PROINVEST
Unlimited Steel Solutions

PROINVEST
Infrastructure

Sisteme pentru Infrastuctura
Infrastructure Systems

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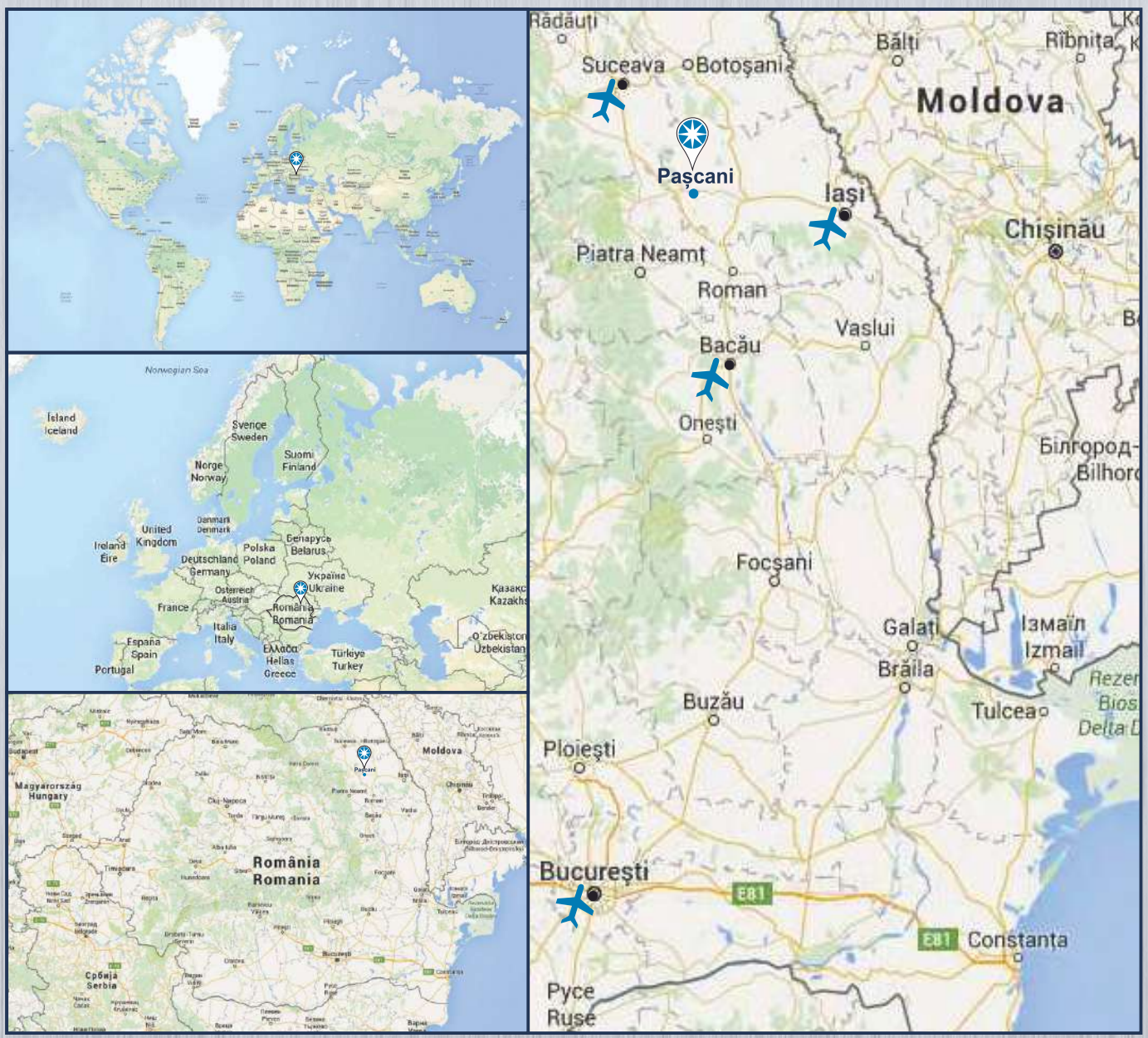
Locatie / *Location*



Cuprins / *Index*

Certificari ____ 3
Certifications

Divizia Sisteme pentru Infrastructura MBS® ____ 4
MBS® Infrastructure Divizion

I Sisteme de parapet EN 1317 / *EN 1317 guardrail systems*

Teste de impact ____ 5
Crash Tests

Specificatii tehnice generale ____ 6
General technicnicaal specifications

Nivelul de retentie al sistemelor de parapet ____ 7 - 9
Guardrails containment level

Sistem de parapet deformabillateral MBS® N2W4 ____ 10 - 11
MBS® N2W4 Single side guardrail system

Sistem de parapet deformabil lateral MBS® N2W6 ____ 12 - 13
MBS® N2W6 single side guardrail

Sistem de parapet deformabil lateral MBS® H1W4 ____ 14 - 15
MBS® H1W4 single side guardrail system

Sistem de parapet deformabil lateral MBS® H2W5 ____ 16 - 17
MBS® H2W5 single side guardrail system

Sistem de parapet deformabil lateral MBS® H2W6 ____ 18 - 19
MBS® H2W6 single side guardrail system

Sistem de parapet deformabil lateral pentru poduri MBS® H4bW4 ____ 20 - 21
MBS® H4BW5 single side guardrail system - for bridges

II Sisteme de parapet STAS 1948 / *STAS 1948 guardrail systems*

Specificatii tehnice generale ____ 22 - 27
General technic specifications

Sistem de parapet deformabil MBS® tip semigreu ____ 28
MBS® Semiheavy single side guardrail system

Cuprins / *Index*

Sistem de parapet deformabil MBS® tip greu ____ 29
MBS® Heavy single side guardrail system

Sistem de parapet deformabil MBS® tip foarte greu ____ 30
MBS® Very heavy single side guardrail system

Sistem de parapet deformabil MBS® tip combinat ____ 31
MBS® Combined side guardrail system

Parapet pietonal din teava rotunda ____ 32
MBS® *Round pipe pietonal guardrail*

Parapet pietonal MBS® din teava rectangulara ____ 33
MBS® Rectangular pipe pietonal guardrail

III Bariere acustice MBS® - Informatii generale
MBS® Acoustical barriers - General information

Specificatii tehnice generale ____ 34
General technical specifications

Panouri fonice MBS® ABSORB ____ 35
MBS® ABSORB acoustical barriers

Panouri fonice MBS® REFLEX ____ 35
MBS® REFLEX acoustical barriers

Panouri fonice MBS® PMMA15 ____ 36
MBS® PMMA15 acoustical barriers

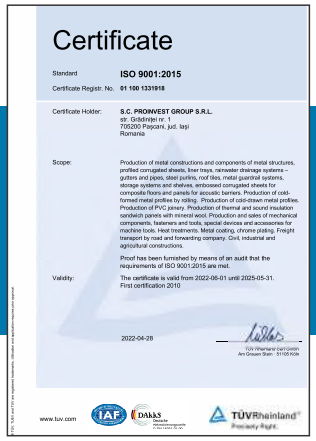
Poduri, pasarele si console rutiere ____ 37
Bridges, walkways and road consoles

Aplicatii ____ 38-40
Applications

Referinte ____ 41
References

Certificari
Certifications

Certificari generale / *General certifications*
ISO 14001:2004; ISO 9001:2008; SR OHSAS 45001:2018


Certificate

Standard: ISO 9001:2015
Certificate Registr. No.: 01 100 1331918

Certificate Holder: S.C. PROINVEST GROUP S.R.L.
str. Grădiniței nr. 1
705200 Pașcani, jud. Iași
Romania

Scope: Production of metal constructions and components of metal structures, profiled corrugated sheets, liner trays, rainwater drainage systems – gutters and pipes, steel purlins, roof tiles, metal guardrail systems, storage systems and shelves, embossed corrugated sheets for composite floors and panels for acoustic barriers. Production of cold-formed metal profiles by rolling. Production of cold-drawn metal profiles. Production of PVC joinery. Production of thermal and sound insulation sandwich panels with mineral wool. Production and sales of mechanical components, fasteners and tools, special devices and accessories for machine tools. Heat treatments. Metal coating, chrome plating. Freight transport by road and forwarding company. Civil, industrial and agricultural constructions.

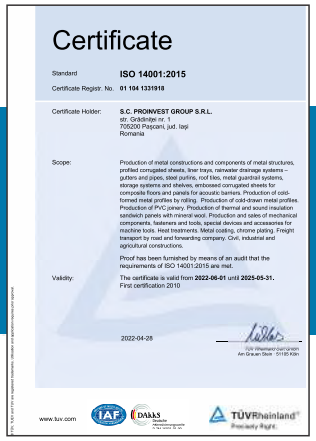
Proof has been furnished by means of an audit that the requirements of ISO 9001:2015 are met.

Validity: The certificate is valid from 2022-06-01 until 2025-05-31.
First certification 2010

2022-04-28

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

www.tuv.com


Certificate

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Certificate Registr. No.: 01 104 1331918

Certificate Holder: S.C. PROINVEST GROUP S.R.L.
str. Grădiniței nr. 1
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Proof has been furnished by means of an audit that the requirements of ISO 14001:2015 are met.

Validity: The certificate is valid from **2022-06-01** until **2025-05-31.**
First certification 2010

2022-04-28

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

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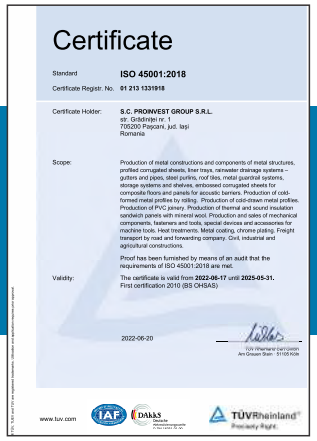

Certificate

Standard: ISO 45001:2018
Certificate Registr. No.: 01 213 1331918

Certificate Holder: S.C. PROINVEST GROUP S.R.L.
str. Grădiniței nr. 1
705200 Pașcani, jud. Iași
Romania

Scope: Production of metal constructions and components of metal structures, profiled corrugated sheets, liner trays, rainwater drainage systems – gutters and pipes, steel purlins, roof tiles, metal guardrail systems, storage systems and shelves, embossed corrugated sheets for composite floors and panels for acoustic barriers. Production of cold-formed metal profiles by rolling. Production of cold-drawn metal profiles. Production of PVC joinery. Production of thermal and sound insulation sandwich panels with mineral wool. Production and sales of mechanical components, fasteners and tools, special devices and accessories for machine tools. Heat treatments. Metal coating, chrome plating. Freight transport by road and forwarding company. Civil, industrial and agricultural constructions.

Proof has been furnished by means of an audit that the requirements of ISO 45001:2018 are met.

Validity: The certificate is valid from **2022-06-17** until **2025-05-31.**
First certification 2010 (BS OHSAS)

2022-06-20

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

www.tuv.com

Certificate de conformitate / *Conformity certifications*
MBS® N2W6; MBS® N2W4; MBS® H1W4; MBS® H2W5; MBS® H2W6; MBS® H4bW4

Certificate de conformitate / *Conformity certifications*
Sisteme de parapet MBS®semigreu, greu si foarte greu si foarte greu / *Semiheavy, heavy and very heavy MBS® guardrail systems*

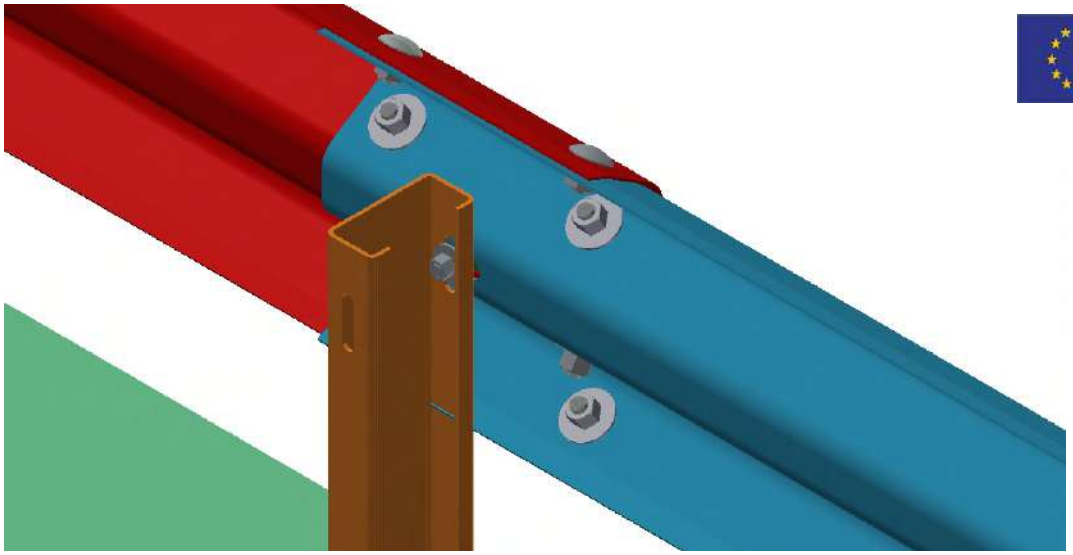

CERTIFICAT DE CONFORMITATE


CERTIFICAT DE CONFORMITATE


CERTIFICAT DE CONFORMITATE

Divizia Sisteme pentru Infrastructura MBS®
MBS® Infrastructure Division

• Parapeti laterali • Parapeti pentru poduri • Sisteme integrate de panouri fonice
• *Single sided guardrails • Guardrails for bridges • Integrated noise protection and safety guardrails*



Proinvest Group este singura firma din Romania care, prin resurse financiare si umane proprii, a proiectat, testat si certificat sisteme de parapet metalic rutier in conformitate cu specificatiile SR EN 1317.
Sistemele de parapet MBS® produse de Proinvest Group sunt concepute si dezvoltate respectand standardele interne si internationale in vigoare.
Actualmente, Standardul European EN 1317 (Dispositive de Protectie la Drumuri) impune criteriile de performanta ce trebuiesc indeplinite de sistemele de parapet si stabilesc clasele de performanta, criteriile de acceptare si executie a incercarilor la impact.
Pentru incadrarea in clasele de performanta si certificare, sistemele de parapet se supun la minim doua teste de impact: cu vehicul greu pentru a testa capacitatea de retentie si de readucere pe sensul de mers, respectiv cu vehicul usor pentru a testa comportamentul vehiculului si al pasagerilor la impact.
De la produse semiprelucrate de calitate superioara, ulterior galvanizate sau prevopsite, solutiile de infrastructura MBS® sunt proiectate, asamblate si apoi testate pentru a se conforma cerintelor specifice normativelor.
Gama de solutii de infractructura pe care o oferim include de la parapeti rutierii pana la solutii integrate de bariere acustice.

