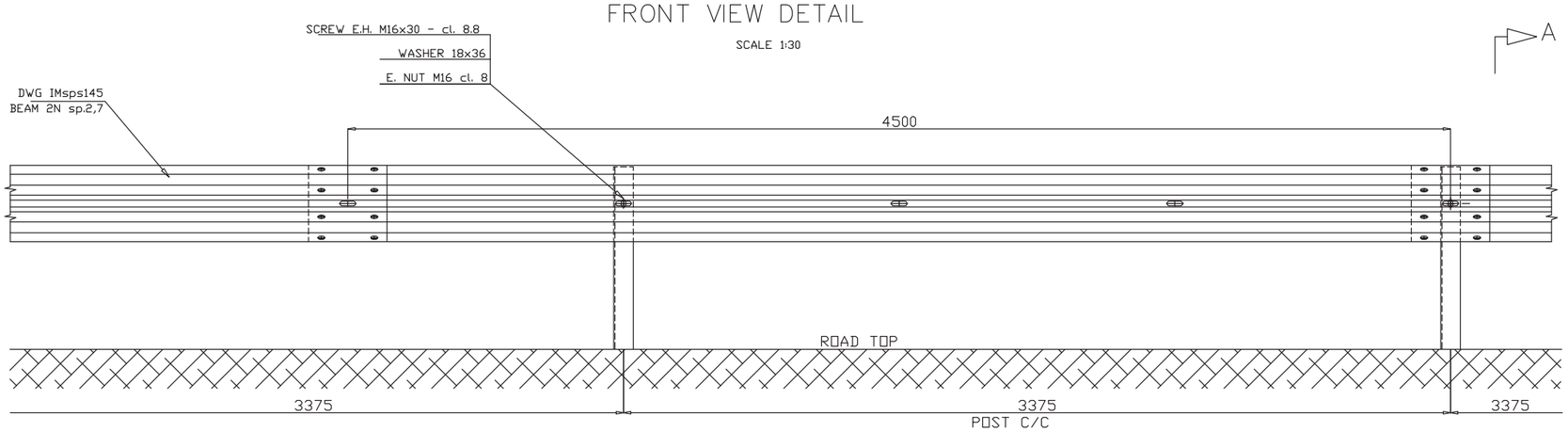
SECTION A–A

SCALE 1:15



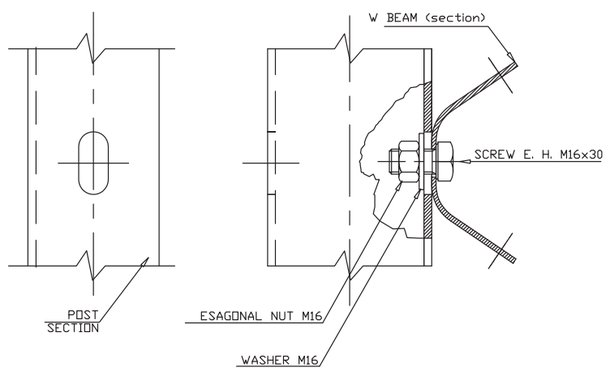
FRONT VIEW DETAIL

SCALE 1:30

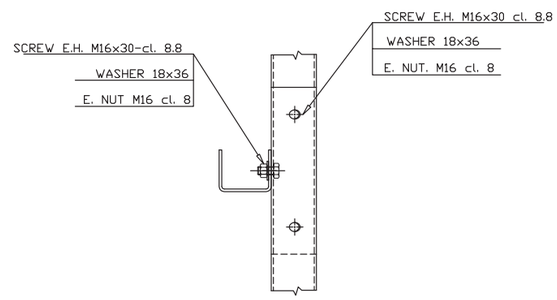


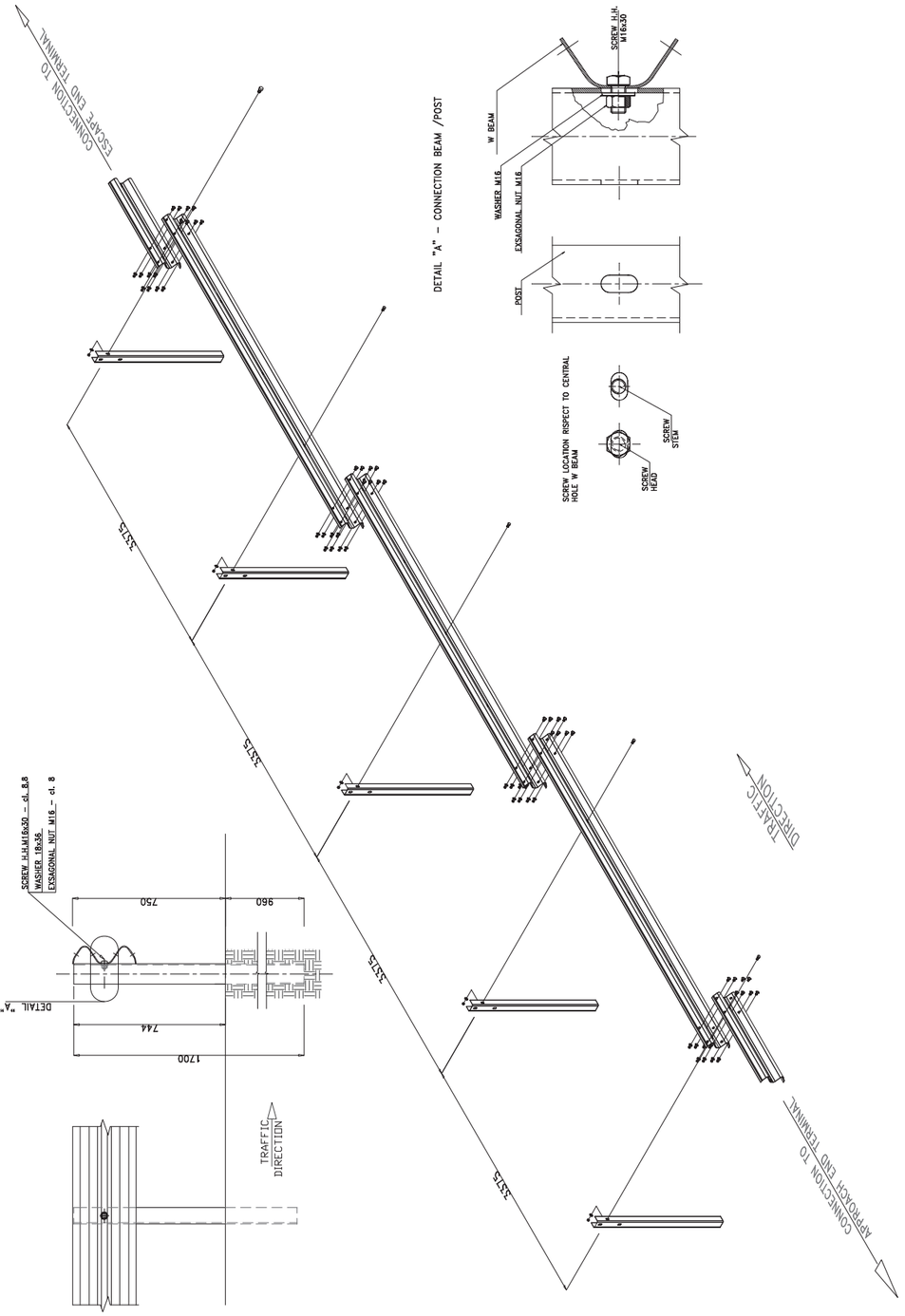
TRAFFIC DIRECTION

CONNECTION DETAIL JUNCTION BEAM/POST



VIEW FROM X





N2 hard shoulder

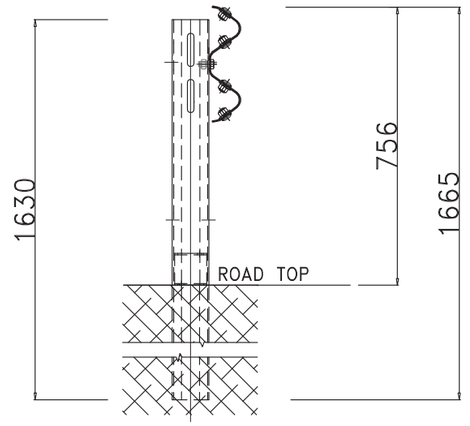
N2BL300

components

- W beam 5333 mm th. 2,0 mm;
- "C" section post 25x60x100 mm th. 4,0 mm H= 1630 mm c/c 2666 mm;
- Bolts and nuts;
- Stiffner for "C" section post
- Reflectors (1 every 12,0 m)

This barrier provides for Approach/Escape End Sections of 32,0 m (16,0 for approach + 16,0 for escape)

section



- **Dwg. n.: N2BL300**
  c/c distance between the posts: **2.666 mm**

performance

Car 900 kg

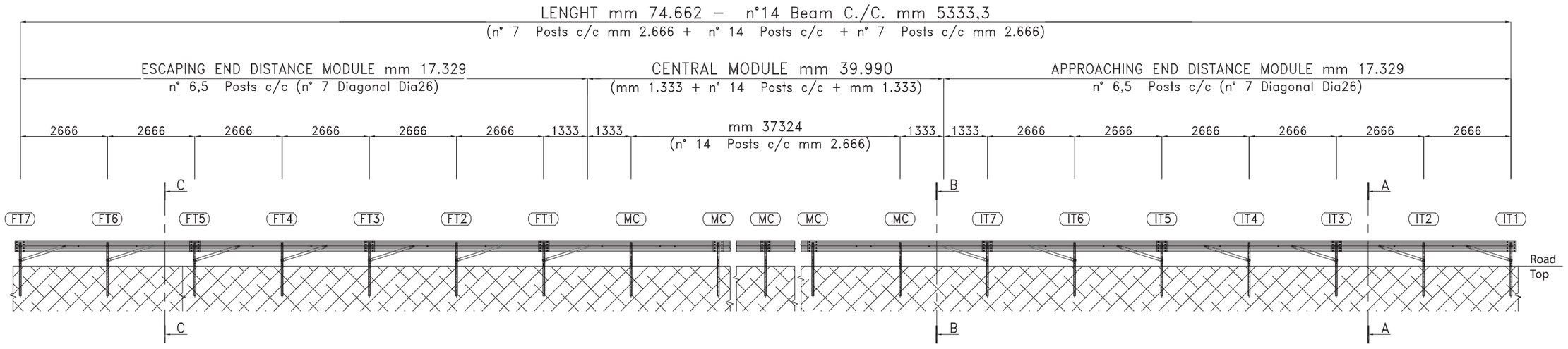
Test:	IME/GAM -002/1144
ASI:	0,70
W:	0,80 m (W3≤1,0)
WCDI:	RF0002000
THIV:	25,0 km/h
PHD:	11,0 g

- CE Certificate
  n. 1835-CPD-0008/2

Car 1.500 kg

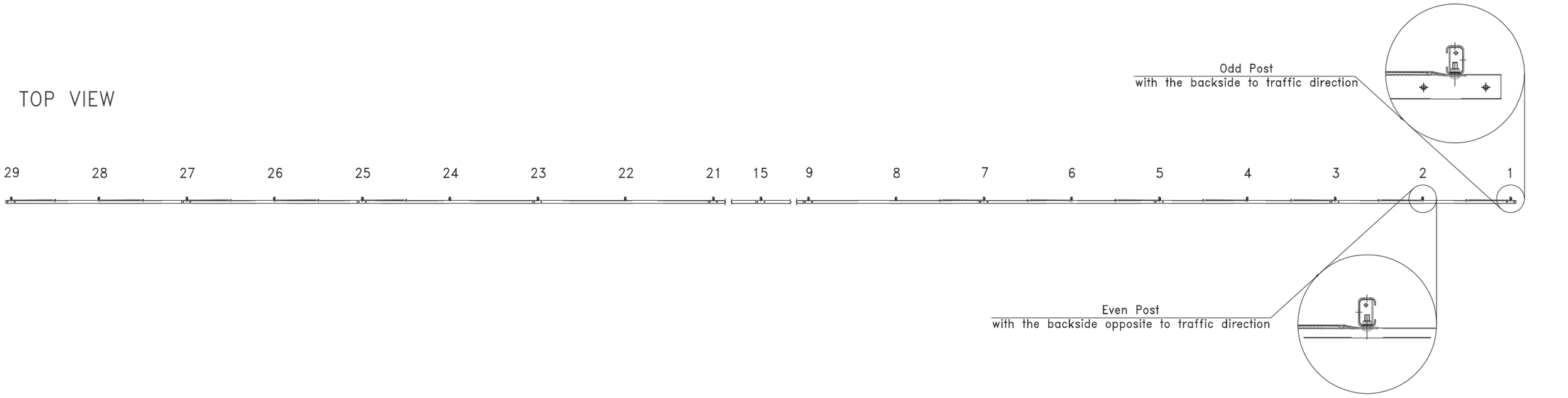
Test:	IME/GAM-001/1143
W:	1,10 m (W4≤1,3)

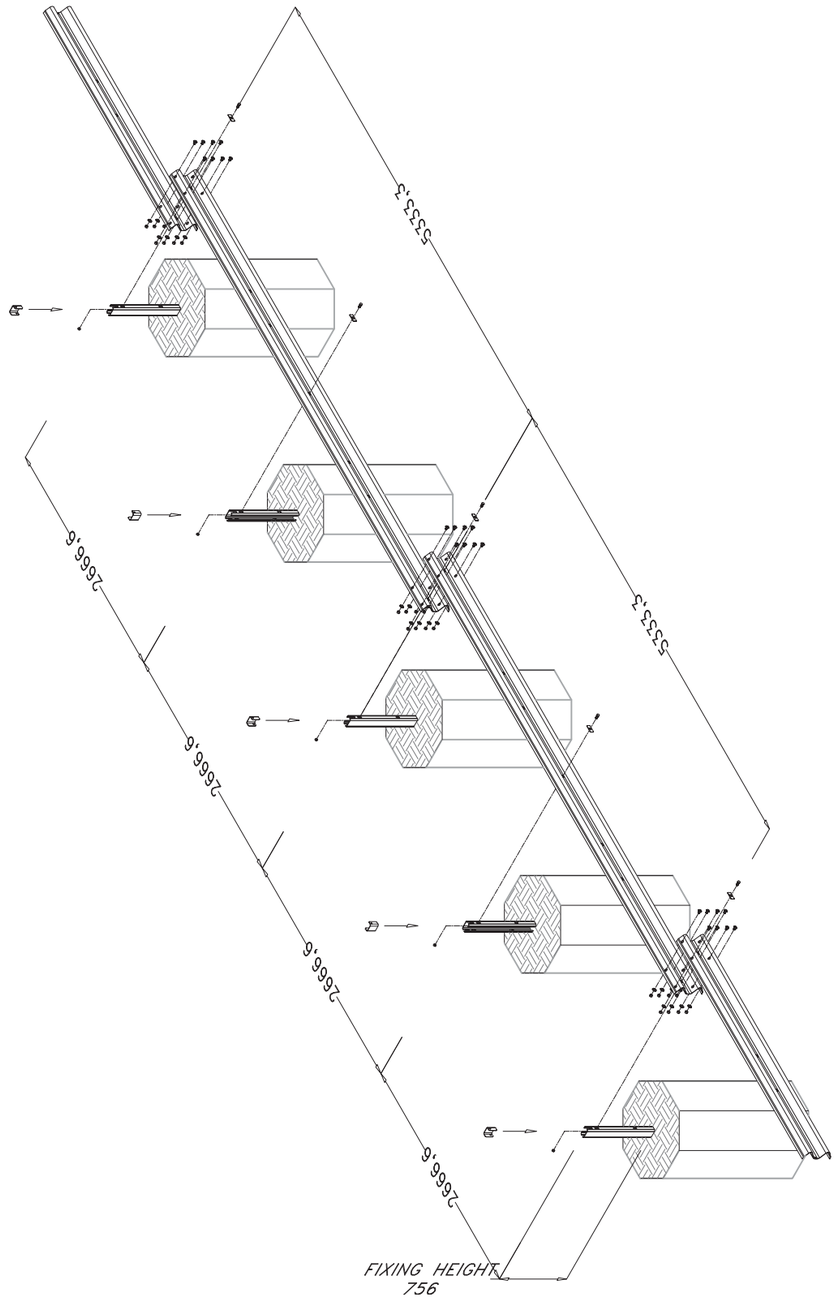
FRONT VIEW



TRAFFIC DIRECTION (Impact on the right)

TOP VIEW





N2 hard shoulder

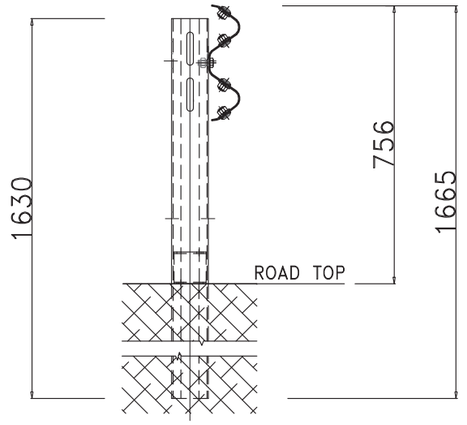
N2BL400

components

- W beam 5333 mm th. 2,0 mm;
- "C" section post 25x60x100 mm th. 4,0 mm H= 1630 mm c/c 4000 mm;
- Stiffner for "C" section post;
- Bolts and nuts;
- Reflectors (1 every 12,00 m)

This barrier provides for Approach/Escape End Sections of 21,332 m (10,666 for approach + 10,666 for escape)

section



- **Dwg. n.: N2BL400**
  c/c distance between the posts: **4.000 mm**

performance

Car 900 kg

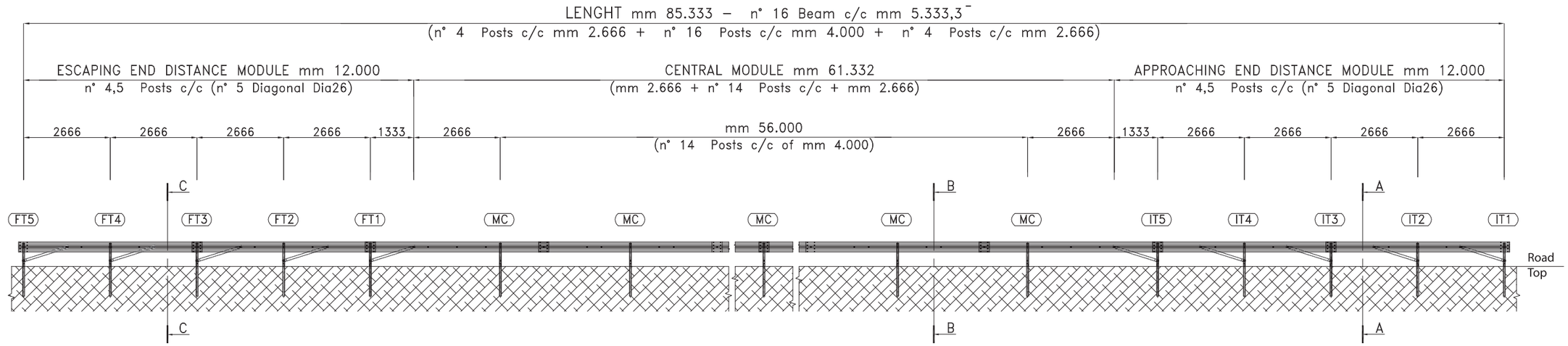
Test:	IME/GAM-005/1148
ASI:	0,70
W:	1,20 m (W4≤1,3)
WCDI:	RF0002000
THIV:	19,0 km/h
PHD:	7,0 g

- CE Certificate
  n. 1835-CPD-0008/3

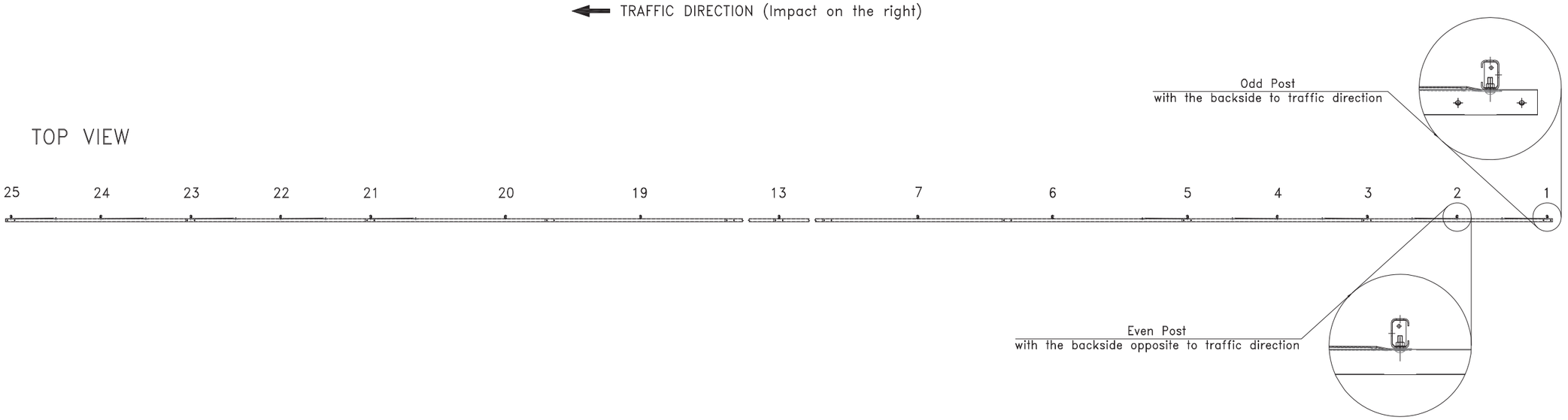
Car 1.500 kg

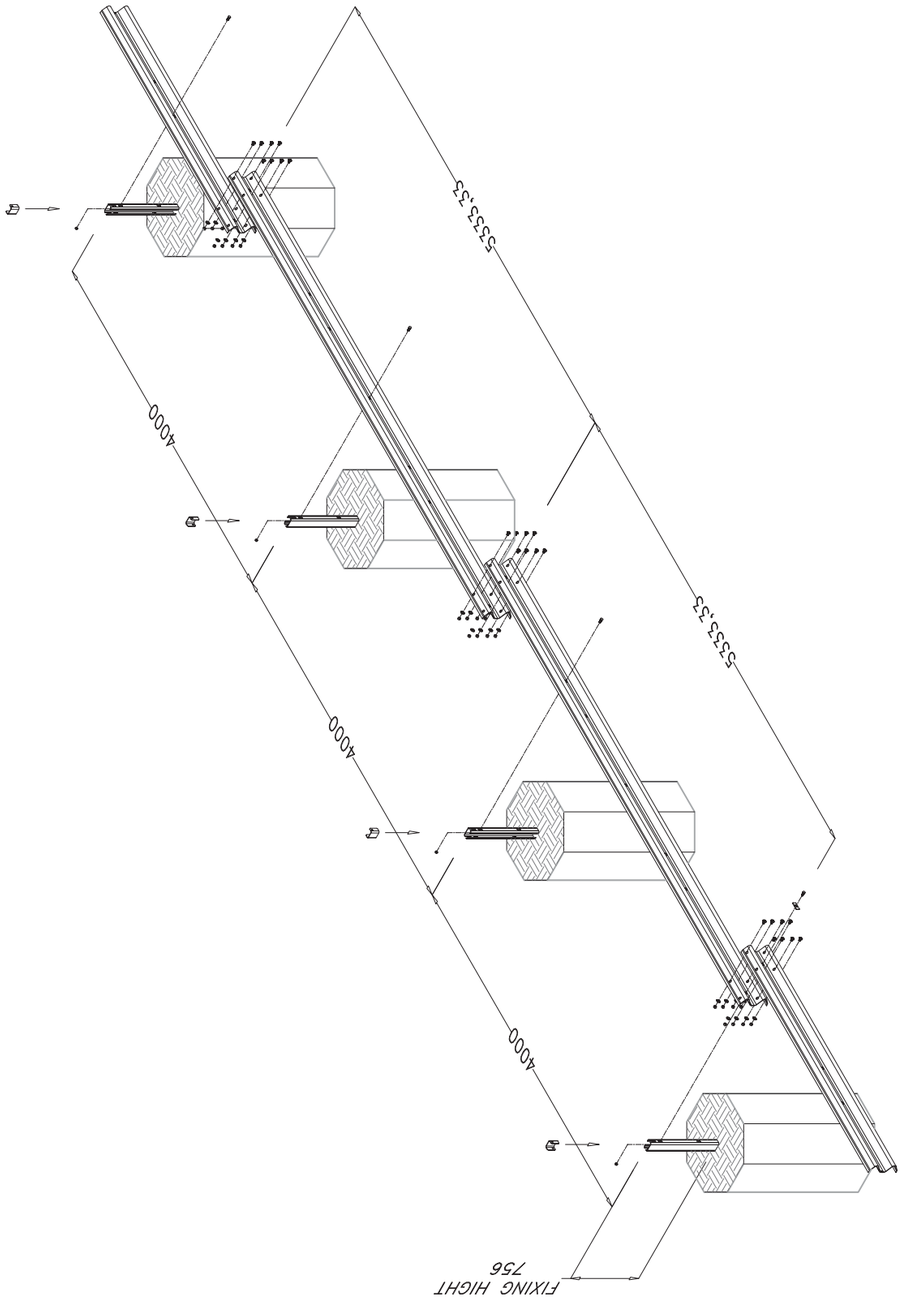
Test:	IME/GAM-004/1147
W:	1,70 m (W5≤1,7)

FRONT VIEW



TOP VIEW





H1 hard shoulder

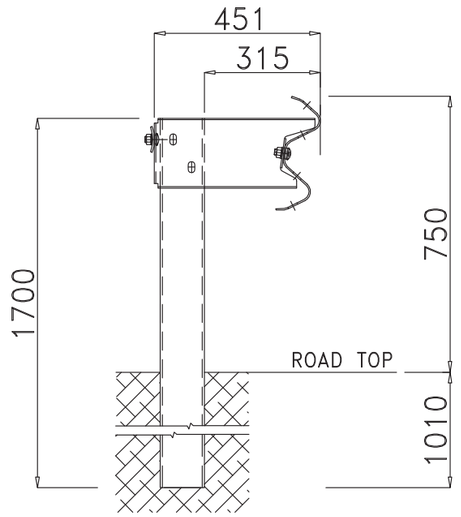
H1BL200

components

- W beam 4000 mm th. 3,0 mm;
- "U" section post 80x120x80 mm th. 4,0 mm H= 1700 mm c/c 2000 mm;
- Spacer;
- Shaped plate;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (1 every 12,0 m)

This barrier provides for Approach/Escape End Sections of 21,332 m (10,666 for approach + 10,666 for escape)

section



- **Dwg. n.: H1BL200**
  c/c distance between the posts: **2.000 mm**

performance

Car 900 kg

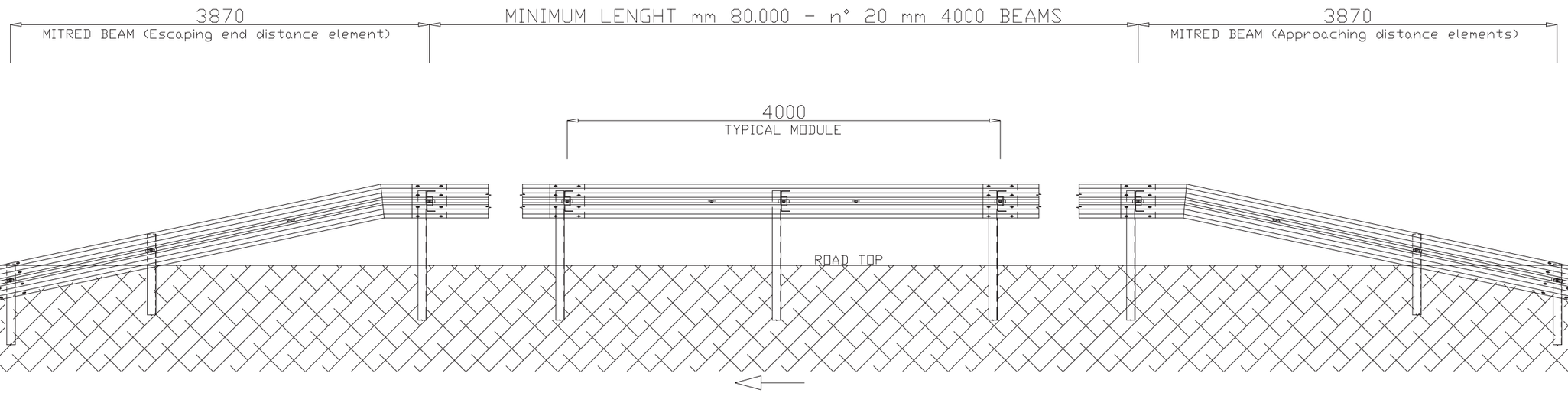
Test:	IME/BSI -24/502
ASI:	0,8
W:	0,93 m (W3≤1,0)
WCDI:	RS0001000
THIV:	23,0 km/h
PHD:	16,5 g

- CE Certificate
  n. 1835-CPD-0008/4

Truck 10.000 kg

Test:	IME/BSI-21/500
W:	1,63 m (W5≤1,7)

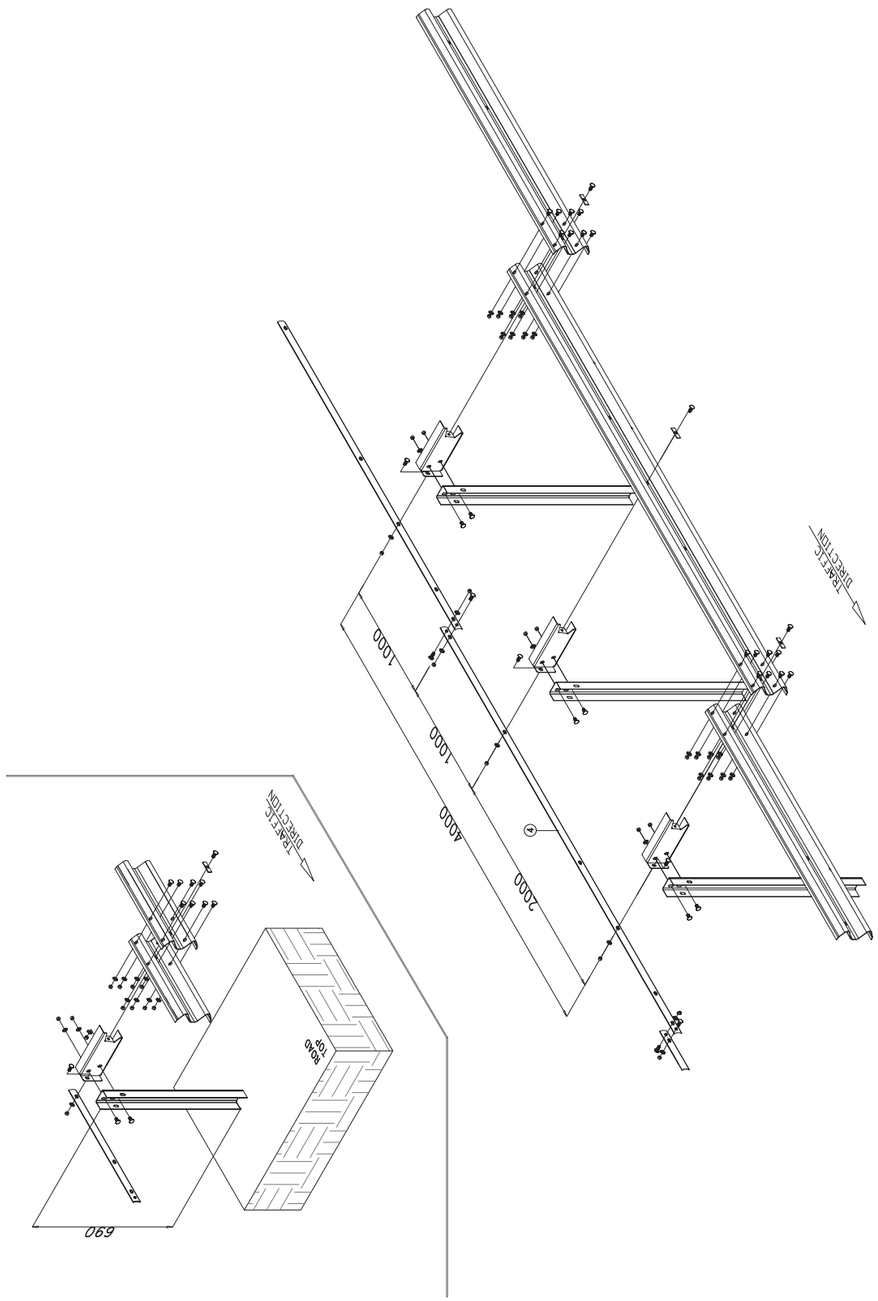
FRONT VIEW



TOP VIEW

H1 hard shoulder

H1BL300

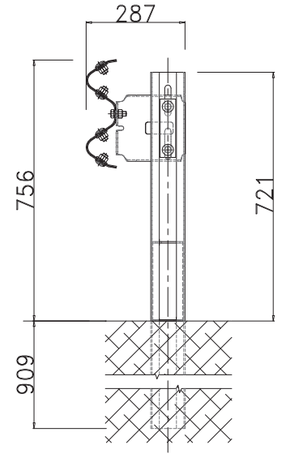


components

- W beam 5333 mm th. 2,5 mm;
- "C" section post 25x60x100 mm th. 4,0 mm H= 1630 mm c/c 1777 mm;
- Spacer with strengthening plate;
- Stiffner for "C" post;
- Bolts and nuts;
- Reflectors (1 every 16,0 m).

This barrier provides for Approach/Escape End Sections of 21,332 m (10,666 for approach + 10,666 for escape).

section



- **DIS.: H1BL300**
  c/c distance between the posts: **1.777 mm**

performance

Car 900 kg

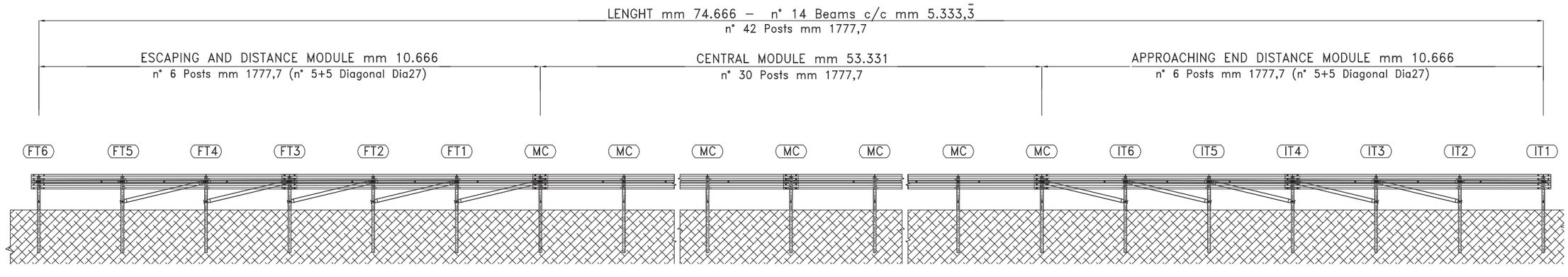
Test:	IME/BAM -066/1177
ASI:	0,80
W:	0,70 m (W2≤0,8)
WCDI:	RF0012000
THIV:	26,0 km/h
PHD:	12,0 g

- CE Certificate
  n. 1835-CPD-0008/5

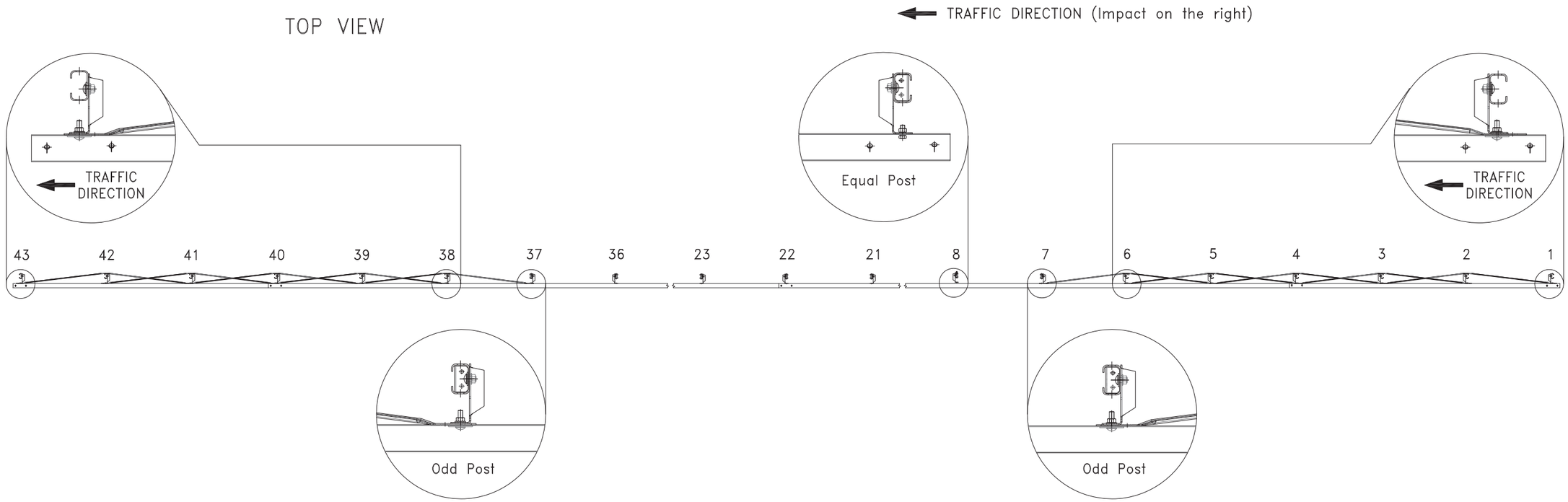
Truck 10.000 kg

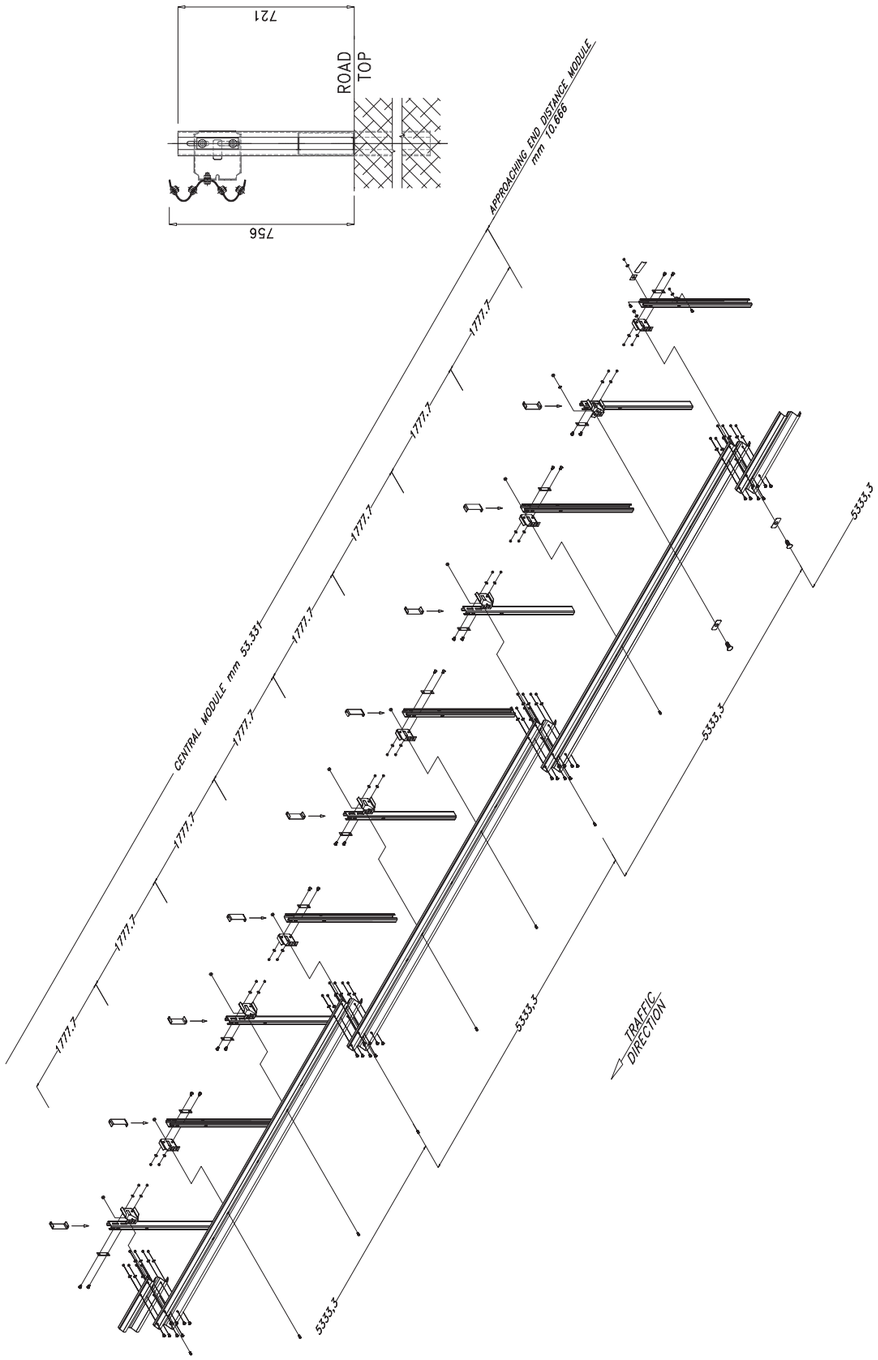
Test:	IME/BAM - 003/1174
W:	1,00 m (W3≤1,0)

FRONT VIEW



TOP VIEW





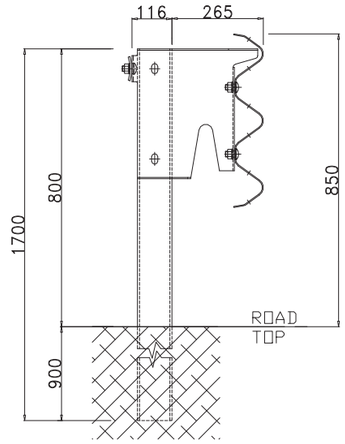
H2 hard shoulder

H2BL100

components

- Three wave beam c/c 4000 mm th 2,5 mm;
- "C" section post 80x100x80 mm th. 5,0 mm H = 1700 mm c/c mm 2667;
- Spacer;
- Shaped tape;
- Unthreading proof plate;
- Bolts and nuts;
- Reflectors (n° 1 every 12,50 m).