Proinvest Group is the only Romanian company that, through its own financial and human resources, designed, tested and certified road metallic guardrail systems according to SR EN 1317 specifications.
The MBS® road metallic guardrail systems produced by Proinvest Group are designed and developed in accordance with the domestic and international standards.
Now, the European Standard EN 1317 (Road Safety Devices) imposes the performance criteria to be met by guardrail systems and establishes the performance classes, acceptability and execution criteria for impact tests.
For performance and certification classes, guardrail systems are subject to at least two impact tests: with a heavy vehicle to test the retention and reversing ability on the direction of travel, respectively with a light vehicle to test the behavior of the vehicle and of the passengers inside it, in case of impact.
From top quality certified semiprocessed products, subsequently hot-dip galvanized or prepainted, MBS® infrastructure solutions are engineered, assembled then tested in order to comply with specific norm requirements.
The range of infrastructure solutions we offer goes from guardrail systems to integrated noise acoustical barriers.

Teste de impact
Crash tests

Cele mai noi sisteme de parapet metalic rutier MBS® ale Proinvest Group sunt testate in cadrul laboratoarelor autorizate AISICO (Associazione Italiana per la Sicurezza dela Circolazione – Asociatia Italiana pentru Siguranta Circulatiei) si CSI (Centro Sicurezza SpA – Centrul pentru Siguranta SpA), in conditiile impuse de standardul EN 1317.

The newest MBS® metallic guardrail systems of Proinvest Group are tested in the AISICO (Associazione Italiana per la Sicurezza dela Circolazione – *Italian Association for Circulation Safety) and CSI (Centro Sicurezza SpA – Safety Center SpA) authorized laboratories, in conformity with EN 1317 standard requierements.*

Sistem parapet deformabil lateral MBS® N2 / *MBS® N2 Single side guardrail*

Sistem parapet deformabil lateral MBS® H1 / *MBS® H1 Single side guardrail*

Sistem parapet deformabil lateral MBS® H2 / *MBS® H2 Single side guardrail*

Sistem parapet deformabil lateral MBS® H4b / *MBS® H4b Single side guardrail*

Specificatii tehnice generale
General technical specifications

Productia de sisteme de parapet metalic rutier MBS® a Proinvest Group este proiectata si dezvoltata in concordanta cu standardale de siguranta in vigoare.
Standardul european de referinta EN 1317 indica criteriile de performanta pentru sistemele de siguranta si defineste clasele de performanta si criteriile de acceptare pentru testele de impact.

Proinvest Group's MBS® metallic guardrail systems are designed and developed in compliance with appliable safety standards.
The european reference standard EN 1317 (Road Restrain Systems) indicates the performance requirements for restraint systems and defines the performance classes and crash test acceptance criteria.

Sisteme de parapet metalic rutier MBS® / *MBS® metallic guardrail systems*

Informatii despre clasele de performanta si criterile de acceptare pentru testele de impact in conformitate cu standardele EN1317

Standardul European SR EN 1317 - 2010 "Dispozitive de Protectie la Drumuri" a fost adoptat ca standard in Romania la 31 octombrie 2010, cu aplicare efectiva din 2015.
Acest standard specifica cerintele de performanta la impact ale sistemelor de prapet rutier, nivelurile de retentie, latimea de lucru, patrunderea vehiculului, nivelul de severitate al impactului precum si metodologia de efectuare a testelor de performanta in cadrul labratoarelor acreditate.
Sistemelele de parapet rutier MBS® care urmeaza fi instalate pe sol stabilizat, asfalt sau beton se supun unor teste de impact pentru a certifica obtinerea a doua rezultate principale:
- la vehicule usoare: absorbtia impactului;
- la vehiculele grele: retinerea si redirectionarea vehiculului
Standardul stabileste criteriile ce trebuiesc indeplinite pentru rezultatele testelor de control, în scopul garantarii sigurantei produsului.
Conformitatea sistemelor de parapet rutier MBS® cu cerintele standardului EN1317 trebuie sa includa:
- ITT - Testarea initiala a tipului;
- FPC - Controlul productiei din fabrica;
In prezenta acestei conformitati, institutele de certificare acreditate de Uniunea Europeana pot emite certificatul de conformitate care permite aplicarea marcajului CE. Marcajul CE indica faptul ca produsele sunt in conformitate cu un anumit standard armonizat si ca pot circula liber pe piata Uniunii Europene.

Information about performance classes and acceptance criteria for crash tests according to EN1317 STANDARDS.

The European Standard SR EN 1317 -2010 "Road Safety Devices" was adopted as a standard in Romania on 31 October 2010, with effective application in 2015.
This standard specifies the impact performance requirements of the metallic guardrail systems, containment levels, work width, vehicle penetration, severity of impact and performance testing methodology in accredited labs.
The MBS® metallic guardrail systems to be instaled on stabilised ground, asphalt or concrete products undergo crash tests to certify they have obtained two main results:
-lightweight vehicle: impact absorbtion;
-heavy vehicles: containment and redirection of vehicle
The standard establishes the following criteria for the control test results, for the purpose of guaranteeing the safety of the product.

The conformity of the MBS® metallic guardrail systems with the requirementsof the EN1317 standard must include:
- ITT - Initial Type Testing
- FPC - Factory Production Control.
In the presence of this conformity, the certfying institutes acredited by the European Union can issue the certificate of conformity wich allows affixing the EC mark. The CE mark indicates the products are in conformity with a specific harmonised standard and that they can circulate freely on the Market of European Union.

Nivelul de retentie al sistemelor de parapet
Guardrails containment level

Criterii EN 1317 la testul de impact al autovehiculului / *EN 1317 vehicle impact test criteria*				
Test	Viteza de impact (km/h) *Impact speed (km/h)*	Unghiul de impact (grade) *Impact angle (degrees)*	Masa totala a vehiculului (kg) *Total vehicle mass (kg)*	Tipul vehiculului *Type of vehicle*
TB11	100	20	900	autoturism / *car*
TB21	80	8	1300	autoturism / *car*
TB22	80	15	1300	autoturism / *car*
TB31	80	20	1500	autoturism / *car*
TB32	110	20	1500	autoturism / *car*
TB41	70	8	10000	Camion nearticulat / *righid HGV*
TB42	70	15	10000	Camion nearticulat / *rigid HGV*
TB51	70	20	13000	Autocar, Autobuz / *bus*
TB61	80	20	16000	Camion nearticulat / *rigid HGV*
TB71	65	20	30000	Camion nearticulat / *rigid HGV*
TB81	65	20	38000	Camion articulat / *articulated HGV*

Niveluri de retentie / *Containment levels*				
	Niveluri de retentie *Containment levels*			Incercari de acceptare *Acceptance test*
Retentie la unghiuri mici *Low angle containment*	T1			TB 21
	T2			TB 22
		T3		TB 41, TB 21
Retentie normala *Normal containment*	N1			TB 31
	N2			TB 32, TB 11
Retentie ridicata *Higher containment*		H1		TB 42, TB 11
			L1	TB 42, TB 32, TB 11
		H2		TB 51, TB 11
			L2	TB 51, TB 32, TB 11
		H3		TB 61, TB 11
			L3	TB 61, TB 32, TB 11
Retentie foarte ridicata *Very high containment*		H4a		TB 71, TB 11
		H4b		TB 81, TB 11
			L4a	TB 71, TB 32, TB 11
			L4b	TB 81, TB 32, TB 11

Nivelurile de retentie la unghi mic (T1, T2, T3) se utilizeaza numai pentru sisteme de parapet temporare.
Un parapet incercat la un anumit nivel de retentie satisface cerintele nivelurilor de retentie inferioare cu exceptiile: N1 si N2 nu includ T3, nivelurile de la H1 la H4b nu includ N2, nivelurile H nu includ nivelurile L.
Nivelurile de retentie L au performanta mai buna decat nivelurile H datoritat adaugarii testului TB32.

Low angle containment levels (T1, T2, T3) are only used for temporary guardrail systems.
A parapet tested to a certain level of containment satisfies the requirements of the lower containment levels with the exceptions: levels N1 and N2 do not include T3, levels H1 to H4b do not include N2, H levels do not include L levels.
L containment levels have better performance than H levels due to the addition of the TB32 test.

Nivelul de retentie al sistemelor de parapet
Guardrails containment level

Nivelul de severitate al impactului (soculuI) "ASI" / *Acceleration Severity Index "ASI"*

Indicii nivelului de severitate al soculuI sunt raportati pentru toate testele efectuate. Sistemele de parapet rutier MBS® cu lise cu ondule au nivelul A de performanta, evaluate la valori care asigura o siguranta mai mare pentru ocupantii vehiculelor.

Severity indices are reported for all car impact tests. All MBS® road gurdrails systems with beams have a level A performance, distinguished by performances that provide greater safecty for vehicle occupants.

Nivele aprobate / *Approved levels*

Nivel de severitate al impactului *Acceleration Severity Index*	Valorile indicelor ASI si THIV *Index Values*	
A	ASI ≤1,0	THIV ≤33 km/h
B	ASI ≤1,4	
C	ASI ≤1,9	

ASI: Nivelul de severitate al impactului / *Acceleration Severity Index*
THIV: Viteza teoretica a impactului frontal / *Theoretical Head Impact Velocity*

Deformarea sistemelor de parapet rutier / *Deformation of road guardrails systems*

Deformarea sistemului de parapet rutier este caracterizata de Latimea de lucru (W_N), Deflexiunea dinamica (D_N) si Intruziunea vehiculului (Vi). Latimea de lucru este distanta dinte partea dinspre calea de rulare inaintea impactului si pozitia in care s-a deplasat parapetul. Deflexiunea dinamica este deplasarea laterala maxima a partii parapetului indreptata spre calea de rulare. Pentru parapetii ingusti valoarea W_N poate fi luata drept (D_N).
Al treilea parametru definit ca Intruziunea vehiculului este utilizat pentru masurarea miscarii laterale maxime a vehiculului. Deflexiunea dinamica, latimea de lucru si intruziunea vehiculului permit determinarea conditiilor de baza pentru instalarea sistemului de parapet si definirea distantelor fata de obstacolele laterale.

Nivelul latimii de lucru / *Levels of working width*

Clase de nivele ale latimii de lucru *Classes of working width levels*	Nivele ale latimii de lucru (m) *Levels of working width (m)*
W1	$W_N \leq 0,6$
W2	$W_N \leq 0,8$
W3	$W_N \leq 1,0$
W4	$W_N \leq 1,3$
W5	$W_N \leq 1,7$
W6	$W_N \leq 2,1$
W7	$W_N \leq 2,5$
W8	$W_N \leq 3,5$

The deformation of the gurardrail is caracterised by Working width (W), Dynamic deflection (D) and Vehicle Intrusion (Vi). The working width is the distance between the side facing the traffic side before the crash and the maximum lateral position of the guardrail itself. The Dynamic deflection is the maximum lateral dynamic displacement of the side of the guardrail facing the traffic side. Fortnarrow guardrails, the vehicle intrusion is used to measure the maximum lateral dynamic position of the vehicle. Dynamic deflection, work width and vehicle intrusion allow determination of the basic conditions for the installation of the sill system and defining the distances to the side obstacles.