section



- **Dwg. n.: H2BL100**
  c/c distance between the posts: **2.666 mm**

performance

Car kg 900

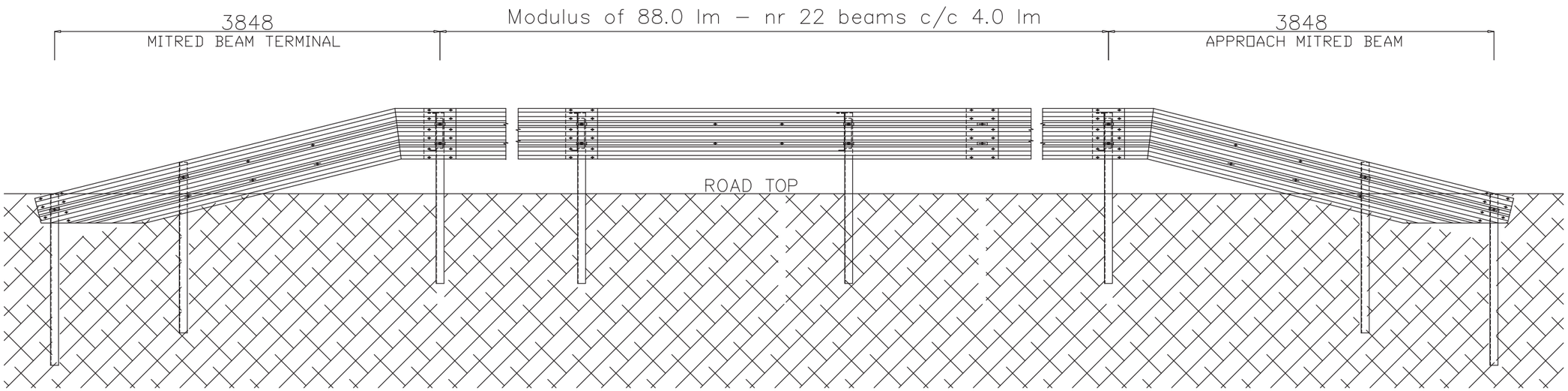
Test:	X70 01 AB10
ASI:	0,90
W:	m 0,92 (W3)
VCDI:	LF0002000
THIV	Km/h 23,38
PHD	g 13,16

- CE Certificate
  n. 1835-CPD-0008/13

Bus 13.000 kg

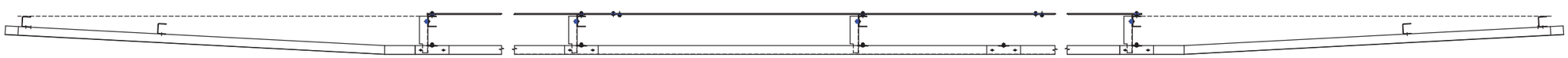
Test:	X70 02 AB10
W:	1,75 m (W6)

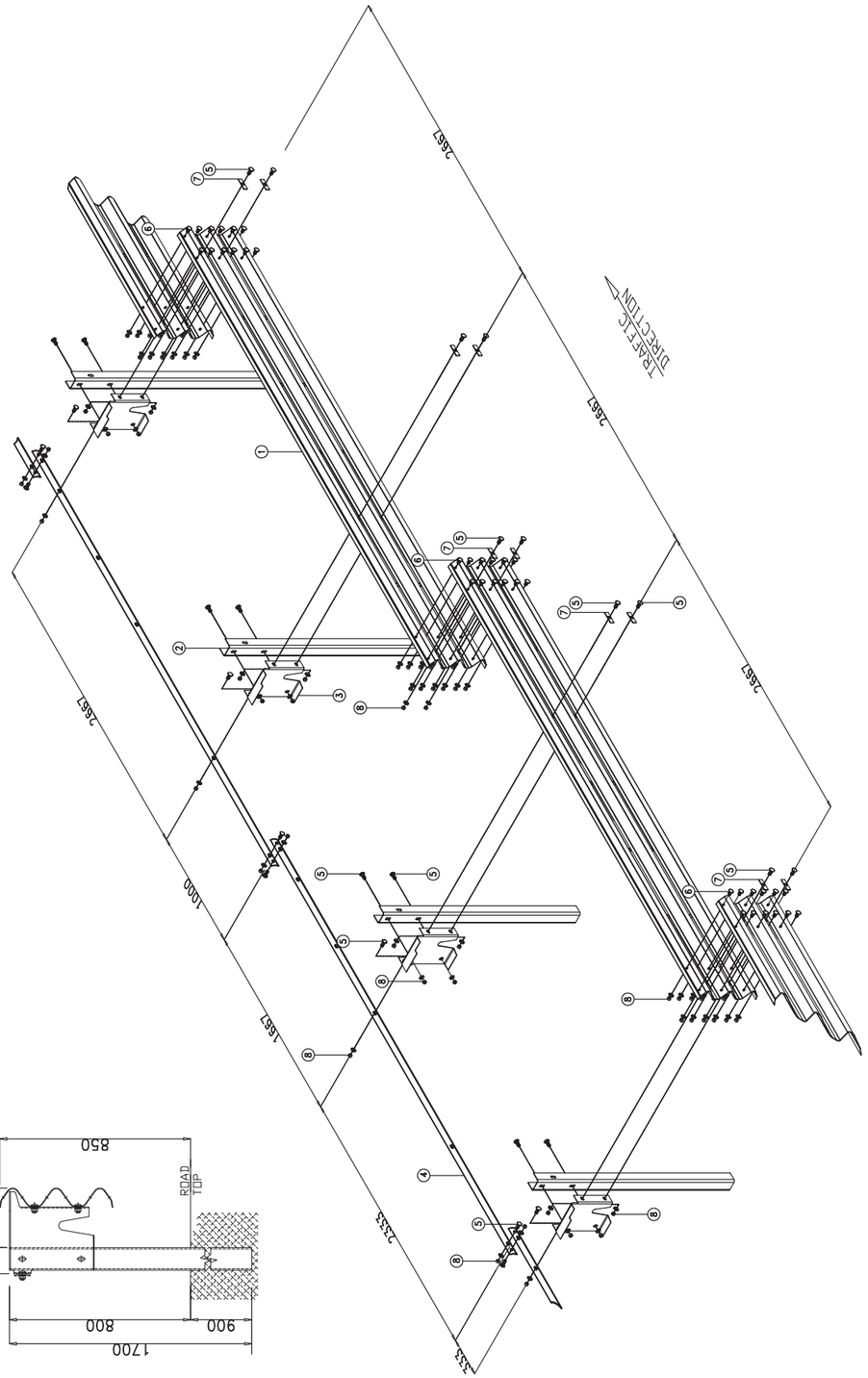
FRONT VIEW

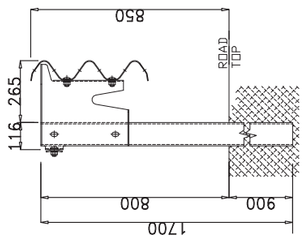


TRAFFIC DIRECTION

TOP VIEW







H2 hard shoulder

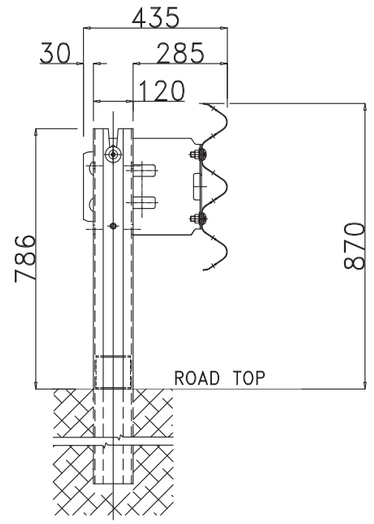
H2BL300

components

- Thrie beam 4500 mm th. 2,0 mm;
- "C" section post 30x80x120 mm th. 5,0 mm H= 1650 mm c/c 3000 mm;
- Stiffner for "C" section post;
- Flat horizontal diagonal 68x2 mm;
- Spacer;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (1 every 13,50 m).

This barrier provides for Approach/Escape End Sections of 24,964 m (12,482 for approach + 12,482 for escape)

section



- **Dwg. n.: H2BL300**
  c/c distance between the posts: **3.000 mm**

performance

Car 900 kg

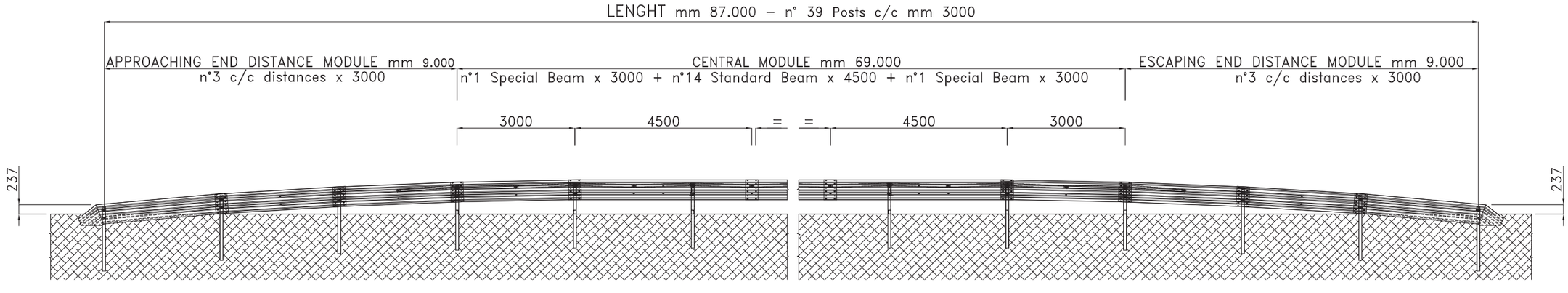
Test:	X61.05.F08
ASI:	0,90
W:	1,50 m (W5≤1,7)
WCDI:	LF0010100
THIV:	28,0 km/h
PHD:	19,0 g

- CE Certificate
  n. 1835-CPD-0008/6

Bus 13.000 kg

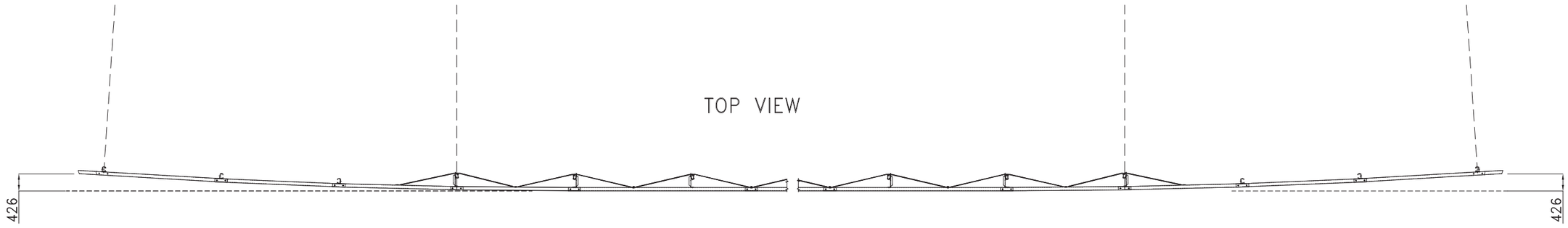
Test:	X61.06.F08
W:	2,00 m (W6≤2,1)

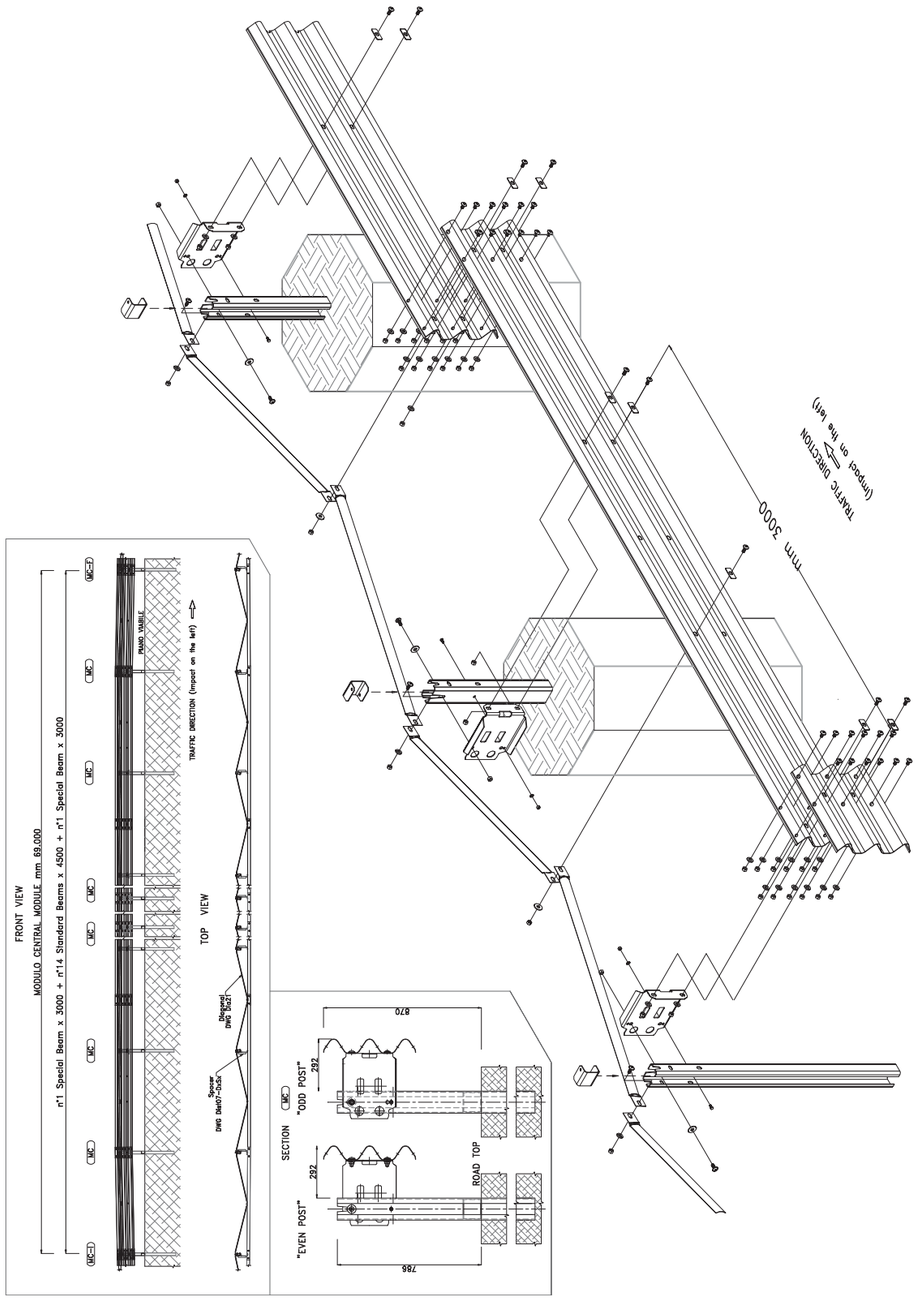
FRONT VIEW



TRAFFIC DIRECTION (Impact on the left) →

TOP VIEW





H2 hard shoulder

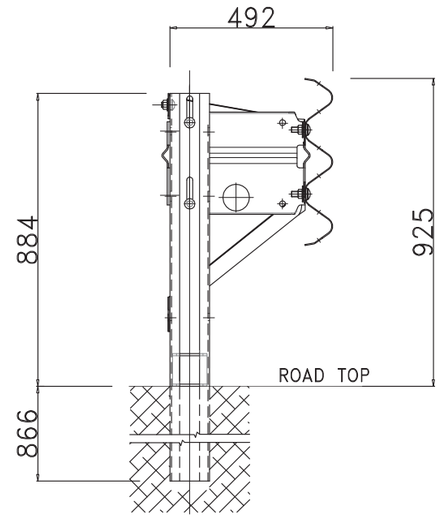
H2BL400

components

- Thrie beam 4500 mm th. 2,5 mm;
- "C" section post 30x80x120 mm th. 5,0 mm
  H= 1750 mm c/c 2250 mm;
- Stiffner for "C" section post;
- Flat horizontal diagonal 68x2,5 mm;
- Spacer;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (1 every 13,50 m).

This barrier provides for Approach/Escape End Sections of 18,00 m (9,00 for approach + 9,00 for escape)

section



- **Dwg. n.: H2BL400**
  c/c distance between the posts: **2.250 mm**

performance

Car 900 kg

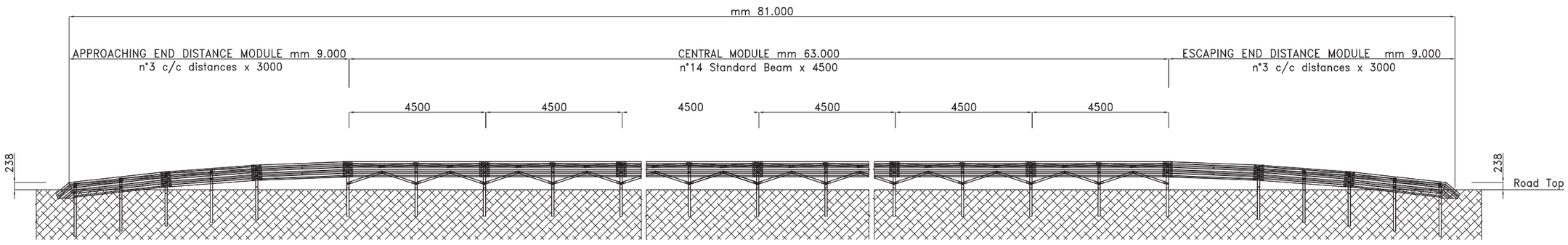
Test:	X61.02.G07
ASI:	1,00
W:	1,00 m (W3≤1,0)
WCDI:	LF0010000
THIV:	25,0 km/h
PHD:	13,0 g

- CE Certificate
  n. 1835-CPD-0008/7

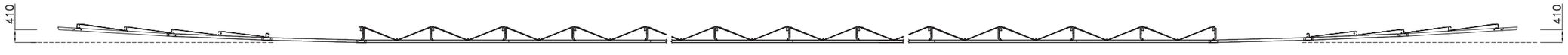
Bus 13.000 kg

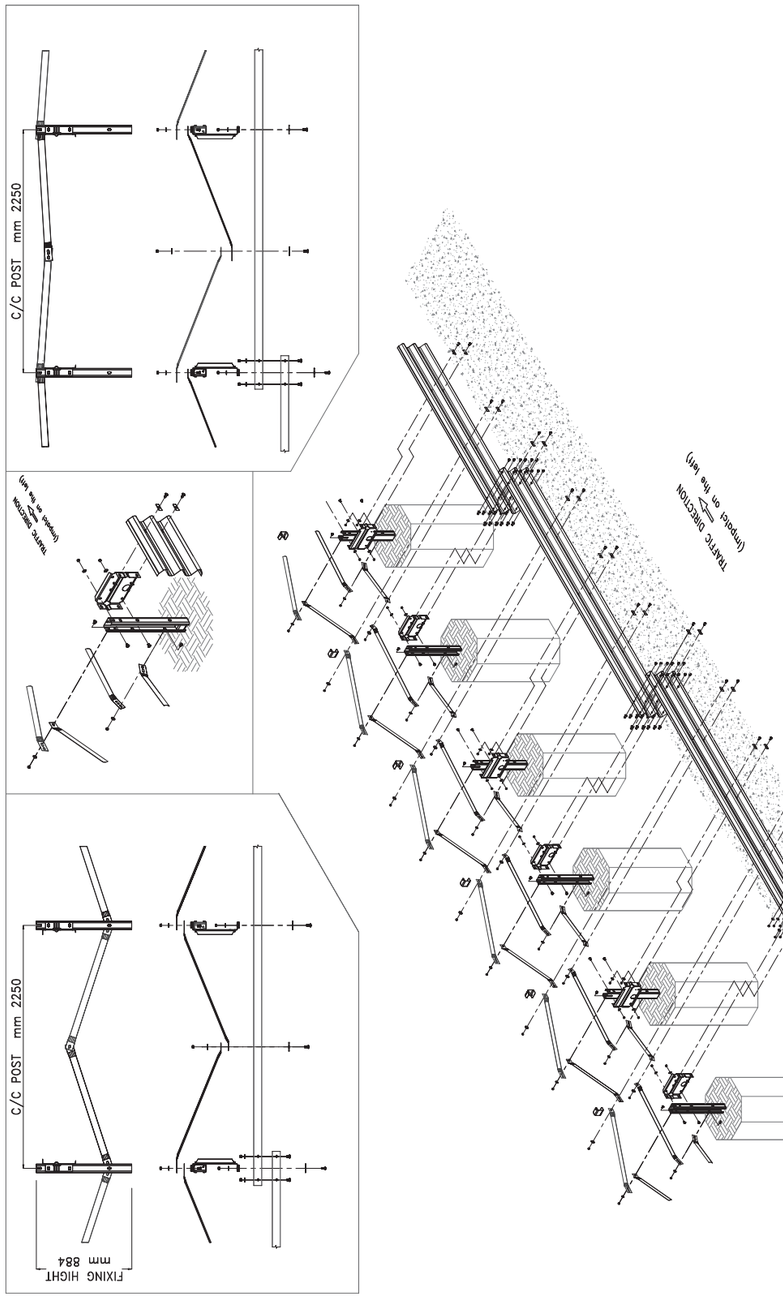
Test:	X61.01.G07
W:	1,60 m (W5≤1,7)

FRONT VIEW



TOP VIEW





H2 hard shoulder

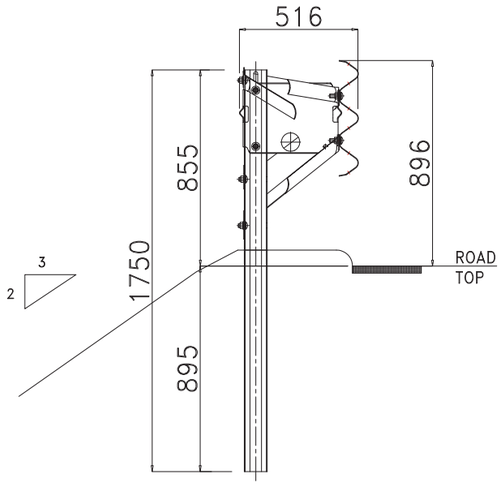
H2BL500-arg.

components

- Thrie beam 4500 mm th. 2,5 mm;
- "C" section post 25x60x100 mm th. 4,0 mm H= 1750 mm c/c 1125 mm;
- Spacer;
- Flat upper and lower diagonal 68x2,5 mm;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (1 every 13,50 m).

This barrier provides for Approach/Escape End Sections of 18,00 m (9,00 for approach + 9,00 for escape)

section



- **Dwg. n.: H2BL500-arg.**
  c/c distance between the posts: **1.125 mm**

performance

Car 900 kg

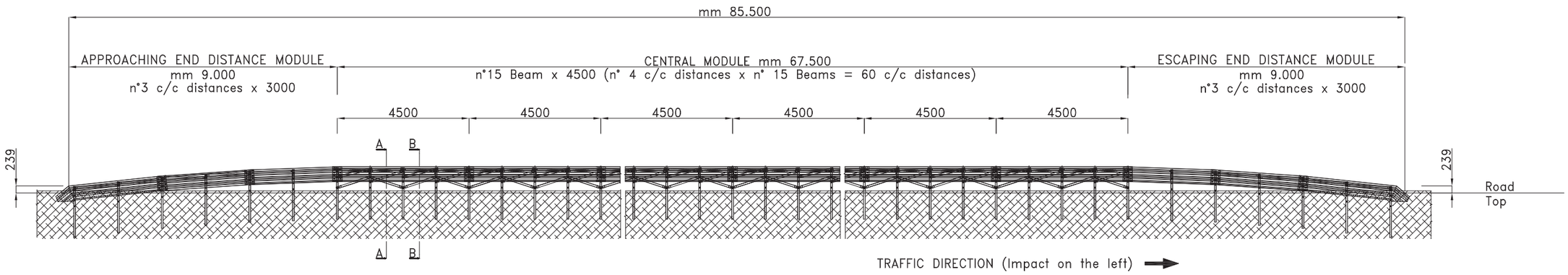
Test:	X61.04.G10
ASI:	1,00
W:	0,90 m (W3≤1,0)
WCDI:	LF1010001
THIV:	28,0 km/h
PHD:	10,0 g

- CE Certificate
  n. 1835-CPD-0008/8

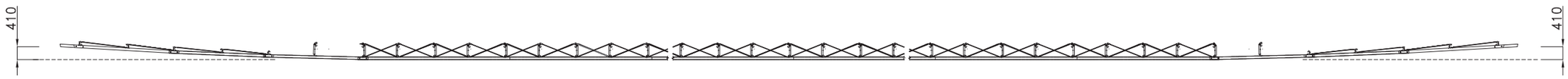
Bus 13.000 kg

Test:	X61.03.G10
W:	1,30 m (W4≤1,3)

FRONT VIEW

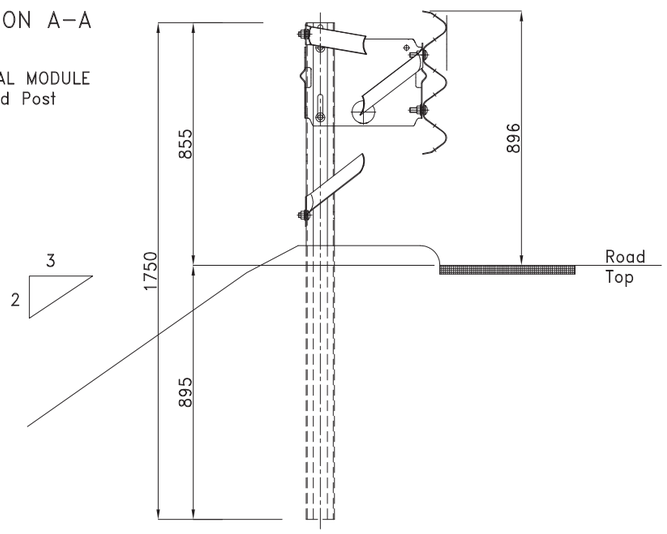


TOP VIEW



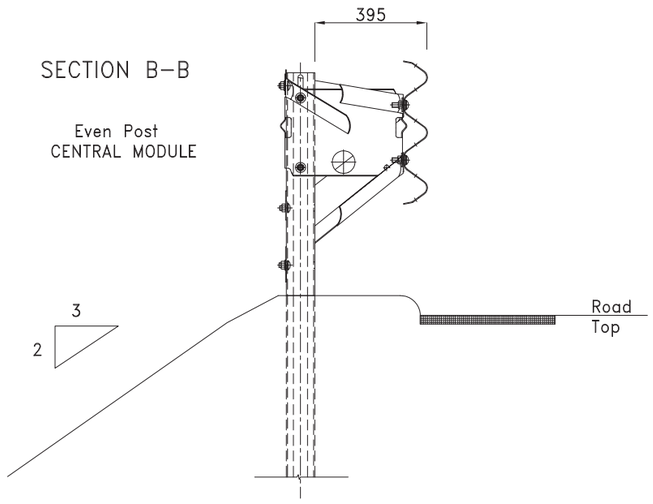
SECTION A–A

CENTRAL MODULE
Odd Post

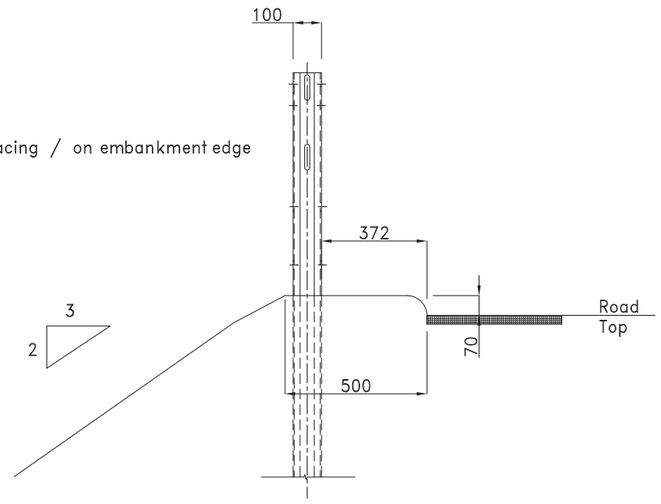


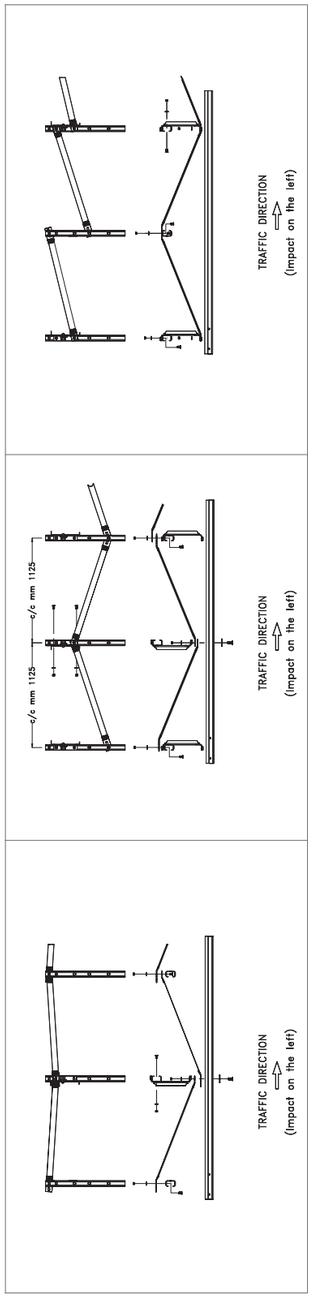
SECTION B–B

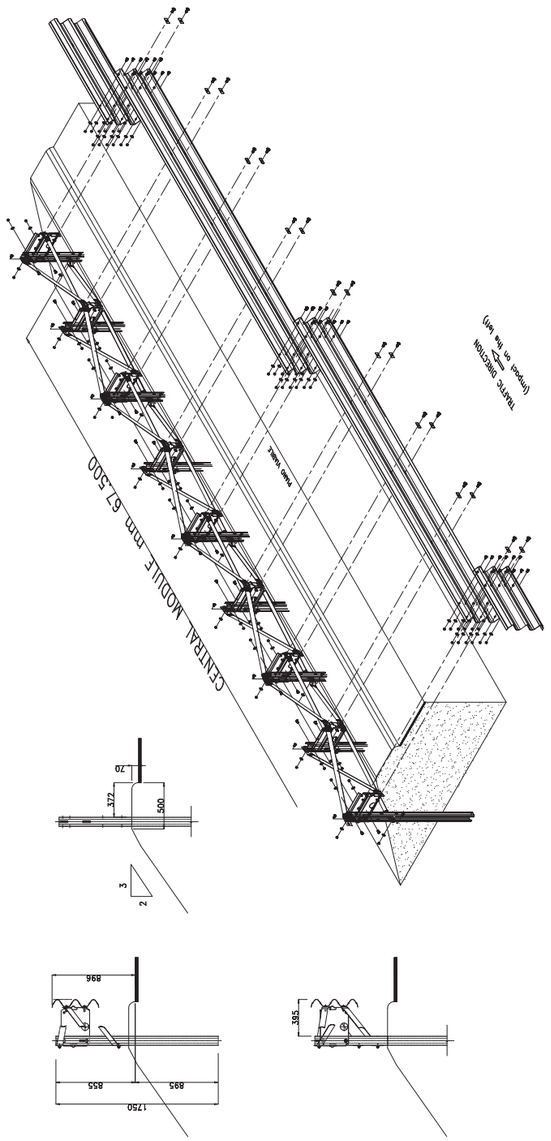
Even Post
CENTRAL MODULE



Post Placing / on embankment edge







» H2 hard shoulder

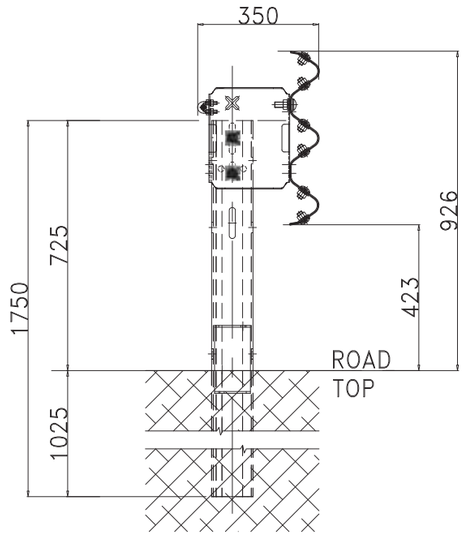
H2BL700

components

- Three wave beam c/c 5333 mm th. 2,5 mm;
- "C" section post 30x80x120 mm th. 5,0 mm H = 1750 mm c/c mm 2667;
- Spacer th.3 mm;
- Stiffener for "C" section post,
- Steel metal rope,
- Unthreading proof plates
- Bolts and nuts;
- Reflector (n° 1 every 10,66 m).

This barrier includes, for each section to be installed, approaching/escaping modules total length 11,610 m (5,805for approach + 5,805 for escape)

section



- **Dwg. n.: H2BL700**
  c/c distance between the posts: **2.666 mm**

performance

Car 900 kg

Test:	844
ASI:	0,70
W:	0,90 m (W3)
VCDI:	LF1011000
THIV:	23,0 km/h

Car kg 1.500

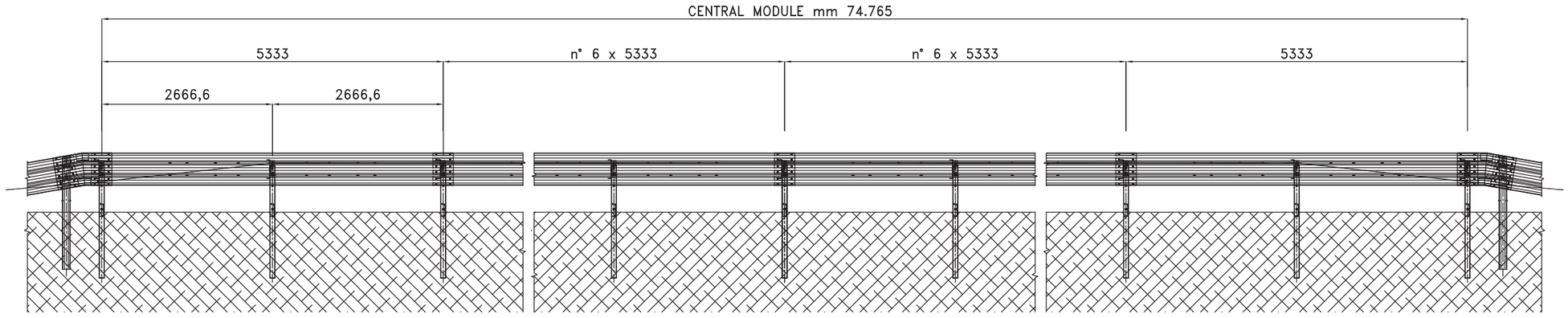
Test:	845
ASI:	0,90
W:	m 0,90 (W3)
VCDI:	LF0000000
THIV	Km/h 23,0

Bus kg 13.000

Test:	843
W:	m 1,3 (W4)

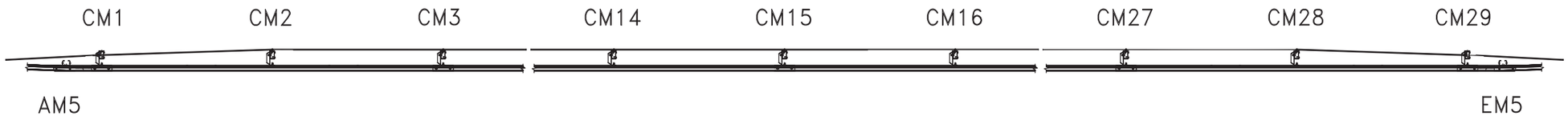
- CE Certificate
  n. 1835-CPD-0008/14

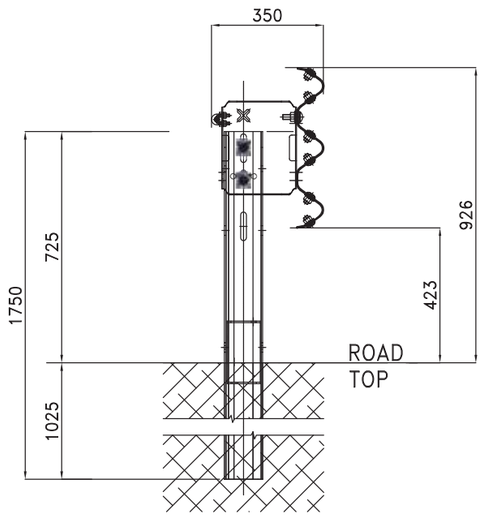
FRONT VIEW

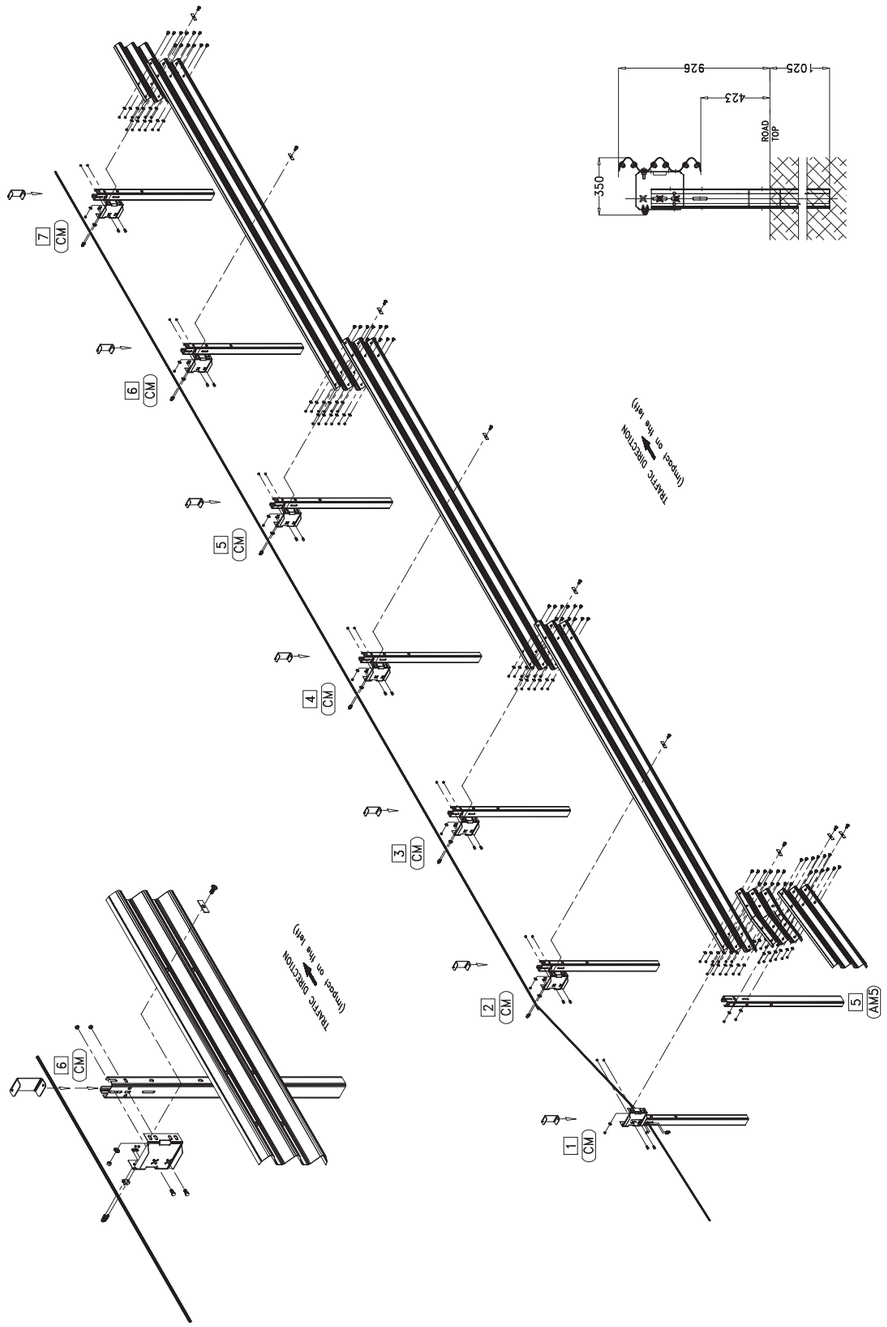


TRAFFIC DIRECTION (Impact on the left)

TOP VIEW







H2 hard shoulder

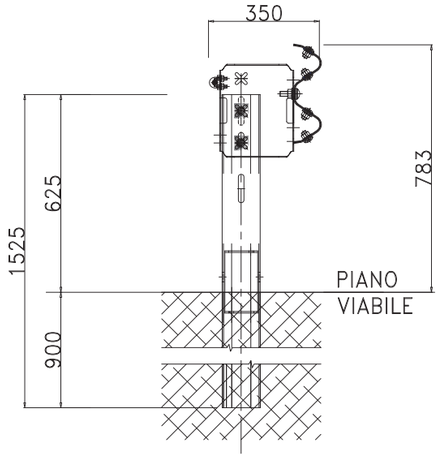
H2BL800

components

- W beam c/c 5333 mm th. 3,0 mm;
- "C" section post 30x80x120 mm th. 4,0 mm H = 1525 mm c/c mm 2667;
- Spacer th.3 mm;
- Stiffener for "C" section post
- Steel metal rope,
- Unthreading proof plates
- Bolts and nuts;
- Reflectors (n° 1 every 10,66 m).

This barrier includes, for each section to be installed, approaching/escaping modules total length 11,610 m (5,805 for approach + 5,805 for escape)

section



- **Dwg. n.: H2BL800**
  c/c distance between the posts: **2.666 mm**

performance

Car 900 kg

Test:	874
ASI:	0,70
W:	1,00 m (W3)
VCDI:	.
THIV:	24,0 km/h
PHD:	9,26 g

Car kg 1.500

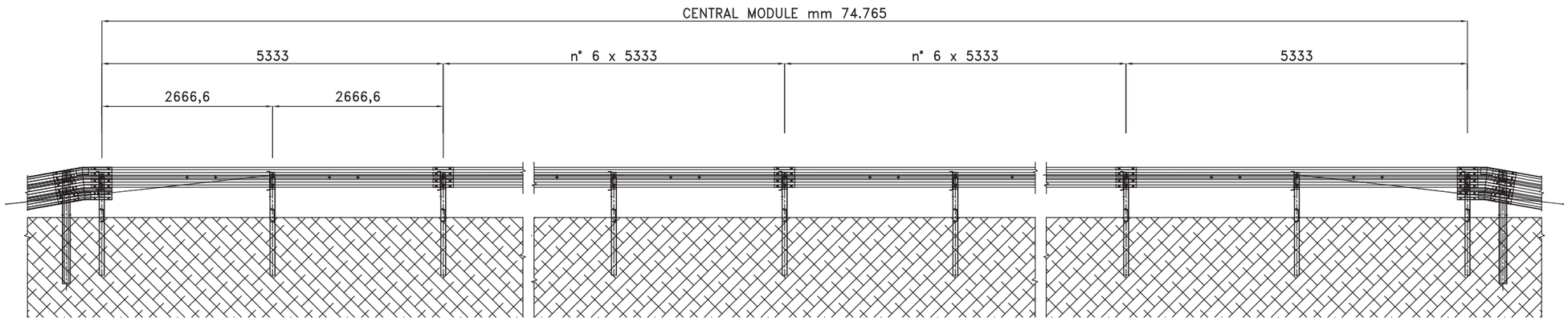
Test:	875
ASI:	0,60
W:	m 1,40 (W5)
VCDI:	.
THIV	Km/h 19,0
PHD:	11,03 g

Bus kg 13.000

Test:	873
W:	m 1,7 (W5)

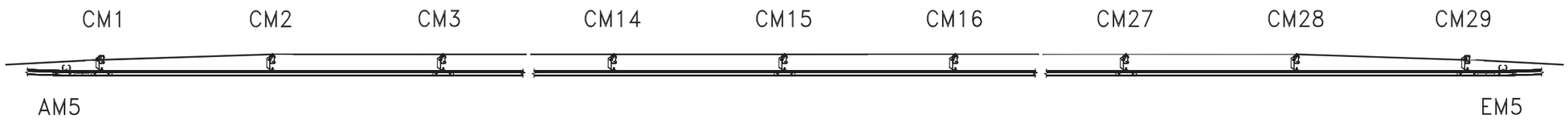
- CE Certificate
  n. 1835-CPD-0008/15

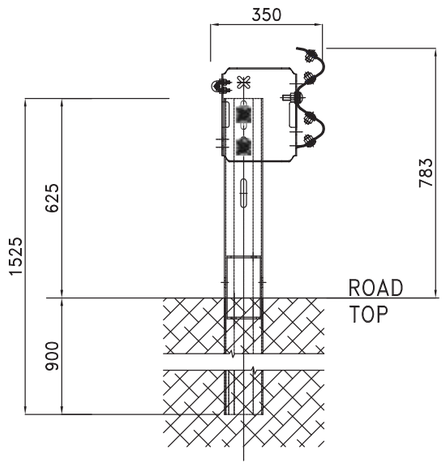
FRONT VIEW

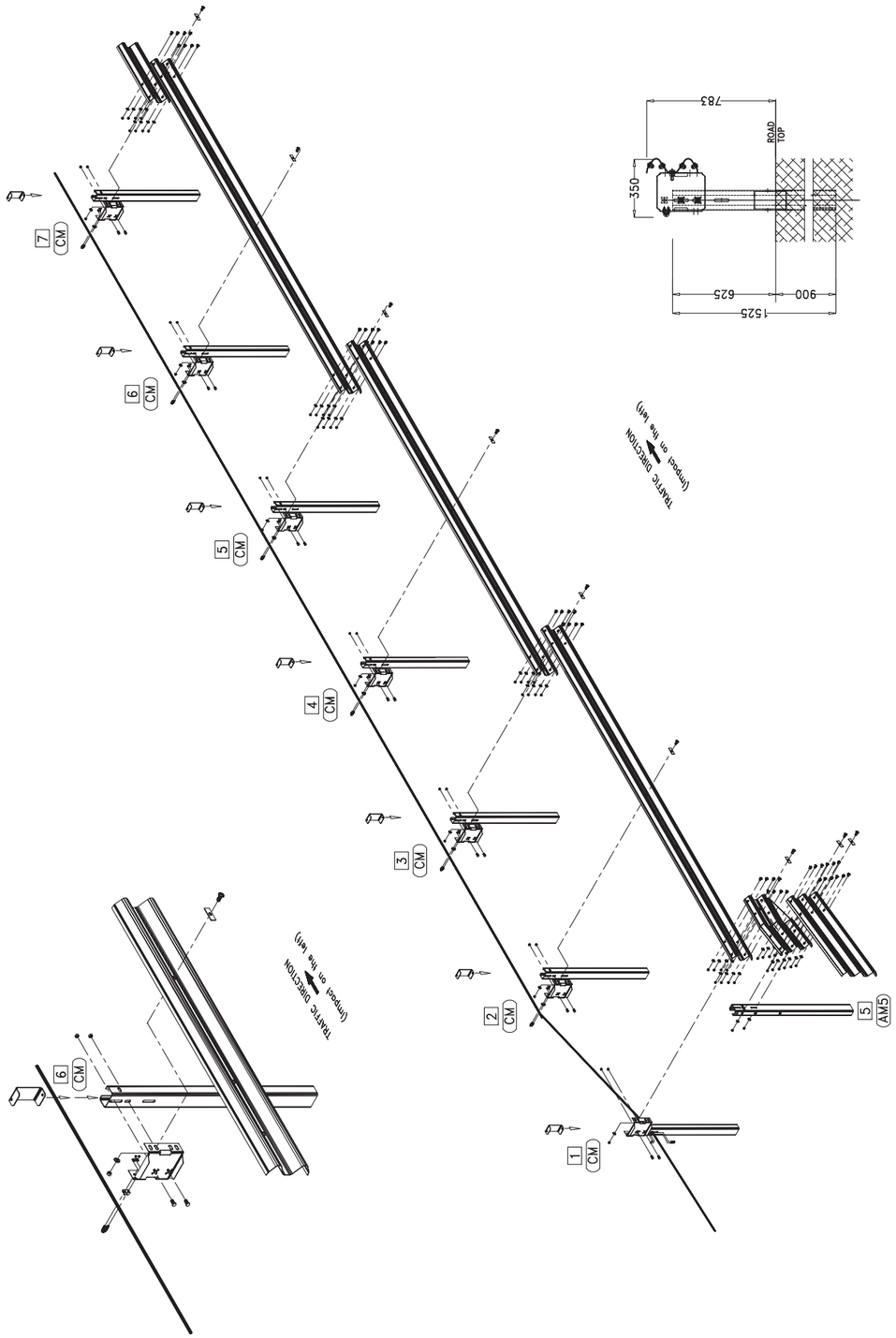


TRAFFIC DIRECTION (Impact on the left)

TOP VIEW







H3 hard shoulder

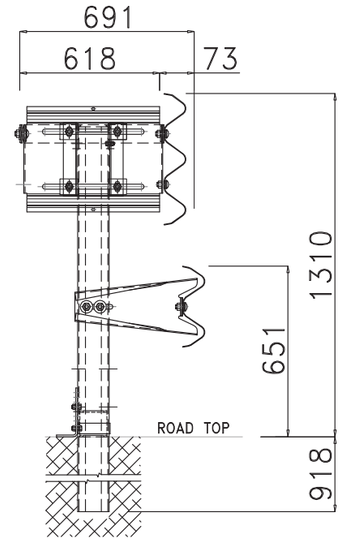
H3BL200

components

- W lower beam 4500 mm th. 2,5 mm;
- Thrie upper beam 4500 mm th. 2,5 mm;
- "C" section post 30x80x120x80x30 mm th.5,0 mm H= 2100 mm c/c 2250 mm;
- Little base, collar and stiffner for "C" post;
- Lower spacer th. 4,0 mm;
- Upper spacer th. 4,0 mm with unhooking device;
- Flat horizontal diagonal 70x5,0 mm (1:3 c/c-p= 6750 mm);
- Upper plate c/c 70x5,0 mm;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (1 every 13,5 m).

This barrier provides Approach/Escape End Sections of 27,00 m (13,5 for approach + 13,5 for escape)

section



- **Dwg. n.: H3BL200**
  c/c distance between the posts: **2.250 mm**

performance

Car 900 kg

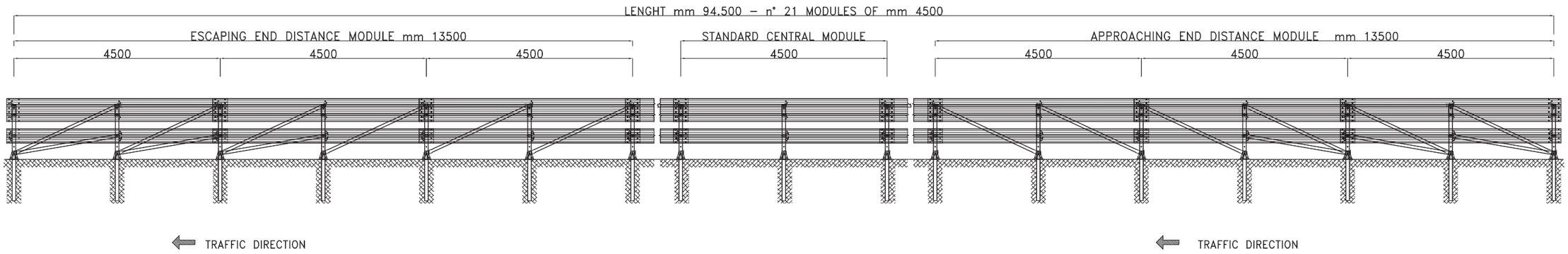
Test:	IME/BSI-29/680B
ASI:	1,00
W:	1,00 m (W3≤1,0)
WCDI:	RS0000000
THIV:	25,0 km/h
PHD:	13,0 g

- CE Certificate
  n. 1835-CPD-0008/9

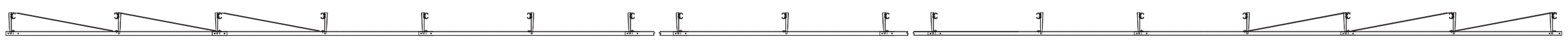
Truck 16.000 kg

Test:	IME/BSI-33/690B
W:	2,70 m (W8≤3,5)

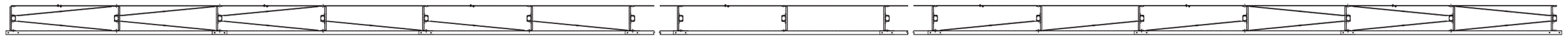
FRONT VIEW



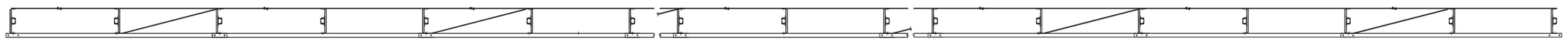
LOW DIAGONAL ARRANGEMENT (DWG DIA08) FROM POST BASE TO W BEAM

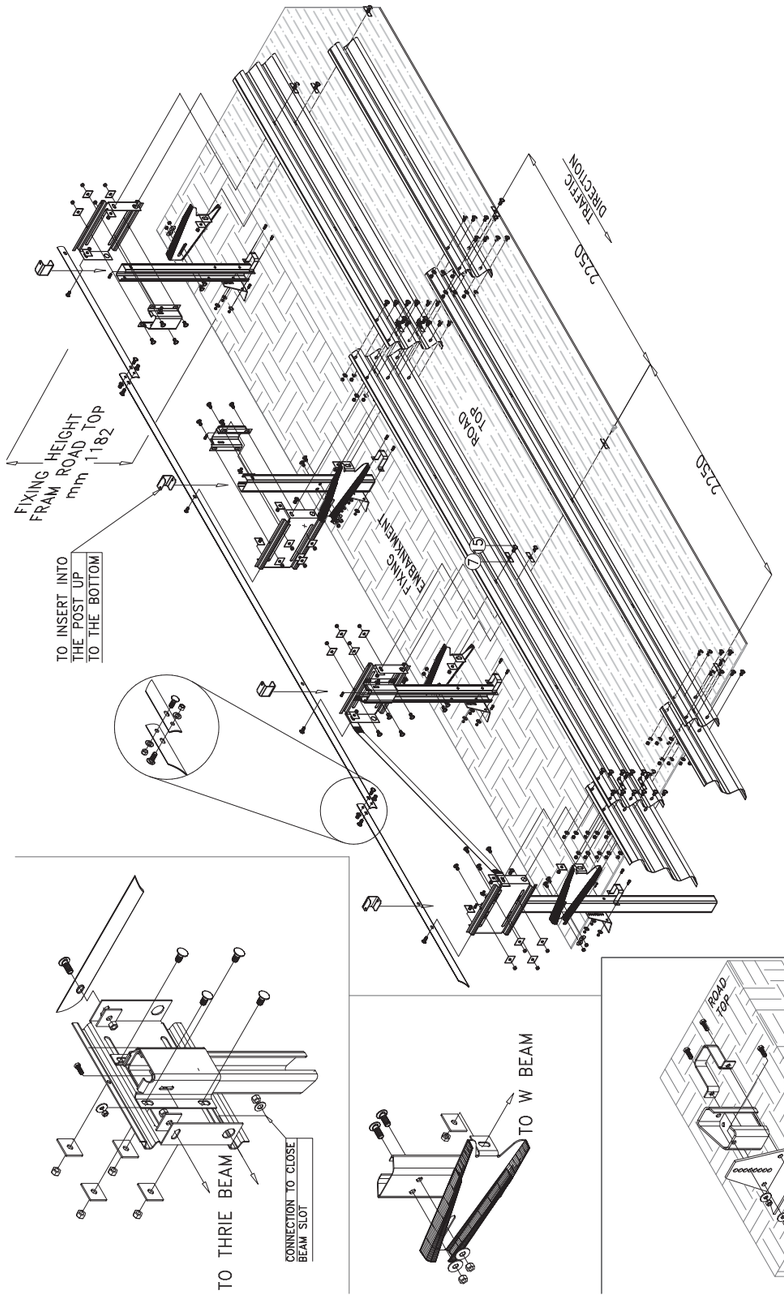


HIGH DIAGONAL ARRANGEMENT (DWG DIA07) FROM POST BASE TO THRIE BEAM



HORIZONTAL TOP DIAGONAL ARRANGEMENT (DWG DIA06) FROM THE BACK OF THRIE SPACER TO THE FRONT





H3 hard shoulder

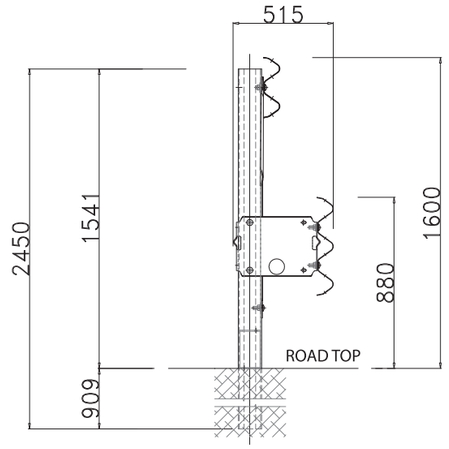
H3BL300

components

- W upper beam 5333 mm th. 2,5 mm;
- Thrie lower beam 5333 mm th. 2,5 mm;
- "C" section post 30x80x120 mm th. 5,0 mm H= 2450 mm c/c1777 mm;
- Stiffner for "C" section post;
- Spacer for lower thrie beam th. 4,0 mm;
- Vertical flat diagonal 70x5,0 mm;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (1 every 16 m).

This barrier provides Approach/Escape End Sections of 32,0 m (16 of approach + 16 of escape)

section



- **Dwg. n.: H3BL300**
  c/c distance between the posts: **1.777 mm**

performance

Car 900 kg

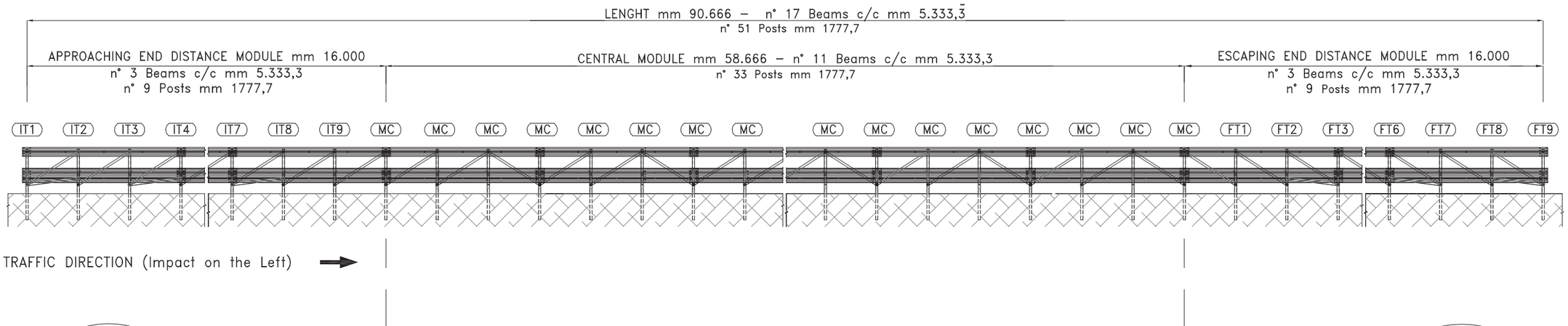
Test:	IME/BAM - 008/1197
ASI:	1,00
W:	0,80 m (W2≤0,8)
WCDI:	LF0001000
THIV:	27,0 km/h
PHD:	10,0 g

- CE Certificate
  n. 1835-CPD-0008/10

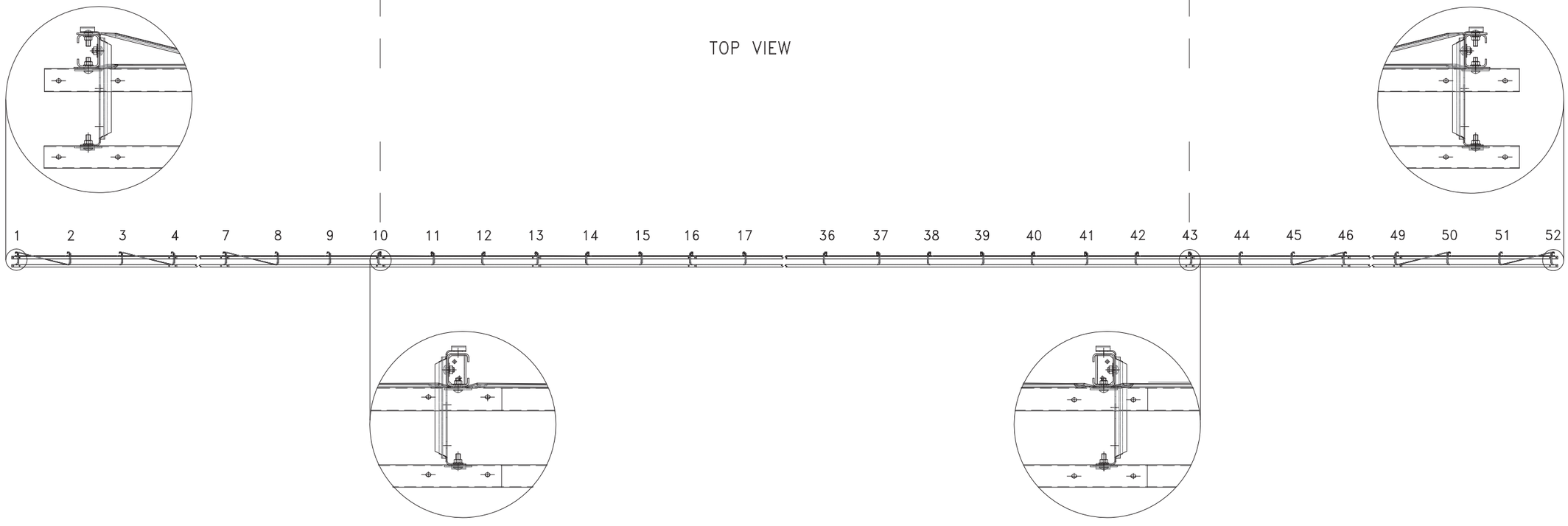
Truck 16.000 kg

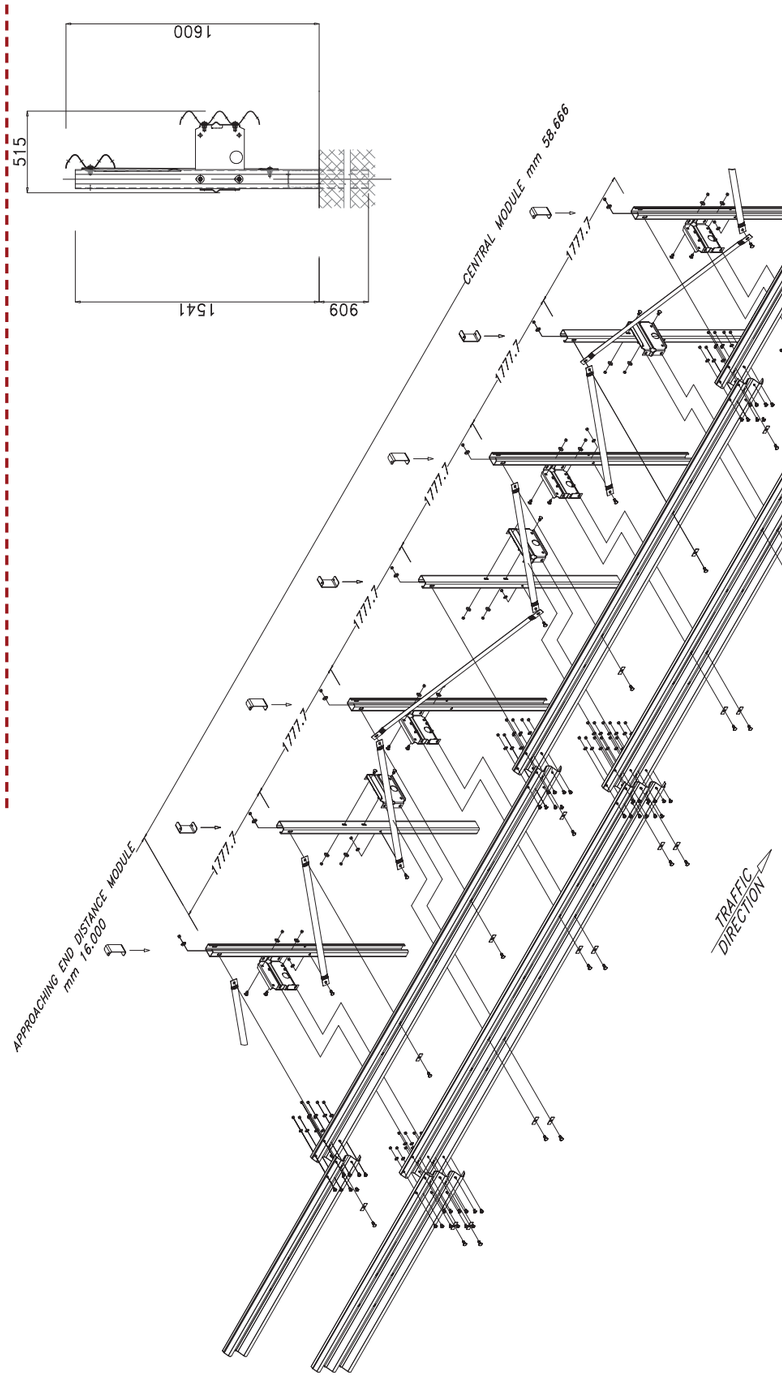
Test:	IME/BAM - 007/1196
W:	1,60 m (W5≤1,7)

FRONT VIEW



TOP VIEW





H4a hard shoulder

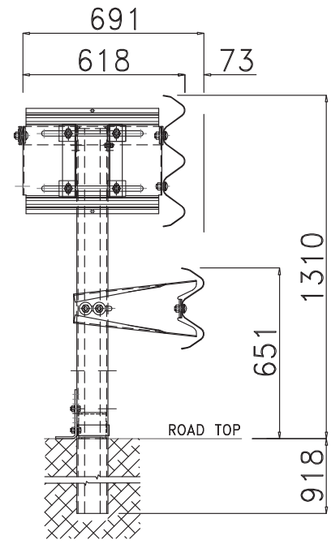
H4aBL100

components

- W lower beam 4500 mm th. 2,5 mm;
- Thrie upper beam 4500 mm th. 2,5 mm;
- "C" section post 30x80x120x80x30 mm th. 5,0 mm H= 2100 mm c/c 2250 mm;
- Little base, collar and stiffner for "C" post;
- Lower spacer th. 4,0 mm;
- Upper spacer th. 4,0 mm with unhooking device;
- Flat horizontal diagonal 70x5,0 mm (1:3 c/c-p= 6750 mm);
- Upper plate c/c 70x5,0 mm;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (1 every 13,5 m).

This barrier provides Approach/Escape End Sections of 27,00 m (13,5 for approach + 13,5 for escape)

section



- **Dwg. n.: H4aBL100**
  c/c distance between the posts: **2.250 mm**

performance

Car 900 kg

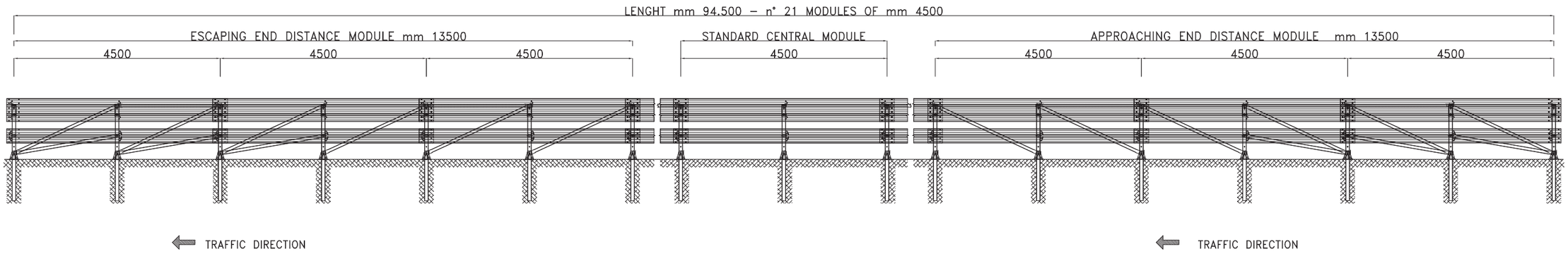
Test:	IME/BSI-29/680B
ASI:	1,00
W:	1,00 m (W3≤1,0)
WCDI:	RS0000000
THIV:	25,0 km/h
PHD:	13,0 g

- CE Certificate
  n. 1835-CPD-0008/11

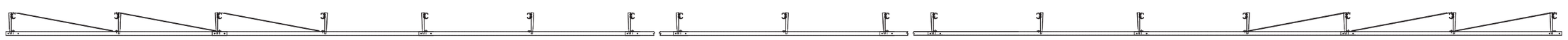
Truck 30.000 kg

Test:	IME/BSI-38/719B
W:	2,90 m (W8≤3,5)

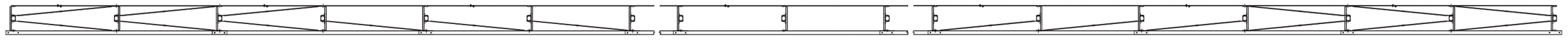
FRONT VIEW



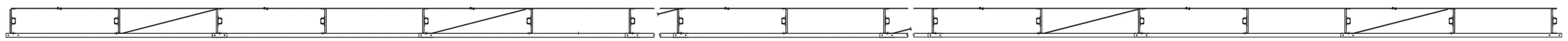
LOW DIAGONAL ARRANGEMENT (DWG DIA08) FROM POST BASE TO W BEAM

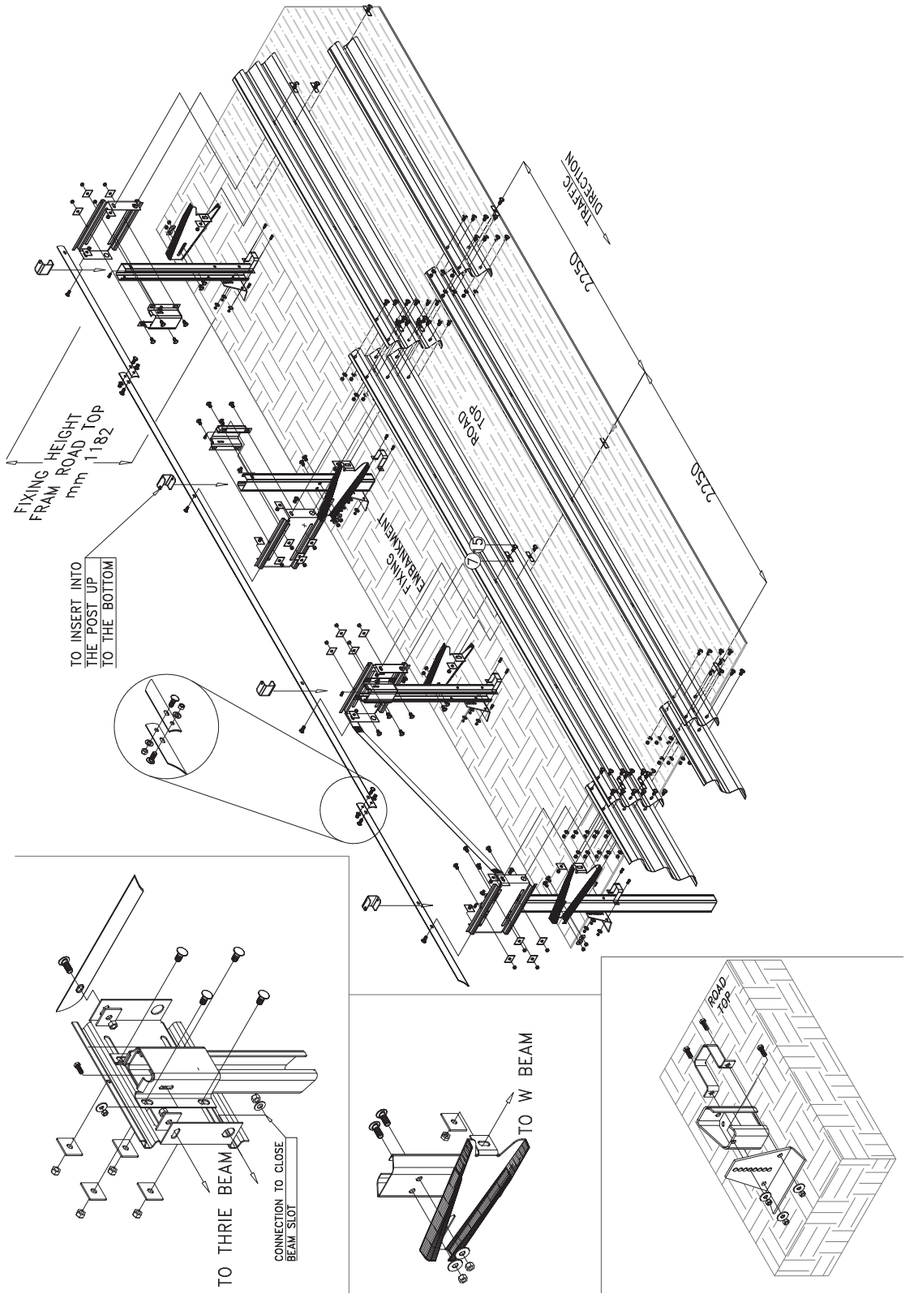


HIGH DIAGONAL ARRANGEMENT (DWG DIA07) FROM POST BASE TO THRIE BEAM



HORIZONTAL TOP DIAGONAL ARRANGEMENT (DWG DIA06) FROM THE BACK OF THRIE SPACER TO THE FRONT





H4 hard shoulder

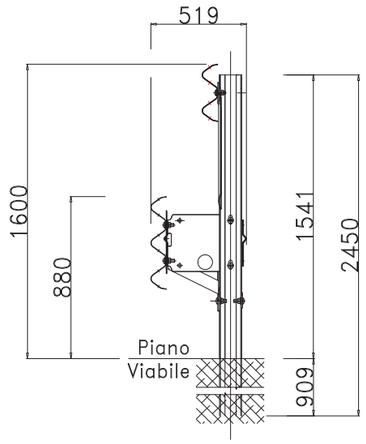
H4bBL200

components

- Three wave lower beam c/c. 5333 mm th 2,5 mm;
- W upper beam c/c. 5333 mm th 4,0 mm;
- "C" section post 30x80x120 mm th. 5,0 mm H = 2450 mm c/c mm 1777,7;
- Stiffener for "C" section post
- Spacer th.4,0 mm for three wave lower beam;
- Oblique diagonal 70x5 mm;
- Unthreading proof plate;
- Bolts and nuts;
- Reflectors (n° 1 every 16,0 m).

This barrier includes, for each section to be installed, approaching/escaping modules total length 32,00 m (16,00 for approach + 16,00 for escape)

section



- **Dwg. n.: H4bBL200**
  c/c distance between the posts: **1.777,7 mm**

performance

Car kg 900

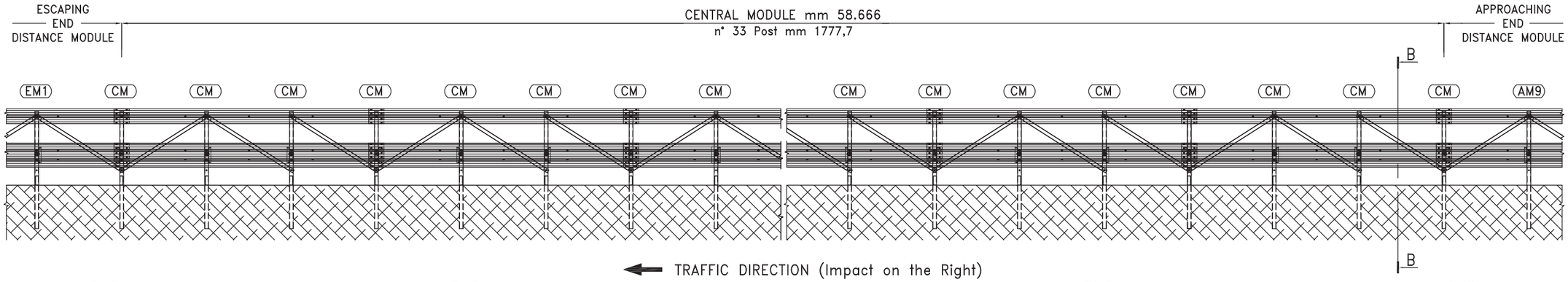
Test:	IME/BDM -001/1267
ASI:	1,00
W:	m 0,90 (W3)
VCDI:	RF0000110
THIV	Km/h 26,0
PHD	g 10,0

- CE Certificate
  n. 1835-CPD-0008/12

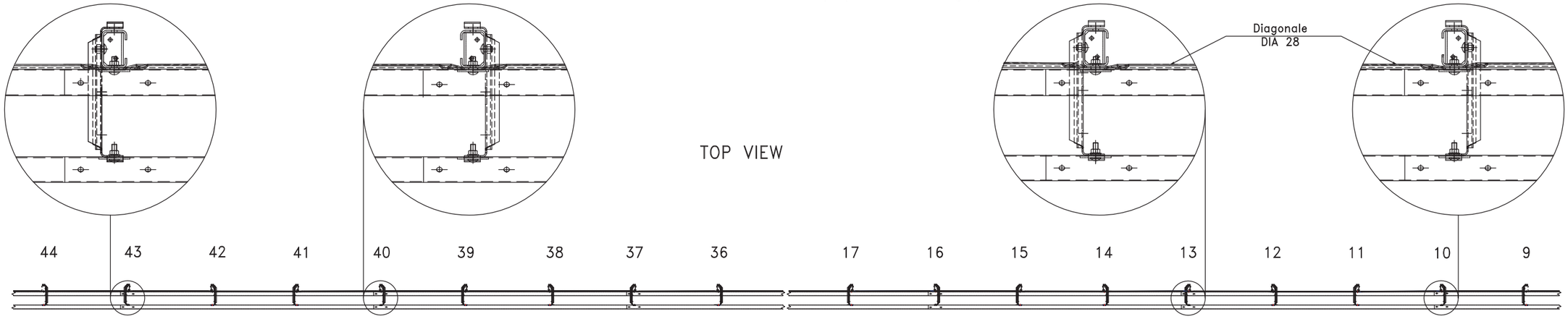
Truck kg 38.000

Test:	IME/BDM-002/1268
W:	m 1,90 (W6)

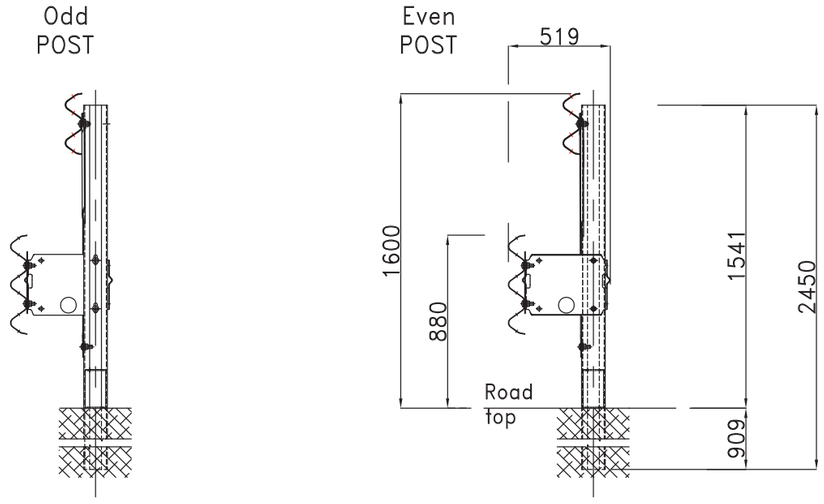
FRONT VIEW

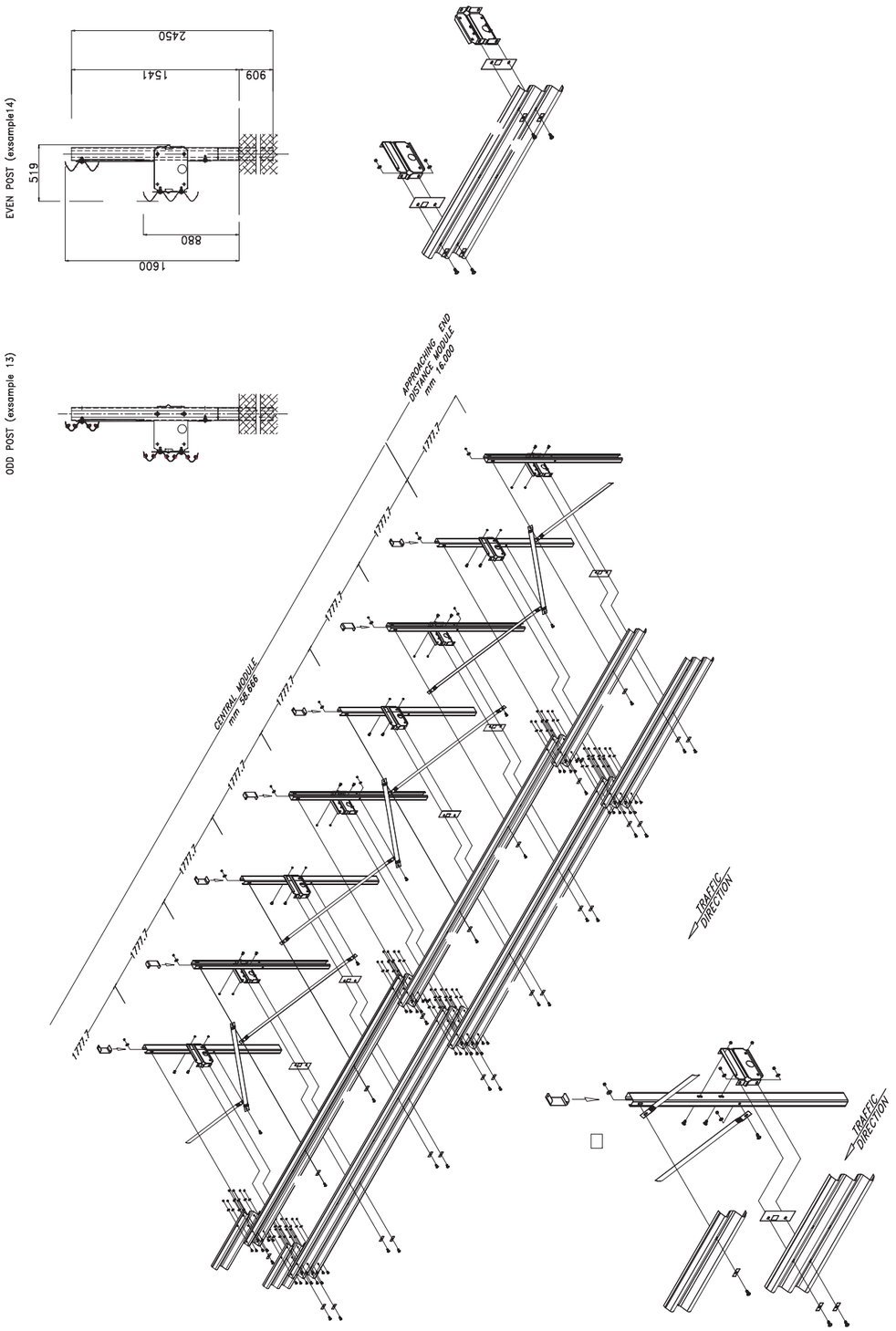


TOP VIEW



SECTION
B–B





H2 bridge barrier

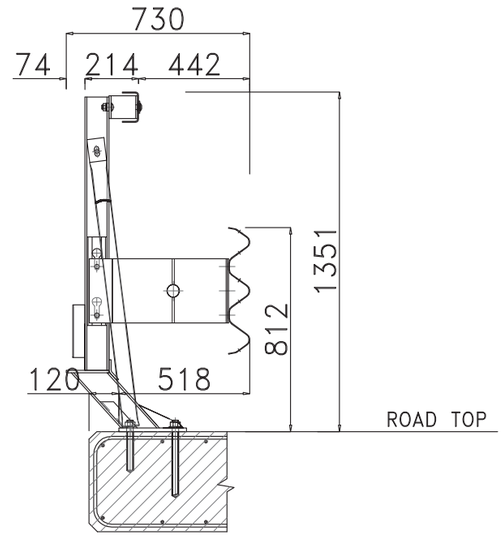
H2BP200

components

- Thrie beam 4500 mm th. 2,5 mm;
- "HEA 100" post with base plate with a c/c distance of 3000 mm ;
- Spacer th. 5,0 mm;
- "U" section upper handrail 65x120x65 mm th. 4,0 mm with spacer;
- Horizontal and oblique diagonal;
- Unthreading proof little plate;
- Bolts and nuts;
- Anchorbolts MA 24;
- Reflectors (1 every 13,5 m).