Niveluri de intruziune ale vehiculelor / *Levels of vehicles intrusion*

Clasele de niveluri de intruziune a vehiculului *Classes of vehicle intrusion levels*	Nivele de intruziune ale vehiculului (m) *Levels of vehicle intrusion (m)*
VI1	$VI_N \leq 0,6$
VI2	$VI_N \leq 0,8$
VI3	$VI_N \leq 1,0$
VI4	$VI_N \leq 1,3$
VI5	$VI_N \leq 1,7$
VI6	$VI_N \leq 2,1$
VI7	$VI_N \leq 2,5$
VI8	$VI_N \leq 3,5$
VI9	$VI_N \leq 3,5$

Nivelul de retentie al sistemelor de parapet
Guardrails containment level

Parametri evaluati utilizand criterii de calitate

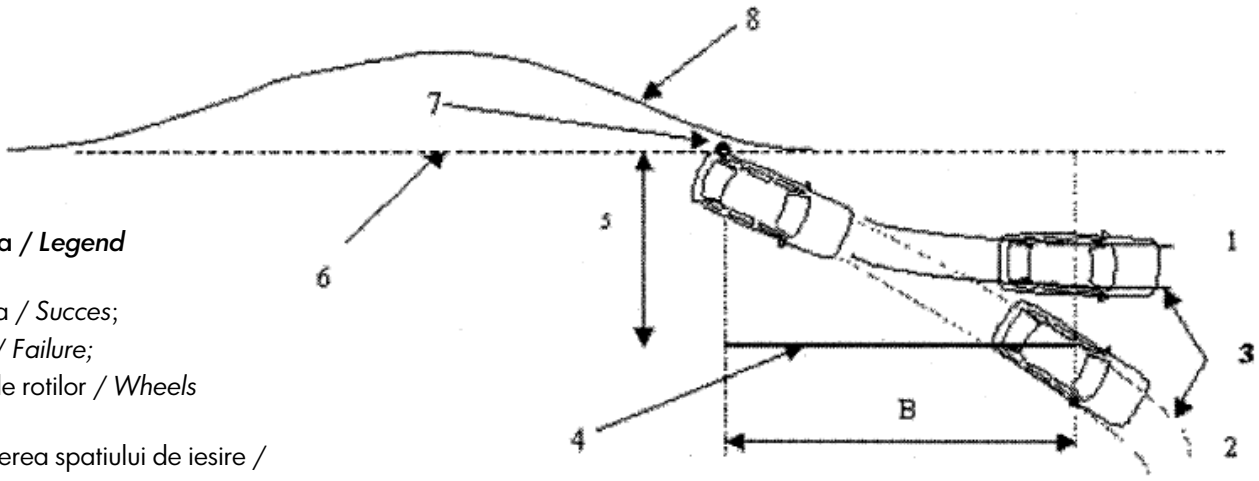
Comportarea parapetului de siguranta la impact
Parapetul de siguranta trebuie sa permita patrunderea vehiculului fara ca niciunul din elementele principale longitudinale sa se rupa. Elementele din componenta parapetului nu trebuie sa patrunda in compartimentul pentru pasageri al vehiculului.

Comportarea vehiculului de incercare
In timpul si dupa impact, cel mult una din rotile vehiculului sa treaca peste sau pe sub parapetul testat. Vehiculul nu trebuie sa se rastoarne in timpul sau dupa impact. Dupa impact, vehiculul nu trebuie sa se indeparteze de parapet si sa ruleze in caseta cu latimea si lungimea standardizate.

Parameters assessed using quality type criteria

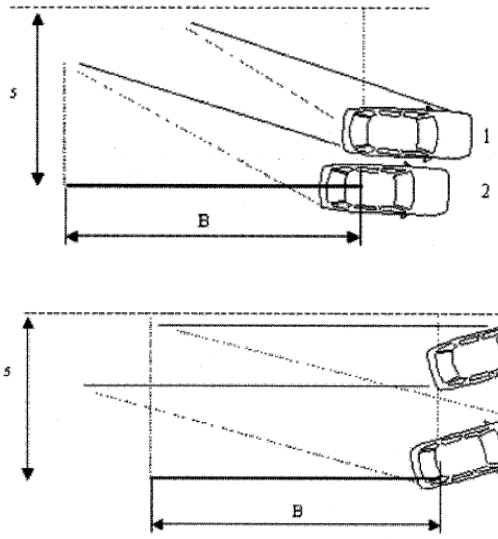
Guardrail impact behaviour
The guardrail must allow the vehicle to penetrate without any of the main longitudinal elements breaking apart. The elements of the guardrail shall not penetrate the passenger compartment of the vehicle.

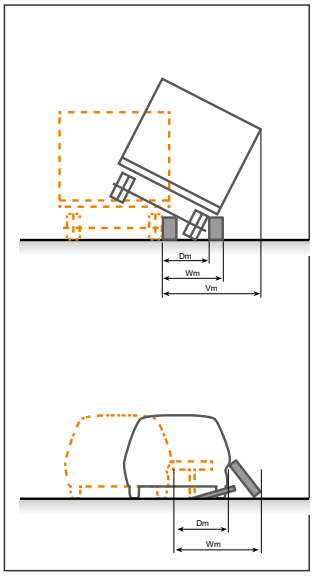
Test car behaviour
During and after impact, at most one of the wheels of the vehicle shall pass over or under the guardrail being tested. The vehicle must not overturn during or after impact. After impact, the vehicle must not move away from the guardrail and run in the standardised width and length box.



Legenda / *Legend*

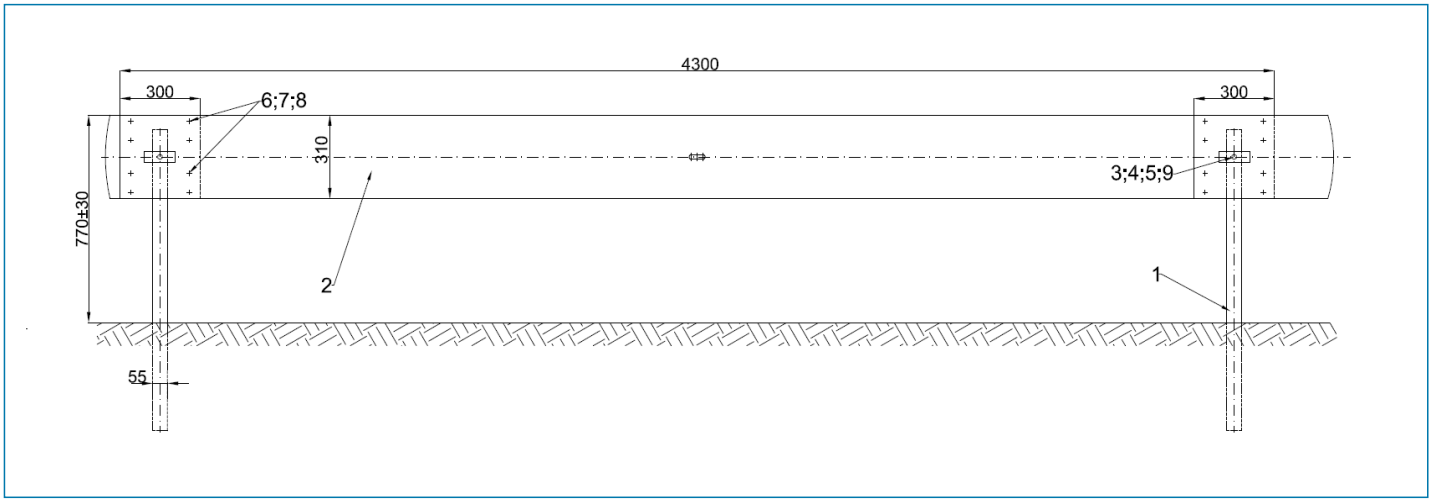
1 Reusita / *Succes;*
2 Esec / *Failure;*
3 Urmele rotilor / *Wheels traces;*
4 Intinderea spatiului de iesire / *Exit space;*
5 Latimea vehiculului + 16% din lungimea vehiculului / *Vehicle width + 16% of vehicle length;*
6 Fata initiala expusa traficului a parapetului de siguranta / *The initial face exposed to the guardrail ;*
7 Punctul P / *Point P;*
8 Forma deformata a parapetului de securitate, inclusiv a parapetului pentru lucrari de arta / *The deformed shape of the guardrail, including the guardrails for works of art;*
B Distanta din punctul P / *Distance from the last P point;*





Sistem parapet deformabil lateral MBS® N2W4
MBS® N2W4 Single side guardrail system

1833-CPR-0055



Test de impact / *Crash test* TB 32 Nr. 1660/2018 AISICO
Vehicul greu / Heavy vehicle - 1500 kg • Viteza / Speed - 110 km/h • Unghi de impact / Impact angle - 20°

Test de impact / *Crash test* TB 11 No. 1658/2018 AISICO
Vehicul usor / Light vehicle - 900 kg • Viteza / Speed - 100 km/h • Unghi de impact / Impact angle - 20°

Sistem parapet deformabil lateral MBS® N2W4
MBS® N2W4 Single side guardrail system

Caracteristici / *Characteristics*	
Calitate otel utilizat / *Steel quality*	S 355 JR
Lungime minima / *Minimum length* [ml]	60,00
Distanta dintre stalpi ax-ax /*Distance between posts* [m]	4,00
Greutate sistem / *Weight* [kg /ml]	13,80
Inaltime deasupra solului / *Height out of ground* [m]	0,77
Grosime parapet / *Transversal dimensions* [m]	0,205
Informatii conform EN 1317-2 *Additional information according EN 1317-2*	
Latime de lucru / *Normalised working width* [m]	1,30
Clasa pentru latimea de lucru / *Class of normalised working width* [Wn]	W4
Deformarea dinamica / *Normalised dynamic deflection* [m]	1,20
Indice de severitate impact / *Acceleration Severity Index* [ASI]	0,5 - A
Tip de testare initiala / *Initial Type Test* [ITT]	TB 32 (autoturism / car - 1500 kg, 110 km/h, 20°)
	TB 11 (autoturism / car – 900 kg, 100 km/h, 20°)

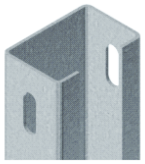
Componente pentru 60 ml / *Components for 60 lm*	
Lisa / *Beam* - 4300x310x2,5 mm	15
Stalp / *Post* - "C" 120x55x1700 mm	16
Surub / *Bolt* - M16x27	112
Saiba plata / *Washer* - M16	112
Piulita / *Fastener* - M16	112
Surub / *Bolt* - M10x45	16
Saiba patrata / *Square Washer*	32
Piulita / *Fastener* - M10	16

Detalii / *Details*

① **Stalp / *Post***
- Tip / *Type*: "C120" 120 x 55 x 20
- Inaltime / *Height*: 1700 mm
- Grosime / *Thickness*: 4 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

② **Lisa / *Beam***
- Tip / *Type*: 2 ondulee / *2 waves*
- Dimensiuni / *Dimensions*: 4300 x 310 x 80 mm
- Grosime / *Thickness*: 2,5 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

③ **Suruburi / *Bolts***
- Tip / Type: M16 x 27
- Cap rotund si nas / *Round head and nose*
- Conform / *According*: ANSI B18.5.2.1M



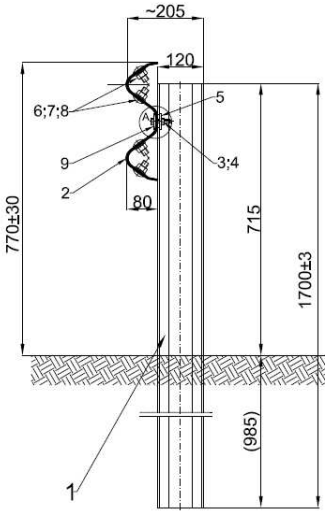
④ **Saibe / *Washers***
- Saiba plata / *Flat type washer*: M16

⑤ **Piulite / *Fasteners***
- Tip / *Type*: M16

⑥ **Suruburi / *Bolts***
- Tip / *Type*: M10 x 45
- Clasa / *Class*: 8.8
- Conform / *According*: ANSI B18.5.2.1M

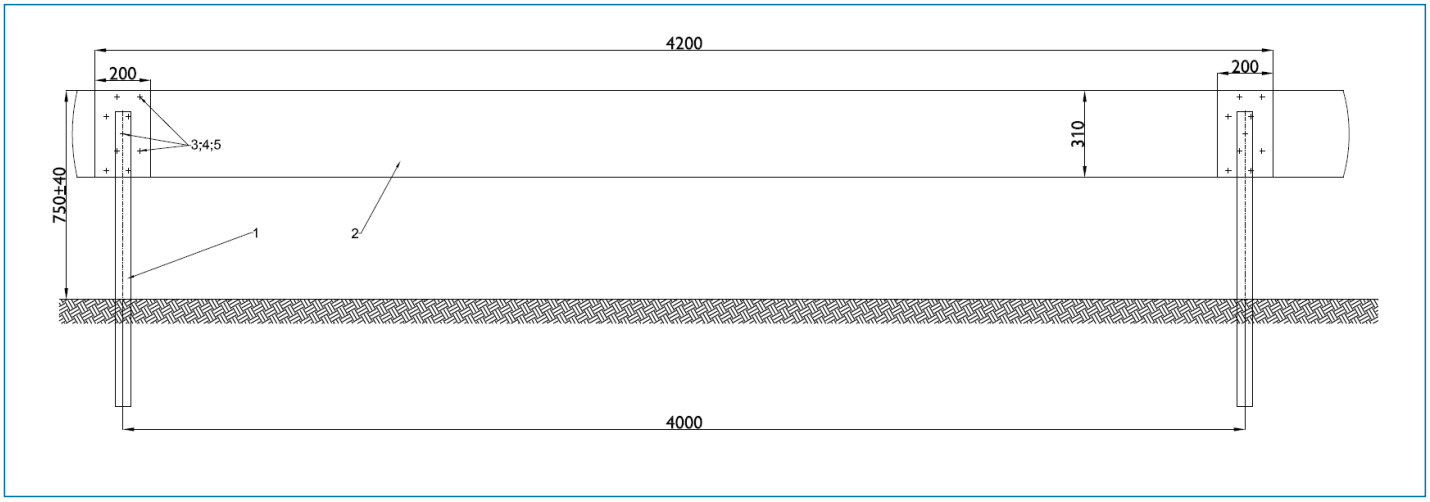
⑦ **Saibe / *Washers***
- Saiba patrata / *Square type washer*