This barrier provides Approach/Escape End Sections of 27,00 m (13,5 for approach + 13,5 for escape)

section



- **Dwg. n.: H2BP200**
  c/c distance between the posts: **3.000 mm**

performance

Car 900 kg

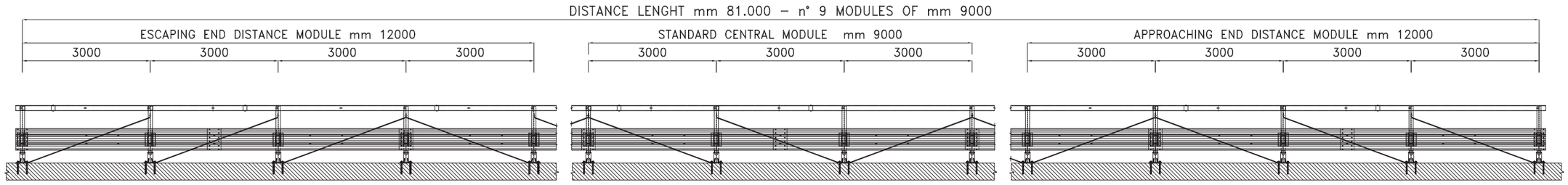
Test:	IME/BSI -42/791A
ASI:	1,00
W:	0,70 m (W2≤0,8)
WCDI:	RS0000000
THIV:	22,0 km/h
PHD:	16,0 g

- CE Certificate
  n. 1835-CPD-0008/101

Bus 13.000 kg

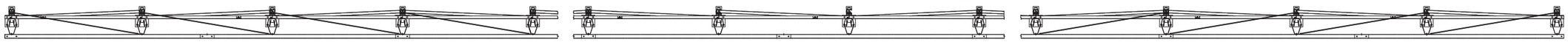
Test:	IME/BSI-43/792A
W:	1,40 m (W5≤1,7)

FRONT VIEW

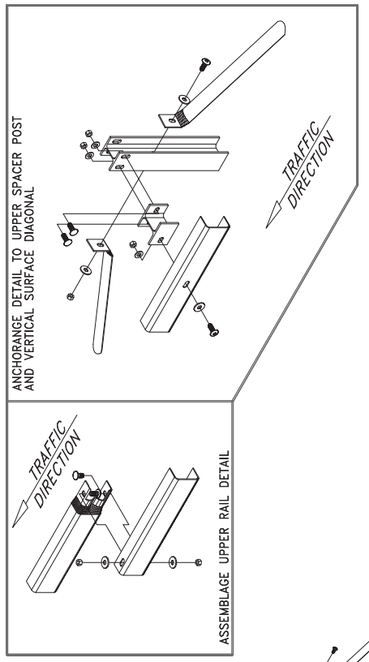


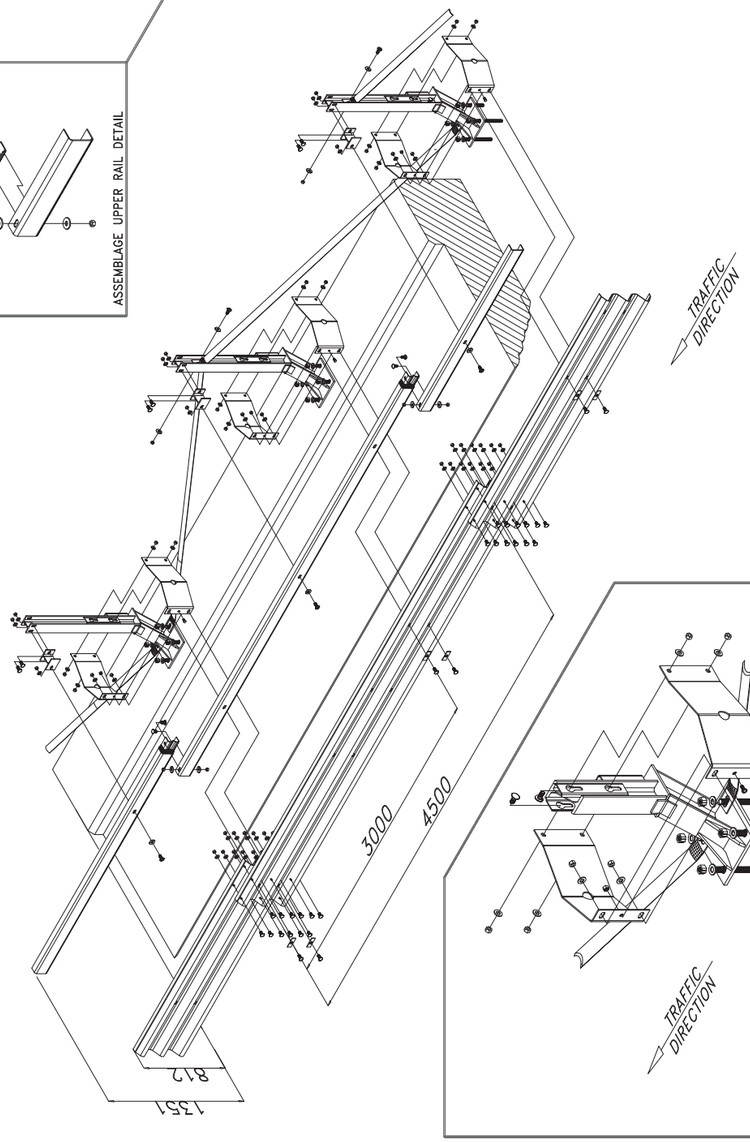
TRAFFIC DIRECTION
(Impact on the right)

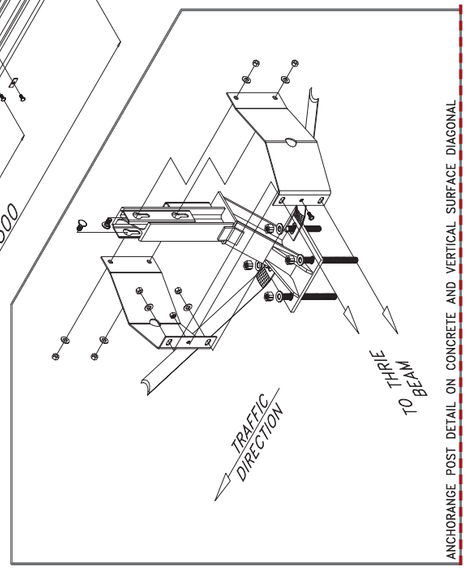
TOP VIEW



TRAFFIC DIRECTION
(Impact on the right)







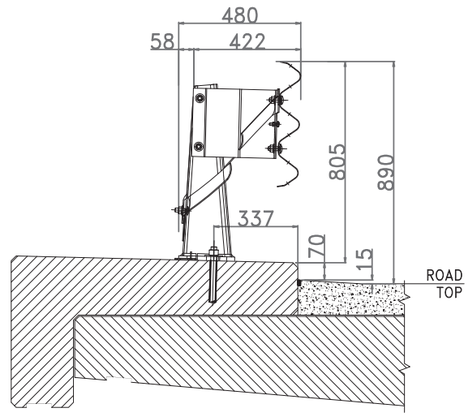
H2 bridge barrier

H2BP300-aus.

components

- Thrie beam 4500 mm th. 2,5 mm;
- "C" tapered post with base plate with a c/c distance of 1333 mm;
- Spacer th. 4,0 mm;
- Diagonal;
- Unthreading proof little plate;
- Bolts and nuts;
- Anchorbolts MA 24;
- Reflectors (1 every 12,0 m).

section



- **Dwg. n.: H2BP-aus.**
  c/c distance between the posts: **1.333 mm**

performance

Car 900 kg

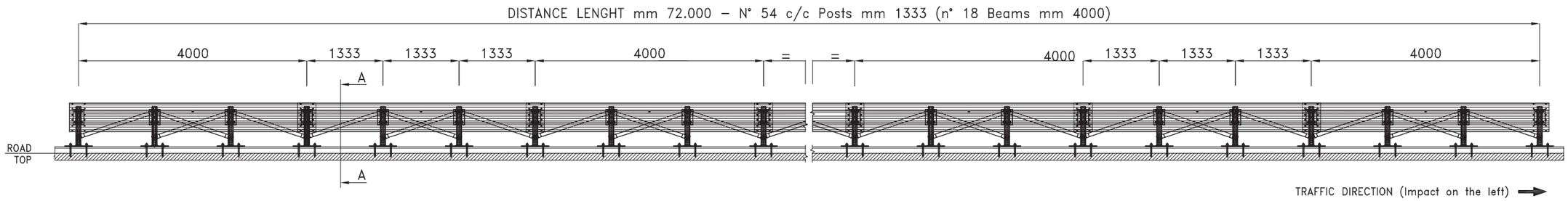
Test:	X61.03.I01
ASI:	1,1
W:	0,50 m (W1≤0,6)
WCDI:	LF0010000
THIV:	27,0 km/h
PHD:	13,0 g

- CE Certificate
  n. 1835-CPD-0008/103

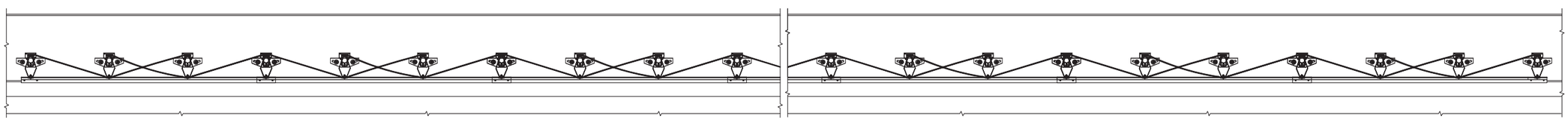
Bus kg 13.000

Test:	X61.01.I01
W:	0,80 m (W2≤0,8)

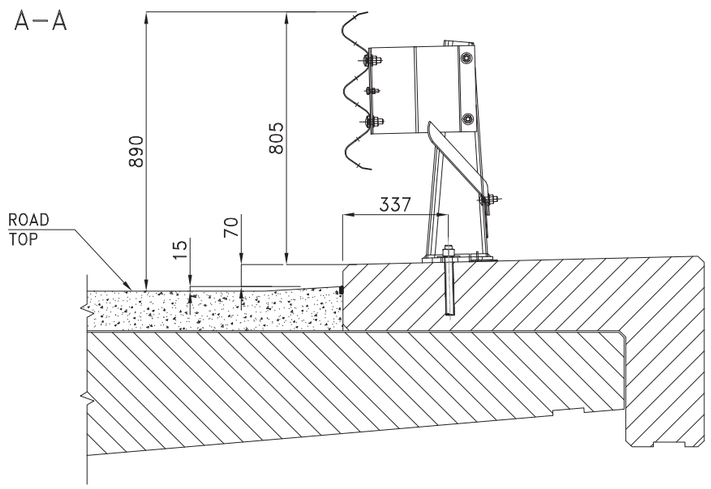
FRONT VIEW

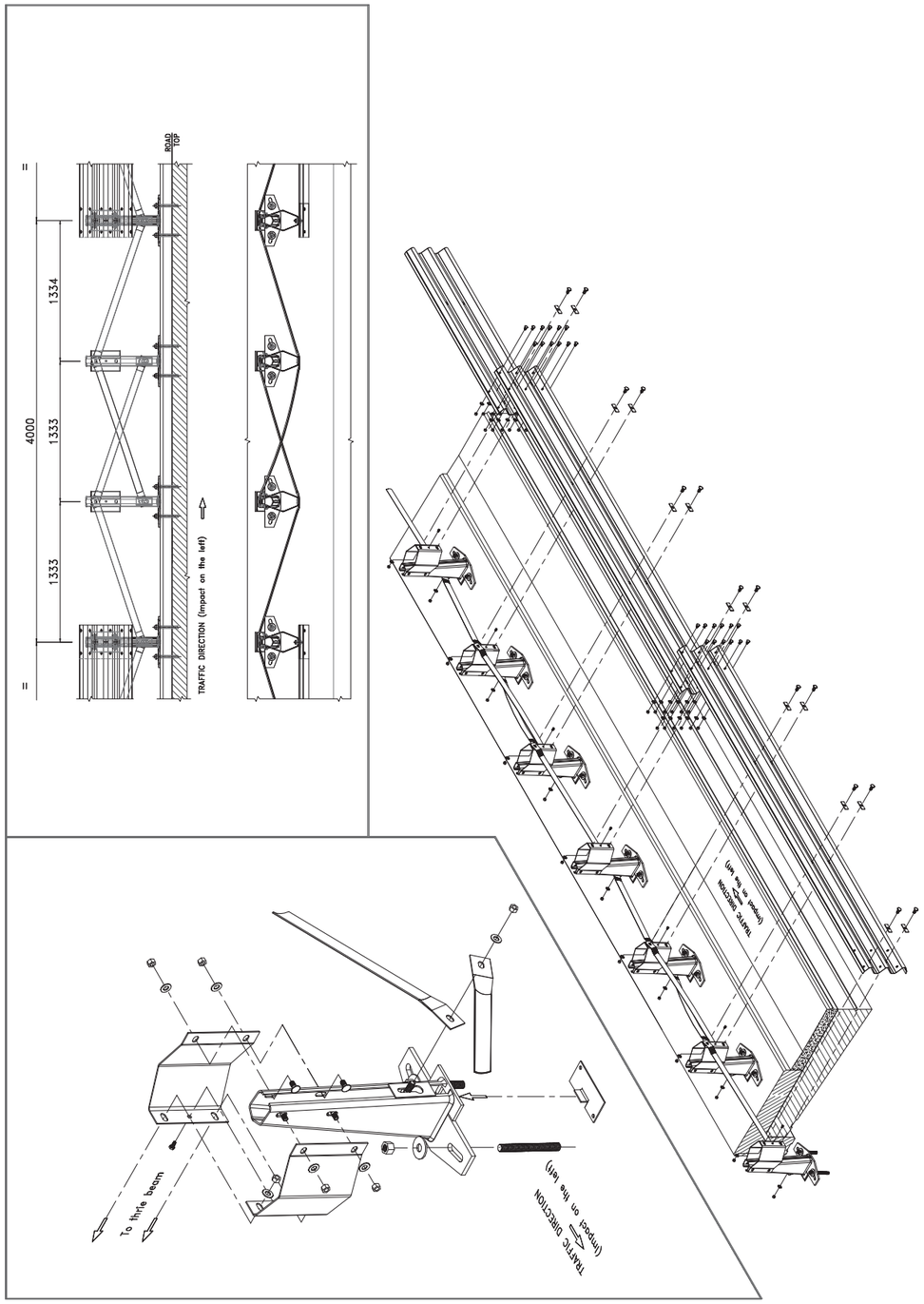


TOP VIEW



SECTION A–A





H2 bridge barrier

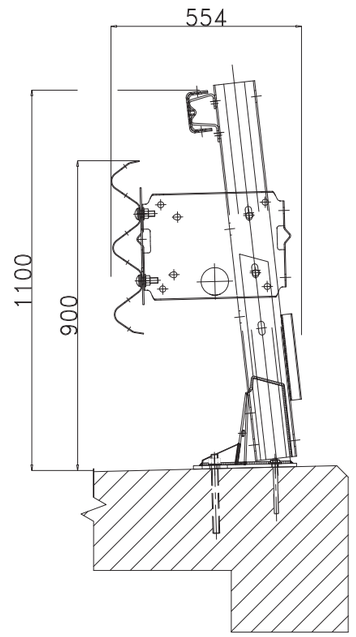
H2BP400

components

- Three wave beam c/c 5333 mm th 2,5 mm;
- "U" section upper rail 65x120x65 mm th. 4,0 mm c/c. 5333 mm with linkage;
- "C" section post 30x80x120 mm th. 4,0 mm, H= 1114 mm with base plate, c/c mm 2666,6;
- Spacer th. 3,0 mm for three wave beam;
- Vertical and horizontal diagonal 70x5 mm for approaching/escaping section;
- Unthreading proof plate;
- Bolts and nuts;
- Anchorbolts MA 16 and MA 20;
- Reflectors (n° 1 every 16,0 m).

This barrier includes, for each section to be installed, approaching/escaping modules total length 21,332 m (10,666 for approach + 10,666 for escape)

section



- **Dwg. n.: H2BP400**
  c/c distance between the posts: **2.666 mm**

performance

Car kg 900

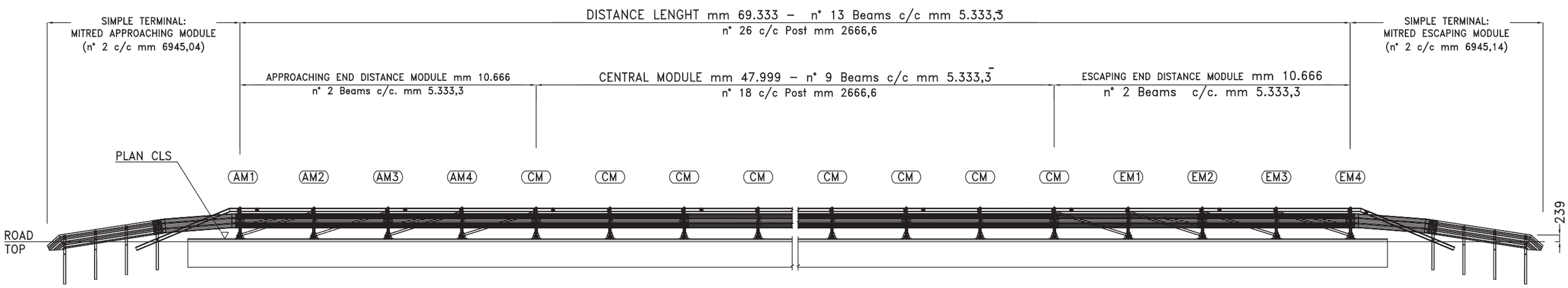
Test:	X61.02.K06Rev01
ASI:	1,20
W:	m 0,60 (W1)
VCDI:	LF0000001
THIV	Km/h 27,0
PHD	g 16,0

- CE Certificate
  n. 1835-CPD-0008/104

Bus kg 13.000

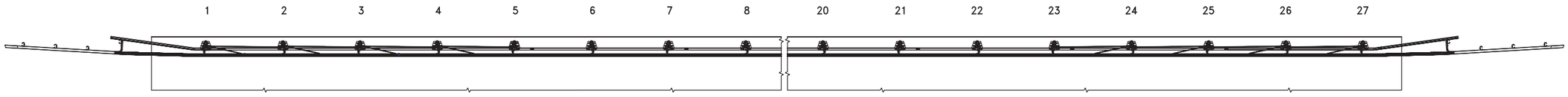
Test:	X61.03.K06Rev01
W:	m 1,40 (W5)

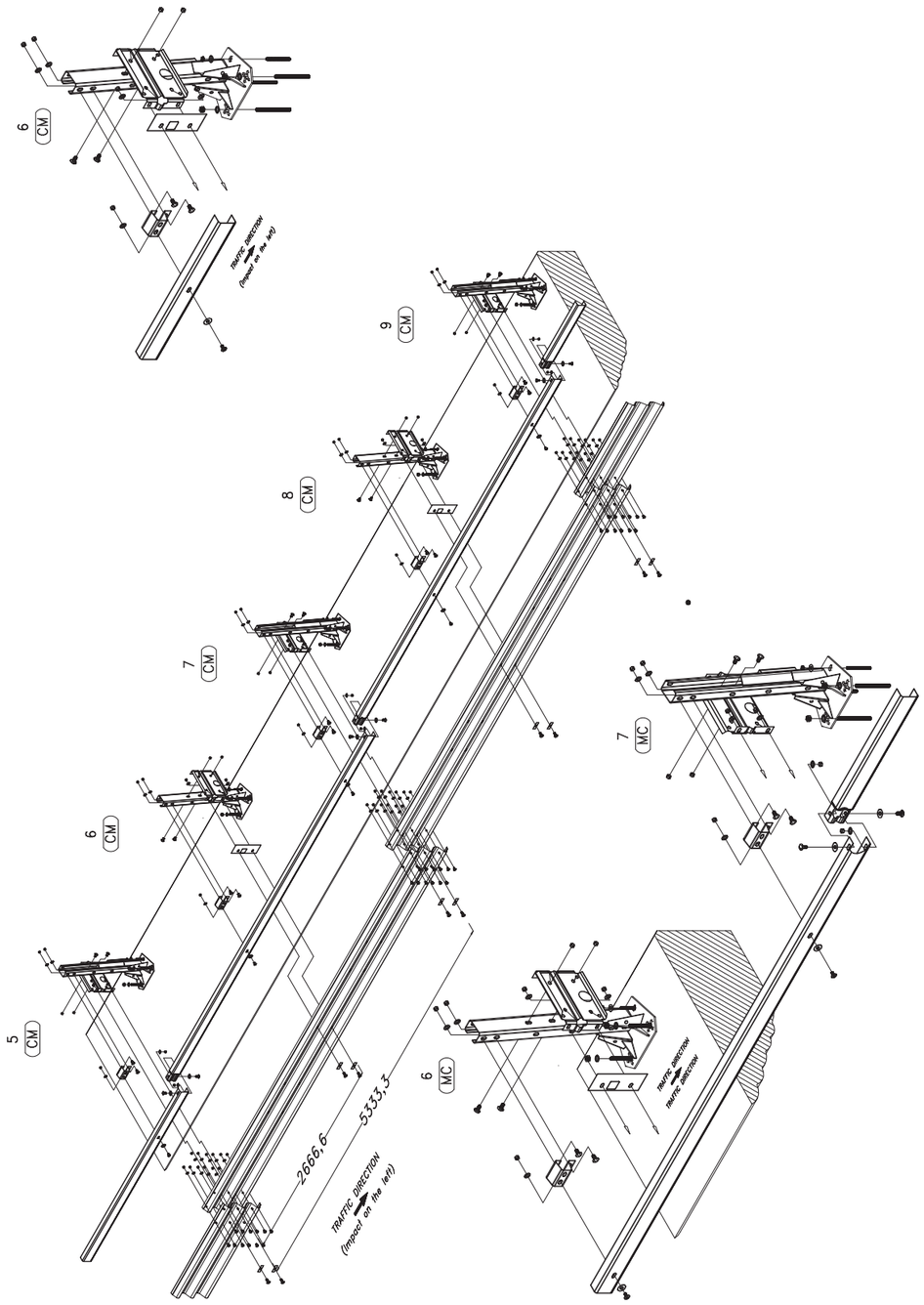
FRONT VIEW



TRAFFIC DIRECTION (Impact on the left) →

TOP VIEW





H2 bridge barrier with panels on concrete 13 cm

H2BP200P3000

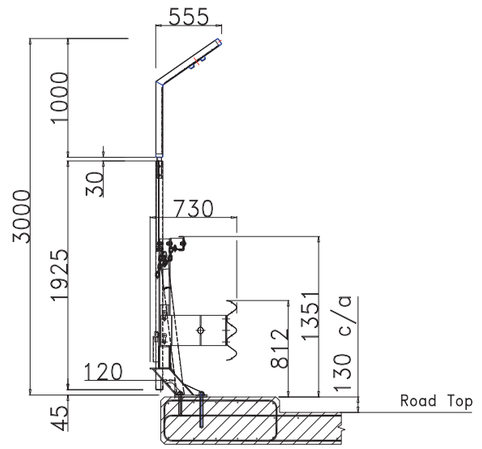
components

- Thrie beam 4500 mm th. 2,5 mm;
- "HEA 100" post with base plate with a c/c distance of 3000 mm;
- Spacer th. 5,0 mm;
- "U" section upper handrail 65x120x65 mm th. 4,0 mm with spacer;
- Horizontal and oblique diagonal;
- Unthreading proof little plate;
- Bolts and nuts;
- Anchorbolt MA 24;
- Reflectors (1 every 13,5 m);

- Lower panel L= 2972 mm H= 1925 mm, mesh 50x50x3 mm;
- Angular upper panel 55° 1000 mm (639+639), mesh 50x50x3 mm;
- Lower post/panel connecting item;
- Omega shaped connecting item for angular upper panel;
- Chain/lower panel connecting item;
- Mesh welded chain diam. 7,5-49x28 mm L=1000 mm;
- Spare parts and connecting bolts and nuts.

This barrier provides Approach/Escape End Sections of 27,00 m (13,5 for approach + 13,5 for escape)

section



- **Dwg. n.: H2BP200P3000**
  c/c distance between the posts: **3.000 mm**

performance

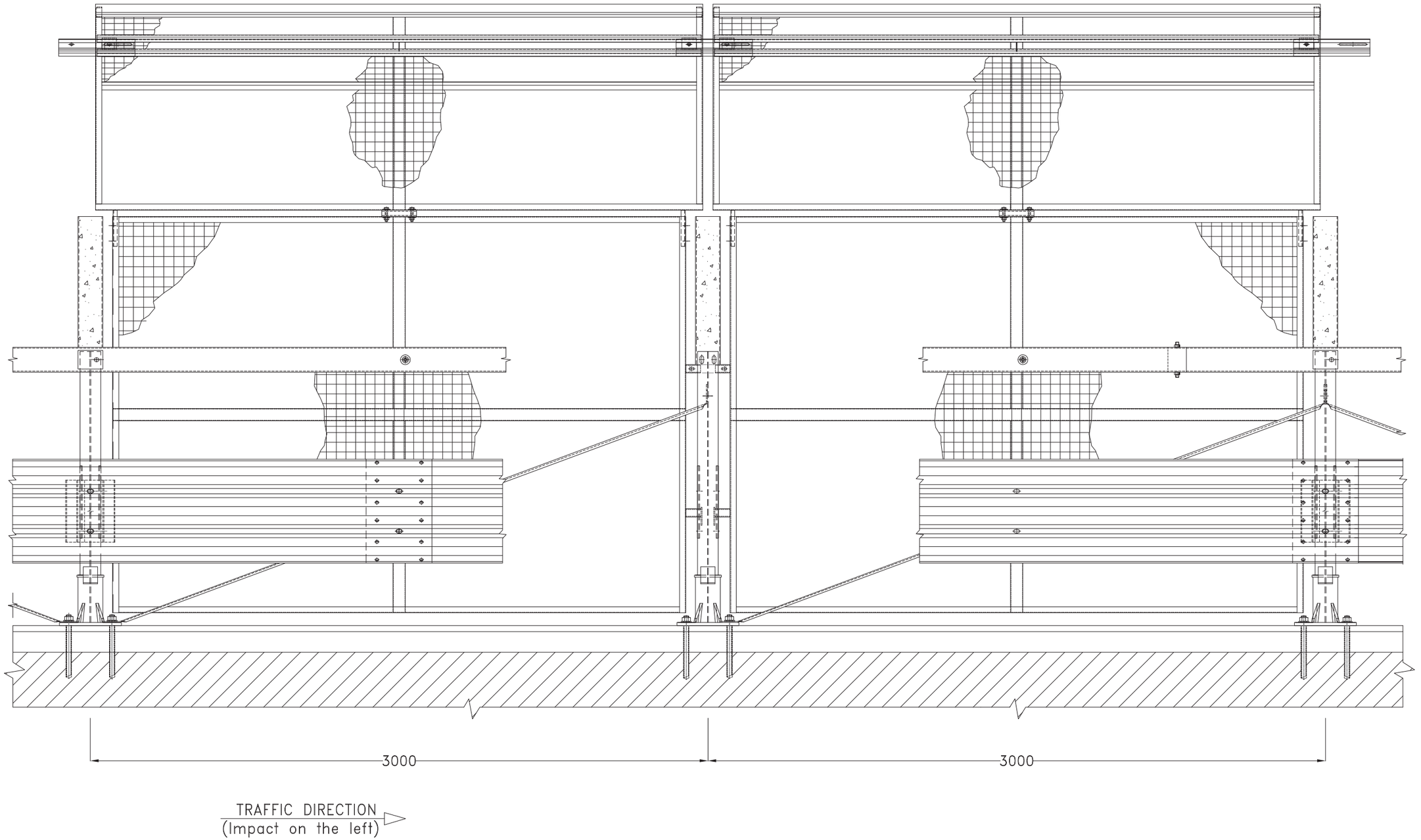
Car 900 kg

Test:	IME/BSI-49/837A
ASI:	0,90
W:	0,70 m (W2≤0,8)
WCDI:	LS0022000
THIV:	23,0 km/h
PHD:	18,0 g

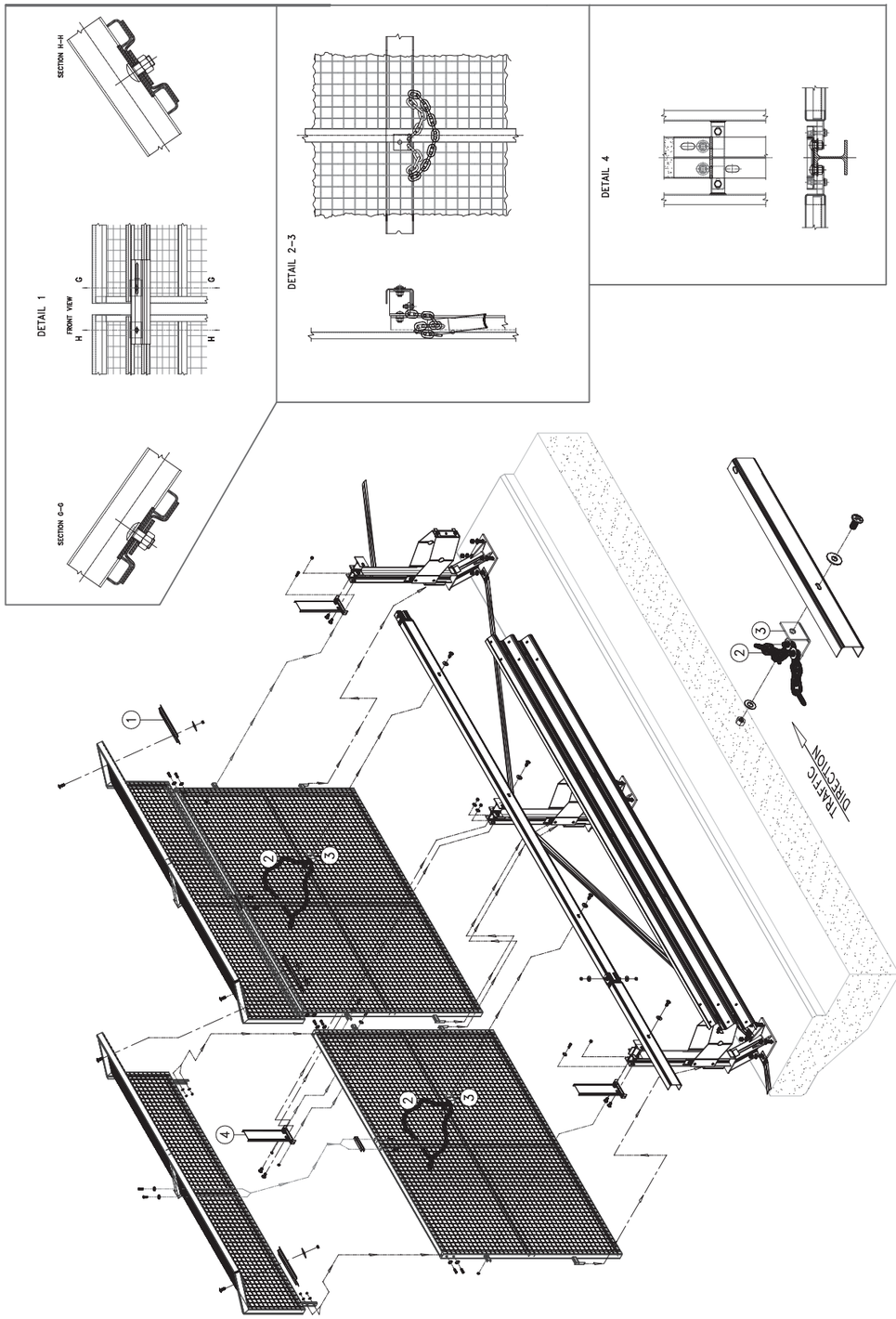
- CE Certificate
  n. 1835-CPD-0008/102

Bus 13.000 kg

Test:	IME/BSI-50/838A
W barrier:	1,5 m (W5≤1,7)
W panels:	1,8 m (W6≤2,1)



TRAFFIC DIRECTION
(Impact on the left)



H3 bridge barrier

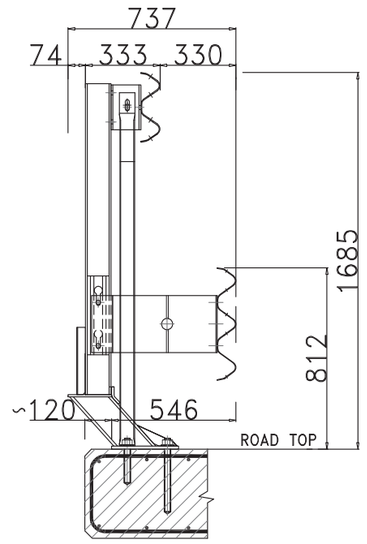
H3BP100

components

- Lower thrie beam 4500 mm th. 2,5 mm;
- Upper W beam 4500 mm th. 4,0 mm;
- "HEA 120" post with base plate with a c/c distance of 3000 mm;
- Lower spacer th. 5,0 mm;
- "HEA140" upper spacer;
- Diagonal;
- Unthreading proof little plate;
- Bolts and nuts;
- Anchorbolts MA 27;
- Reflectors (1 every 13,5 m).

This barrier provides Approach/Escape End Sections of 27,00 m (13,5 for approach + 13,5 for escape)

section



- **Dwg. n.:H3BP100**
  c/c distance between the posts: **3.000 mm**

performance

Car 900 kg

Test:	IME/BSI-39/755B
ASI:	1,00
W:	0,80 m (W2≤0,8)
WCDI:	LS0012100
THIV:	23,0 km/h
PHD:	14,0 g

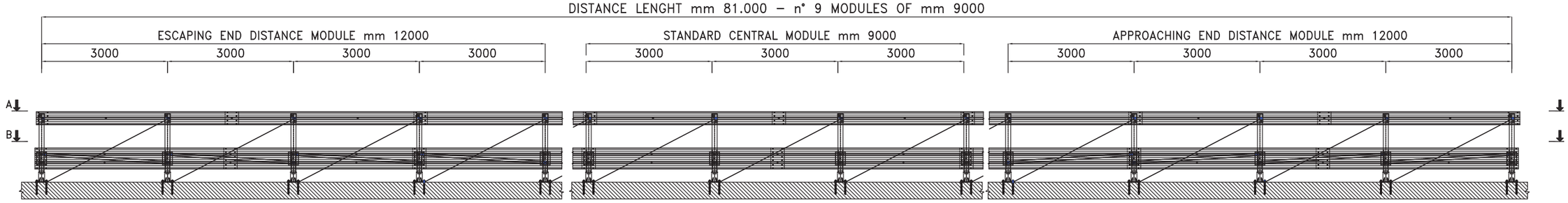
- CE Certificate
  n. 1835-CPD-0008/105

Truck 16.000 kg

Test:	IME/BSI-40/756B
W:	2,00 m (W6≤2,1)

FRONT VIEW

DISTANCE LENGHT mm 81.000 – n° 9 MODULES OF mm 9000



TRAFFIC DIRECTION
(Impact on the left)

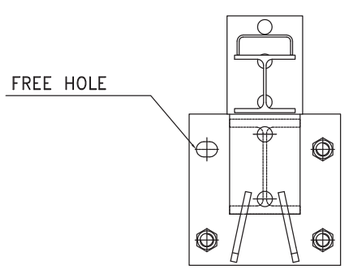
VIEW FROM "A" W-BEAM

TRAFFIC DIRECTION
(Impact on the left)

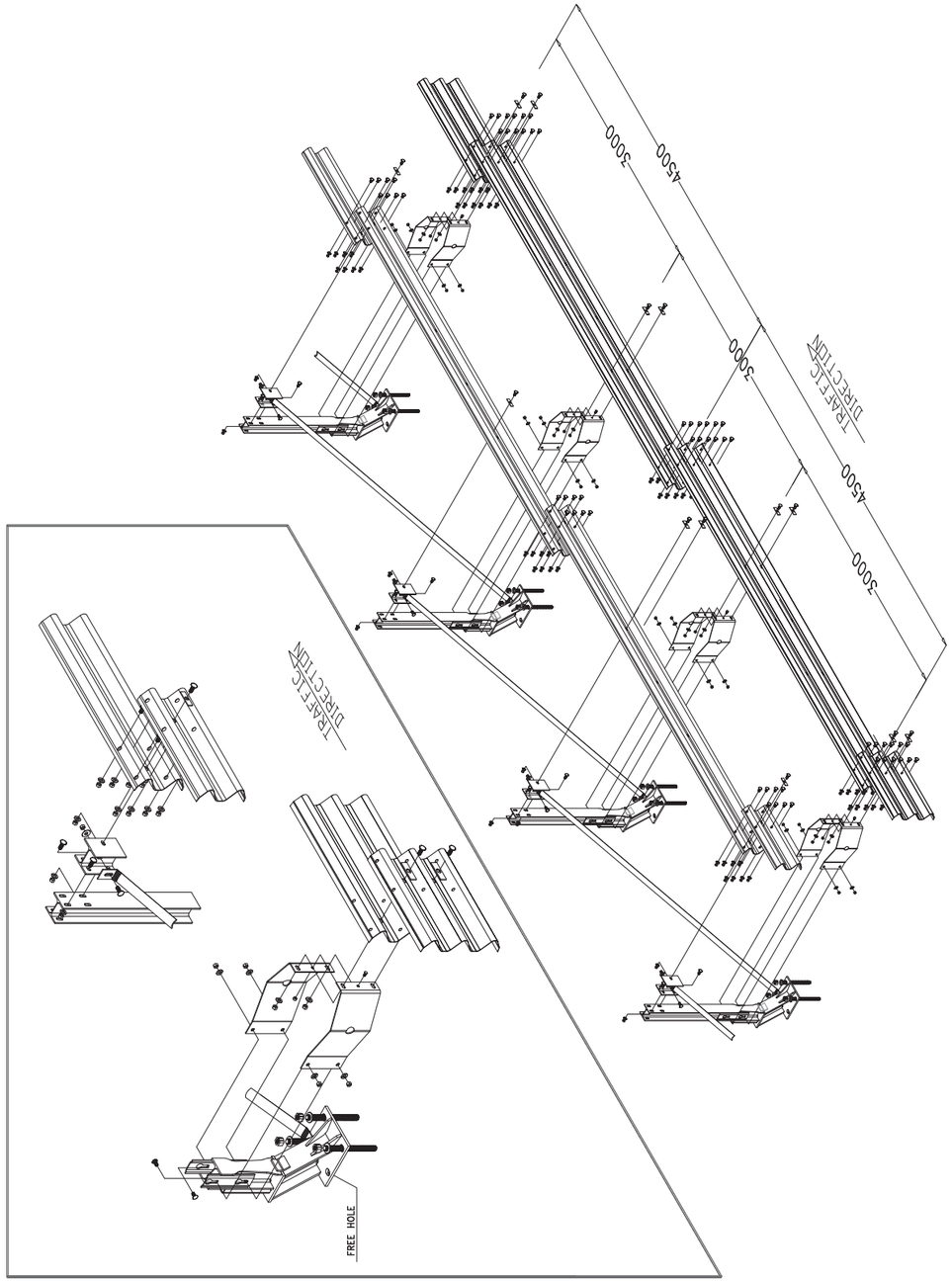
VIEW FROM "B" – THRIE BEAM

TRAFFIC DIRECTION
(Impact on the left)

PLATE JUNCTION DETAIL



TRAFFIC DIRECTION
(Impact on the left)



H3 bridge barrier

with or without panels

H3BP300

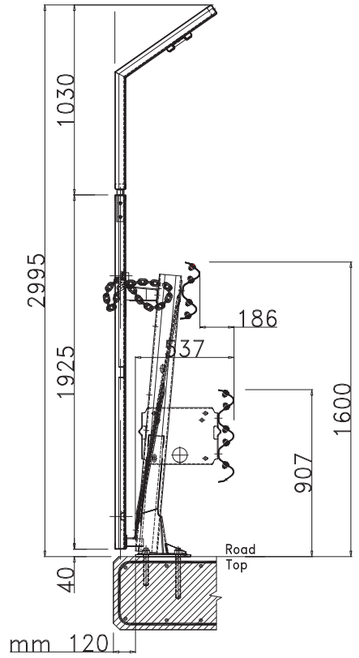
components

- Three wave lower beam c/c 5333 mm th. 2,5 mm;
- W upper beam c/c. 5333 mm th. 2,5 mm;
- "C" section post 30x80x120 mm th. 5,0 mm, H = 1525 mm with base plate, c/c mm 1777,7;
- Spacer th. 4,0 mm for three wave beam;
- Oblique diagonals 70x5 mm;
- Unthreading proof plates;
- Bolts and nuts;
- Anchorbolts MA 24;
- Reflectors (n° 1 every 10,666 m).

- Lower panel c/c. 3555 mm L = 3490 mm H 1925 mm, net 50x50x3 mm;
- Inclined upper transom 55° H 1000 mm (639+639) with net 50x50x3 mm;
- Omega section item to connect upper transom;
- Mesh welded chain diam. 7,5-49x28 mm L= 1000 mm;
- Straps to connect to barrier and bolts

This barrier includes, for each section to be installed, approaching/escaping modules total length 26,666 m (16,00 for approach + 10,666 for escape)

section



- **Dwg. n.: H3BP300**
  c/c distance between the posts: **1.777 mm**

performance

Car kg 900

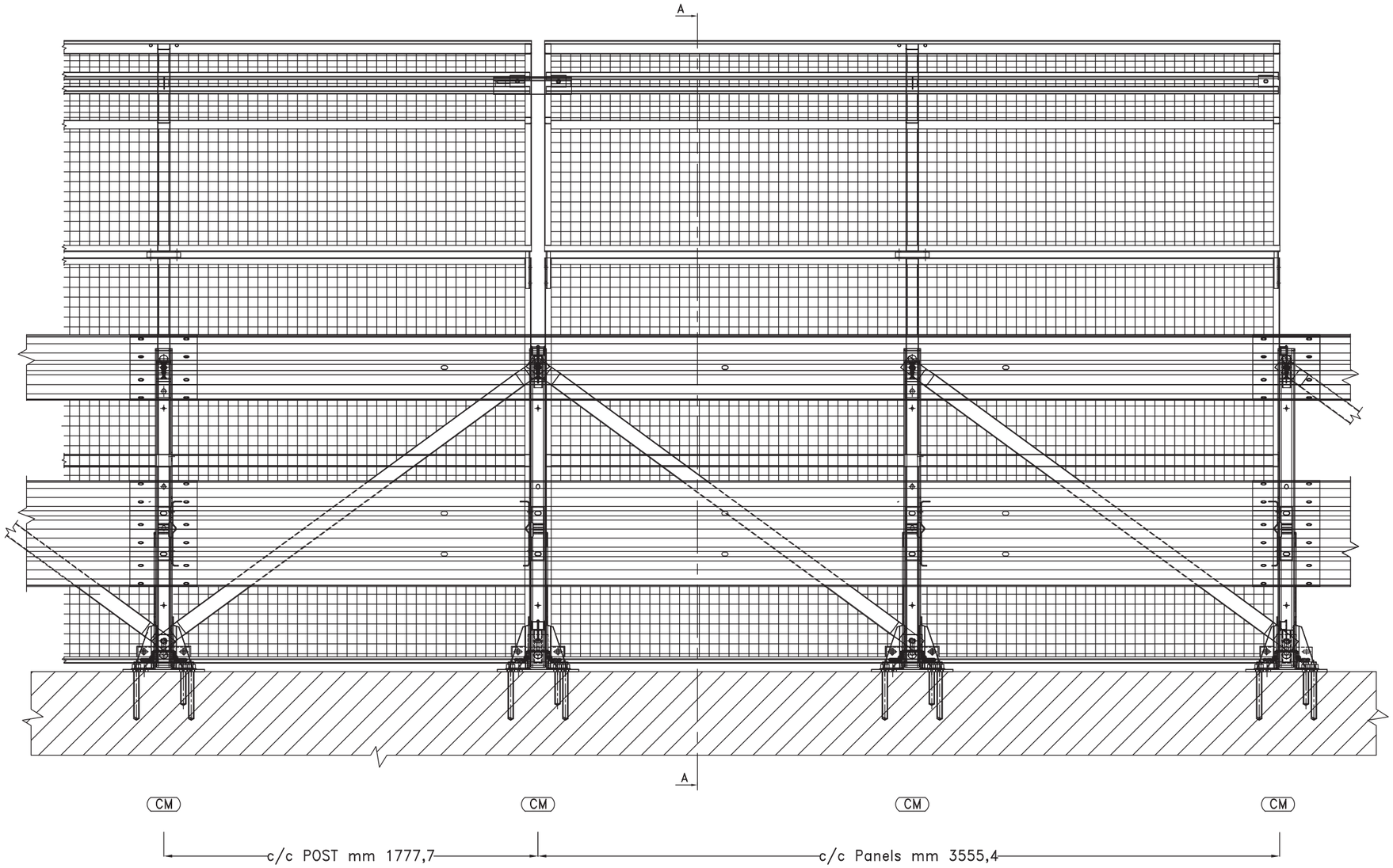
Test:	IME/BPM -003/1223
ASI:	1,3
W:	m 0,60 (W1)
VCDI:	RF0000110
THIV	Km/h 30,0
PHD	g 9,0

- CE Certificate
  n. 1835-CPD-0008/106

Truck kg 16.000

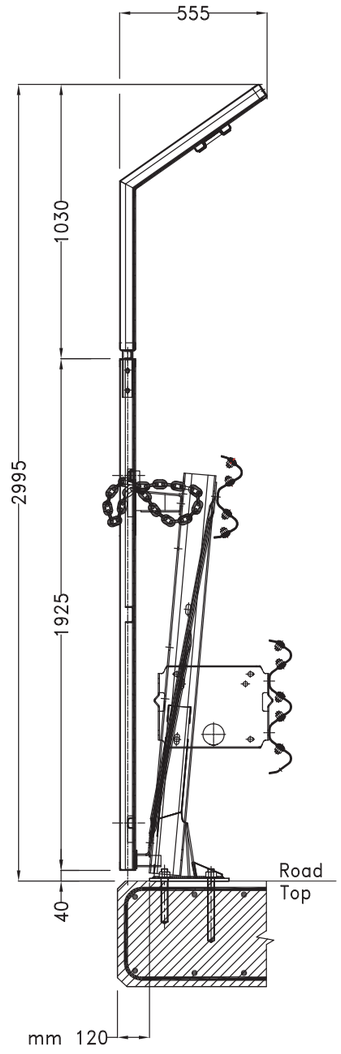
Test:	IME/BPM-004/1224
W barrier:	m 1,30 (W4)
W panels:	m 2,00 (W6)

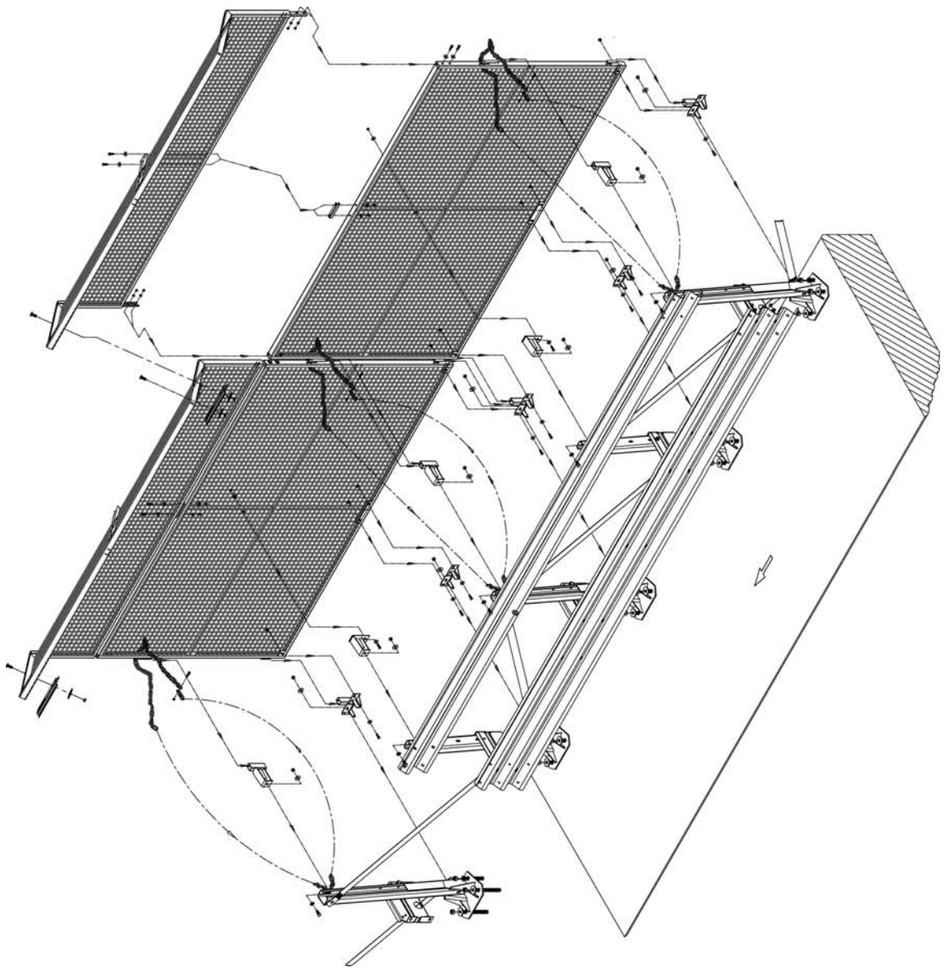
FRONT VIEW



TRAFFIC DIRECTION (Impact on the right)

SECTION A–A





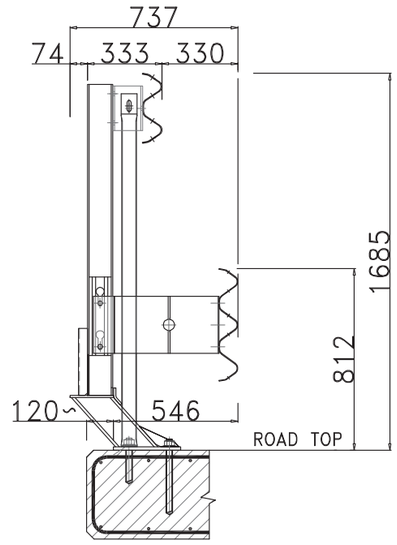
H4 bridge barrier
H4BP400

components

- Lower thrie beam 4500 mm th. 2,5 mm;
- Upper W beam 4500 mm th. 4,0 mm;
- "HEA 120" post with base plate with a c/c distance of 2250 mm;
- Lower spacer th. 5,0 mm;
- "HEA140" upper spacer;
- Diagonal;
- Unthreading proof little plate;
- Bolts and nuts;
- Anchorbolts MA 27;
- Reflectors (1 every 13,5 m).

This barrier provides Approach/Escape End Sections of 18,00 m (9,0 for approach + 9,0 for escape)

section



- **Dwg. n.: H4BP400**
  c/c distance between the posts: **2.250 mm**

performance

Car 900 kg

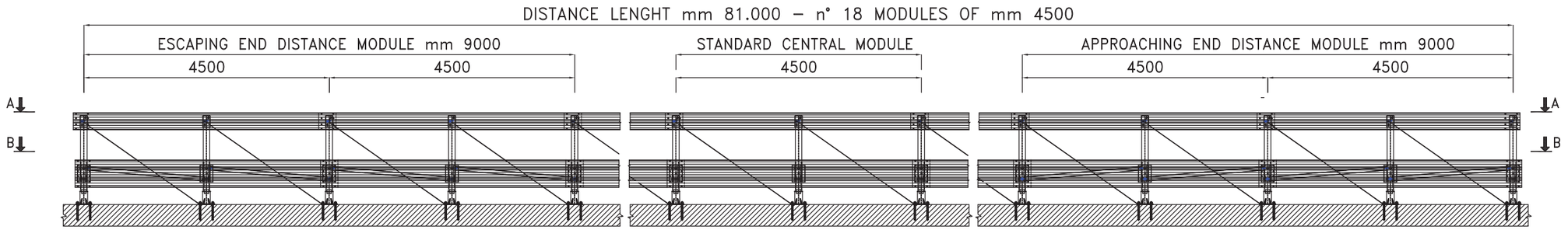
Test:	IME/BSI-36/713A
ASI:	1,00
W:	0,70 m (W2≤0,8)
WCDI:	RS0000000
THIV:	24,0 km/h
PHD:	14,0 g

- CE Certificate
  n. 1835-CPD-0008/107

Truck 38.000 kg

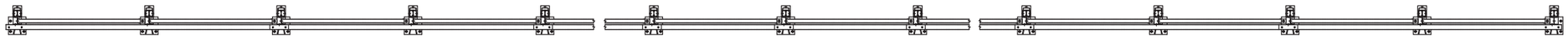
Test:	IME/BSI-37/714A
W:	1,50 m (W5≤1,7)

FRONT VIEW



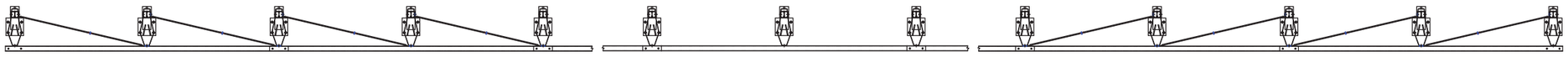
TRAFFIC DIRECTION
(Impact on the right)

VIEW FROM "A" – W-BEAM



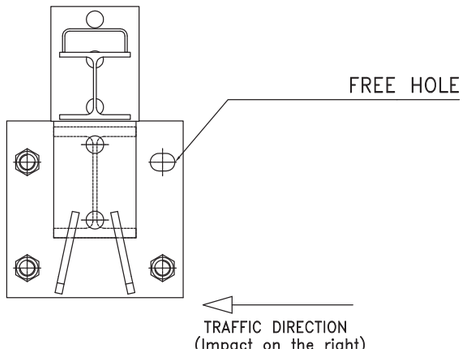
TRAFFIC DIRECTION
(Impact on the right)

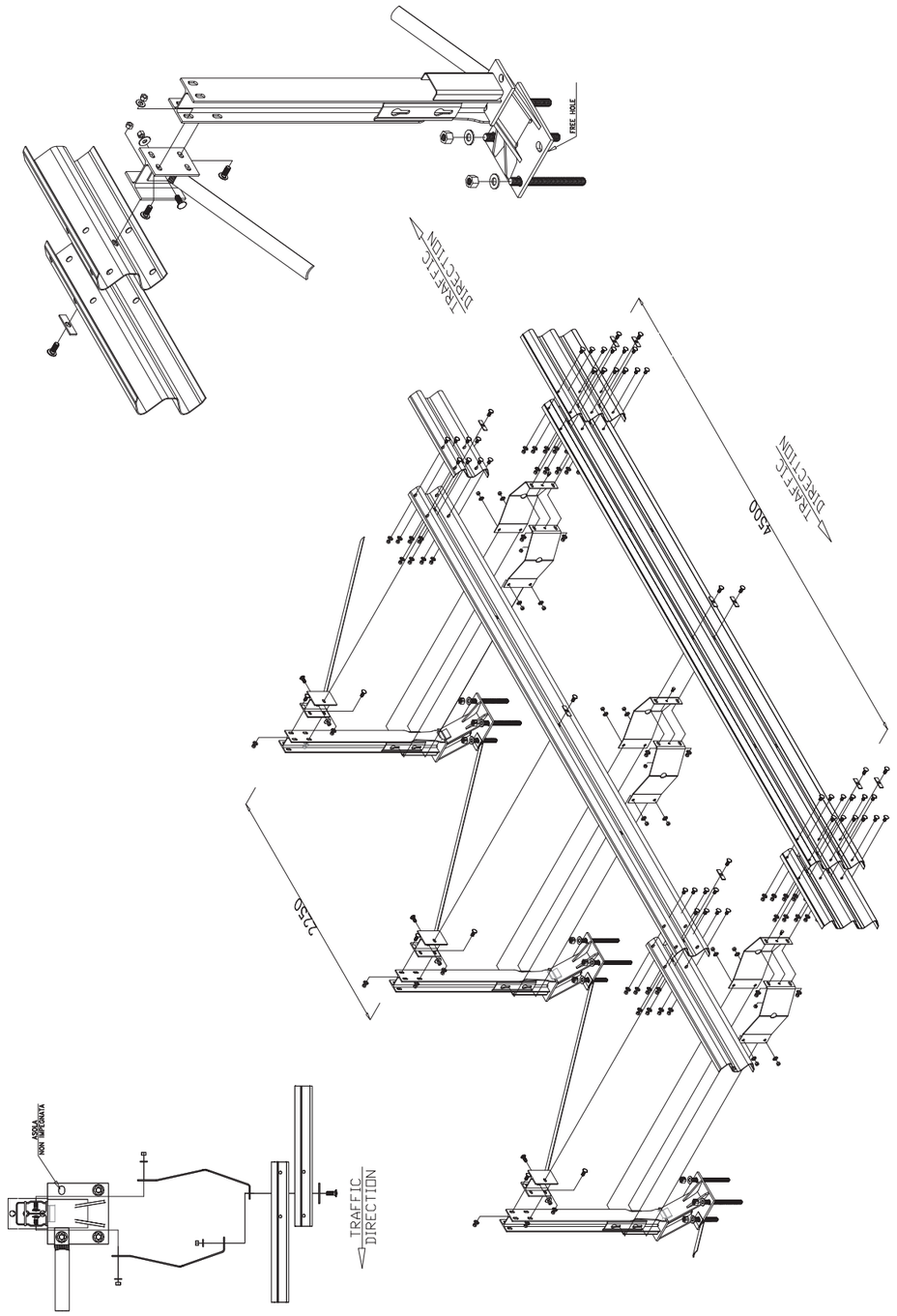
VIEW FROM "B" – THRIE BEAM



TRAFFIC DIRECTION
(Impact on the right)

PLATE JUNCTION DETAIL





H4 bridge barrier

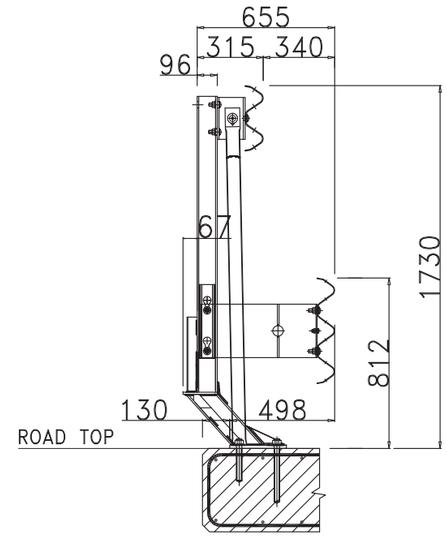
H4BP500L

components

- Lower thrie beam 4000 mm th. 2,5 mm;
- Upper W beam 4000 mm th. 4,0 mm;
- "HEA 100" post with base plate with a c/c distance of 2.667 mm;
- Lower spacer th. 5,0 mm;
- "HEA140" upper spacer;
- Diagonal;
- Unthreading proof little plate;
- Bolts and nuts;
- Anchorbolts MA 24;
- Reflectors (1 every 12,0 m).

This barrier provides for Approach/Escape End Sections of 24,00 m (12,0 for approach + 12,0 for escape)

section



- **Dwg. n.: H4BP500L**
  c/c distance between the posts: **2.667 mm**

performance

Car 900 kg

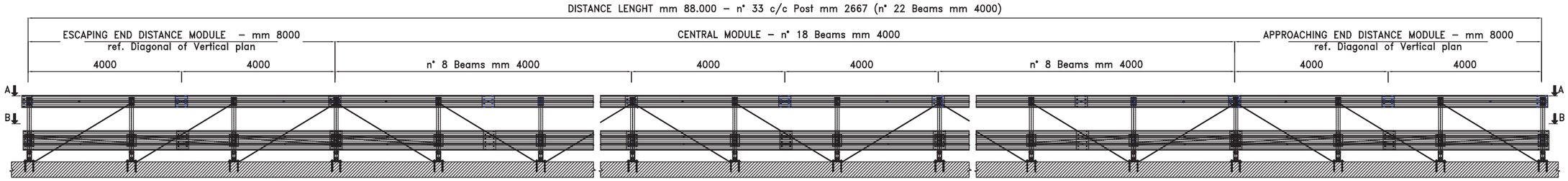
Test:	IME/BSI-51/964
ASI:	1,0
W:	0,70 m (W2≤0,8)
WCDI:	RS0000000
THIV:	25,0 km/h
PHD:	13,0 g

- CE Certificate
  n. 1835-CPD-0008/109

Truck 38.000 kg

Test:	IME/BSI-52/965
W:	2,10 m (W6≤2,1)

FRONT VIEW



TRAFFIC DIRECTION
(Impact on the right)

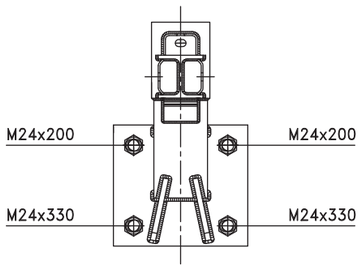
VIEW FROM "A" – W–BEAM

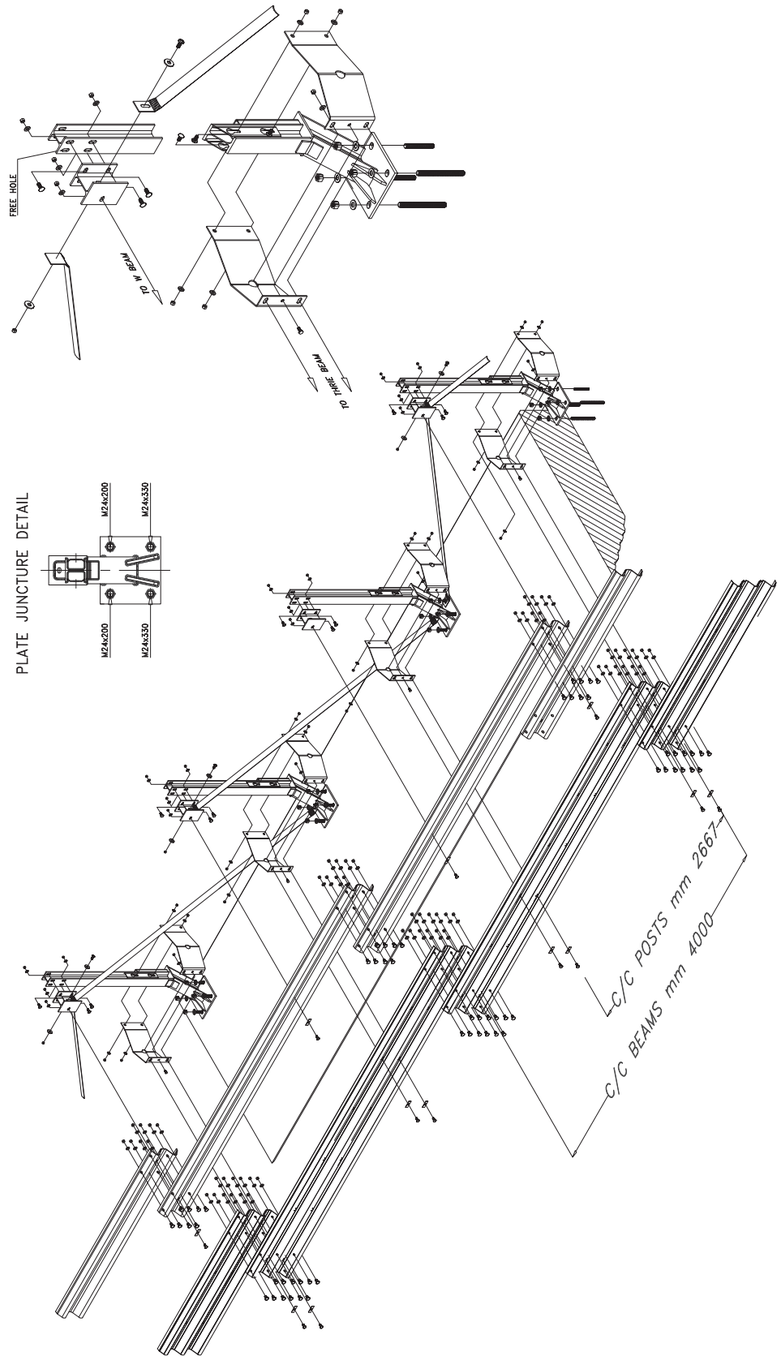
VIEW FROM "B" – THRIE BEAM

ESCAPING END DISTANCE MODULE – mm 10668
ref. Diagonal of Horizontal plan

APPROACHING END DISTANCE MODULE – mm 10668
ref. Diagonal of Horizontal plan

PLATE JUNCTION DETAIL





H4 bridge barrier with panels on concrete 13 cm

H4BP400P2250

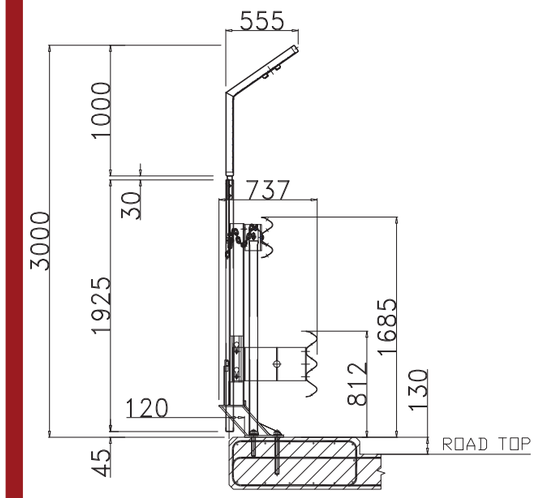
components

- Lower thrie beam 4500 mm th. 2,5 mm;
- Upper W beam 4500 mm th. 4,0 mm;
- "HEA 120" post with base plate with a c/c distance of 2.250 mm;
- Lower spacer th. 5,0 mm;
- "HEA140" upper spacer;
- Diagonal;
- Unthreading proof little plate;
- Bolts and nuts;
- Anchorbolts MA 27;
- Reflectors (1 every 13,5 m);

- Lower panel L= 2035/2192 mm H= 1925 mm, mesh 50x50x3 mm;
- Angular upper panel 55° 1000 mm (639+639), mesh 50x50x3 mm;
- Lower post/panel connecting item;
- Omega shaped connecting item for angular upper panel;
- Chain/lower panel connecting item;
- Mesh welded chain diam. 7,5-49x28 mm L=1000 mm;
- Spare parts and connecting bolts and nuts.

This barrier provides Approach/Escape End Sections of 18,00 m (9,0 for approach + 9,0 for escape)

section



- **Dwg. n.: H4BP400P2250**
  c/c distance between the posts: **2.250 mm**

performance

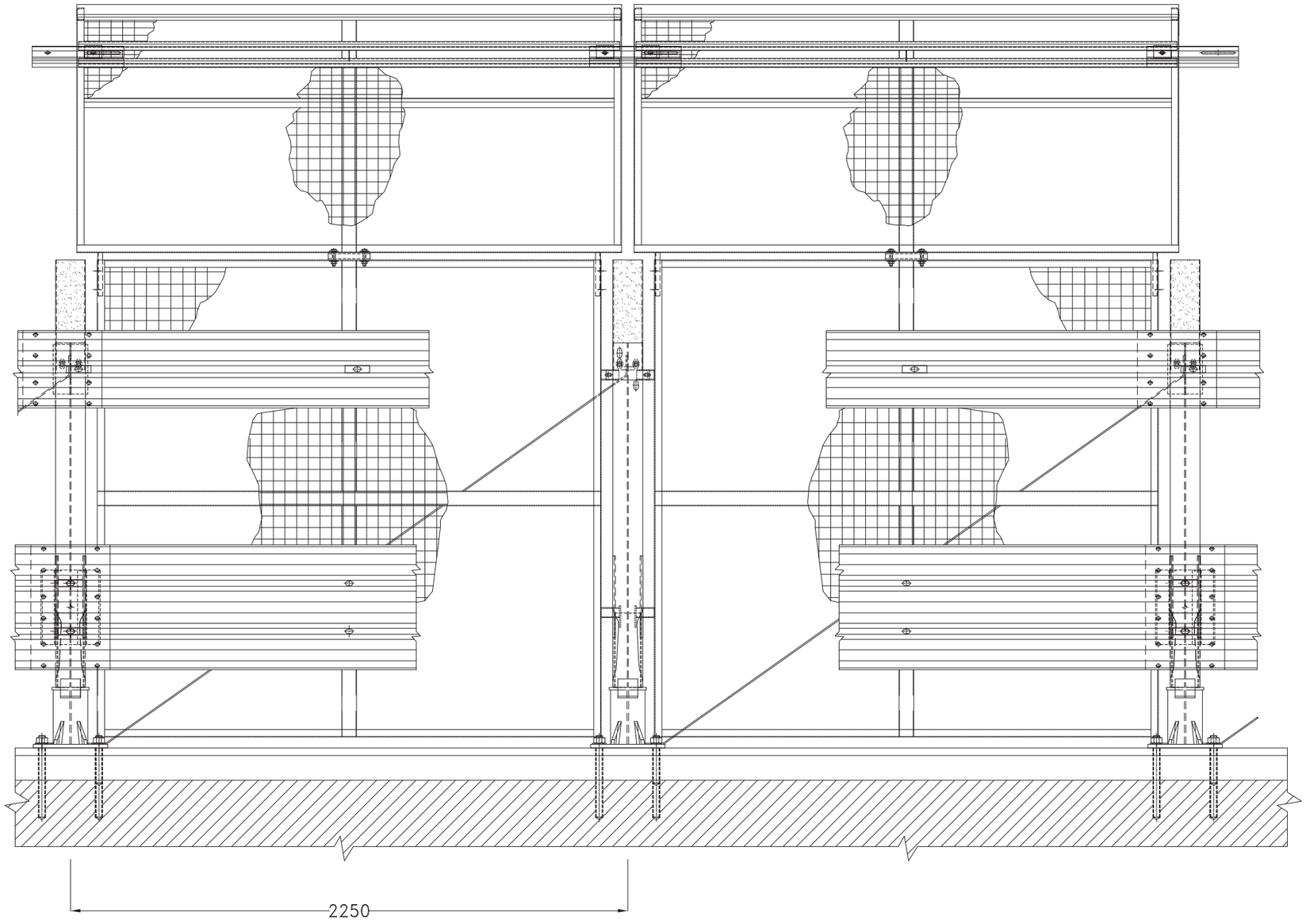
Car 900 kg

Test:	IME/BSI-46/818A
ASI:	1,00
W:	0,70 m (W2≤0,8)
WCDI:	LF0120000
THIV:	24,0 km/h
PHD:	20,0 g

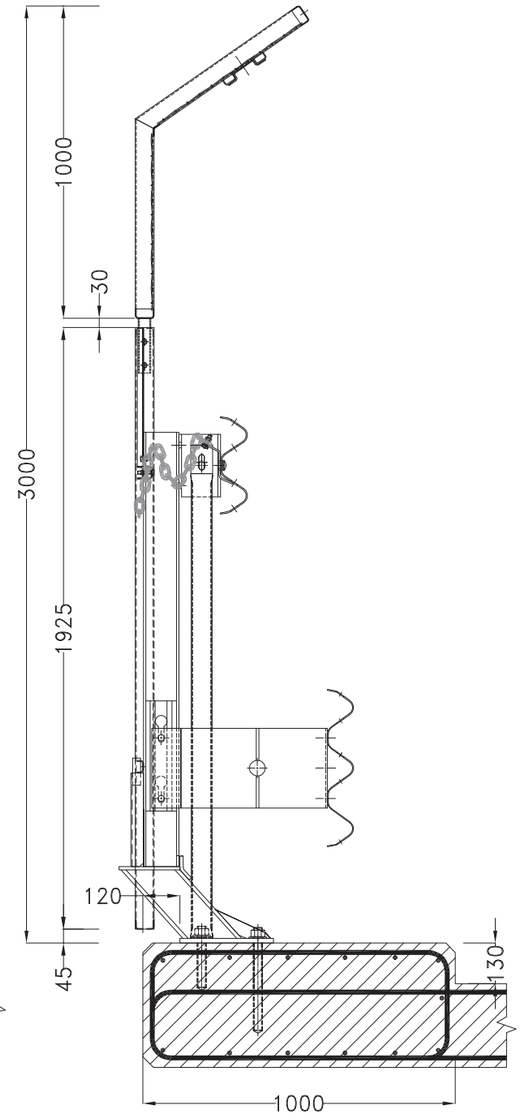
- CE Certificate
  n. 1835-CPD-0008/108

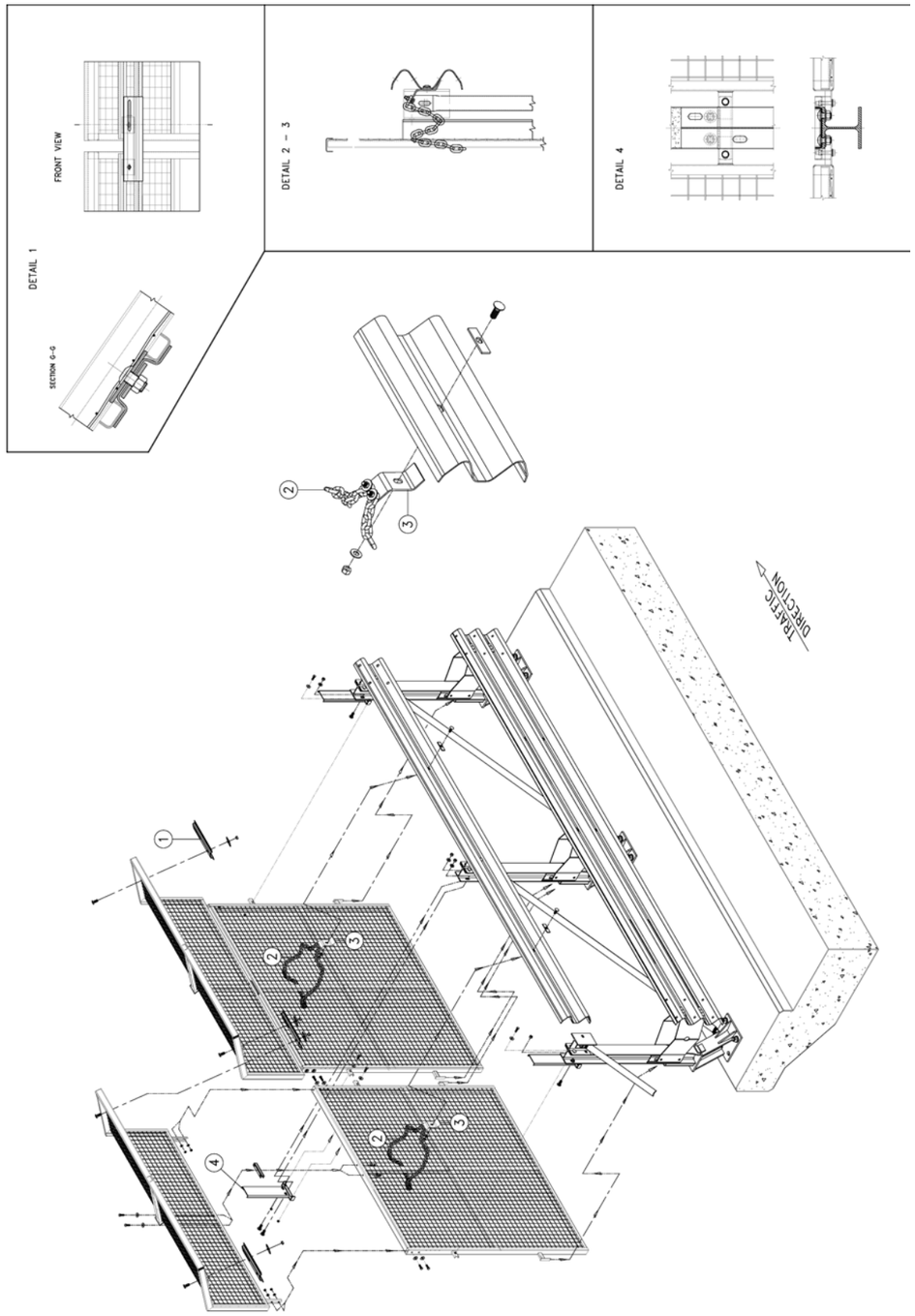
Truck 38.000 kg

Test:	IME/BSI-48/820A
W barrier:	1,8 m (W6≤2,1)
W panels:	2,4 m (W7≤2,5)



TRAFFIC DIRECTION
(Impact on the left)





H2 median barrier on embankment

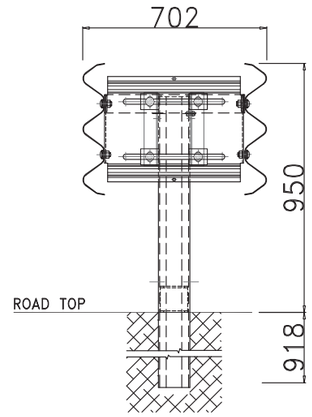
H2ST-R100

components

- Thrie beam 4500 mm th. 2,5 mm;
- "C" section post 30x80x120x80x30 mm th. 5,0 mm H= 1740 mm c/c 3375 mm;
- Stiffner for "C" section post;
- Spacers th 4,0 mm with unhooking;
- Flat diagonal 70x5,0 mm;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (2 every 13,5 m).

This barrier provides Approach/Escape End Sections of 45,00 m (22,5 for approach + 22,5 for escape)

section



- **Dwg. n.: H2ST-R100**
  c/c distance between the posts: **3.375 mm**

performance

Car 900 kg

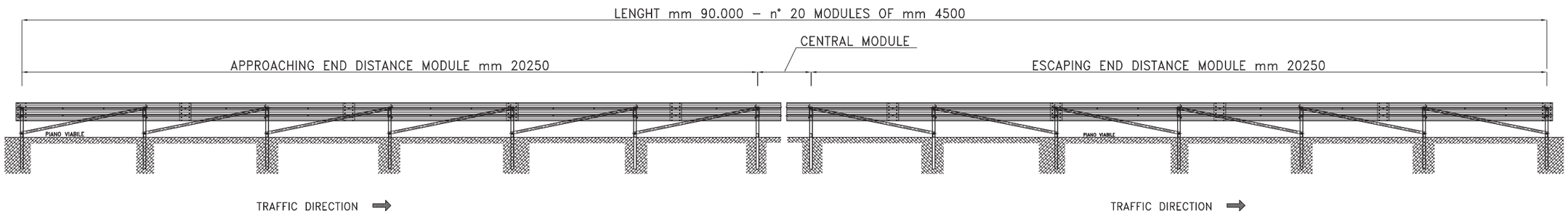
Test:	X61.01/A.D07
ASI:	0,90
W:	1,40 m (W5≤1,7)
WCDI:	LF0012001
THIV:	18,27 km/h
PHD:	19,095 g

- CE Certificate
  n. 1835-CPD-0008/1001

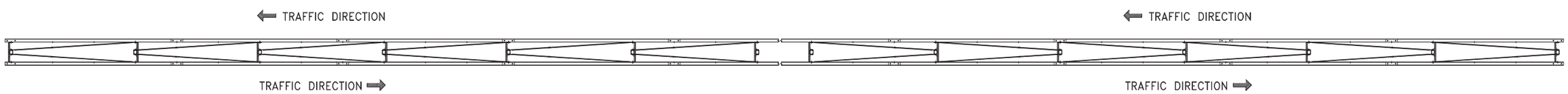
Bus 13.000 kg

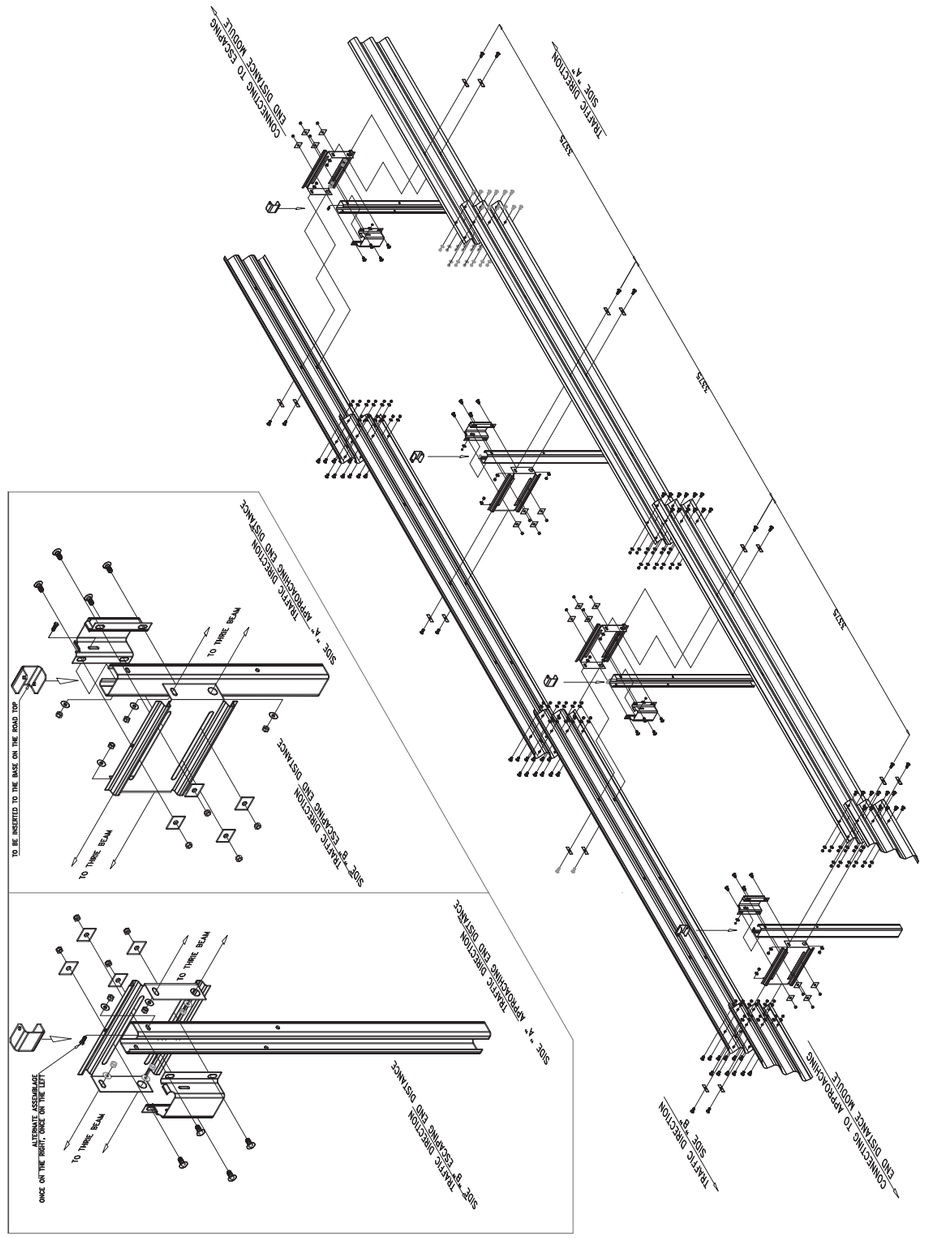
Test:	X61.02/A.D07
W:	2,30 m (W7≤2,5)

FRONT VIEW



TOP VIEW





H4b median barrier on embankment

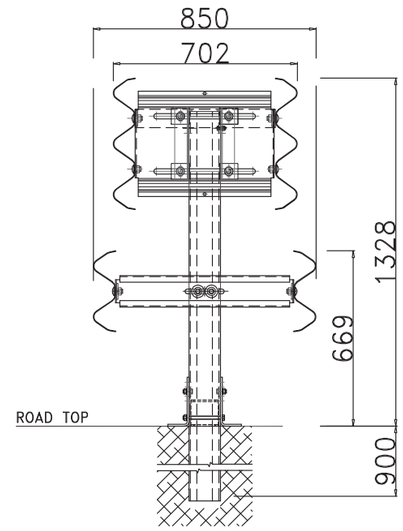
H4ST-R200

components

- Lower W beam 4500 mm th. 2,5 mm;
- Upper thrie beam 4500 mm th. 2,5 mm;
- "C" section post 30x80x120x80x30 mm th. 5,0 mm H= 2100 mm c/c 2250 mm;
- Little base and stiffner for "C" section post;
- Lower spacer th. 4,0 mm;
- Upper spacer th. 4,0 mm with unhooking device;
- Flat horizontal diagonal 70x5,0 mm;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (2 every 13,5 m).