⑧ **Piulite / *Fasteners* :**
- Tip / *Type*: M10



Sistem parapet deformabil lateral MBS® N2W6
MBS® N2W6 Single side guardrail system

1833-CPR-0007 M



Test de impact / *Crash test* TB 32 Nr. 0108/ME/HRB/13 CSI
Vehicul greu / Heavy vehicle - 1500 kg • Viteza / Speed - 110 km/h • Unghi de impact / Impact angle - 20°

Test de impact / *Crash test* TB 11 No. 0121/ME/HRB/13 CSI
Vehicul usor / Light vehicle - 900 kg • Viteza / Speed - 100 km/h • Unghi de impact / Impact angle - 20°

Sistem parapet deformabil lateral MBS® N2W6
MBS® N2W6 Single side guardrail system

Caracteristici / *Characteristics*	
Calitate otel utilizat / *Steel quality*	S 235 JR
Lungime minima / *Minimum length* [ml]	60,00
Distanta dintre stalpi ax-ax / *Distance between posts* [m]	4,00
Greutate sistem / *Weight* [kg /ml]	13,50
Inaltime deasupra solului /*Height out of ground* [m]	0,75 +/- 0,02
Grosime parapet / *Transversal dimensions* [m]	0,200
Informatii conform EN 1317-2 *Additional information according EN 1317-2*	
Latime de lucru / *Normalised working width* [m]	1,80 (W6) - 0,9 (W3)
Clasa pentru latimea de lucru / *Class of normalised working width* [Wn]	W6
Deformarea dinamica / *Normalised dynamic deflection* [m]	1,80
Indice de severitate impact / *Acceleration Severity Index* [ASI]	0,68 - A
Tip de testare initiala / *Initial Type Test* [ITT]	TB 32 (autoturism / car - 1500 kg, 110 km/h, 20°)
	TB 11 (autoturism / car – 900 kg, 100 km/h, 20°)

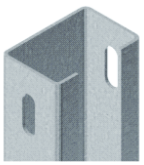
Componente pentru 60 ml / *Components for 60 lm*	
Lisa / *Beam* - 4200x310x2,5 mm	15
Stalp / *Post* - "C" 120x55x1700 mm	16
Surub / *Bolt* - M16x35	128
Piulita / *Fastener* - M16	128

Detalii / *Details*

① **Lisa / *Beam***
- Tip / *Type*: 2 ondulee / *2 waves*
- Dimensiuni / *Dimensions*: 4200 x 310 x 80 mm
- Grosime / *Thickness*: 2,5 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

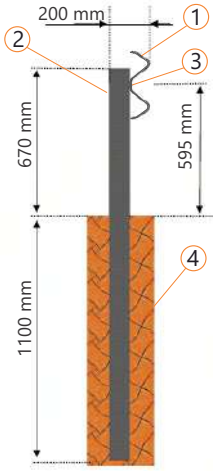
② **Stalp / *Post***
- Tip / *Type*: "C120" 120 x 55 x 20
- Inaltime / *Height*: 1770 mm
- Grosime / *Thickness*: 4 mm
- Otel / *Steel*: S 235 JR
- Conform / *According*: EN 10025

③ **Suruburi / *Bolts***
- Tip / Type: M16 x 35
- Cap rotund si nas / *Round head and nose*
- Conform / *According*: ANSI B18.5.2.1M



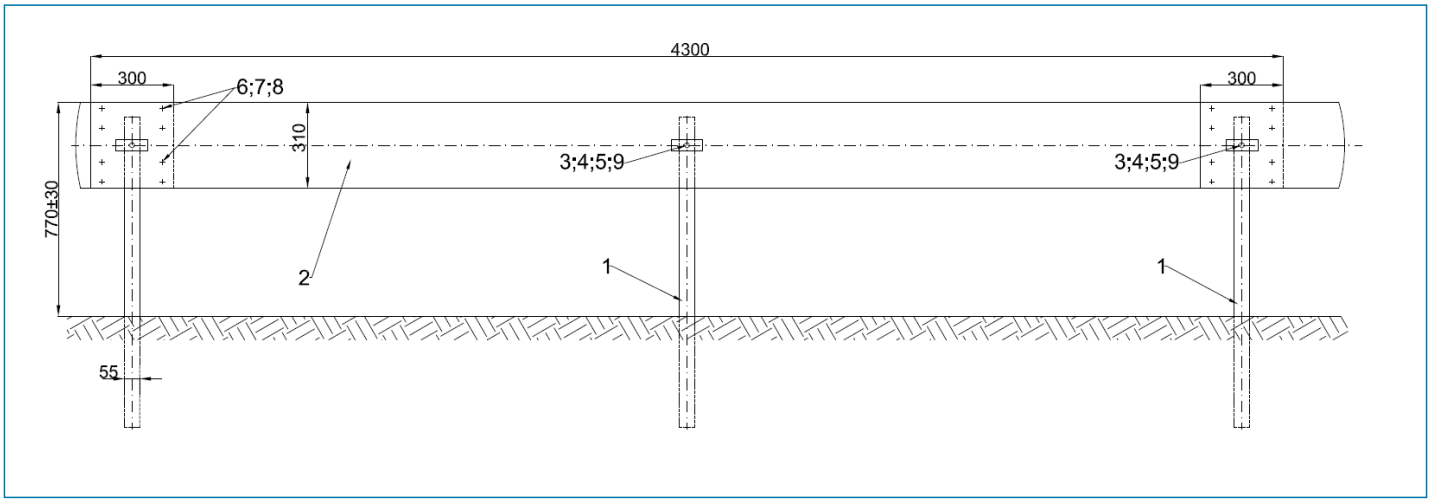
③.1 **Piulite / Fasteners**
- Tip / *Type*: M16

④ **Sol / *Soil***
- Se poate instala in pamant sau fundatii de beton / *Can be instaled in hard soil or concrete isolated fundation*



Sistem parapet deformabil lateral MBS® H1W4
MBS® H1W4 Single side guardrail system

CE
1833-CPR-0056



Test de impact / *Crash test* TB 42 Nr. 1657/2018 AISICO
Vehicul greu / Heavy vehicle - 10000 kg • Viteza / Speed - 70 km/h • Unghi de impact / Impact angle - 15°

Test de impact / *Crash test* TB 11 No. 1658/2018 AISICO
Vehicul usor / Light vehicle - 900 kg • Viteza / Speed - 100 km/h • Unghi de impact / Impact angle - 20°

Sistem parapet deformabil lateral MBS® H1W4
MBS® H1W4 Single side guardrail system

Caracteristici / *Characteristics*	
Calitate otel utilizat / *Steel quality*	S 355 JR
Lungime minima / *Minimum length* [ml]	60,00
Distanta dintre stalpi ax-ax / *Distance between posts* [m]	2,00
Greutate sistem / *Weight* [kg /ml]	17,50
Inaltime deasupra solului / *Height out of ground* [m]	0,77
Grosime parapet / *Transversal dimensions* [m]	0,205
Informatii conform EN 1317-2 *Additional information according EN 1317-2*	
Latime de lucru / *Normalised working width* [m]	1,30
Clasa pentru latimea de lucru / *Class of normalised working width* [Wn]	W4
Deformarea dinamica / *Normalised dynamic deflection* [m]	1,20
Indice de severitate impact / *Acceleration Severity Index* [ASI]	0,5 - A
Tip de testare initiala / *Initial Type Test* [ITT]	TB 42 (camion / *truck* - 10000 kg, 70 km/h, 15°)
	TB 11 (autoturism /*car* – 900 kg, 100 km/h, 20°)

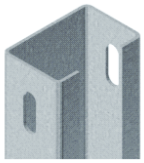
Componente pentru 60 ml / *Components for 60 lm*	
Lisa / *Beam* - 4300x310x2,5 mm	15
Stalp / *Post* - "C" 120x55x1700 mm	31
Surub / *Bolt* - M16x27	112
Saiba plata / *Washer* - M16	112
Piulita / *Fastener* - M16	112
Surub / *Bolt* - M10x45	31
Saiba patrata / *Square Washer*	62
Piulita / *Fastener* - M10	31

Detalii / *Details*

① **Stalp / *Post***
- Tip / *Type*: "C120" 120 x 55 x 20
- Inaltime / *Height*: 1700 mm
- Grosime / *Thickness*: 4 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

② **Lisa / *Beam***
- Tip / *Type*: 2 ondulee / *2 waves*
- Dimensiuni / *Dimensions*: 4300 x 310 x 80 mm
- Grosime / *Thickness*: 2,5 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

③ **Suruburi / *Bolts***
- Tip / Type: M16 x 27
- Cap rotund si nas / *Round head and nose*
- Conform / *According*: ANSI B18.5.2.1M



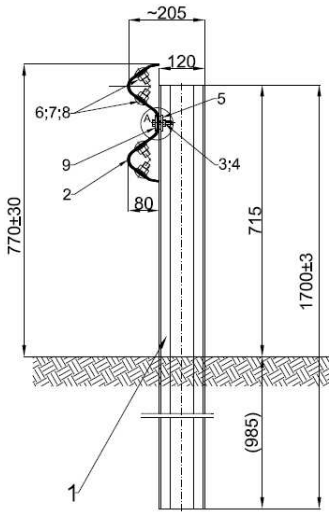
④ **Saibe / *Washers***
- Saiba plata / *Flat type washer*: M16

⑤ **Piulite / *Fasteners***
- Tip / *Type*: M16

⑥ **Suruburi / *Bolts***
- Tip / *Type*: M10 x 45
- Clasa / *Class*: 8.8
- Conform / *According*: ANSI B18.5.2.1M

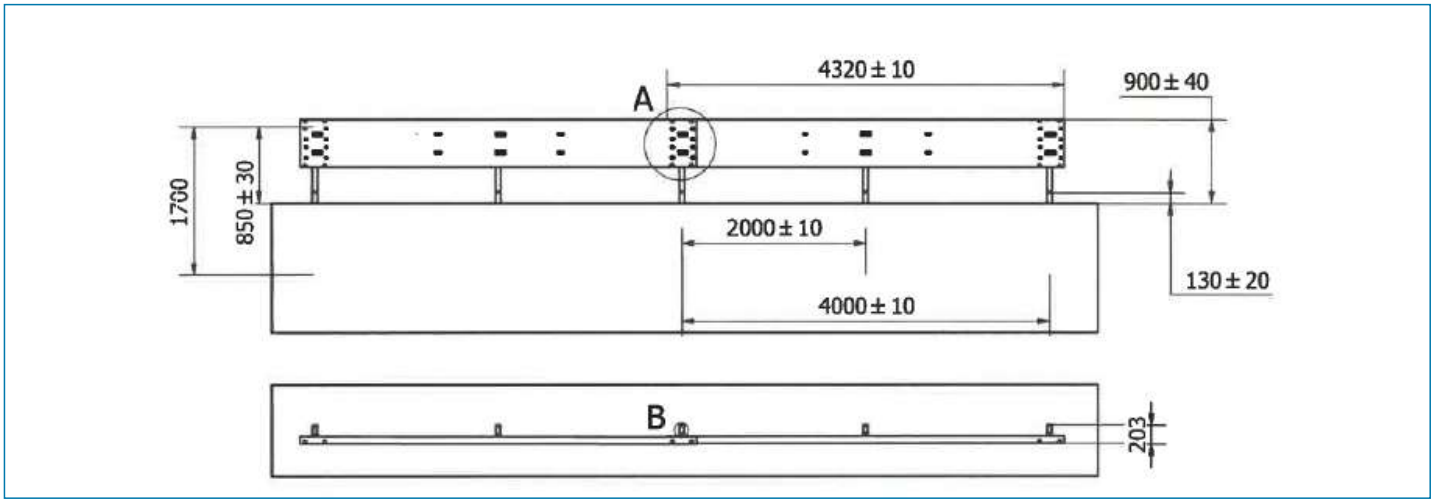
⑦ **Saibe / *Washers***
- Saiba patrata / *Square type washer*

⑧ **Piulite / *Fasteners* :**
- Tip / *Type*: M10



Sistem parapet deformabil lateral MBS® H2W5
MBS® H2W5 Single side guardrail system

1833-CPR-0081



Test de impact / *Crash test* TB 51 Nr. 2258/2022 AISICO
Vehicul greu / Heavy vehicle - 13000 kg • Viteza / Speed - 70 km/h • Unghi de impact / Impact angle - 20°