This barrier provides for Approach/Escape End Sections of 27,00 m (13,5 for approach + 13,5 for escape)

section



- **Dwg. n.: H4ST-R200**
  c/c distance between the posts: **2.250 mm**

performance

Car 900 kg

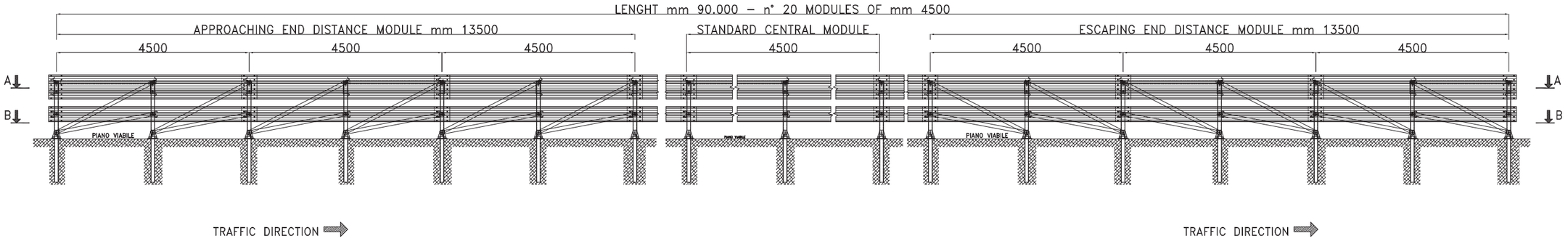
Test:	X61.02/A.C11
ASI:	1,00
W:	1,00 m (W3≤1,0)
WCDI:	LF0010010
THIV:	27,7 km/h
PHD:	18,938 g

- CE Certificate
  n. 1835-CPD-0008/1002

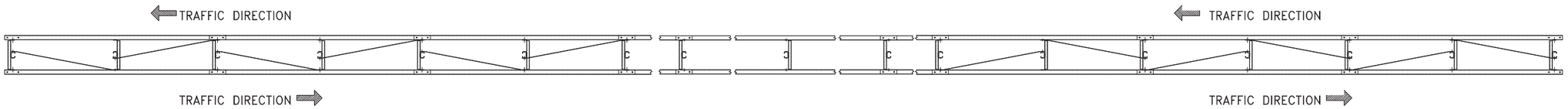
Truck 38.000 kg

Test:	734
W:	2,1 m (W6≤2,1)

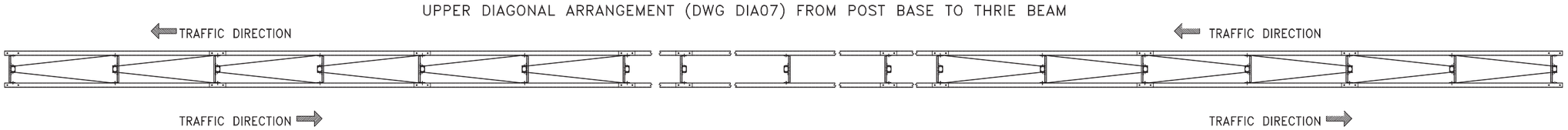
FRONT VIEW



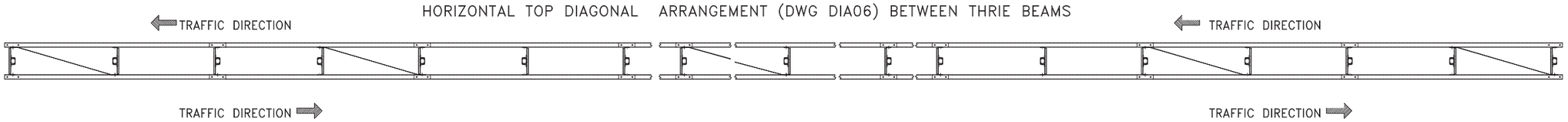
LOWER DIAGONAL ARRANGEMENT (DWG DIA08) FROM POST BASE TO W–BEAM

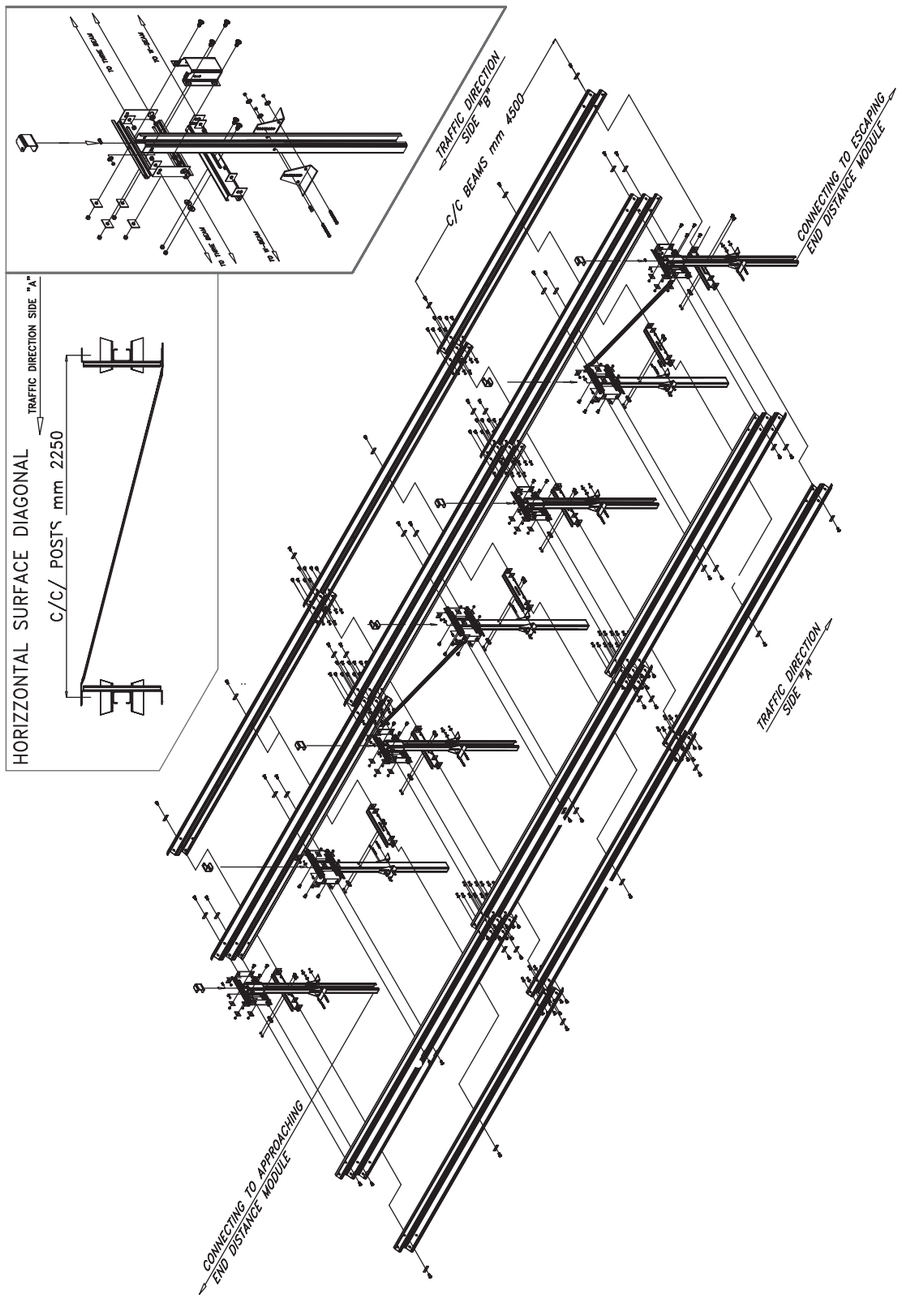


UPPER DIAGONAL ARRANGEMENT (DWG DIA07) FROM POST BASE TO THRIE BEAM



HORIZONTAL TOP DIAGONAL ARRANGEMENT (DWG DIA06) BETWEEN THRIE BEAMS





H4 median barrier on embankement

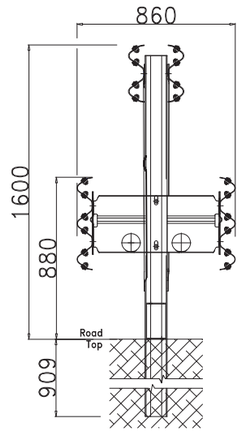
H4ST-R300

components

- Three wave lower beam c/c. 5333 mm th. 2,5 mm;
- W upper beam c/c. 5333 mm th. 4,0 mm;
- "C" section post 30x80x120 mm th. 5,0 mm H = 2450 mm c/c mm 1777,7;
- Stiffener for "C" section post
- Spacer th.4,0 mm for three wave lower beam;
- Oblique diagonal 70x5 mm;
- Unthreading proof plates;
- Bolts and nuts;
- Reflector (n° 1 every 16,0 m).

This barrier includes, for each section to be installed, approaching/escaping modules total length 32,00 m (16,00 for approach + 16,00 for escape)

section



- **Dwg. n.: H4ST-R300**
  c/c distance between the posts: **1.777 mm**

performance

Car kg 900

Test:	756
ASI:	1,00
W:	m 1,10 (W4)
VCDI:	LF0001000
THIV	Km/h 24,0

Car kg 1.500

Test:	757
ASI:	1,00
W:	m 1,30 (W4)
VCDI:	LF0001000
THIV	Km/h 27,0

Truck kg 38.000

Test:	761
W:	m 1,60 (W5)

- CE Certificate
  n. 1835-CPD-0008/1004

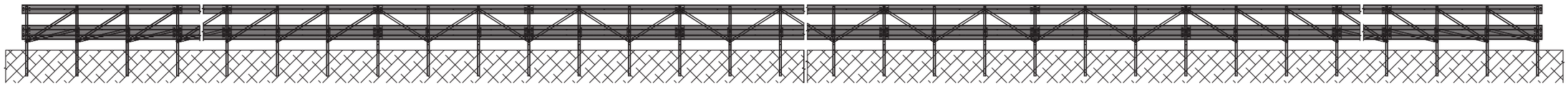
FRONT VIEW

DISTANCE LENGHT mm 85.333 – n° 16 Beams C/C mm 5.333,3
n° 48 Posts C/C mm 1777,7

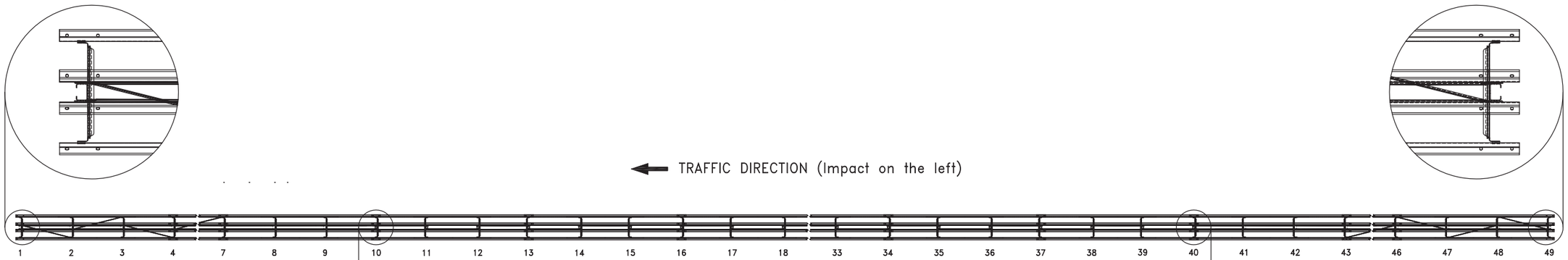
APPROACHING END DISTANCE MODULE mm 16.000
n° 3 Beams C/C mm 5.333,3

CENTRAL MODULE mm 53.333 – n° 10 Beams C/C mm 5.333,3
n° 30 Posts C/C mm 1777,7

ESCAPING END DISTANCE MODULE mm 16.000
n° 3 Beams C/C mm 5.333,3

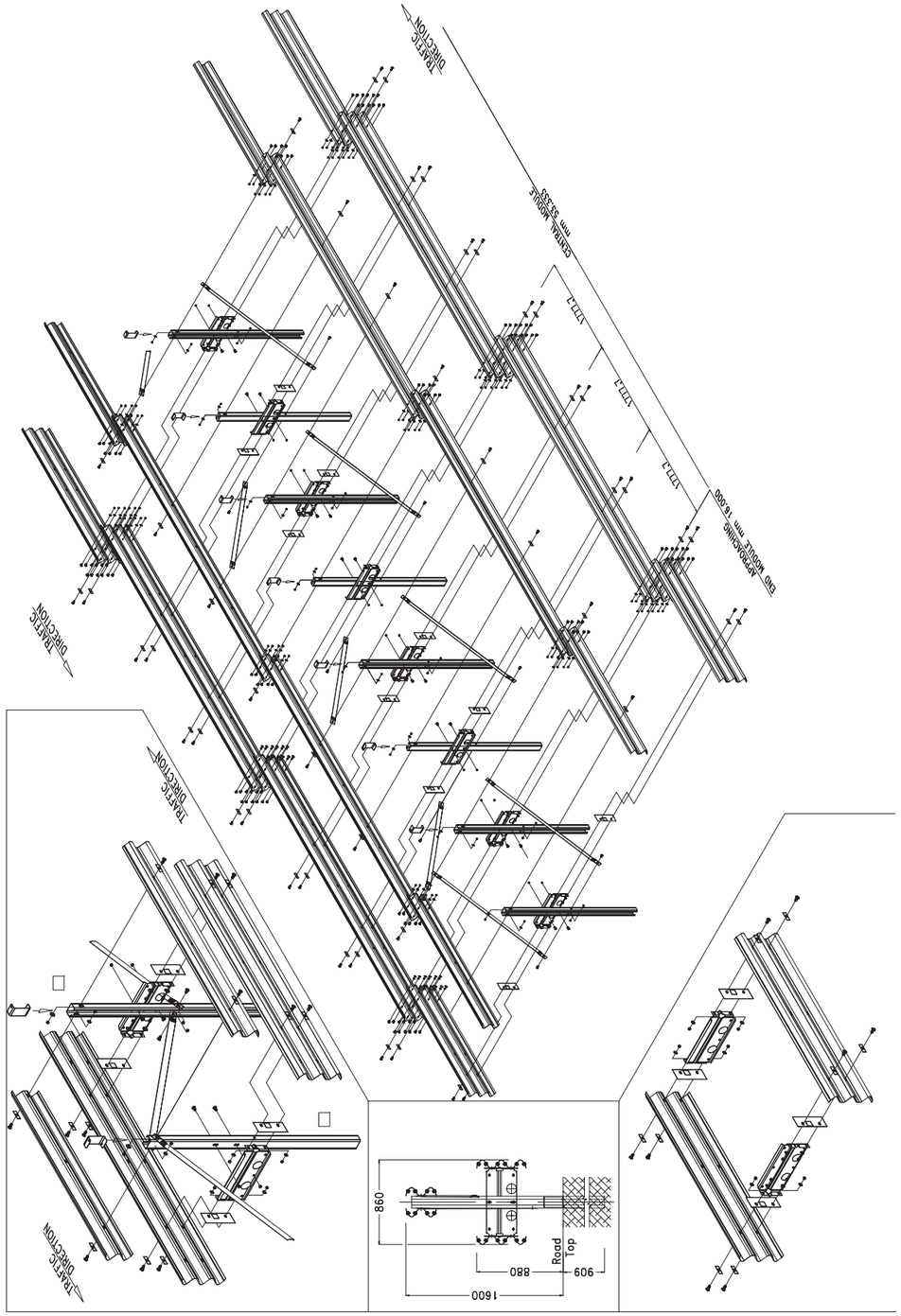


TRAFFIC DIRECTION (Impact on the left) →



← TRAFFIC DIRECTION (Impact on the left)

TRAFFIC DIRECTION (Impact on the left) →



H4b median barrier on concrete

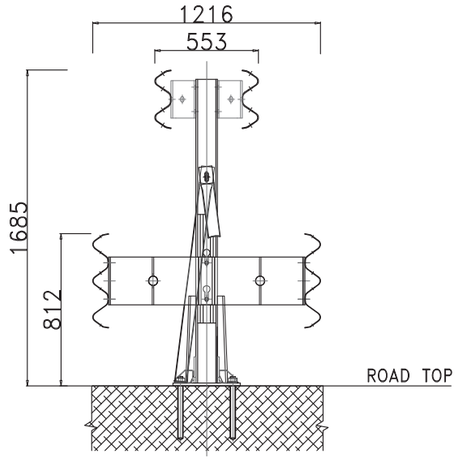
H4ST-P100

components

- Lower thrie beam 4500 mm th. 2,5 mm;
- Upper W beam 4500 mm th. 4,0 mm;
- "HEA 120" post with base plate c/c distance 2250 mm;
- Lower spacer th 5,0 mm;
- Upper spacer "HEA 140";
- Diagonal;
- Unthreading proof little plate;
- Bolts and nuts;
- Reflectors (2 every 13,5 m).

This barrier provides Approach/Escape End Sections of 18,00 m (9,0 for approach + 9,0 for escape)

section



- **Dwg. n.: H4ST-P100**
  c/c distance between the posts: **2.250 mm**

performance

Car 900 kg

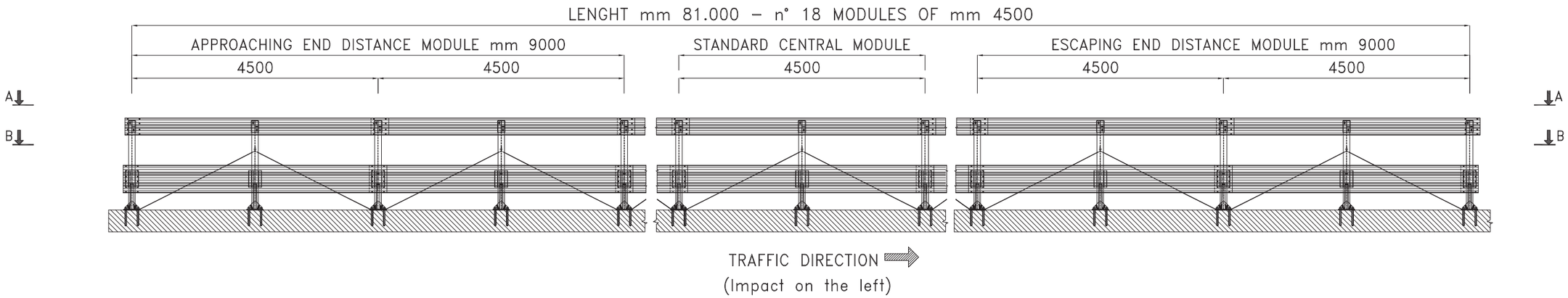
Test:	IME/BSI-44/793
ASI:	0,90
W:	1,20 m (W4≤1,3)
WCDI:	LS0000000
THIV:	25,0 km/h
PHD:	11,0 g

- CE Certificate
  n. 1835-CPD-0008/1005

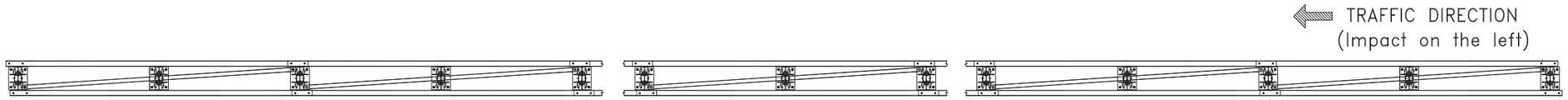
Truck 38.000 kg

Test:	IME/BSI-45/794
W:	1,5 m (W5≤1,7)

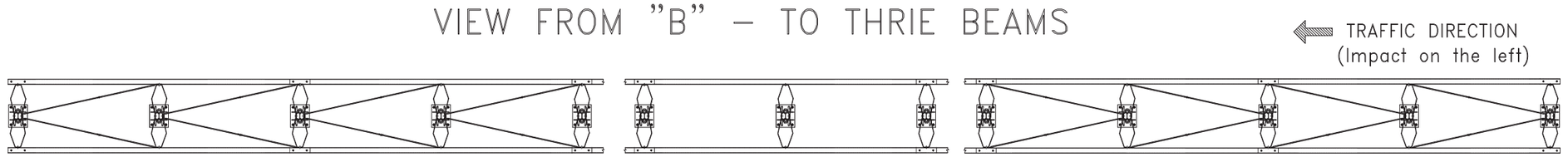
FRONT VIEW

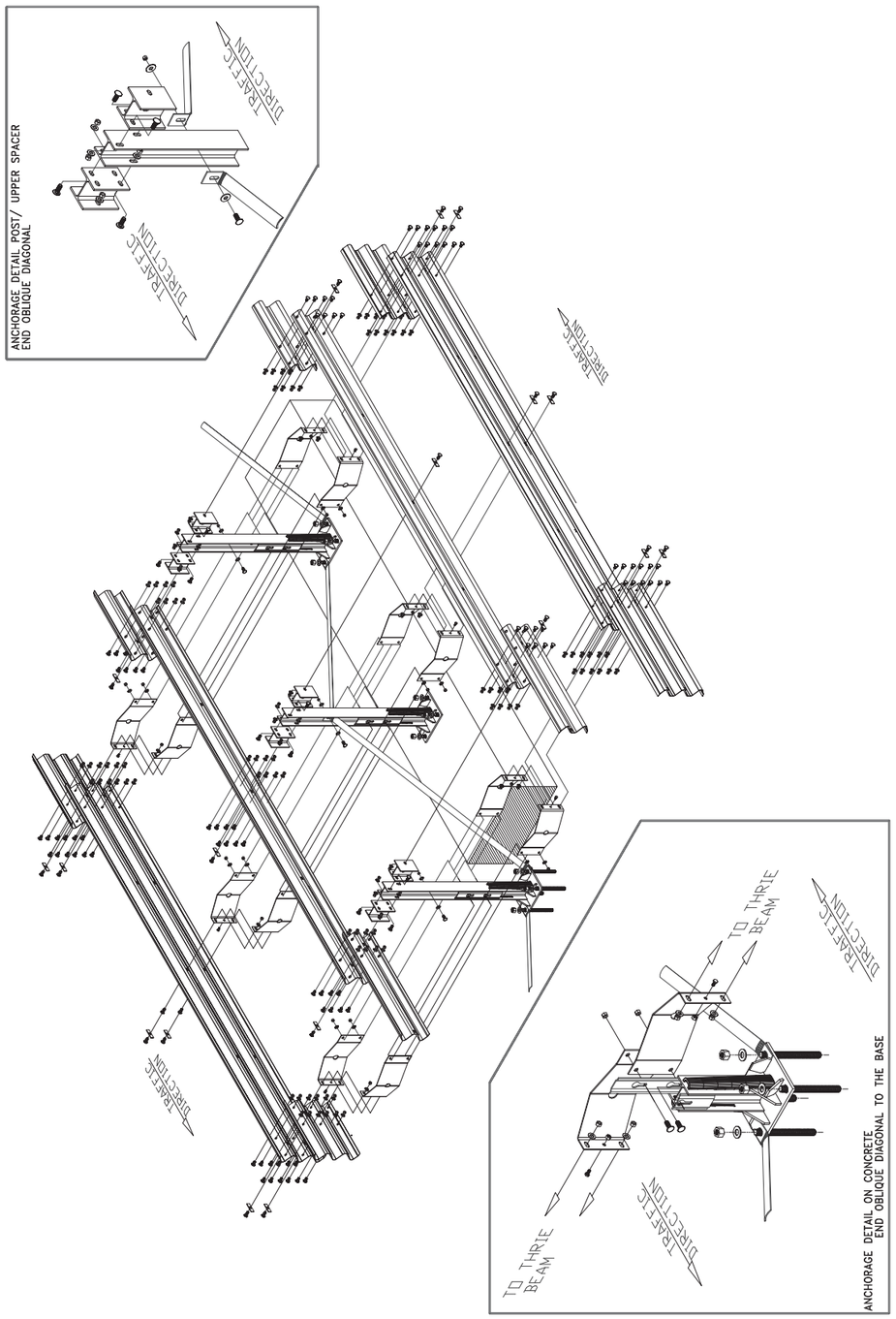


VIEW FROM "A" – TO W-BEAMS



VIEW FROM "B" – TO THRIE BEAMS





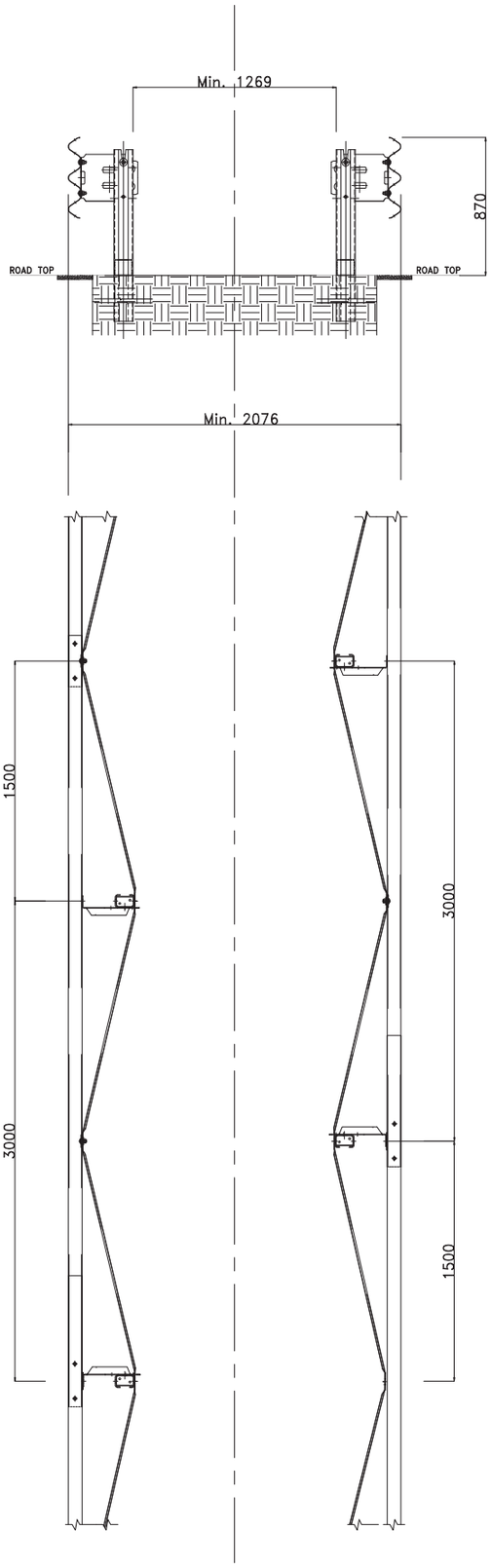
» Median barriers resulting from side barriers

Side barriers may be installed on the median area as double row median barriers if appropriately spaced out in relation to the working width.

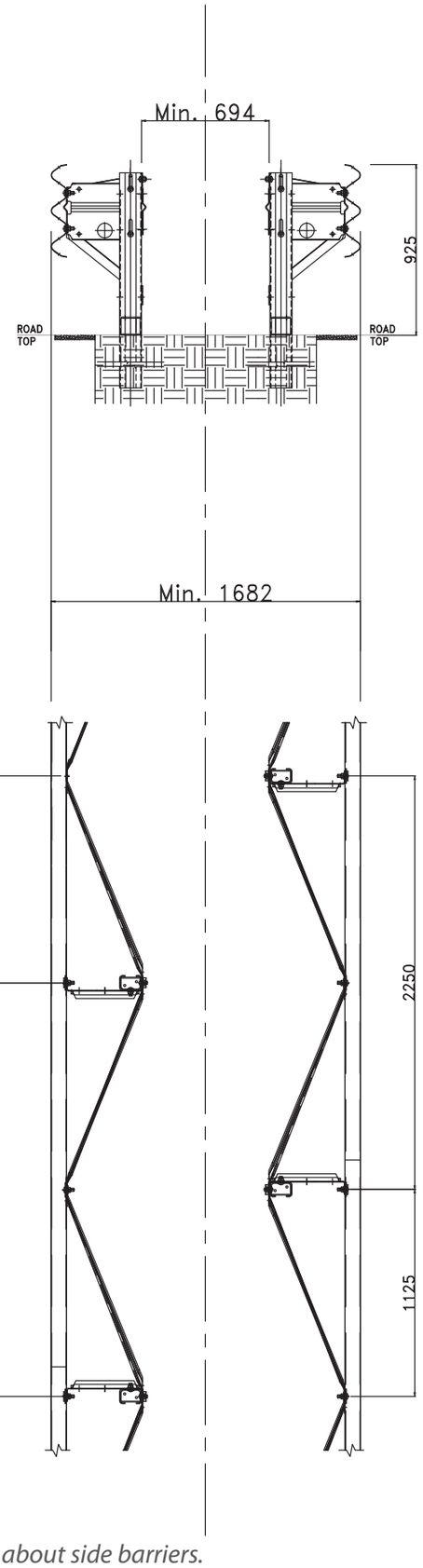
Double row median barrier

H2BL300 - H2BL400

H2BL300



H2BL400

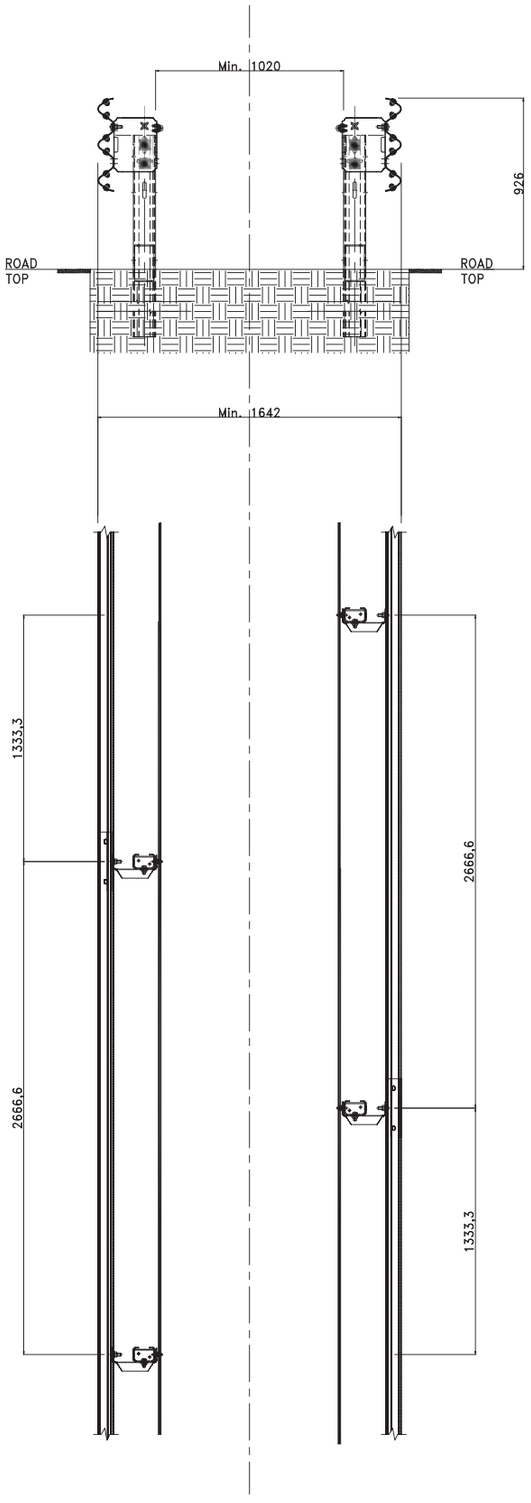


For other characteristics look at the pages about side barriers.

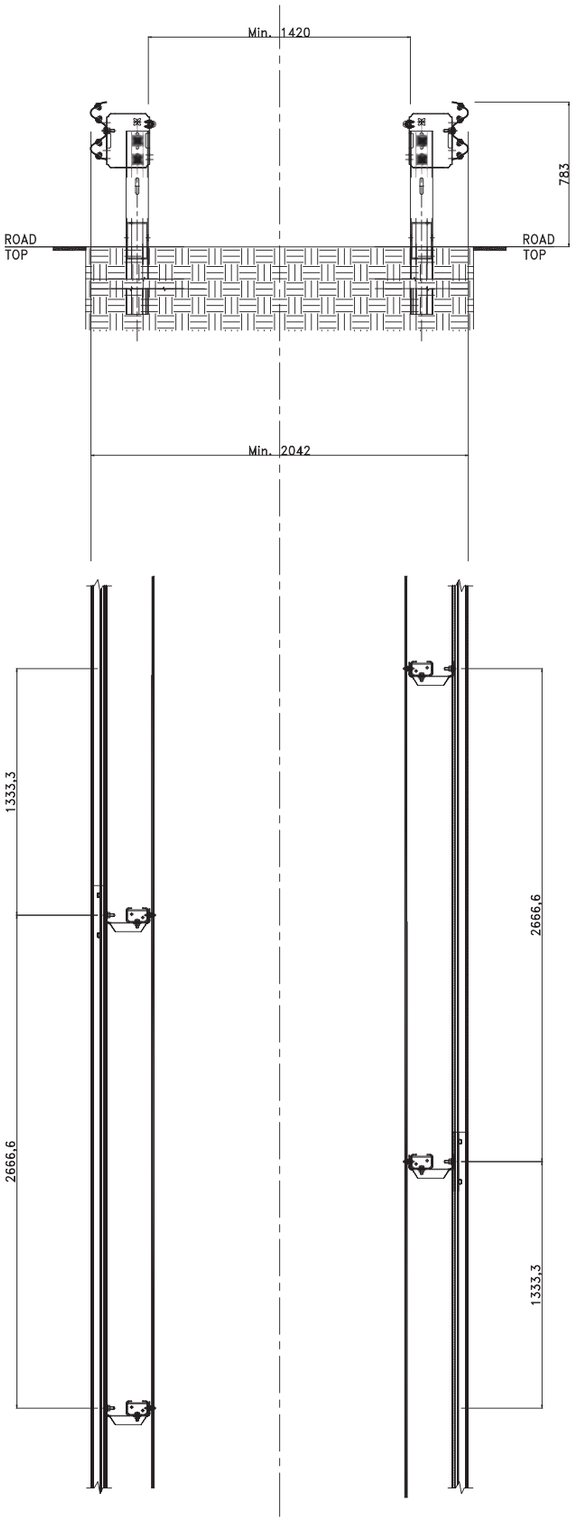
Double row median barrier

H2BL700 - H2BL800

H2BL700



H2BL800

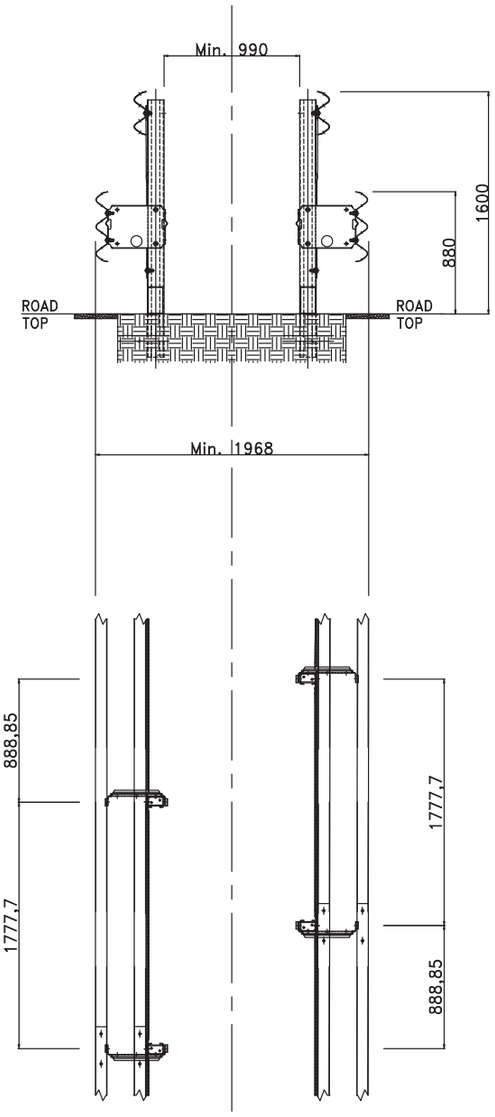


For other characteristics look at the pages about side barriers.

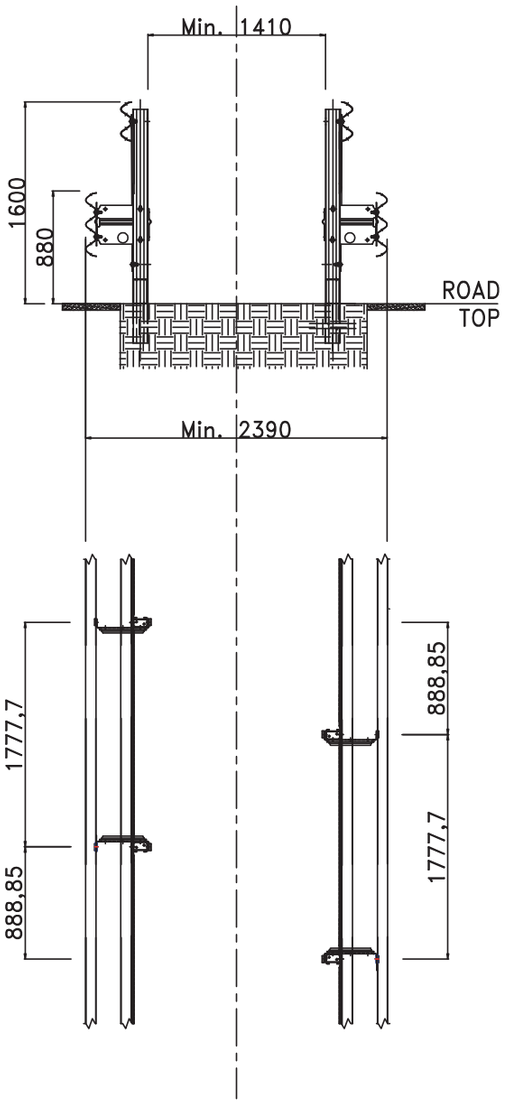
Double row median barrier

H3BL300 - H4bBL200

H3BL300



H4bBL200



For other characteristics look at the pages about side barriers.

complementary products

“they appear as reticular giants in a uncontaminated view... I look far over the horizon and I still feel secure in my travel...

imeva

pedestrian parapet
type 1

description

Parapet railing “Type 1” with grid panel, steel quality S235JR, hot dip galvanization according UNI EN ISO 1461.
Composition:
- “IPE” section hot profiled upright;
- Upper and lower longitudinal profiled panel with “U” section and vertical flat rods;
- Circular section handrail, th. 3,0 mm.

standard series

components

Post:	IPE 120
Handrail:	pipe Ø 60 mm
Panel:	
• upper/lower strip:	40x65x40x4 mm
• vert. flat rod:	50x6 mm

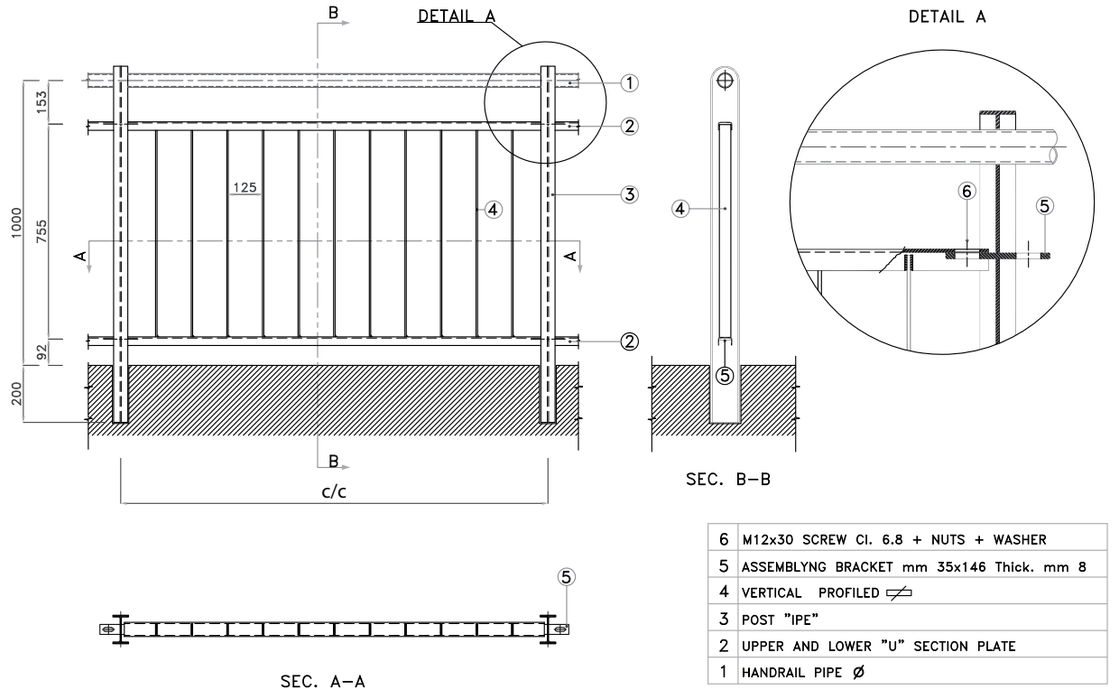
c/c (mm)	**weights (kg/m)**
1500	38,37
2000	36,26
3000	33,50

light series

components

Post:	IPE 100
Handrail:	pipe Ø 48 mm
Panel:	
• upper/lower strip:	30x50x30x4 mm
• vert. flat rod:	40x5 mm

c/c (mm)	**weights (kg/m)**
1500	26,40
2000	24,74
3000	23,00



6	M12x30 SCREW Cl. 6.8 + NUTS + WASHER
5	ASSEMBLYNG BRACKET mm 35x146 Thick. mm 8
4	VERTICAL PROFILED ⌲
3	POST "IPE"
2	UPPER AND LOWER "U" SECTION PLATE
1	HANDRAIL PIPE Ø

description

Parapet railing "Type 2" with three handrails, steel quality S235JR, hot dip galvanization according UNI EN ISO 1461.
Composition:
- "IPE" section hot profiled upright;
- Circular longitudinal handrail in cold profiled pipe th. 3,0 mm.

standard series

components

Post:	IPE 120
Handrail:	pipe Ø 60 mm

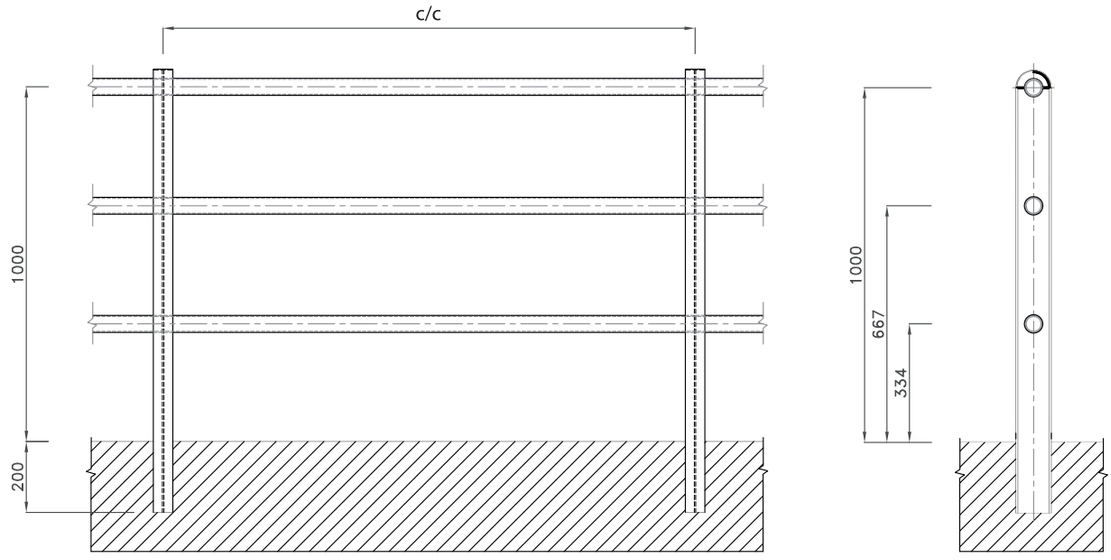
c/c (mm)	**weights (kg/m)**
1500	22,97
2000	20,66
3000	18,51

light series

components

Post:	IPE 100
Handrail:	pipe Ø 48 mm

c/c (mm)	**weights (kg/m)**
1500	18,13
2000	16,32
3000	14,65



description

Mesh panels for application with brackets on guard rails or pedestrian parapets. Steel quality S235JR, hot dip galvanization according UNI EN ISO 1461, height 2000 mm.
Composition:
- "U" section channel frame 30x60x30 mm th. 3,0 mm;
- Square and interwisted net, corrugated wire th. 3,0 mm;
- Connecting brackets (two for the handrail and one for the upright);
- Optional sheet for lower half-area, th. 2,0 mm, Sendzimir galvanization.