Test de impact / *Crash test* TB 11 No. 2286/2022 AISICO
Vehicul usor / Light vehicle - 900 kg • Viteza / Speed - 100 km/h • Unghi de impact / Impact angle - 20°

Sistem parapet deformabil lateral MBS® H2W5
MBS® H2W5 Single side guardrail system

Caracteristici / *Characteristics*		
Calitate otel utilizat / *Steel quality*	S 355 JR	
Lungime minima / *Minimum length* [ml]	40,00	
Distanta dintre stalpi ax-ax / *Distance between posts* [m]	2,00	
Greutate sistem / *Weight* [kg /ml]	27,50	
Inaltime deasupra solului / *Height out of ground* [m]	0,90	
Grosime parapet / *Transversal dimensions* [m]	0,203	
Informatii conform EN 1317-2 *Additional information according EN 1317-2*		
Latime de lucru / *Normalised working width* [m]	1,50 (TB 51 autobuz / *bus*)	0,70 (TB 11 autoturism / *car*)
Clasa pentru latimea de lucru / *Class of normalised working width* [Wn]	W5	W2
Deformarea dinamica / *Normalised dynamic deflection* [m]	1,40	
Indice de severitate impact / *Acceleration Severity Index* [ASI]	B	
Tip de testare initiala / *Initial Type Test* [ITT]	TB 51 (autobuz / *bus* - 13000 kg, 70 km/h, 15°)	
	TB 11 (autoturism / *car* - 900 kg, 100km/h, 20°)	
Componente pentru 40 ml / *Components for 40 lm*		
Stalp / *Post* - "C" 120x55x1700 mm	21	
Piesa intarire / *Reinforcement Post* - "C" 108x44x300 mm	21	
Lisa / *Beam* - 4320x507x3,0 mm	10	
Saiba plata / *Flat Washer* - 100x35 mm	42	
Surub / *Bolt* - M10x40	42	
Saiba plata / *Flat Washer* - 40x35 mm	42	
Piulita / *Fastener* - M10	42	
Surub / *Bolt* - M16x35 CBGO	108	
Saiba plata / *Flat Washer* - A16	108	
Piulita / *Washer* - M16	108	

Detalii / *Details*

① **Stalp / *Post***
- Tip / *Type*: "C120" 120 x 55 x 22
- Inaltime / *Height*: 1700 mm
- Grosime / *Thickness*: 4 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

③ **Piesa intarire / *Reinforcement post***
- Tip / *Type*: "C108" 108 x 44 x 25
- Inaltime / *Height*: 300 mm
- Grosime / *Thickness*: 4 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

② **Lisa / *Beam***
- Tip / *Type*: 3 ondulee / *3waves*
- Dimensiuni / *Dimensions*: 4320 x 507 x 80
- Grosime / *Thickness*: 3,0 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

④ **Saibe / *Washers***
- Saiba plata / *Flat tye washer*: 100x35 mm

⑤ **Suruburi / *Bolts***
- Tip / *Type*: M10 x 40
- Clasa / *Class*: 8.8
- Conform / *According*: ANSI B18.5.2.1M

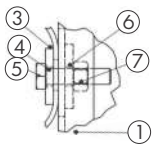
⑥ **Saibe / *Washers***
- Saiba plata / *Flat tye washer*: 100x35 mm

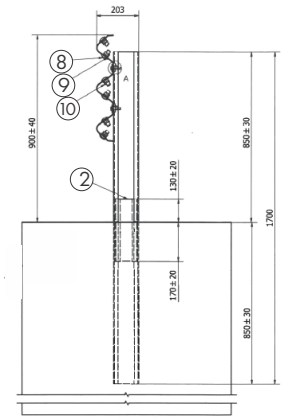
⑦ **Piulite / *Fasteners* :**
- Tip / *Type*: M10

⑧ **Suruburi / *Bolts***
- Tip / *Type*: M16x35 CBGO

⑨ **Saibe / *Washers***
- Saiba plata / *Flat tye washer*: A16

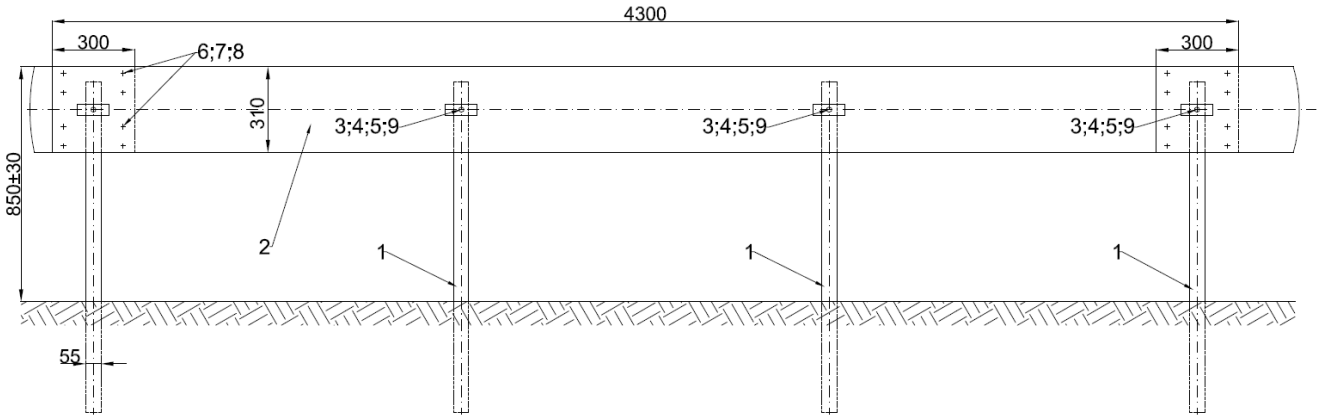
⑩ **Piulite / *Fasteners***
- Tip / *Type washer*: M16





Sistem parapet deformabil lateral MBS® H2W6
MBS® H2W6 Single side guardrail system

CE
1833-CPR-0057



Test de impact / *Crash test* TB 51 Nr. 1660/2018 AISICO
Vehicul greu / Heavy vehicle - 13000 kg • Viteza / Speed - 70 km/h • Unghi de impact / Impact angle - 20°

Test de impact / *Crash test* TB 11 No. 1661/2018 AISICO
Vehicul usor / Light vehicle - 900 kg • Viteza / Speed - 100 km/h • Unghi de impact / Impact angle - 20°

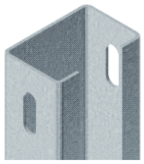
Sistem parapet deformabil lateral MBS® H2W6
MBS® H2W6 Single side guardrail system

Caracteristici / *Characteristics*	
Calitate otel utilizat / *Steel quality*	S 355 JR
Lungime minima / *Minimum length* [ml]	80,00
Distanta dintre stalpi ax-ax / *Distance between posts* [m]	1,33
Greutate sistem / *Weight* [kg /ml]	24,80
Inaltime deasupra solului / *Height out of ground* [m]	0,85
Grosime parapet / *Transversal dimensions* [m]	0,205
Informatii conform EN 1317-2 *Additional information according EN 1317-2*	
Latime de lucru / *Normalised working width* [m]	1,90
Clasa pentru latimea de lucru / *Class of normalised working width* [Wn]	W6
Deformarea dinamica / *Normalised dynamic deflection* [m]	1,80
Indice de severitate impact / *Acceleration Severity Index* [ASI]	0,8 - A
Tip de testare initiala / *Initial Type Test* [ITT]	TB 51 (autobuz / *bus* - 13000 kg, 70 km/h, 15°)
	TB 11 (autoturism / *car* – 900 kg, 100 km/h, 20°)

Componente pentru 80 ml / *Components for 80 lm*	
Lisa / *Beam* - 4300x310x2,5 mm	20
Stalp / *Post* - "C" 120x55x1700 mm	61
Surub / *Bolt* - M16x27	152
Saiba plata / *Washer* - M16	152
Piulita / *Fastener* - M16	152
Surub / *Bolt* - M10x45	61
Saiba patrata / *Square Washer*	122
Piulita / *Fastener* - M10	61

Detalii / *Details*

① **Stalp / *Post***
- Tip / *Type*: "C120" 120 x 55 x 20
- Inaltime / *Height*: 1700 mm
- Grosime / *Thickness*: 4 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2



② **Lisa / *Beam***
- Tip / *Type*: 2 ondulee / *2 waves*
- Dimensiuni / *Dimensions*: 4300 x 310 x 80 mm
- Grosime / *Thickness*: 2,5 mm
- Otel / *Steel*: S 355 JR
- Conform / *According*: EN 1317-2

③ **Suruburi / *Bolts***
- Tip / Type: M16 x 27
- Cap rotund si nas / *Round head and nose*
- Conform / *According*: ANSI B18.5.2.1M

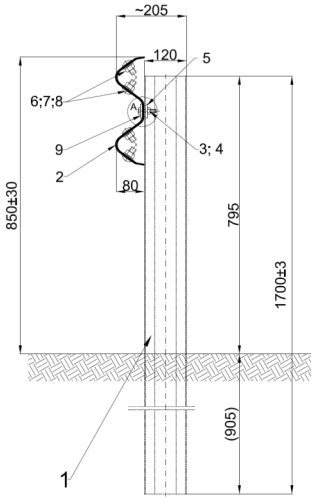
④ **Saibe / *Washers***
- Saiba plata / *Flat type washer*: M16

⑤ **Piulite / *Fasteners***
- Tip / *Type*: M16

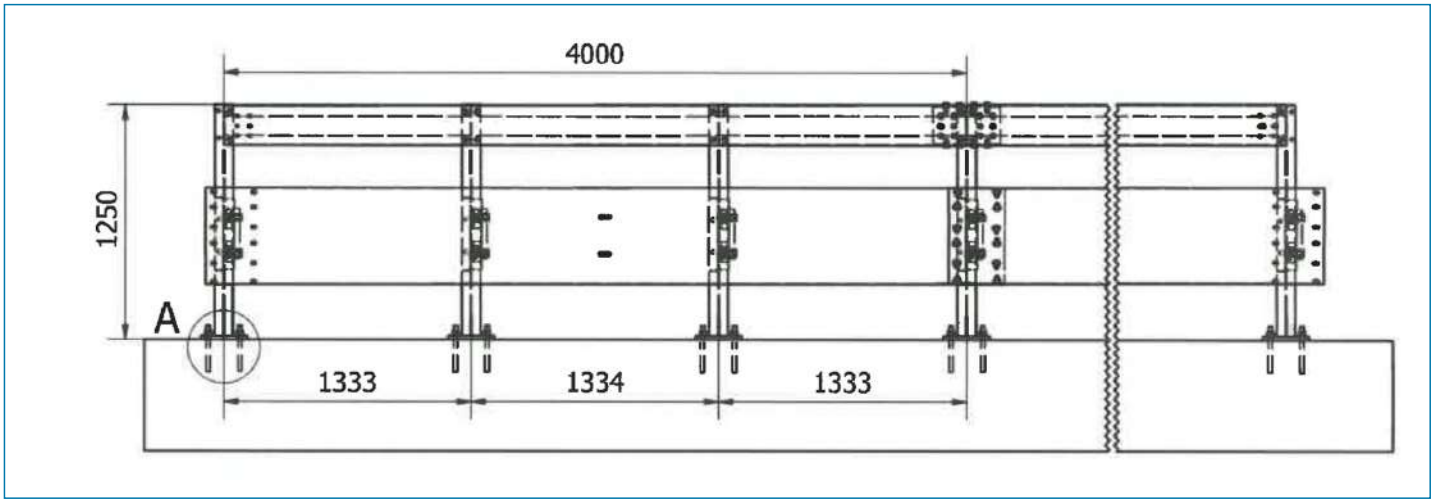
⑥ **Suruburi / *Bolts***
- Tip / *Type*: M10 x 45
- Clasa / *Class*: 8.8
- Conform / *According*: ANSI B18.5.2.1M

⑦ **Saibe / *Washers***
- Saiba patrata / *Square type washer*

⑧ **Piulite / *Fasteners* :**
- Tip / *Type*: M10



Sistem parapet deformabil lateral pentru poduri MBS® H4bW4
MBS® H4bW4 Single side guardrail system - for bridges



Test de impact / *Crash test* TB 81 Nr. 2348/2022 AISICO
Vehicul greu / Heavy vehicle - 38000 kg • Viteza / Speed - 65 km/h • Unghi de impact / Impact angle - 20°

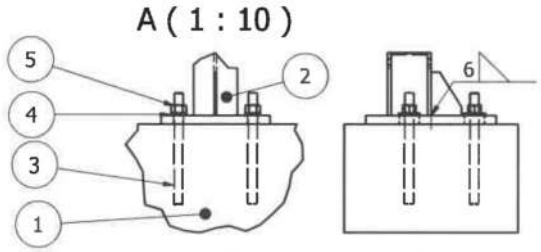
Test de impact / *Crash test* TB 11 No. 2349/2022 AISICO
Vehicul usor / Light vehicle - 900 kg • Viteza / Speed - 100 km/h • Unghi de impact / Impact angle - 20°

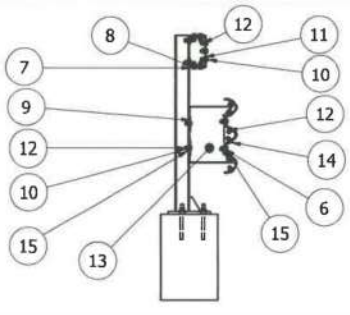
Sistem parapet deformabil lateral pentru poduri MBS® H4bW4

MBS® H4bW4 Single side guardrail system - for bridges

Caracteristici / *Characteristics*		
Calitate otel utilizat / *Steel quality*	S 355 JR	
Lungime minima / *Minimum length* [ml]	60,00	
Distanta dintre stalpi ax-ax / *Distance between posts* [m]	1,333	
Greutate sistem / *Weight* [kg /ml]	67	
Inaltime deasupra solului / *Height out of ground* [m]	1,25	
Grosime parapet / *Transversal dimensions* [m]	0,435	
Informatii conform EN 1317-2 *Additional information according EN 1317-2*		
Latime de lucru / *Normalised working width* [m]	1,10 (TB 51 autobuz / *bus*)	0,20 (TB 11 autoturism / *car*)
Clasa pentru latimea de lucru / *Class of normalised working width* [Wn]	W4	W1
Deformarea dinamica / *Normalised dynamic deflection* [m]	1,1	
Indice de severitate impact / *Acceleration Severity Index* [ASI]	C	
Tip de testare initiala / *Initial Type Test* [ITT]	TB 81 (camion / HGV - 38000 kg, 65 km/h, 20°)	
	TB 11 (autoturism / car – 900 kg, 100 km/h, 20°)	

Componente pentru 60 ml / *Components for 60 lm*				
1	1	Grinda beton pod / *Bridge concrete joist*	Beton armat / *Reinforced concrete*	C30/37
2	44	Stalp H1250 curent / *H1250 current beam*	HEA 100 - 1230 mm	S 275 JR
3	176	Tija filetata / *Threaded rod*	20x250 mm	Cls. 8.8
4	176	Saiba rectangulara / *Rectangular washer*	Tabla / *Sheet* - 50x35x5 mm	S 355 JR
5	176	Piulita hexagonala / *Hex nut*	M20	Otel / *Steel*
6	15	Lisa 3 ondule GO / *GO beam with 3 waves*	Tabla/ *Sheet* - 4300x507x3 mm	S 355 JR
7	15	Lisa rigida LRC / *GO beam with 3 waves*	Tabla/ *Sheet* - 3998x210x4 mm	S 355 JR
8	14	Imbinare lise rigide / *Rigid beams fittings*	Tabla/ *Sheet* - 360x208x4 mm	S 355 JR
9	176	Saiba rectangulara / *Rectangular washer*	Tabla/ *Sheet* - 100x35x5 mm	S 355 JR
10	512	Surub cap hexagonal / *Hex head screw*	M16x40	Cls. 8.8
11	416	Saiba plata / *Flat washer*	A16	Otel / *Steel*
12	680	Piulita hexagonala / *Hex nut*	M16	Otel / *Steel*
13	44	Distantier / *Spacer*	Tabla/ *Sheet* - 390x300 mm	S 355 JR
14	168	Surub cap bombat / *Hex head screw*	M16x35	Cls 8.8
15	176	Saiba rectangulara / *Rectangular washer*	Tabla/ *Sheet* - 40x35x4 mm	S 355 JR





STAS 1948/1-1991 - Stalpi de ghidare si parapete - Specificatii tehnice generale
STAS 1948/1-1991 - Guardrails - General technical specifications

Prescriptii generale de proiectare si amplasare pe drumuri / *General design and road placement requirements*

Domeniul de aplicabilitate: drumuri publice si de exploatare, cu exceptia podurilor, strazilor si autostrazilor.
Tipuri de parapet metalic deformabil standardizate: semigreu, greu si foarte greu. Acestea permit alunecarea si ghidarea in lungul lor a jantei rotilor autovehiculelor si revenirea acestora pe partea carosabila cu conditia ca unghiul de impact sa nu fie mai mare de 15 grade.
Alegerea tipului de parapet se face in functie de:

-clasa tehnica a drumului;
-configuratia terenului;
-inaltimea rambleelor sau a zidurilor de sprijin;
-elemente geometrice in plan ale drumului;
-alte conditii locale.

Utility domain: public and exploitation roads, except for bridges, streets and highways.
Standard deformable metallic guardrail types: semiheavy, heavy and very heavy. They allow the wheel rims to slide and guide along their length and return them to the carriage, with the condition that the impact angle not to be more than 15 degrees.
The choice of the guardrail type t is made according to:

-road technical class;
-land configuration;
-enbankment or supporting walls height;
-geometric elements of the road plan;
-other local conditions.

Amplasarea sistemelor de parapet / *Guardrail systems placement*

1.1 Parapetele se amplaseaza in profil transversal, in afara latimii platformei sau in cadrul latimii acostamentelor, conform reglementarilor legale in vigoare.
1.2 Amplasarea parapetelor in lungul drumului se face tinand seama de:
- elementele geomentrice ale traseului;
- inaltimea rambleului sau inclinarea versantilor;
- impadurirea terenului inconjurator;
- existenta unor ziduri de sprijin la marginea platformei spre aval;
- vecinatatea unor ape;
- vecinatatea altor cai de comunicatie;
- conditii meteorologice locale nefavorabile (ceata frecventa);
- necesitatea inchiderii perspectivei in exteriorul unor curbe;
- in unele intersectii.

1.1 *The guardrail systems shall be placed in a transverse profile, outside the platform width or within the width of the platforms, according to the legal regulations.*
1.2 *The location of the guardrails along the road is made taking into account:*
- geomentric elements of the route;
- enbankment height or slope inclination;
- forestation of the surrounding land;
- the existence of supporting walls at the edge of the platform to the downstream;
- the vicinity of some waters;
- the vicinity of other rils or roads;
- unfavorable local weather conditions (frequent fog);
- the need to close the perspective outside of curves;
- in some intersections.

STAS 1948/1-1991 - Stalpi de ghidare si parapete - Specificatii tehnice generale
STAS 1948/1-1991 - Guardrails - General technical specifications

1.3 Amplasarea parapetelor, in cazul in care drumul este in rambleu, se face conform Tabelului 1.

1.3 *The location of the guardrails, if the road is in embankment, is according to Table 1.*

Tabel 1 / *Table 1*

Elemente geometrice ale traseului *Geometric elements of the route*	Inaltimea rambleului *Embankment height* (h)	Clasa tehnica a drumului *Road technical class*					
		II & III			IV & V		
		Parapete rigide sau deformabile de tip *Rigid or deformable guardrails types*			Parapete rigide de tip *Rigid guardrails types*		
		Semigreu *Semiheavy*	Greu *Heavy*	Foarte greu *Very heavy*	Usor *Light*	Semigreu *Semiheavy*	Greu *Heavy*
1	2	3	4	5	6	7	8
Aliniamente si interiorul curbelor cu raza R>250 m *Alignments and inside curves with radius R>250 m*	3<h≤4	x	-	-	-	-	-
	4<h≤6	x	-	-	x	-	-
	h>6	-	x	-	-	x	-
Exteriorul curbelor cu R>250 m si interiorul curbelor cu 125<R≤250 m *The exterior of the curves with R>250 m and the inside of curves with 125 <R≤250*	3<h≤4	x	-	-	-	-	-
	4<h≤6	-	x	-	x	-	-
	h<6	-	x	-	-	x	-
Exteriorul curbelor cu 125<R≤250 m si interiorul curbelor cu R≤125 m *Outside curves with 125<R≤250 m and the inside of curves with R≤125*	3<h≤4	x	-	-	x	-	-
	4<h≤6	-	x	-	x	-	-
	h>6	-	x	-	-	x	-
Exteriorul curbelor cu 30<R≤125 m *Outside curves with 30<R≤125 m*	1<h≤2	x	-	-	x	-	-
	2<h≤4	-	x	-	x	-	-
	4<h≤6	-	x	-	-	x	-
	h>6	-	-	x	-	-	x
Exteriorul curbelor cu R≤30 m *Outside curves with R≤30 m*	1<h≤2	x	-	-	x	-	-
	2<h≤4	-	x	-	-	x	-
	h>6	-	-	x	-	-	x

NOTA - In cazul cand autovehiculele cu sarcina utila >50kN reprezinta minimum 15% din traficul de perspectiva, se prevad parapete de tip semigreu in locul celor usoare si de tip greu in locul celor de tip semigreu.

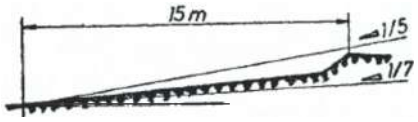
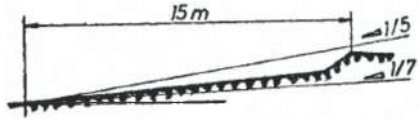
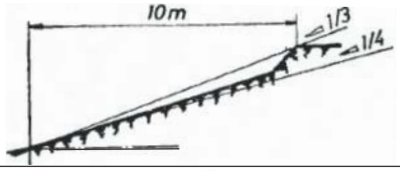
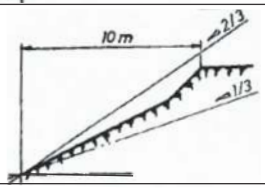
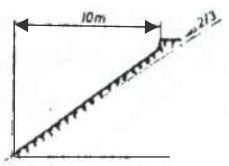
NOTE *- When vehicles with a workingload >50kN represent at least 15% of predicted traffic, semiheavy tguardrails type are to be used instead of light guardrails and heavy type instead of semiheavy type.*

STAS 1948/1-1991 - Stalpi de ghidare si parapete - Specificatii tehnice generale
STAS 1948/1-1991 - Guardrails - General technical specifications

1.4 In cazul cand drumul este situat pe un versant, amplasarea parapetelor se face asimiland versantul cu inclinatie <11/7 cu drumuri la nivelul terenului, iar cu inclinarea >1/7 cu un rambleu, conform Tabelului 2.

1.4 *Where the road is located on a slope, the placing of the guardrail is done by assimilating the slope with an inclination of <11/7 with roads at ground level, and with a slope of >1/7 with an embankment according to Table 2.*

Tabel 2 / *Table 2*

Reprezentare grafica a versantului *Graphic representation of the slope*	Inclinarea versantului dincolo de ampriza *Tilt of the slope beyond the road footprint*	Felul versantului *Slope type*	
		Impadurit/*Forested*	Despadurit/*Deforested*
		Inaltimea h a rambleului cu care se asimileaza versantul *The height h of the embankment tith wich the slope assimilates*	
1	2	3	4
	1/7...1/5	1<h<2	2<h<3
	1/5...1/4	2<h<3	3<h<4
	1/4...1/3	3<h<4	3<h<6
	1/3...2/3	4<h<6	h<6
	1/3>2/3	h>6	h>6

NOTA - Pe sectoarele de drum in care marginea platformei drumului este situata la limita unui versant abrupt (prapastie) se prevad parapete de tip foarte greu sau greu, in functie de clasa tehnica a drumului.

NOTE *- On the road sections where the edge of the road platform is located at the edge of a steep slope (ravine), there are to be used very heavy or heavy type guardrails, depending on the technical class of the road.*

STAS 1948/1-1991 - Stalpi de ghidare si parapete - Specificatii tehnice generale
STAS 1948/1-1991 - Guardrails - General technical specifications

1.5 Amplasarea parapetelor, in cazul cand sectoarele de drum sunt prevazute cu ziduri de sprijin la marginea platformei spre aval, se face conform Tabelului 3.

1.5 *The placing of the guardrails, when the road sections are designed with support walls at the edge of the platform to the downstream side, is to be made according to Table 3.*

Tabel 3 / *Table 3*

Elemente geometrice ale traseului *Geometric elements of the route*	Inaltimea platformei drumului, h_1, fata de baza zidului de sprijin *Road platform height road, h1, towards the base of the support wall*	Clasa tehnica a drumului *Road technical class*					
		II & III			IV & V		
		Parapete rigide sau deformabile de tip *Rigid or deformable guardrails types*			Parapete rigide de tip *Rigid guardrails types*		
		Semigreu *Semiheavy*	Greu *Heavy*	Foarte greu *Very heavy*	Usor *Light*	Semigreu *Semiheavy*	Greu *Heavy*
Aliniamente, interiorul curbelor de orice raza si exteriorul *Alignments, inside curves of any radius and exterior*	$0,5<h_1\leq2$	x	–	–	x	–	–
	$2<h_1\leq4$	–	x	–	–	x	–
	$h_1\leq4$	–	–	x	–	–	x
Exteriorul curbelor cu raza R>125 m *The exterior of the curves with radius R>125 m*	$0,5<h_1\leq2$	–	x	–	–	x	–
	$h_1\leq2$	–	–	x	–	–	x

NOTA - In cazul in care autovehiculele cu sarcina utila >50 kN reprezinta minim 15% din traficul de perspectiva, se prevad parapete de de tip semigreu in locul celor usoare si de tip greu in locul celor de tip semigreu.