full mesh

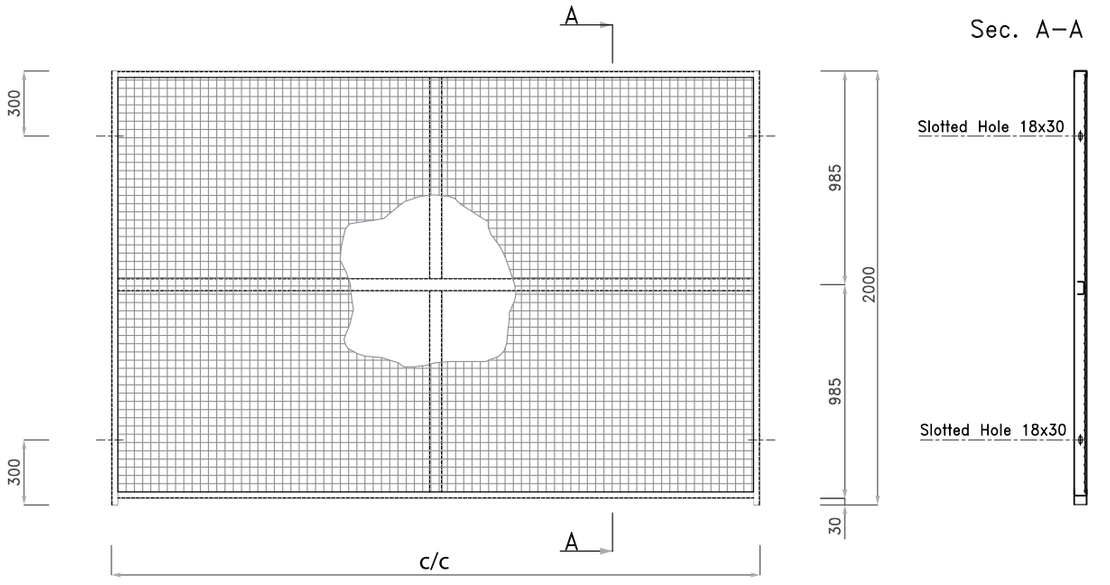
● mesh 30x30 mm

c/c (mm)	weights (kg/m)
2667	25,60
3000	24,22
3600	22,61
4000	22,05

full mesh

● mesh 50x50 mm

c/c (mm)	weights (kg/m)
2667	22,33
3000	20,87
3600	19,19
4000	18,75



3	ELECTROWELDED MESH
2	"U" SECTION MIDDLE PROFILED ITEM mm 30x60x30 Sp. mm 3
1	"U" SECTION PERIMETRAL PROFILED ITEM mm 30x60x30 Sp. mm 3

mesh and sheet

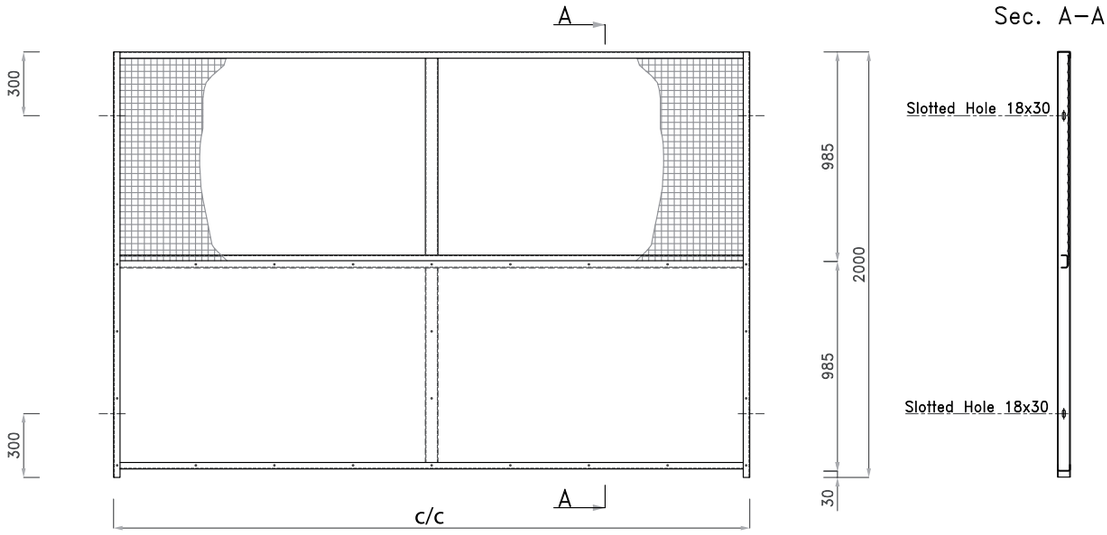
- **mesh 30x30 mm**

c/c (mm)	weights (kg/m)
2667	33,75
3000	32,56
3600	31,14
4000	36,46

mesh and sheet

- **mesh 50x50 mm**

c/c (mm)	weights (kg/m)
2667	32,80
3000	31,01
3600	29,59
4000	35,75



5	RIVETS ø mm 4,8
4	PLAIN SHEET THICK. mm 2
3	ELECTROWELDED MESH ø mm 3
2	"U" SECTION MIDDLE PROFILED ITEM mm 30x60x30 THICK mm 3
1	"U" SECTION PERIMETRAL PROFILED ITEM mm 30x60x30 THICK mm 3

panels with omega shaped uprights

description

Self - bearing panels with their own uprights; steel quality S235JR, hot dip galvanization according UNI EN ISO 1461, height 2000 mm.
Composition:
- "U" section channel frame 30x60x30 mm th. 3,0 mm;
- Square and interwisted net, corrugated wire th. 3,0; mm
- Omega shaped uprights 20x70x70 mm th. 4,0 mm height 2250 mm;
- Optional sheet for lower half-area, th. 2,0 mm, Sendzimir galvanization.

full mesh

● **mesh 30x30 mm**

c/c (mm)	weights (kg/m)
2667	30,05
3000	28,22
3600	25,94
4000	25,05

full mesh

● **mesh 50x50 mm**

c/c (mm)	weights (kg/m)
2667	26,83
3000	24,87
3600	22,52
4000	21,75

mesh and sheet

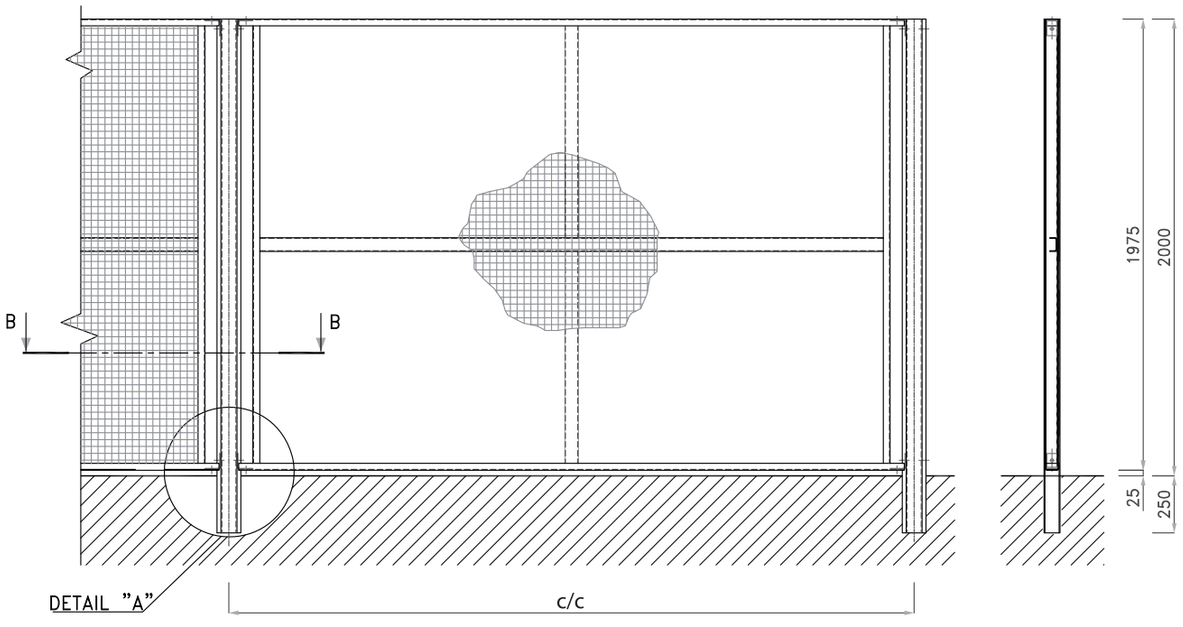
● **mesh 30x30 mm**

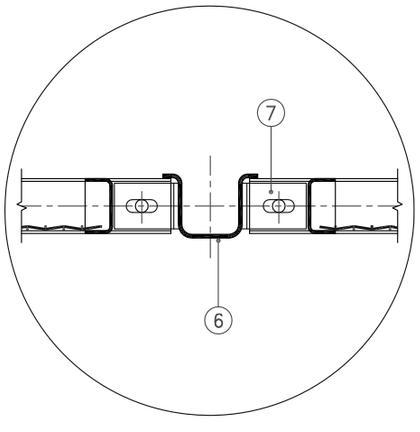
c/c (mm)	weights (kg/m)
2667	38,25
3000	36,56
3600	34,47
4000	39,46

mesh and sheet

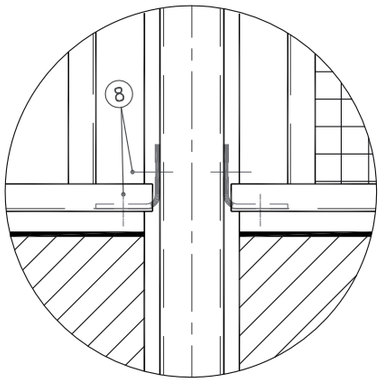
● **mesh 50x50 mm**

c/c (mm)	weights (kg/m)
2667	37,30
3000	35,01
3600	32,92
4000	38,75





SECTION B–B



DETAIL "A"

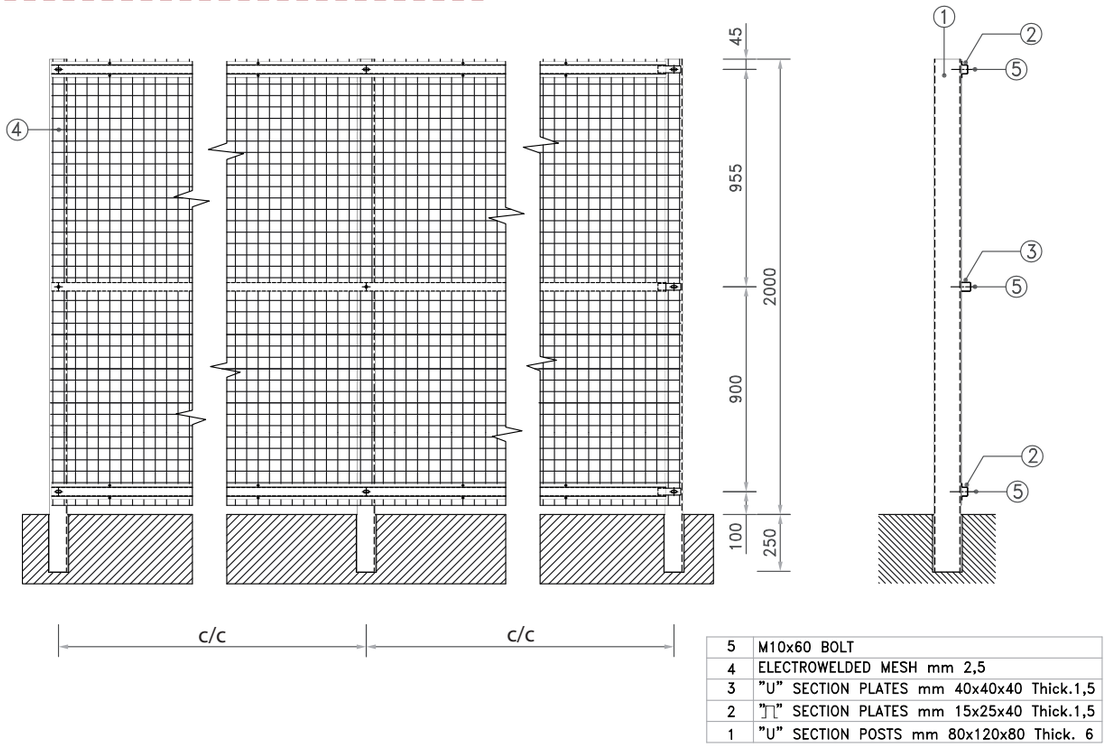
6	Bolts M10
5	"L" – braket mm 70x70 L=70 Thick mm 5
4	"⊔" SECTION PROFILED POST mm 20x70x70x70x20 Thick mm 4
3	ELECTROWELDED MESH
2	"U" SECTION MIDDLE PROFILED mm 30x60x30 Thick mm 3
1	"U" SECTION PERIMETRAL PROFILED mm 30x60x30 Thick mm 3

flyovers mesh protection “F3”

description

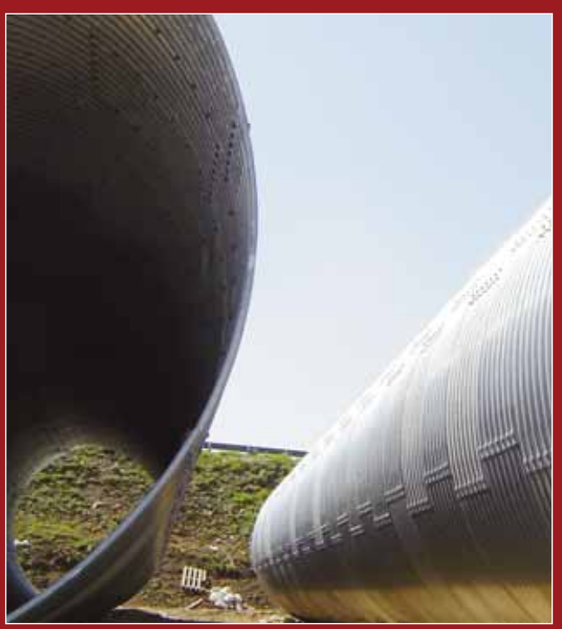
Structure for flyovers with steel posts quality S235JR, hot dip galvanization according UNI EN ISO 1461.
Composition:
- “U” section upright 80x120x80 mm th. 6,0 mm , H = 2250 mm;
- Electrowelded square mesh net 50x50 mm; wire 2,5 mm; H = 1930 mm;
- Steel strip according Sendzimir UNI EN 10142
- “Ω” section upper and lower rails 15x25x40x25x15 mm, th. 1,5 mm, lenght 6000 mm;
- “U” section median rail 40x40x40 mm th. 1,5 mm, lenght 6000 mm;
- Fastening wire Ø 2,0 mm;
- Bolts and nuts.

● c/c (mm)	weights (kg/m)
1500	25,67
3000	16,35



5	M10x60 BOLT
4	ELECTROWELDED MESH mm 2,5
3	"U" SECTION PLATES mm 40x40x40 Thick.1,5
2	"⎍" SECTION PLATES mm 15x25x40 Thick.1,5
1	"U" SECTION POSTS mm 80x120x80 Thick. 6

sheet corrugated structural elements



“they unwind in essential works of art like precious and easy shapes and I still feel secure in my travel...

imeva

Sheet Steel Corrugated Structural Elements Corrugation 150/100/70

IMEVA **Steel Corrugated Structural Elements Corrugation 150/ 100/ 70**, may be used in different ways in the field of general constructions such as the performance of the following products:

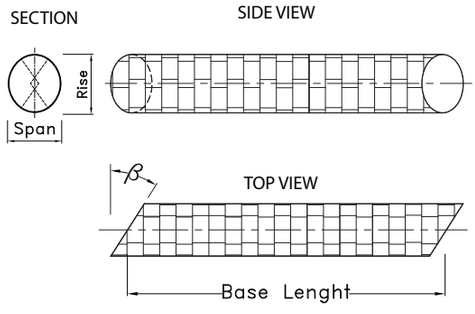
- service tunnels under aggregate pile to be extracted by use of belt conveyers, in crushing aggregate plants and/or concreting production;
- silos to contain aggregate or cereals, vertical axe tanks for water storing and so on;
- well liners for underground waters seizing drifts;
- protecting barriers for various different vertical works (such as steel or concrete pylons) from accidental impacts of vehicles and/or work means;
- earth bearing bulkheads, sheet piles and so on;
- rock falling-proof barriers to protect roads;
- underground for pedestrian crossing (even without traffic interruption);
- underground and out-ground environments for civil, industrial and agricultural uses (coverings for material stocking, working tools shelters and so on).

This Catalogue describes particularly the use of such **Structural Elements for the production of culverts and pipes used in the field of road constructions.**

The tables of this Catalogue show the dimensions (element-thickness related to the height of the embankment above the culvert) which however-arising from calculation methods concerning particularly road installation-are, to be meant as indicative and not compelling since they essentially aim at the calculation of the theoretical weights of the corresponding culverts.
Depending on particular use conditions, the Customer will provide for verifying the structural stability of his installation and for fulfilments according applicable regulations about construction matters (law 1086/1971; local provisions), because the chosen culvert is not subject to the norm **mass-produced products,** according to Italian M.D. LL. PP. 09.01.96 - Part III.

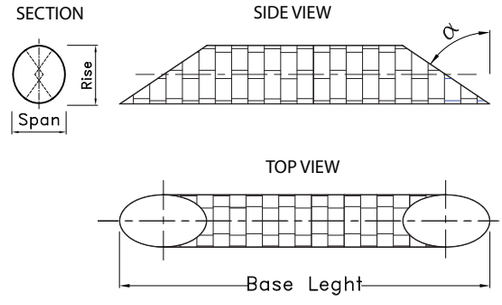
cutting typologies

1. Example of Planimetrical cut (vertical cuts according performance need of the planimetrical elbow and/or possible adaption)



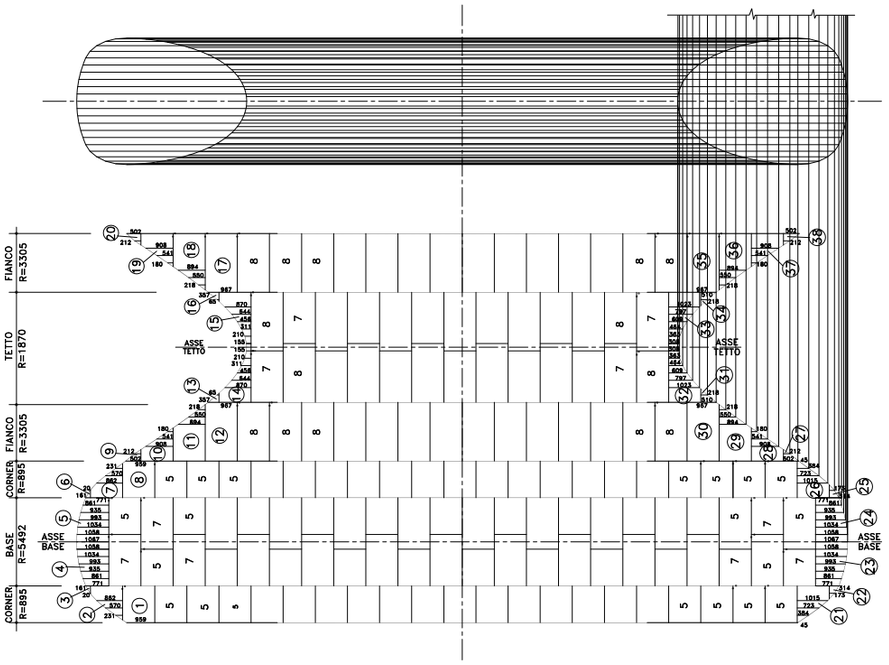
β= Planimetrical cutting angle

2. Example of Altimetrical cut (bevels according the slope of the embankment)

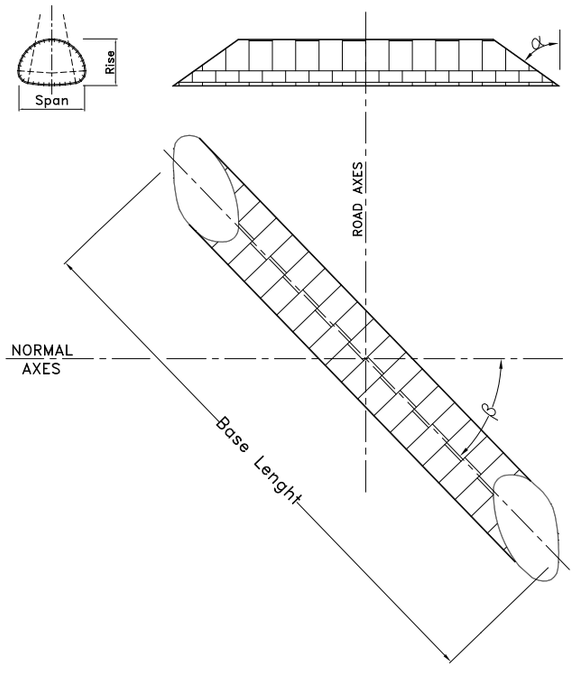


α= Altimetrical cutting angle

3. Flat view of a culvert with bevels



4. Plano Altimetrical cut (whit skew bevels)



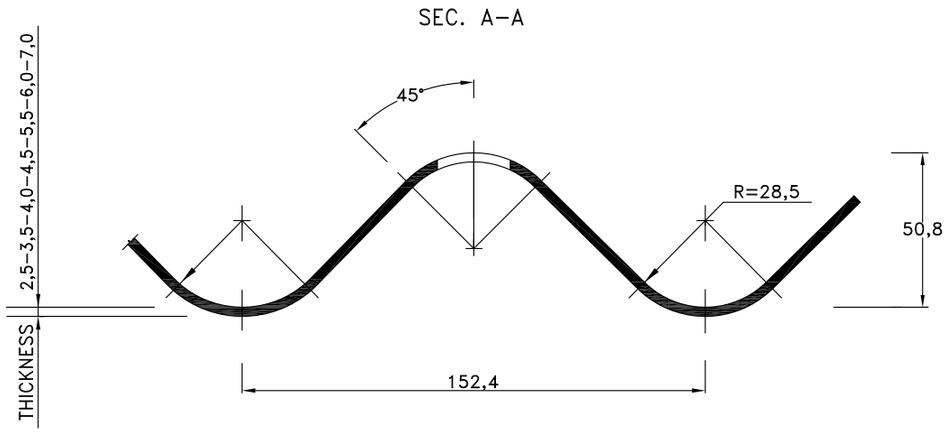
SIDE VIEW

α = cutting angle according the slope of embankment

β = skew angle between culvert axes and normal axes

TOP VIEW

corrugation 150

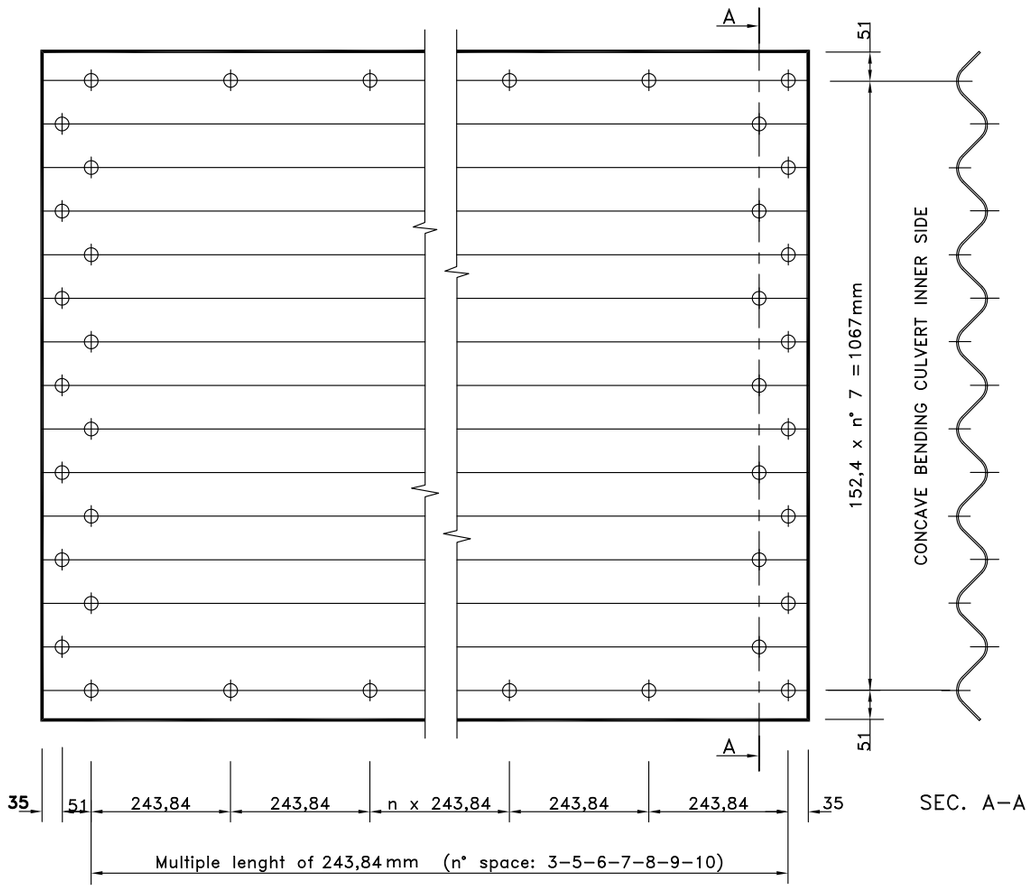


CONCAVE BENDING CULVERT INNER SIDE

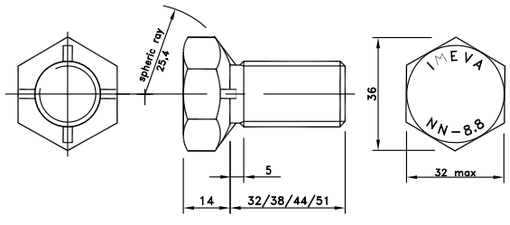
MULTIPLATES - CORRUGATION 152,4 x 50,8 mm

GEOMETRICAL AND RESILIENT FEATURES

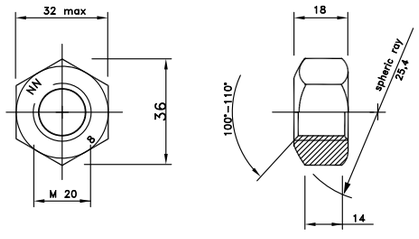
T (*)	MOMENT OF INERTIA	INERTIA RADIUS	SPECIFIC AREA	MAXIMUM RESISTANCE ON JOINT COMPRESSION (n° 2 bolts / wave)	(n° 4 bolts / wave)
mm	I [cm^4/cm]	r [cm]	a [cm^2/cm]	Kg / m	Kg / m
2,5	0,9279	1,441	0,3100	73.200	
3,5	1,3062	1,734	0,4342	107.700	
4,0	1,4968	1,736	0,4965	135.200	
4,5	1,6884	1,738	0,5588	141.300	
5,5	2,0746	1,742	0,6835	188.400	297.100
6,0	2,2693	1,744	0,7460	223.700	328.800
7,0	2,6617	1,748	0,8712	236.300	354.500
(*) not galvanized unrefined sheet thickness - tolerance UNI EN 10051				TIGHTENING TORQUE Nm from 220 to 300	



SCREW T.E. M20x32/38/44/51 –Class 8.8 according UNI EN ISO 898–1 –
– Pitch mm 2,25 –

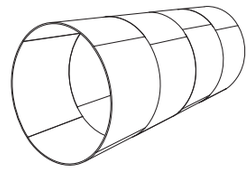


NUT M20 – Class 8 – According UNI EN ISO 20898–2



FOR SCREWS AND NUTS GALVANIZIATION : According UNI EN ISO 1461

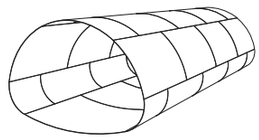
corrugation 150 circular section



CULVERT THICKNESS							GEOMETRICAL FEATURES				THEORICAL WEIGHT WITH BOLTS						
height of the embankment m											thickness mm						
min ÷ 1,00	1,01 ÷ 2,50	2,51 ÷ 5,00	5,01 ÷ 7,50	7,51 ÷ 10,00	10,01 ÷ 12,50	12,51 ÷ 15,00	n° of plates	n° of spaces	**diam m**	section m²	2,5	3,5	4,0	4,5	5,5	6,0	7,0
2,5	2,5	2,5	2,5	2,5	2,5	2,5	3	18	**1,36**	1,45	141	192	217	242	292	318	368
2,5	2,5	2,5	2,5	2,5	2,5	2,5		19	**1,44**	1,60	148	202	228	254	307	334	386
2,5	2,5	2,5	2,5	2,5	3,5	3,5		20	**1,52**	1,80	155	211	238	266	321	349	404
2,5	2,5	2,5	2,5	2,5	3,5	4,0		21	**1,60**	2,00	162	220	249	278	335	365	422
2,5	2,5	2,5	2,5	3,5	3,5	4,0	4	22	**1,68**	2,20	168	230	259	289	350	381	440
2,5	2,5	2,5	2,5	3,5	3,5	4,0		24	**1,83**	2,65	182	248	281	313	378	412	477
2,5	2,5	2,5	2,5	3,5	3,5	4,0		26	**1,98**	3,10	202	275	311	347	419	455	527
2,5	2,5	2,5	3,5	3,5	4,0	4,5		28	**2,13**	3,55	215	294	332	370	447	487	563
2,5	2,5	2,5	3,5	3,5	4,5	4,5		30	**2,29**	4,10	229	312	353	394	476	518	599
3,5	2,5	2,5	3,5	3,5	4,5	4,5		32	**2,44**	4,70	243	332	376	419	507	549	635
3,5	2,5	3,5	3,5	4,0	4,5	5,5		34	**2,59**	5,30	257	351	397	443	535	604	698
3,5	2,5	3,5	3,5	4,0	4,5	5,5		36	**2,74**	5,90	270	369	418	466	564	636	736
3,5	2,5	3,5	4,0	4,0	4,5	5,5		38	**2,90**	6,60	284	389	440	491	593	668	772
4,0	3,5	3,5	4,0	4,5	5,5	6,0		40	**3,05**	7,30	298	408	461	515	623	699	808
4,0	3,5	3,5	4,0	4,5	5,5	6,0	6	42	**3,20**	8,05	323	441	498	555	671	730	845
4,0	3,5	3,5	4,0	5,5	6,0	7,0		44	**3,35**	8,80	337	460	520	580	701	761	881
4,0	3,5	3,5	4,0	5,5	6,0	7,0		46	**3,51**	9,70	351	479	541	604	730	792	917
4,0	3,5	4,0	4,5	5,5	6,0	7,0		48	**3,66**	10,50	364	498	563	628	759	823	953
4,0	3,5	4,0	4,5	5,5	6,0	7,0		50	**3,81**	11,40	378	517	585	652	788	897	1017
4,0	3,5	4,0	4,5	5,5	6,0	7,0		52	**3,96**	12,30	382	535	606	676	817	910	1053
4,0	4,0	4,0	5,5	6,0	7,0	-		54	**4,11**	13,25	405	554	627	699	846	942	1090
4,5	4,0	4,5	5,5	6,0	7,0	-	8	56	**4,27**	14,30	432	588	665	741	896	973	1126
4,5	4,5	4,5	5,5	6,0	7,0	-		58	**4,42**	15,35	445	607	686	765	925	1004	1162
4,5	4,5	4,5	5,5	6,0	7,0	-		60	**4,57**	16,40	459	626	707	789	954	1036	1198
4,5	4,5	4,5	5,5	7,0	7,0	-		62	**4,72**	17,50	472	644	729	813	982	1067	1235
4,5	4,5	5,5	6,0	7,0	-	-		64	**4,88**	18,70	486	663	750	836	1011	1098	1271
5,5	5,5	5,5	6,0	7,0	-	-		66	**5,03**	19,85	500	682	772	861	1041	1172	1334
5,5	5,5	5,5	6,0	7,0	-	-		68	**5,18**	21,05	514	702	794	886	1071	1185	1371
5,5	5,5	5,5	6,0	7,0	-	-		70	**5,34**	22,40	527	721	815	910	1100	1216	1408
5,5	5,5	5,5	6,0	7,0	-	-		72	**5,49**	23,65	541	739	836	933	1129	1248	1444
5,5	5,5	6,0	7,0	-	-	-		74	**5,64**	25,00	554	758	857	957	1157	1279	1480
6,0	6,0	6,0	7,0	-	-	-		76	**5,79**	26,30	568	777	879	981	1187	1310	1516
6,0	6,0	7,0	7,0	-	-	-		78	**5,95**	27,80	582	796	901	1006	1216	1341	1552
6,0	7,0	7,0	7,0	-	-	-	10	80	**6,10**	29,20	608	830	939	1047	1266	1372	1588
7,0	7,0	7,0	-	-	-	-	12	82	**6,25**	30,65	622	849	960	1071	1295	1429	1653
7,0	7,0	7,0	-	-	-	-		84	**6,40**	32,15	635	868	981	1095	1324	1460	1689

- The diameters indicated are nominal and referred to the circular theoretical section; culverts actually have elliptical section with a standard elongation of about 5% on the vertical axis, except those up to 1,98 m of diameter which have a circular section. A circular pre-moulding can be manufactured on request for all indicated diameters.
- The dimensions indicated and referring to the inside radius, are nominal and therefore subject to manufacturing tolerances.
- The indicated thicknesses are nominal and refer to black plates; they conform to UNI EN 10051 standard. Different tolerances must be therefore previously agreed. Even weights, being theoretical, are variable according to the same thickness tolerances.
- The minimum height of the cover is to be established with a specific verification by the designer.
- The number of plates, for all kinds of sections, is indicative and may vary according to the availability of the semi-manufactured items.
- The above dimensions are indicative and not compelling.
- If required thicknesses higher than the ones in the table, according to the height of the embankment, it is necessay to ask preventively the feasibility because of possible deformations of holes when the ratio bending ray/thickness reduces.

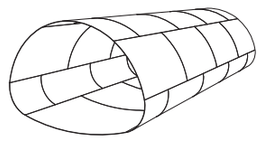
corrugation 150 pipe-arch section
type 1



CULVERT THICKNESS						GEOMETRICAL FEATURES					THEORICAL WEIGHT WITH BOLTS						
height of the embankment m																	
min ÷ 1,00	1,01 ÷ 2,50	2,51 ÷ 4,00	4,01 ÷ 5,50	5,51 ÷ 7,00	7,01 ÷ 8,50	n° of plates	n° of spaces	**Span m**	**Rise m**	section m²	thickness mm 2,5	3,5	4,0	4,5	5,5	6,0	7,0
2,5	2,5	2,5	2,5	2,5	3,5	6	22	**1,85**	**1,40**	2,05	200	246	286	308	399	422	467
2,5	2,5	2,5	2,5	2,5	3,5		23	**1,93**	**1,45**	2,25	207	255	297	320	414	438	485
2,5	2,5	2,5	2,5	3,5	3,5		24	**2,06**	**1,50**	2,40	213	264	307	332	428	454	504
2,5	2,5	2,5	2,5	3,5	3,5		25	**2,13**	**1,55**	2,60	220	274	318	344	443	469	522
2,5	2,5	2,5	2,5	3,5	3,5		26	**2,21**	**1,60**	2,90	227	283	329	356	457	485	540
3,5	2,5	2,5	2,5	3,5	3,5		27	**2,34**	**1,65**	3,05	234	293	339	368	472	501	558
3,5	2,5	2,5	2,5	3,5	3,5		28	**2,41**	**1,70**	3,25	241	302	350	380	486	517	576
3,5	2,5	2,5	2,5	3,5	3,5		29	**2,49**	**1,75**	3,55	248	312	361	392	501	553	608
3,5	2,5	2,5	3,5	3,5	4,0		30	**2,62**	**1,80**	3,70	254	321	372	404	515	569	626
3,5	2,5	2,5	3,5	3,5	4,0		31	**2,69**	**1,85**	4,00	261	330	382	416	530	585	644
3,5	2,5	3,5	3,5	4,0	4,0		32	**2,85**	**1,90**	4,25	268	340	393	428	545	621	676
3,5	3,5	3,5	3,5	4,0	4,0		33	**2,90**	**1,95**	4,55	275	349	404	440	559	637	694
3,5	3,5	3,5	3,5	4,0	4,0		34	**2,97**	**2,00**	4,85	282	359	415	452	574	653	712
3,5	3,5	3,5	3,5	4,0	4,0		35	**3,12**	**2,06**	5,10	289	368	425	464	589	663	730
3,5	3,5	3,5	3,5	4,0	4,5		36	**3,25**	**2,11**	5,40	302	385	444	485	613	675	749
3,5	3,5	3,5	3,5	4,0	4,5	7	37	**3,33**	**2,16**	5,70	315	402	463	506	638	681	767
4,0	3,5	3,5	3,5	4,0	4,5		38	**3,48**	**2,21**	5,95	321	411	474	518	652	697	785
4,0	3,5	3,5	4,0	4,0	4,5		39	**3,53**	**2,26**	6,20	328	421	484	530	667	712	803
4,0	3,5	3,5	4,0	4,0	4,5		40	**3,61**	**2,31**	6,60	335	430	495	541	681	728	821
4,0	3,5	4,0	4,0	4,0	5,5		41	**3,76**	**2,36**	6,90	342	440	505	553	695	744	839
4,0	3,5	4,0	4,0	4,5	5,5		42	**3,81**	**2,41**	7,25	348	449	516	565	710	760	858
4,0	4,0	4,0	4,0	4,5	5,5		43	**3,86**	**2,46**	7,50	357	460	528	578	725	796	889
4,0	4,0	4,0	4,0	4,5	5,5		44	**3,91**	**2,54**	7,90	362	468	538	590	739	812	907
4,0	4,0	4,0	4,0	4,5	5,5		45	**4,09**	**2,57**	8,30	369	478	549	602	754	828	926
4,0	4,0	4,0	4,0	4,5	5,5		46	**4,24**	**2,62**	8,65	376	487	560	614	769	843	944
4,5	4,0	4,0	4,5	5,5	6,0		47	**4,29**	**2,67**	9,00	383	497	570	626	784	850	962
4,5	4,0	4,5	4,5	5,5	6,0		48	**4,34**	**2,72**	9,40	390	506	581	638	798	875	980
4,5	4,5	4,5	4,5	5,5	6,0		49	**4,52**	**2,77**	9,75	397	516	592	650	813	911	1012
4,5	4,5	4,5	4,5	5,5	6,0		50	**4,67**	**2,82**	10,15	403	525	602	662	827	927	1030
4,5	4,5	4,5	4,5	5,5	6,0		51	**4,72**	**2,87**	10,50	410	534	613	673	841	934	1048
4,5	4,5	4,5	5,5	6,0	7,0		52	**4,77**	**2,92**	10,95	417	544	624	686	856	949	1066
4,5	4,5	4,5	5,5	6,0	7,0	9	53	**4,83**	**3,00**	11,35	430	561	642	706	881	965	1085
5,5	4,5	4,5	5,5	6,0	7,0		54	**5,00**	**3,02**	11,70	437	570	653	718	895	971	1102
5,5	5,5	5,5	5,5	6,0	7,0		55	**5,06**	**3,07**	12,20	444	580	664	730	910	987	1121

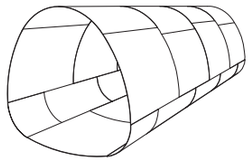
* As to dimensions, thickness, embankment height and number of plates please see notes on the former page

corrugation 150 pipe-arch section
type 2



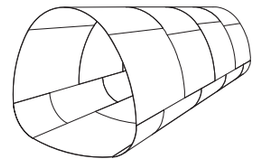
CULVERT THICKNESS						GEOMETRICAL FEATURES					THEORICAL WEIGHT WITH BOLTS						
height of the embankment m																	
min ÷ 1,00	1,01 ÷ 2,50	2,51 ÷ 4,00	4,01 ÷ 5,50	5,51 ÷ 7,00	7,01 ÷ 8,50	n° of plates	n° of spaces	**Span m**	**Rise m**	section m²	thickness mm 2,5	3,5	4,0	4,5	5,5	6,0	7,0
4,0	4,0	4,0	4,0	4,5	5,5	8	46	**4,04**	**2,85**	9,10	357	486	550	613	740	816	943
4,0	4,0	4,0	4,0	4,5	5,5		47	**4,12**	**2,90**	9,50	364	496	560	625	755	831	961
4,5	4,0	4,5	4,5	5,5	6,0		48	**4,27**	**2,95**	9,90	371	505	571	637	769	847	979
4,5	4,0	4,5	4,5	5,5	6,0		49	**4,32**	**3,00**	10,25	377	514	581	648	783	862	998
4,5	4,0	4,5	4,5	5,5	6,0		50	**4,40**	**3,05**	10,70	384	524	592	660	798	878	1016
4,5	4,5	4,5	4,5	5,5	6,0		51	**4,55**	**3,10**	11,05	391	534	603	673	813	894	1034
4,5	4,5	4,5	4,5	5,5	6,0		52	**4,67**	**3,15**	11,50	398	543	614	685	828	910	1053
4,5	4,5	4,5	4,5	5,5	6,0		53	**4,75**	**3,20**	12,20	405	553	625	697	842	916	1061
4,5	4,5	5,5	5,5	6,0	7,0		54	**4,83**	**3,25**	12,40	412	562	636	709	854	941	1089
4,5	4,5	5,5	5,5	6,0	7,0		55	**4,95**	**3,30**	12,85	419	571	646	721	871	978	1120
5,5	5,5	5,5	5,5	6,0	7,0	9	56	**5,03**	**3,35**	13,30	431	588	665	741	896	993	1139
5,5	5,5	5,5	5,5	6,0	7,0		57	**5,18**	**3,40**	13,80	438	598	676	753	910	1000	1157
5,5	5,5	5,5	5,5	6,0	7,0		58	**5,23**	**3,45**	14,25	445	607	686	765	924	1016	1175
5,5	5,5	5,5	5,5	6,0	7,0		59	**5,31**	**3,50**	14,70	452	617	697	777	940	1043	1206
5,5	5,5	5,5	5,5	6,0	7,0		60	**5,46**	**3,55**	15,15	459	626	708	789	954	1059	1224
6,0	5,5	6,0	6,0	7,0	-		61	**5,51**	**3,60**	15,65	465	635	718	801	968	1074	1242
6,0	5,5	6,0	6,0	7,0	-		62	**5,66**	**3,65**	16,20	472	645	729	813	983	1090	1261
6,0	5,5	6,0	6,0	7,0	-		63	**5,72**	**3,70**	16,70	479	655	740	826	998	1106	1279
6,0	5,5	6,0	6,0	7,0	-	10	64	**5,87**	**3,75**	17,20	492	671	759	846	1022	1121	1297
6,0	5,5	6,0	6,0	7,0	-		65	**5,94**	**3,81**	17,70	499	681	769	858	1037	1137	1316
6,0	5,5	6,0	6,0	7,0	-		66	**5,99**	**3,86**	18,25	506	690	780	870	1051	1153	1334
7,0	7,0	7,0	-	-	-		67	**6,07**	**3,91**	18,80	513	700	791	882	1066	1169	1352
7,0	7,0	7,0	-	-	-		68	**6,22**	**3,96**	19,35	520	709	802	894	1081	1184	1370
7,0	7,0	-	-	-	-		69	**6,27**	**4,01**	19,90	563	755	848	942	1099	1200	1389

corrugation 150 underpass section
type 1



CULVERT THICKNESS						GEOMETRICAL FEATURES					THEORICAL WEIGHT WITH BOLTS						
height of the embankment m																	
min ÷ 1,00	1,01 ÷ 2,50	2,51 ÷ 4,00	4,01 ÷ 5,50	5,51 ÷ 7,00	7,01 ÷ 8,50	n° of plates	n° of spaces	**Span m**	**Rise m**	section m²	thickness mm 2,5	3,5	4,0	4,5	5,5	6,0	7,0
2,5	2,5	2,5	2,5	3,5	3,5	6	28	**2,20**	**1,96**	3,55	247	310	359	389	497	528	590
2,5	2,5	2,5	2,5	3,5	3,5		32	**2,45**	**2,25**	4,60	274	347	401	437	555	591	663
3,5	2,5	3,5	3,5	3,5	4,0		34	**2,70**	**2,34**	5,20	288	366	422	460	583	623	699
3,5	2,5	3,5	3,5	4,0	4,0		38	**2,95**	**2,67**	6,50	315	404	465	508	642	727	799
3,5	3,5	3,5	3,5	4,0	4,0		41	**3,20**	**2,85**	7,50	342	440	506	554	696	765	853
3,5	3,5	3,5	3,5	4,0	4,5	7	44	**3,45**	**3,16**	8,90	343	467	528	588	711	794	907
4,0	3,5	4,0	4,0	4,4	4,5		47	**3,70**	**3,36**	10,10	364	495	560	624	754	841	962
4,0	3,5	4,0	4,0	4,0	5,5	8	51	**3,95**	**3,66**	11,80	397	541	611	681	823	936	1062
4,0	4,0	4,0	4,0	4,5	5,5		53	**4,20**	**3,74**	12,80	411	560	632	705	851	968	1098
4,5	4,0	4,5	4,5	5,5	6,0		56	**4,45**	**3,95**	14,30	431	588	664	741	895	1014	1152

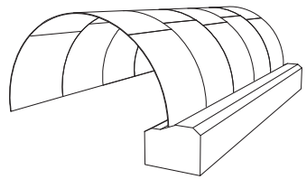
corrugation 150 underpass
type 2



CULVERT THICKNESS						GEOMETRICAL FEATURES					THEORICAL WEIGHT WITH BOLTS						
height of the embankment m											thickness mm						
min ÷ 1,00	1,01 ÷ 2,50	2,51 ÷ 4,00	4,01 ÷ 5,50	5,51 ÷ 7,00	7,01 ÷ 8,50	n° of plates	n° of spaces	**Span m**	**Rise m**	section m²	2,5	3,5	4,0	4,5	5,5	6,0	7,0
4,5	4,5	4,5	5,5	5,5	6,0	8	59	**4,65**	**4,25**	16,30	452	616	697	777	939	1053	1207
4,5	4,5	5,5	5,5	6,0	7,0		62	**4,89**	**4,43**	17,82	473	645	729	814	984	1099	1261
5,5	5,5	5,5	5,5	6,0	7,0	9	65	**5,14**	**4,63**	19,80	499	681	770	858	1037	1138	1316
5,5	5,5	5,5	6,0	7,0	-		68	**5,40**	**4,82**	21,65	520	709	802	894	1081	1184	1370
6,0	5,5	6,0	6,0	7,0	-	10	71	**5,65**	**5,02**	23,60	540	737	833	930	1124	1243	1438
6,0	6,0	6,0	6,0	7,0	-		74	**5,88**	**5,19**	25,65	566	773	873	974	1177	1291	1493
7,0	7,0	7,0	7,0	7,0	-		77	**6,13**	**5,39**	27,50	587	802	906	1011	1222	1337	1548
7,0	7,0	7,0	7,0	7,0	-		81	**6,42**	**5,77**	30,75	615	840	949	1059	1281	1400	1621
7,0	7,0	7,0	7,0	-	-		84	**6,67**	**5,97**	32,95	635	868	982	1095	1324	1468	1689
7,0	7,0	7,0	7,0	-	-		87	**6,92**	**6,16**	35,15	656	896	1013	1131	1367	1527	1756
7,0	7,0	7,0	7,0	-	-	11	90	**7,18**	**6,37**	37,85	683	932	1054	1176	1422	1565	1811
7,0	7,0	7,0	7,0	-	-		93	**7,42**	**6,54**	40,10	703	960	1086	1211	1465	1612	1865
7,0	7,0	7,0	-	-	-		96	**7,68**	**6,73**	42,85	724	989	1118	1248	1509	1680	1934
7,0	7,0	7,0	-	-	-	12	99	**7,91**	**6,91**	45,25	750	1024	1158	1292	1562	1727	1988

- The dimensions indicated and referring to the inside radius, are nominal and therefore subject to manufacturing tolerances.
- The indicated thicknesses are nominal and refer to black plates; they conform to UNI EN 10051 standard. Different tolerances must be therefore previously agreed. Even weights, being theoretical, are variable according to the same thickness tolerances.
- The minimum height of the cover is to be established with a specific verification by the designer.
- The number of plates, for all kinds of sections, is indicative and may vary according to the availability of the semi-manufactured items.
- The above dimensions are indicative and not compelling.
- If required thicknesses higher than the ones in the table, according to the height of the embankment, it is necessay to ask preventively the feasibility because of possible deformations of holes when the ratio bending ray/thickness reduces.

corrugation 150 arch-section



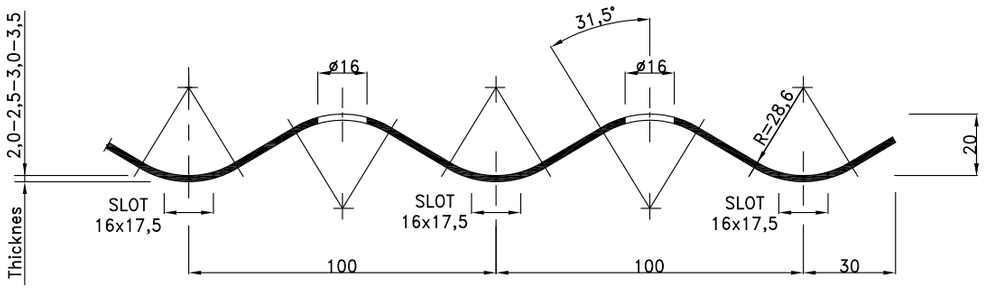
CULVERT THICKNESS						GEOMETRICAL FEATURES					THEORICAL WEIGHT WITH BOLTS						
height of the embankment m																	
min ÷ 0,75	0,76 ÷ 1,50	1,51 ÷ 2,50	2,51 ÷ 3,50	3,51 ÷ 4,50	4,51 ÷ 5,50	n° of plates	n° of spaces	**Span m**	**Rise m**	section m²	thickness mm 2,5	3,5	4,0	4,5	5,5	6,0	7,0
2,5	2,5	2,5	2,5	2,5	2,5	1	10	**1,52**	**0,81**	1,00	74	102	115	129	156	190	209
2,5	2,5	2,5	2,5	2,5	2,5	2	12	**1,83**	**0,97**	1,40	94	128	145	161	195	212	245
3,5	2,5	2,5	2,5	2,5	2,5		14	**2,13**	**1,12**	1,85	108	147	166	185	224	243	282
3,5	2,5	2,5	2,5	2,5	2,5		16	**2,44**	**1,27**	2,40	122	166	188	209	253	286	331
3,5	3,5	2,5	2,5	3,5	3,5		18	**2,74**	**1,44**	3,05	135	185	209	233	282	318	367
3,5	3,5	3,5	3,5	3,5	3,5	3	20	**3,05**	**1,60**	3,80	155	211	238	266	321	349	404
4,0	3,5	3,5	3,5	3,5	3,5		22	**3,35**	**1,75**	4,65	168	230	259	289	350	381	440
4,0	3,5	3,5	3,5	4,0	4,0		24	**3,65**	**1,90**	5,50	182	249	281	314	379	424	490
4,0	4,0	3,5	4,0	4,0	4,5		26	**3,96**	**2,06**	6,50	196	268	303	338	409	455	526
4,0	4,0	4,0	4,0	4,5	4,5		28	**4,27**	**2,21**	7,45	210	287	324	362	438	487	563
4,5	4,5	4,5	4,5	4,5	5,5	4	30	**4,57**	**2,36**	8,55	229	312	353	394	476	518	599
4,5	4,5	4,5	4,5	5,5	5,5		32	**4,88**	**2,51**	9,75	243	332	376	419	507	561	649
5,5	5,5	5,5	5,5	5,5	5,5		34	**5,18**	**2,69**	11,05	257	351	397	443	535	592	685
5,5	5,5	5,5	5,5	5,5	6,0		35	**5,49**	**2,72**	11,70	263	360	407	454	549	608	703
6,0	6,0	5,5	6,0	6,0	6,0		37	**5,79**	**2,88**	13,00	277	379	429	479	579	639	740
6,0	6,0	6,0	6,0	6,0	7,0		39	**6,10**	**3,05**	14,60	291	398	451	503	608	671	776
7,0	6,0	6,0	7,0	7,0	-	5	41	**6,40**	**3,20**	16,00	311	425	480	536	648	714	826
7,0	6,0	6,0	7,0	7,0	-		43	**6,71**	**3,35**	17,65	324	443	501	560	677	745	863
7,0	6,0	6,0	7,0	-	-		45	**7,01**	**3,50**	19,30	338	462	523	584	706	776	898
-	7,0	7,0	-	-	-		47	**7,31**	**3,66**	21,00	352	481	544	608	735	808	935
-	7,0	7,0	-	-	-	6	49	**7,62**	**3,81**	22,95	366	500	566	632	764	851	985
-	-	7,0	-	-	-		51	**7,92**	**3,96**	24,60	385	527	596	664	803	882	1021
-	-	7,0	-	-	-		53	**8,23**	**4,14**	26,75	399	545	617	688	832	914	1057
-	-	7,0	-	-	-		55	**8,53**	**4,29**	28,80	413	564	638	712	862	945	1094
-	-	7,0	-	-	-		57	**8,84**	**4,45**	30,85	426	583	660	736	891	989	1114
-	-	7,0	-	-	-		59	**9,14**	**4,60**	32,90	440	602	681	760	919	1020	1180

- The above weights must be increased of 22 kg/lm because they do not include the anchorages.
- The data in the tables refer to structure with a rise/span relation of about 0.50. Imeva produces on request special structures with a different rise/spam relation.
- The dimensions indicated and referring to the inside radius, are nominal and therefore subject to manufacturing tolerances.
- The indicated thicknesses are nominal and refer to black plates; they conform to UNI EN 10051 standard. Different tolerances must be therefore previously agreed. Even weights, being theoretical, are variable according to the same thickness tolerances.
- The minimum height of the cover is to be established with a specific verification by the designer.
- The number of plates, for all kinds of sections, is indicative and may vary according to the availability of the semi-manufactured items.
- The above dimensions are indicative and not compelling.
- If required thicknesses higher than the ones in the table, according to the height of the embankment, it is necessay to ask preventively the feasibility because of possible deformations of holes when the ratio bending ray/thickness reduces.

corrugation100

HOLES ø 16 ON THE TOP
SLOTS 16x17,5 IN THE CAVITIES

SEC. A–A

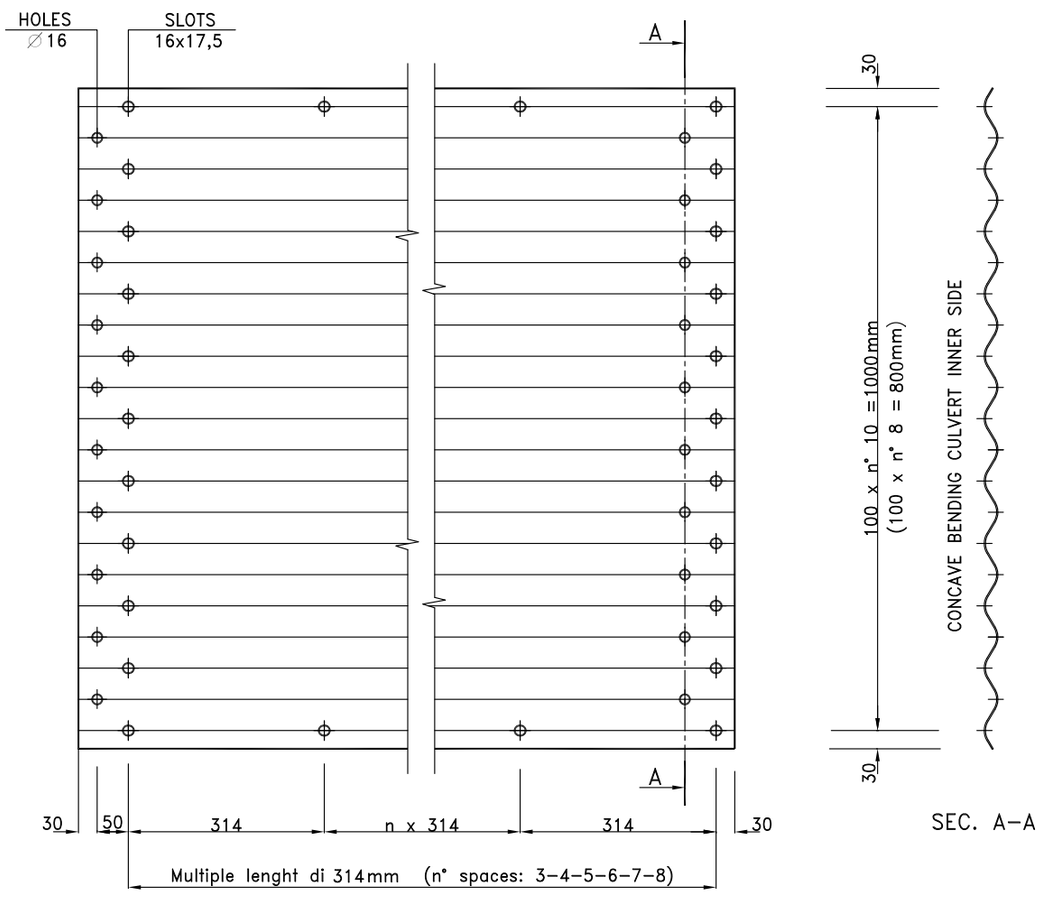


CONCAVE BENDING CULVERT INNER SIDE

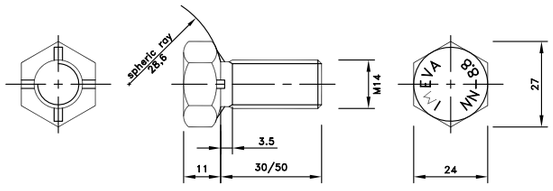
MINIMULTIPLATES - CORRUGATION 100 x 20 mm

GEOMETRICAL AND RESILIENT FEATURES

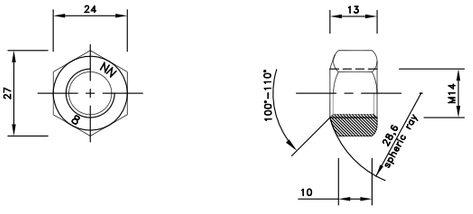
T (*)	MOMENT OF INERTIA	INERTIA RADIUS	SPECIFIC AREA	MAXIMUM RESISTANCE ON JOINT COMPRESSION (n° 2 bolts / wave)
mm	I [cm^4/cm]	r [cm]	a [cm^2/cm]	Kg / m
2,0	0,1064	0,697	0,2188	73.300
2,5	0,1334	0,698	0,2736	90.800
3,0	0,1607	0,699	0,3283	100.500
3,5	0,1881	0,700	0,3832	125.000
(*) not galvanized unrefined sheet thickness - tolerance UNI EN 10051				TIGHTENING TORQUE Nm from 160 to 220



SCREW T.E. M14x30/50 – Class 8.8 According UNI EN ISO 898-1 -Pitch mm 2

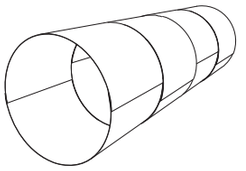


NUT M14 – Class 8 – According UNI EN ISO 20898-2



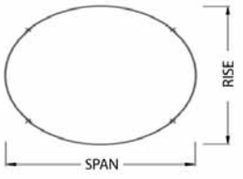
FOR SCREWS AND NUTS – GALVANIZATION : According UNI EN ISO 1461

corrugation 100 circular section



CULVERT THICKNESS									GEOMETRICAL FEATURES				THEORICAL WEIGHT WITH BOLTS				
height of the embankment m																	
0,70 ÷ 1,00	1,01 ÷ 4,00	4,01 ÷ 6,00	6,01 ÷ 8,00	8,01 ÷ 10,00	10,01 ÷ 12,00	12,01 ÷ 14,50	14,51 ÷ 16,00	16,01 ÷ 17,00	n° of plates	n° of spaces	diam m	section m²	thickness mm 1,5	2,0	2,5	3,0	3,5
1,5	1,5	1,5	1,5	1,5	2,0	2,0	2,0	2,5	2	8	**0,80**	0,48	44	57	69	82	95
1,5	1,5	1,5	1,5	2,0	2,5	2,5	2,5	3,0		10	**1,00**	0,75	54	69	84	100	116
2,0	1,5	1,5	2,0	2,5	2,5	3,0	3,0	3,5		12	**1,20**	1,09	63	81	99	118	136
2,0	1,5	2,0	2,0	2,5	3,0	3,0	3,5	-		14	**1,40**	1,50	72	93	114	136	157
2,0	1,5	2,0	2,5	2,5	3,0	3,0	3,5	-	3	15	**1,50**	1,72	81	103	126	150	173
2,5	1,5	2,0	2,5	2,5	3,0	3,0	3,5	-	2	16	**1,60**	1,96	82	106	129	155	178
2,5	2,0	2,0	2,5	3,0	3,0	3,5	-	-	3	18	**1,80**	2,49	95	122	149	178	205
2,5	2,0	2,5	2,5	3,0	3,5	-	-	-		20	**2,00**	3,08	104	134	164	196	226
2,5	2,0	2,5	3,0	3,0	3,5	-	-	-		22	**2,20**	3,73	113	146	179	214	247
3,0	2,5	2,5	3,5	3,5	-	-	-	-		24	**2,40**	4,45	123	158	194	232	268
3,0	2,5	3,0	3,5	-	-	-	-	-	4	25	**2,50**	4,83	131	168	206	246	283
3,0	2,5	3,0	3,5	-	-	-	-	-		26	**2,60**	5,23	135	175	214	255	294
3,5	3,0	3,0	3,5	-	-	-	-	-		28	**2,80**	6,07	145	187	229	273	315

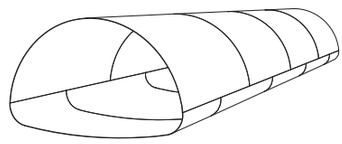
corrugation 100 elliptical section



CULVERT THICKNESS							GEOMETRICAL FEATURES					THEORICAL WEIGHT WITH BOLTS					
height of the embankment m																	
0,70 ÷ 1,00	1,01 ÷ 4,00	4,01 ÷ 6,00	6,01 ÷ 8,00	8,01 ÷ 10,00	10,01 ÷ 12,00	12,01 ÷ 14,50	n° of plates	n° of spaces	Span m	Rise m	section m²	thickness mm 1,5	2,0	2,5	3,0	3,5	
2,5	2,0	2,0	2,5	3,0	3,0	3,5	4	18	**1,87**	**1,69**	2,49	98	126	153	182	210	
2,5	2,0	2,5	2,5	3,0	3,5	-		20	**2,08**	**1,88**	3,08	107	138	168	201	231	
2,5	2,0	2,5	3,0	3,0	3,5	-		22	**2,29**	**2,07**	3,73	117	150	183	219	252	
3,0	2,5	2,5	3,0	3,5	-	-		24	**2,50**	**2,26**	4,45	126	162	199	237	273	
3,0	2,5	3,0	3,5	-	-	-		26	**2,71**	**2,45**	5,23	135	175	214	255	294	
3,5	3,0	3,0	3,5	-	-	-		28	**2,92**	**2,64**	6,07	145	187	229	273	315	

- The dimensions indicated and referring to the inside radius, are nominal and therefore subject to manufacturing tolerances.
- The indicated thicknesses are nominal and refer to black plates; they conform to UNI EN 10051 standard. Different tolerances must be therefore previously agreed. Even weights, being theoretical, are variable according to the same thickness tolerances.
- The number of plates, for all kinds of sections, is indicative and may vary according to the availability of the semi-manufactured items.
- The above dimensions are indicative and not compelling.

corrugation 100 pipe-arch section



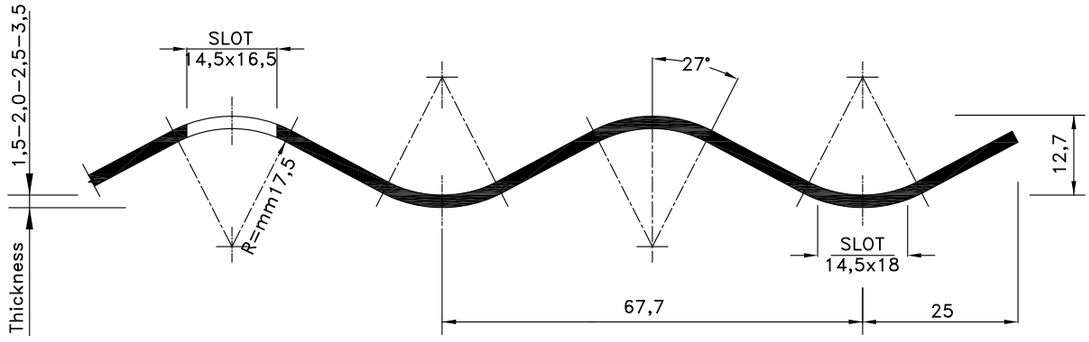
CULVERT THICKNESS							GEOMETRICAL FEATURES					THEORICAL WEIGHT WITH BOLTS				
height of the embankment m																
0,80 ÷ 5,01	5,01 ÷ 6,00	6,01 ÷ 7,00	7,01 ÷ 8,00	8,01 ÷ 9,00	9,01 ÷ 10,00	10,01 ÷ 12,00	n° of plates	n° of spaces	**Span m**	**Rise m**	section m^2	thickness mm 1,5	2,0	2,5	3,0	3,5
2,0	2,0	2,0	2,5	2,5	2,5	3,0	3	11	**1,20**	**0,99**	0,92	62	79	96	114	131
2,0	2,0	2,5	2,5	2,5	3,0	3,5	4	14	**1,52**	**1,17**	1,48	79	101	123	146	168
2,5	2,0	2,5	2,5	3,0	3,5			15	**1,60**	**1,34**	1,75	84	107	131	155	179
2,5	2,0	2,5	2,5	3,0	3,5			16	**1,75**	**1,34**	1,85	89	113	138	164	189
2,5	2,5	2,5	3,0	3,5	-	-		18	**2,00**	**1,54**	2,42	98	126	153	182	210
2,5	2,5	3,0	3,5	3,5	-	-	5	19	**2,10**	**1,59**	2,72	106	136	165	196	226
2,5	2,5	3,0	3,5	-	-	-		20	**2,20**	**1,66**	2,94	111	142	173	205	236
3,0	2,5	3,0	3,5	-	-	-		21	**2,42**	**1,68**	3,22	116	148	180	215	247
3,0	2,5	3,0	3,5	-	-	-		22	**2,50**	**1,78**	3,52	120	154	188	224	257
3,0	3,0	3,5	-	-	-	-		23	**2,60**	**1,86**	3,90	125	160	195	233	268
3,0	3,0	3,5	-	-	-	-		24	**2,76**	**1,90**	4,15	130	166	203	242	278

- The dimensions indicated and referring to the inside radius, are nominal and therefore subject to manufacturing tolerances.
- The indicated thicknesses are nominal and refer to black plates; they conform to UNI EN 10051 standard. Different tolerances must be therefore previously agreed. Even weights, being theoretical, are variable according to the same thickness tolerances.
- The number of plates, for all kinds of sections, is indicative and may vary according to the availability of the semi-manufactured items.
- The above dimensions are indicative and not compelling.

corrugation 70

SLOTS 14,5x18,0 IN THE CAVITIES
SLOTS 14,5x16,5 ON THE TOP

SEC. A–A

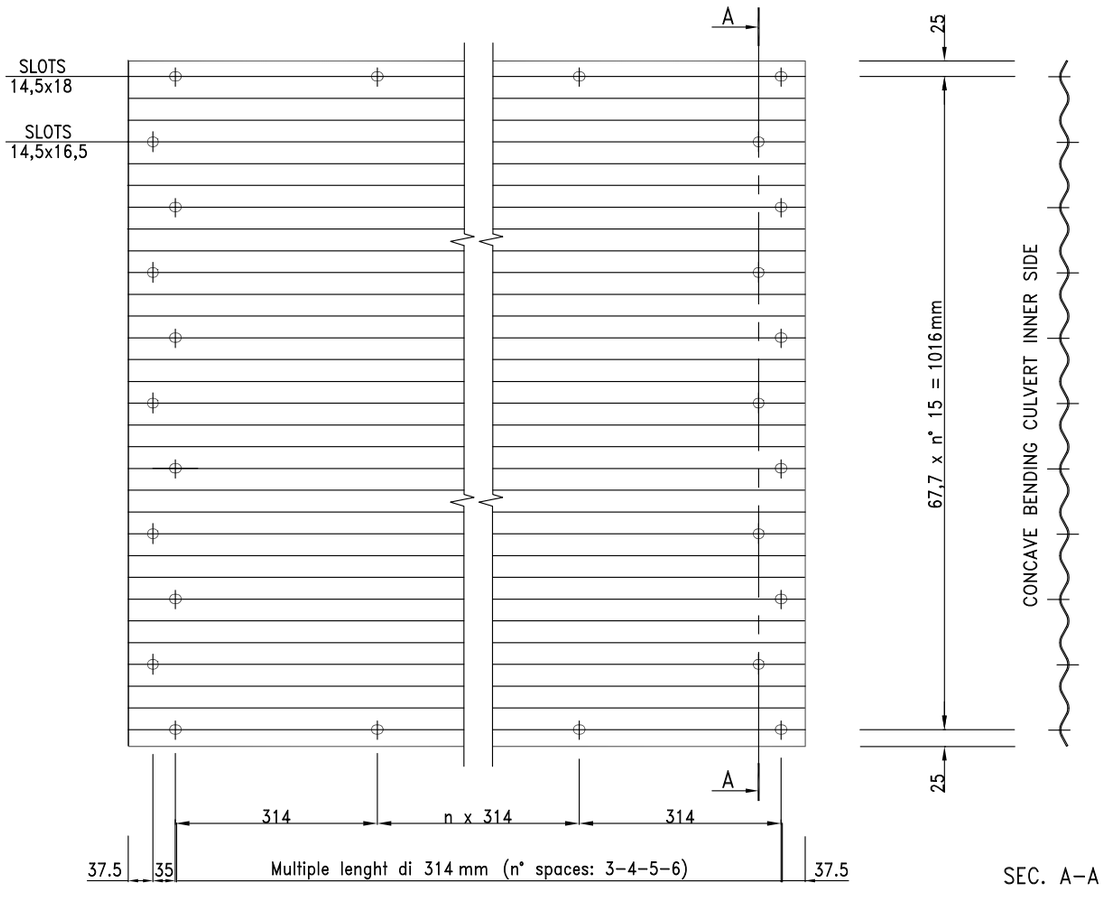


CONCAVE BENDING CULVERT INNER SIDE

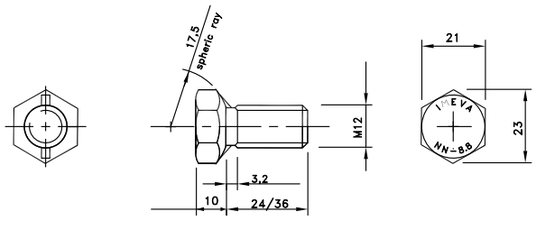
MINIMULTIPLATES - CORRUGATION 67,7 x 12,7 mm

GEOMETRICAL AND RESILIENT FEATURES

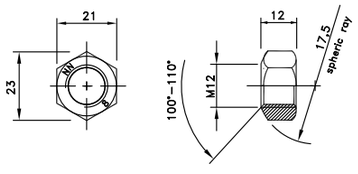
T (*)	MOMENT OF INERTIA	INERTIA RADIUS	SPECIFIC AREA	MAXIMUM RESISTANCE ON JOINT COMPRESSION (n° 2 bolts / wave)
mm	I [cm^4/cm]	r [cm]	a [cm^2/cm]	Kg / m
1,5	0,0303	0,4325	0,1620	34.800
2,0	0,0406	0,4335	0,2160	41.800
2,5	0,0511	0,4349	0,2701	44.500
3,5	0,0725	0,4377	0,3783	120.100
(*) not galvanized unrefined sheet thickness - tolerance UNI EN 10051				TIGHTENING TORQUE Nm from 120 to 160



SCREW T.E. M12x24/36 – Class 8.8 According UNI EN ISO 898-1 -Pitch mm 1,75

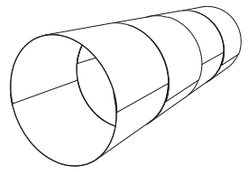


NUT M12 – Class 8 – According UNI EN ISO 20898-2



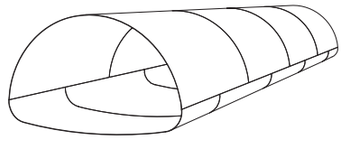
FOR SCREWS AND NUTS – GALVANIZATION : According UNI EN ISO 1461

corrugation 70 circular section



CULVERT THICKNESS									GEOMETRICAL FEATURES				THEORICAL WEIGHT WITH BOLTS			
height of the embankment m																
min ÷ 0,50	0,51 ÷ 1,00	1,01 ÷ 1,50	1,51 ÷ 2,00	2,01 ÷ 3,00	3,01 ÷ 4,00	4,01 ÷ 5,00	5,01 ÷ 7,00	7,01 ÷ 9,00	n° of plates	n° of spaces	**diam m**	section m²	thickness mm 1,5	2,0	2,5	3,5
2,0	2,0	1,5	1,5	1,5	1,5	1,5	1,5	2,0	2	5	**0,50**	0,20	26	33	40	55
2,0	2,0	1,5	1,5	1,5	1,5	1,5	1,5	2,0		6	**0,60**	0,28	30	38	47	64
2,0	2,0	1,5	1,5	1,5	1,5	1,5	2,0	2,5		7	**0,70**	0,38	34	44	54	74
2,0	2,0	1,5	1,5	1,5	1,5	1,5	2,0	2,5		8	**0,80**	0,50	39	50	61	84
2,5	2,5	2,0	2,0	2,0	2,0	2,0	2,0	2,5		9	**0,90**	0,63	43	55	68	93
2,5	2,5	2,0	2,0	2,0	2,0	2,0	2,5	2,5		10	**1,00**	0,78	48	61	75	103
2,5	2,5	2,5	2,0	2,0	2,0	2,5	2,5	3,5		11	**1,10**	0,95	54	69	85	116
2,5	2,5	2,5	2,0	2,0	2,0	2,5	2,5	3,5		12	**1,20**	1,13	56	73	89	123
3,5	2,5	2,5	2,5	2,5	2,5	2,5	3,5	3,5		13	**1,30**	1,33	63	79	96	134
3,5	3,5	2,5	2,5	2,5	2,5	2,5	3,5	3,5		14	**1,40**	1,54	65	84	103	142
3,5	3,5	2,5	2,5	2,5	2,5	2,5	3,5	3,5	3	15	**1,50**	1,77	71	92	113	155
3,5	3,5	2,5	2,5	2,5	2,5	2,5	3,5	3,5		16	**1,60**	2,00	76	98	120	165
3,5	3,5	3,5	2,5	2,5	2,5	3,5	3,5	-		17	**1,70**	2,27	80	103	127	174
3,5	3,5	3,5	2,5	2,5	2,5	3,5	3,5	-		18	**1,80**	2,54	85	109	134	184

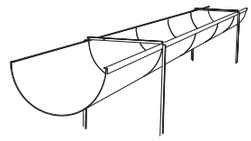
corrugation 70 pipe-arch section



CULVERT THICKNESS								GEOMETRICAL FEATURES					THEORICAL WEIGHT WITH BOLTS			
height of the embankment m																
min ÷ 0,50	0,51 ÷ 1,00	1,01 ÷ 1,50	1,51 ÷ 2,00	2,01 ÷ 3,00	3,01 ÷ 4,00	4,01 ÷ 5,00	5,01 ÷ 7,00	n° of plates	n° of spaces	**Span m**	**Rise m**	section m²	thickness mm 1,5	2,0	2,5	3,5
2,5	2,5	2,5	2,0	2,0	2,0	2,5	2,5	3	11	**1,20**	**0,99**	0,92	54	69	85	116
3,5	3,5	2,5	2,5	2,5	2,5	2,5	3,5	4	14	**1,52**	**1,17**	1,48	69	88	108	148
3,5	3,5	2,5	2,5	2,5	2,5	2,5	3,5		15	**1,60**	**1,34**	1,75	73	94	115	158
3,5	3,5	3,5	2,5	2,5	2,5	3,5	3,5		16	**1,75**	**1,34**	1,85	78	100	122	168

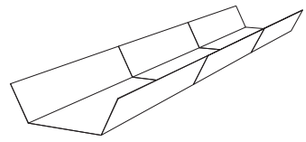
- The dimensions indicated and referring to the inside radius, are nominal and therefore subject to manufacturing tolerances.
- The indicated thicknesses are nominal and refer to black plates; they conform to UNI EN 10051 standard. Different tolerances must be therefore previously agreed. Even weights, being theoretical, are variable according to the same thickness tolerances.
- The minimum height of the cover is to be established with a specific verification by the designer.
- The number of plates, for all kinds of sections, is indicative and may vary according to the availability of the semi-manufactured items.
- The above dimensions are indicative and not compelling.

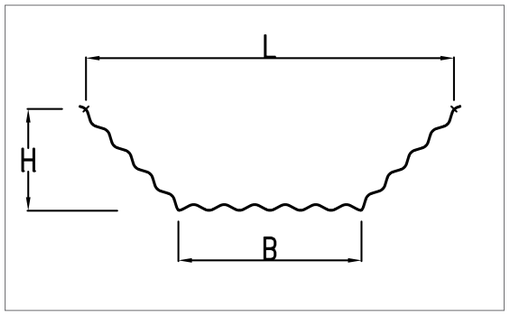
corrugation 70 semi-circular flume



GEOMETRICAL FEATURES				THEORICAL WEIGHT WITH BOLTS												
				PLATES AND BOLTS			SUPPORT DISTANCE 3,05 m					SUPPORT DISTANCE 6,10 m				
n° of plates	n° of spaces	**Span m**	section m²	thickness mm 1,5	2,0	2,5	crossbars and supports	longitudinal lag	total weight 1,5	2,0	2,5	crossbars and supports	longitudinal lag	total weight 1,5	2,0	2,5
1	2½	**0,50**	0,10	12,8	16,7	20,6	1,9	-	14,7	18,6	22,5	1,0	-	13,8	17,7	21,6
		0,50	0,10	12,8	16,7	20,6	1,9	7,2	21,9	25,8	29,7	1,0	7,2	21,0	24,9	28,8
	3	**0,60**	0,14	15,6	20,2	24,8	2,1	-	17,7	22,3	26,9	1,1	-	16,7	21,3	25,9
		0,60	0,14	15,6	20,2	24,8	2,1	7,2	24,9	29,5	34,2	1,1	7,2	24,0	28,6	33,3
	4	**0,80**	0,25	20,2	26,3	32,4	2,6	-	22,9	28,9	35,0	1,3	-	21,5	27,6	32,7
		0,80	0,25	20,2	26,3	32,4	2,6	7,2	30,0	36,1	42,2	1,3	7,2	28,8	34,8	41,0
	5	**1,00**	0,39	24,9	32,4	40,0	3,5	-	28,4	35,9	43,5	1,8	-	26,7	34,2	41,8
		1,00	0,39	24,9	32,4	40,0	3,5	8,3	36,6	44,1	51,6	1,8	8,3	35,1	42,6	50,2
	6	**1,20**	0,61	29,6	38,6	47,6	3,8	-	33,4	42,4	51,4	1,9	-	31,5	40,5	49,5
		1,20	0,61	29,6	38,6	47,6	3,8	8,3	41,7	50,7	59,7	1,9	8,3	39,9	48,9	57,9
2	7	**1,40**	0,80	36,1	46,7	57,4	4,5	-	40,6	51,2	61,9	2,3	-	38,4	49,0	59,7
		1,40	0,80	36,1	46,7	57,4	4,5	8,3	48,9	59,5	70,2	2,3	8,3	46,8	57,4	68,1
	8	**1,60**	1,00	41,5	53,7	65,9	5,0	-	46,5	58,7	70,9	2,5	-	43,9	56,2	68,4
		1,60	1,00	41,5	53,7	65,9	5,0	8,3	54,8	67,0	79,2	2,5	8,3	52,4	64,6	76,8
	9	**1,80**	1,27	46,2	59,9	73,5	7,2	-	53,4	67,1	80,7	3,6	-	49,8	63,5	77,1
		1,80	1,27	46,2	59,9	73,5	7,2	8,3	61,4	75,3	88,9	3,6	8,3	58,2	71,9	85,5

corrugation 70 trapezoidal flume





GEOMETRICAL FEATURES				THEORICAL WEIGHT WITH BOLTS
Base m	**Span m**	**Rise m**	section m²	Distance 1,57 m thickness mm
B	**L**	**H**		1,5 2,0 2,5
0,27	**0,64**	**0,32**	0,15	15,0 19,5 24,0
0,40	**0,75**	**0,26**	0,16	15,0 19,5 24,0
0,75	**1,40**	**0,56**	0,60	30,4 39,3 48,3

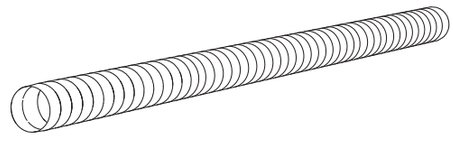
Spiroid draining pipes

These items are ideal in case of draining works; they are purposely drilled in the lower quarter of the section.
Lightness, resistance and functionality make this item easy to install and therefore economically favourable.
The corrugated steel of the sheet has a unitary tensile stress which is not lower than 360 kg/mm2 and it is protected on both sides by a "Sendzimir" galvanization process. The backfilling material used during the installation of the pipe must be permeable so as to make possible a quick passage of waters; besides it must work as a filter so that to block smaller particles which could clog drain holes.
The various backfilling layers must be compressed very carefully : they will be avoided in this way sagging due to settlement phenomena. Spiroid draining steel pipes have about holes of 8,00 mm of diameter with regular intervals in the lower part, they must be placed downwards so as to allow a correct pickling of waters.
The main appliances are :

- drainage of road and sport structures;
- lightening of reinforced concrete structures (pipes without holes);

Suggested thicknesses, in relation to the diameter, correspond to the weights indicated in the following tables; the diameters not included into the table may be available on request.
The standard length of spiroid pipes is of 6,00 m; out of standard lengths may be supplied on request.

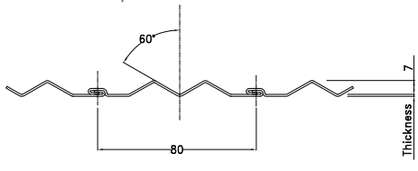
circular section



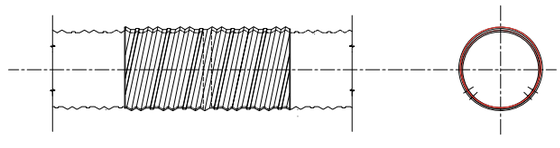
TECHNICAL FEATURES	UNIT THEORICAL WEIGHT		TECHNICAL FEATURES	UNIT THEORICAL WEIGHT	
diameter mm	thickness 8/10	10/10	diameter mm	thickness 8/10	10/10
150	3,70	-	400	11,40	14,20
200	5,30	6,50	500	13,57	16,96
250	6,60	8,10	600	16,28	20,35
300	8,20	10,60	700	18,99	23,74
350	9,47	12,60	800	21,71	27,13

- If used in drainage works, the pipes are equipped with holes of 8,0 mm of diameter, c/c distance of about 78 mm arranged in a double line in the lower part.
- Pipes are available at a standard length of 6,00 m; it is possible on request to realize pipes from 4,00 to 9,00 m.
- The connection between each sections may be performed by joint connections with a slightly greater diameter than the pipes themselves and a double lenght.

CORRUGATION
Inner radius 1,5 mm



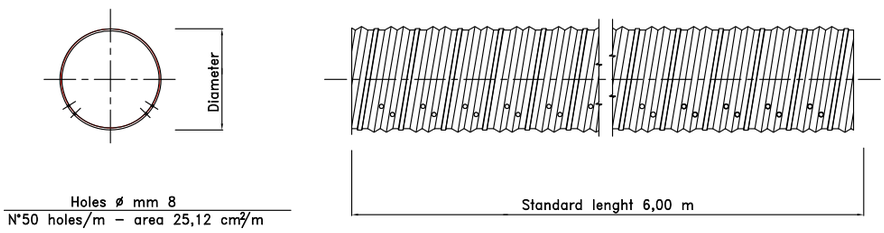
CONNECTION ELEMENT
Grafting Type



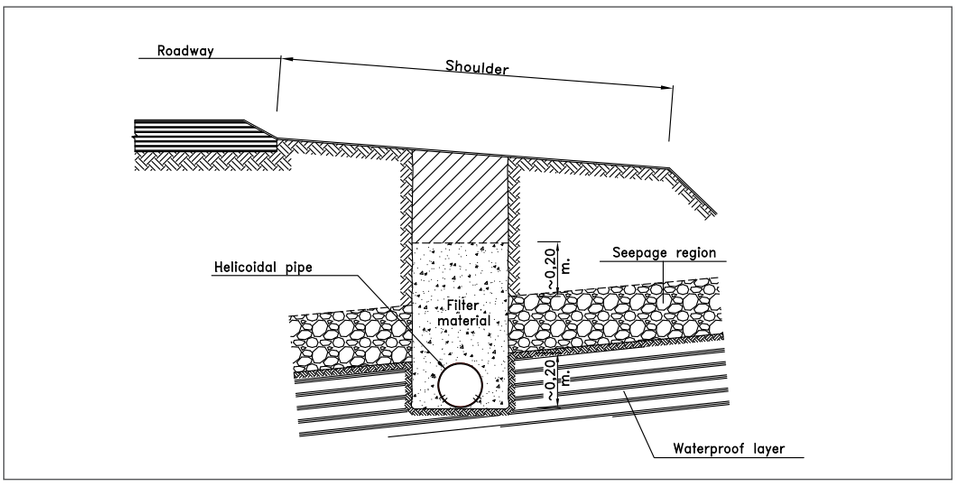
overall table for road transport

POSITION	DIAMETER	U.M.	QUANTITY	
			Tractor	Trailer
1	150	m	1176	2496
2	200	m	606	1296
3	250	m	480	984
4	300	m	264	528
5	350	m	-	468
6	400	m	-	432
7	500	m	-	216
8	600	m	-	168
9	700	m	-	108

SPIROID PIPE



EXAMPLE OF ROAD DRAINAGE



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