NOTE *- If vehicles with a workingload >50 kN represent at least 15% of the predicted traffic, emiheavy tguardrails type are to be used instead of light guardrails and heavy type instead of semiheavy type..*

1.6 In cazul cand traseul drumului este situat in lungul unui curs de apa sau langa malul unui lac, la o distanta de maxim 10 m de la marginea platformei, parapetele se amplaseaza astfel:

- cand nivelul cursurilor de apa, calculat pentru un debit maxim cu o probabilitate anuala de depasire de 2% conform SRAS 4068/2-87, sau cand nivelul apei din lac este <1,5 m fata de fundul albiei, se ia in considerare cota de la marginea platformei fata de fundul albiei si se procedeaza pentru amplasarea parapetelor, dupa caz, conform Tabelelor 1, 2 si 3.

- cand nivelul cursurilor de apa, calculat pentru un debit maxim cu o probabilitate anuala de depasire de 2% conform STAS 4068/2-87, sau cand nivelul apei din lac este >1,5 m, fata de fundul albiei, parapetele se prevad conform Tabelului 4.

1.6 *If the route of the road is situated along a water course or near the shore of a lake, at a distance of not more than 10 m from the edge of the platform, the guardrails shall be placed as it follows:*

- when the water flow level, calculated for a maximum flow rate with an annual 2% probability of exceedance according to SRAS 4068/2-87, or when the water level in the lake is <1,5 m from the bottom of the waterbed, consideration shall be given the elevation of the platform edge from the bottom of the bed and is to be proceed at the placing of the guardrail, as appropriate, according to Tables 1, 2 and 3.

- when the water flow rate, calculated for a maximum flow with an annual 2% overrun probability according to STAS 4068/2-87, or when the water level in the lake is >1,5 m from the bottom of the bed, the guardrails are established according to Table 4.

STAS 1948/1-1991 - Stalpi de ghidare si parapete - Specificatii tehnice generale
STAS 1948/1-1991 - Guardrails - General technical specifications

Tabel 4 / *Table 4*

Elemente geometrice ale traseului *Geometric elements of the route*	Clasa tehnica a drumului *Road technical class*			
	II & III		IV & V	
	Parapete rigide sau deformabile *Rigid or deformable guardrails type*		Parapete rigide de tip *Rigid guardrails types*	
	Greu *Heavy*	Foarte greu *Very heavy*	Semigreu *Semiheavy*	Greu *Heavy*
Aliniament, interiorul tuturor curbelor si exteriorul curbelor cu raza R>125 m *Alignment, the inside of all curves and the outside of the curves with radius R>125 m*	x	–	x	-
Exteriorul curbelor cu raza R<125 m The outside of the curves with radius R<125 m	-	x	-	x

NOTA - In cazul drumurilor de clasa tehnica II si III, cand platforma acestora se afla la o cota >6 m fata de cea a nivelului apei sau cand marginea platformei drumului dinspre apa este prevazuta cu zid de sprijin a carui inaltime h1>4 m, se prevad numai parapete de tip foarte greu.

NOTE - *For Class II & III roads, when their platform is at a height >6 m above the level of the water level or when the edge of the road from the water is provided with a support wall whose height h1>4 m, only very heavy type guardrails are to be used.*

1.7 In cazul cand traseul este paralel cu o alta cale de comunicatie (cale ferata sau drum) situata la nivel superior pana la maxim 1 m fata de nivelul drumului, la acelasi nivel sau la nivel inferior si la distanta de maxim 10 m (masurata intre marginile adiacente ale platformelor), se prevad parapete de tip semigreu la drumurile de clasele II si III si de tip usor la drumurile de clasele IV si V.
Cand portiunile de drum se gasesc la o cota superioara cotei caii de coumicatie paralele, iar la marginea platformei dinspre aceasta exista zid de sprijin, parapetele se monteaza potrivit celei mai defavorabile situatii, tinand seama de prevederile Tabelului 3.

1.7 *In the case where the route is parallel to another railway or road, situated at a level up to a maximum of 1 m from the road level, at the same or lower level and at a distance of not more than 10 m (measured between the adjacent edges of the platforms), there are to be used semiheavy guardrails for class II and III roads and easy type guardrails for class IV and V roads.*
When the road sections are at the highest elevation point of the parallel road or railway, and at the edge of the platform there is a support wall, the guardrails are mounted according to the most unfavorable situation, taking into account the provisions of Table 3.

1.8 Pe portiunile de drum la care in imediata vecinatate a platformei sunt amplasate constructii care pot periclita siguranta circulatiei (de exemplu pile de pasaje superioare) sau care pot fi deteriorate datorita iesirii vehiculelor de pe platforma drumului, trebuie sa se prevada parapete deformabile de tip semigreu pe drumurile de clasa tehnica II si II si parapete rigide de tip usor din beton armat pe drumurile de clasa tehnica IV si V.

1.8 *On the road sections in the vicinity of which are located constructions that may endanger the safety of the traffic (eg. upper passageways pillars) or which may be damaged due to the vehicles that exit the road platform, deformable semiheavy guardrails are to be used for class II and III roads and rigid light reinforced concrete type guardrails are to be used for class IV and V roads.*

STAS 1948/1-1991 - Stalpi de ghidare si parapete - Specificatii tehnice generale
STAS 1948/1-1991 - Guardrails - General technical specifications

1.9 Lungimile pe care se amplaseaza parapete trebuie sa depaseasca cu cate 10 m, la fiecare dintre capete, lungimi care indeplinesc conditiile din Tabelele 1, 2, 3 si 4 sau de la punctele 337 si 336. In cazul cand sectoarele pe care trebuie montate parapetele sunt situate la distante mai mici de 25 m intre ele, se prevad parapete continue.

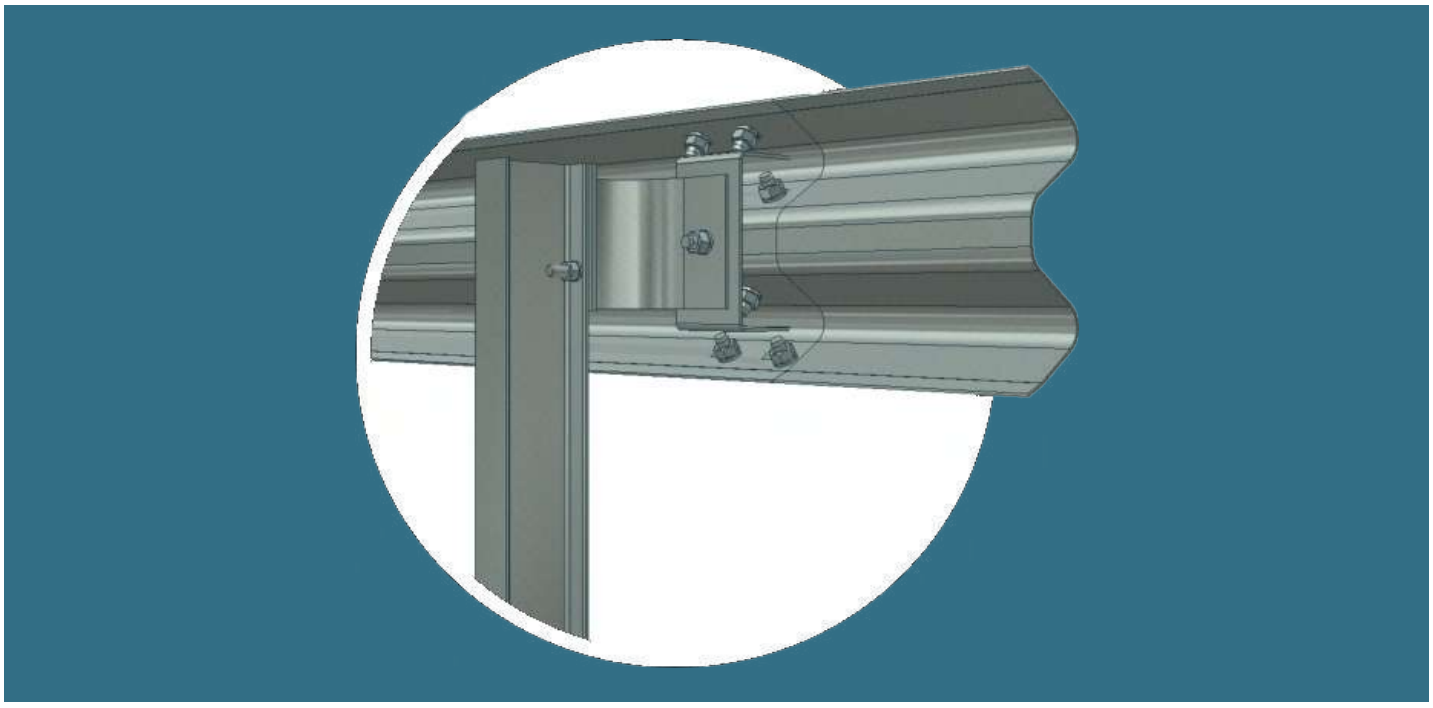
1.10 Pentru sporirea sigurantei circulatiei rutiere si asigurarea continuitatii ghidarii laterale, la parapetele situate pe drumurile avand imbracaminti bituminoase, din beton de ciment sau pavaje, se prevad dispozitive reflectorizante, similare cu ale stalpilor de ghidare, la distantele din Tabelul 5.

1.9 *The lengths of the guardrails shall be 10 m longer, at each end, lengths that meet the conditions specified in Tables 1 to 4. or at points 1.5 and 1.6. In the case where the sectors on which the guardrails are to be fitted are located less than 25 m apart, continuous guardrails ar to be used.*

1.10 *In order to increase road traffic safety and to ensure the continuity of lateral guidance, at the guardrails located on roads with bituminous coatings, cement concrete or pavements, reflective devices similar to those of the guide posts are to be used, at the distances mentioned in Table 5.*

Tabel 5 / *Table 5*

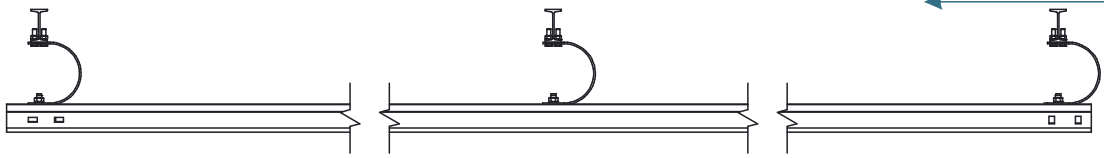
Elemente geometrice ale traseului *Geometric elements of the route*	Aliniament si curbe cu R>250 m *Alignmentand curves with R> 250 m*	Curbe cu raze R de: Curves vit radius R of:		
		125<R≤250 m	30<R≤125 m	3R≤30 m
Distanta intre dispozitivele reflectorizante (m) *Distance between reflective devices (m)*	18,0	12,0	6,0	3,0...4,0

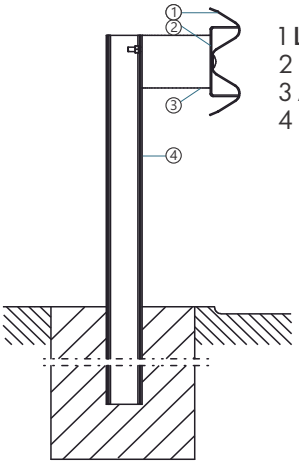


Sistem parapet deformabil MBS® tip semigreu
MBS® semiheavy sigle side guardrail system

Amplasat pe drum normal / *For normal road*

sens parcurs / *direction*



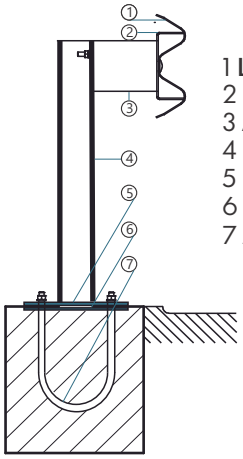


1 **Lisa** / *Beam* - l=6200mm
2 **Etrier** / *Caliper*
3 **Amortizor** / *Shock absorber*
4 **Stalp** / *Post* - IPE100, l=1770

Greutate / *Weight*: ~22,3 kg/ml
Forta de izbire / *Impact force*: 6,5 tf

Conform/ *According*: STAS 1948-1/1991, EN 1317/2000

Amplasat pe zid de sprijin / *For support wall*

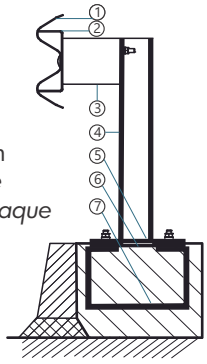


1 **Lisa** / *Beam* - l=6200mm
2 **Etrier** / *Caliper*
3 **Amortizor** / *Shock absorber*
4 **Stalp** / *Post* - IPE100, l=655mm
5 **Placa de fixare** / *Fixing plaque*
6 **Placa inglobata** / *Embeded plaque*
7 **Ancora** / *Anchor* φ25mm

Greutate / *Weight*: ~26,68 kg/ml
Forta de izbire / *Impact force*: 6,5 tf

Amplasat pe pod / *For bridge*

1 **Lisa** / *Beam* - l=6200mm
2 **Etrier** / *Caliper*
3 **Amortizor**/ *Shock absorber*
4 **Stalp** / *Post* - IPE100, l=455mm
5 **Placa de fixare** / *Fixing plaque*
6 **Placa inglobata** / *Embeded plaque*
7 **Ancora** / *Anchor* - φ25mm



Greutate / *Weight*: ~27,59 kg/ml
Forta de izbire / *Impact force*: 6,5 tf

Conform / *According*: SR 1948-2/1995, EN 1317/2000

Specificatii

Calitate otel utilizat: S 235JR - SR EN 10025-2/2004;
Grosimea stratului de zinc: 60 - 80 ftm - ISO 2178/98; ISO 1460/2002;
Tolerante admise: Conform SR EN 10051 + A1/2000;
Forta de izbire: Conform STAS 1545/89.

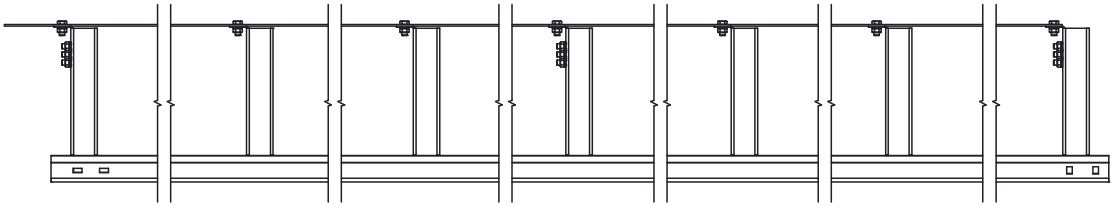
Specifications

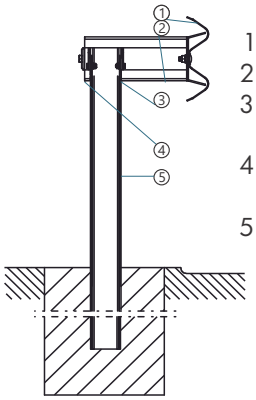
Steel quality: S 235JR - SR EN 10025-2/2004;
Zinc coating thickness: 60 - 80 ftm - ISO 2178/98; ISO 1460/2002;
Admited tolerances: According SR EN 10051 + A1/2000;
Impact force: According STAS 1545/89.

Sistem parapet deformabil MBS® tip greu
MBS® heavy sigle side guardrail system

Amplasat pe drum normal / *For normal road*

sens parcurs / *direction*



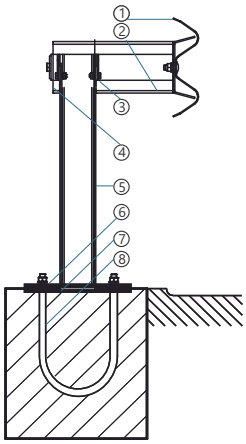


1 **Lisa metalica** / *Beam* - l=6200mm
2 **Distantier** / *Spacer*
3 **Piesa de prindere distantier**
Spacer fixing piece
4 **Banda metalica de solidarizare**
Strenghtening metal band
5 **Stalp** / *Post* - IPE100, l=1750mm

Greutate / *Weight*: ~30,0 kg/ml
Forta de izbire / *Impact force* = 17 tf

Conform / According: STAS 1948-1/1991, EN 1317/2000

Amplasat pe zid de sprijin / *For support wall*

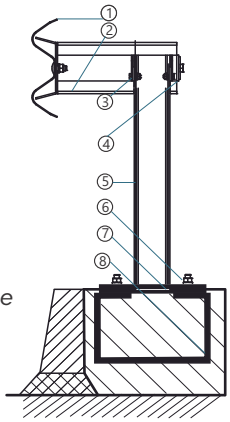


1 **Lisa metalica** / *Beam* - l=6200mm
2 **Distantier** / *Spacer*
3 **Piesa de prindere distantier**
Spacer fixing piece
4 **Banda metalica de solidarizare**
Strenghtening metal band
5 **Stalp** / *Post* - IPE100, l=710mm
6 **Placa de fixare** / *Fixing plaque*
7 **Placa inglobata** / *Emebded plaque*
8 **Ancora / Anchor - Φ** 25mm

Greutate / *Weight*: ~33,72 kg/ml
Forta de izbire / *Impact force* = 17 tf

Amplasat pe pod / *For bridge*

1 **Lisa metalica** / *Beam* - l=6200mm
2 **Distantier** / *Spacer*
3 **Piesa de prindere distantier**
Spacer fixing piece
4 **Banda metalica de solidarizare**
Strenghtening metal band
5 **Stalp** / *Post* - IPE100, l=525mm
6 **Placa de fixare** / *Fixing plaque*
7 **Placa inglobata** / *Emebded plaque*
8 **Ancora / Anchor - Φ** 25mm



Conform / *According*: SR 1948-2/1995, EN 1317/2000

Greutate / *Weight*: ~33,62 kg/ml
Forta de izbire / *Impact force*: 17 tf

Specificatii

La cerere:
Catadioptri pentru sens unic sau sens dublu;
Sisteme de parapet nezincate;
Sistem de parapete tip semigreu sau greu pentru zona mediana.

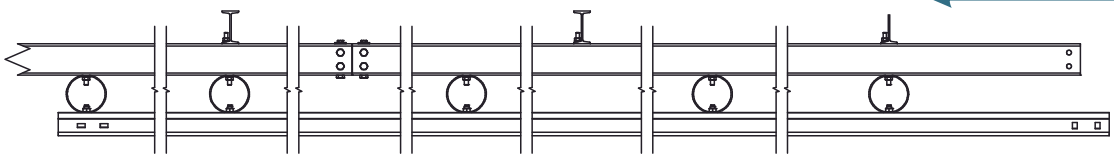
Specifications

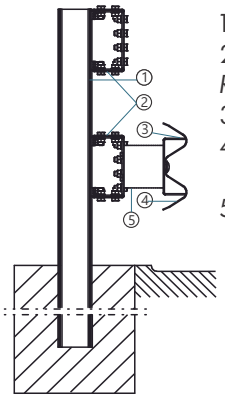
On request:
Reflectors for roads with single or double directions;
Gurdrail sistems without galvanization;
Semiheavy or heavy guardrail sistems for median area.

Sistem parapet deformabil MBS® tip foarte greu
MBS® very heavy sigle side guardrail system

Amplasat pe drum normal / *For normal road*

sens parcurs / *direction*



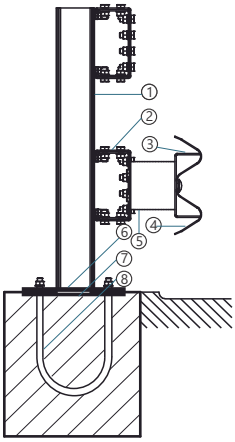


1 **Stalp** / IPE100, l=2250mm
2 **Lise metalice rigide** /
Rigid beams - l=4000mm
3 **Etrier** / *Caliper*
4 **Lisa metalica deformabila**
Deformable beam - l=6200mm
5 **Amortizor** / Shock absorber

Greutate / *Weight*: ~57,72 kg/ml
Forta de izbire / *Impact force*: 19 tf

Conform / *According*: SR 1948-1/1991, EN 1317/2000

Amplasat pe zid de sprijin / *For support wall*

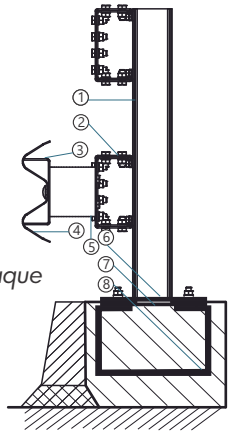


1 **Stalp** / IPE100, l=1135mm
2 **Lise metalice rigide** /
Rigid beams - l=4000mm
3 **Etrier** / *Caliper*
4 **Lisa metalica deformabila**
Deformable beam - l=6200mm
5 **Amortizor** / Shock absorber
6 **Placa de fixare** / *Fixing plaque*
7 **Placa inglobata** / *Emebded plaque*
8 **Ancora / Anchor - Φ** 25mm

Greutate / *Weight*: ~59,50 kg/ml
Forta de izbire / *Impact force*: 19 tf

Amplasat pe pod / *For bridge*

1 **Stalp** / IPE100, l=950mm
2 **Lise metalice rigide** /
Rigid beams - l=4000mm
3 **Etrier** / *Caliper*
4 **Lisa metalica deformabila**
Deformable beam - l=6200mm
5 **Amortizor** / Shock absorber
6 **Placa de fixare** / *Fixing plaque*
7 **Placa inglobata** / *Emebded plaque*
8 **Ancora / Anchor - Φ** 25mm



Conform / *According*: SR 1948-2/1995, EN 1317/2000

Greutate / *Greutate*: ~59,47 kg/ml
Forta de izbire / *Impact force*: 19 tf

Specificatii

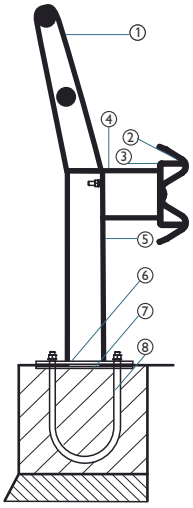
Ambalarea elementelor componente se face sub forma de colete etichetate
Livrarea se face in seturi complete (lise, stalpi, distantieri, organe de asamblare, etc.)
Livrarea este insotita de certificat de calitate si declaratii de conformitate.

Specifications

Components packaging is made in labeled packages;
Deliveries are in complete sets (beams, poles, spacers, fasteners, etc.);
A quality certificate and a conformity declaration are released at the moment of the delivery;

Sistem parapet deformabil MBS® tip combinat
MBS® combined side guardrail system

Amplasat pe zid de sprijin / *For support wall*

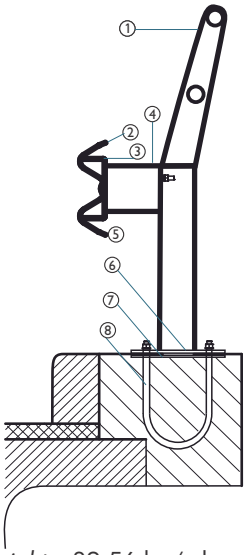


1 **Mana curenta** / *Hand rail*
2 **Lisa deform**abila / *Deformable beam* - l=6200mm
3 **Etrier** / *Caliper*
4 **Amortizor** / Shock absorber
5 **Stalp** / *Post* - IPE 100, l=670 mm
6 **Placa de fixare** / *Fixing plaque*
7 **Placa inglobata** / *Emebded plaque*
8 **Ancora** / **Anchor** - Φ 25mm

Conform / *According*: SR 1948-2/1995

Greutate / *Weight*: ~31,83 kg/ml
Forta de izbire / *Impact force*: 6,5 tf

Amplasat pe pod / *For bridge*



Greutate / *Weight*: ~32,56 kg/ml
Forta de izbire / *Impact force*: 6,5 tf

Specificatii

La cerere:
Transportul elementelor la locul de montaj sau adresa indicata;
Montaj pe santier cu echipe specializate;
Livrare de elemente separate pentru repararea zonelor afectate de accidente.

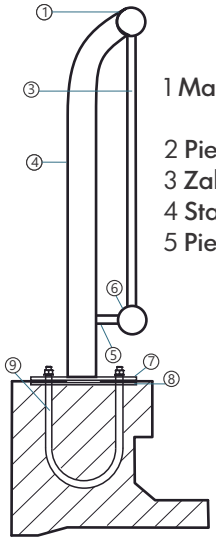
Specificatii

On request:
Transport to the assembly site or the indicated address;
Installation on site with specialized teams;
Delivery of separate elements for the repair of areas affected by accidents.

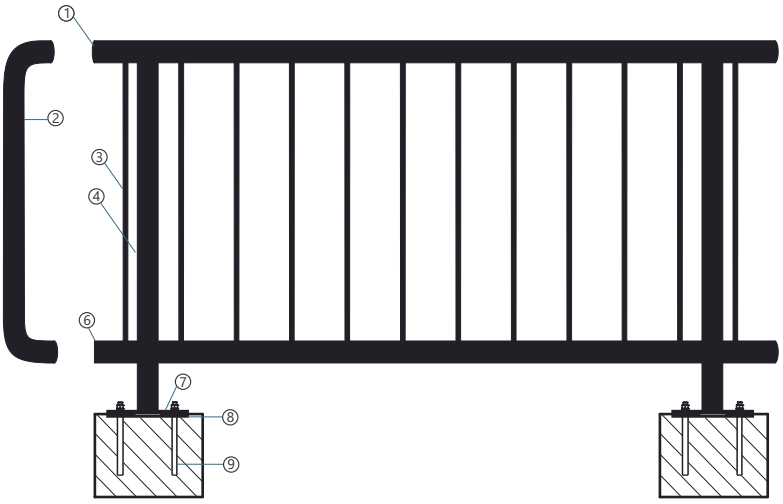
Parapet pietonal MBS® din teava rotunda
MBS® round pipe pietonal guardrail

Amplasat in localitati
Used in residential areas

Tip / *Type*: I, l = 2000mm



1 **Mana curenta** / *Hand rail*
- l=1990mm
2 **Piesa de capat** / Terminal element
3 **Zabrea** / Railing, l= 725mm
4 **Stalp**/ Post - l= 1010mm
5 **Piesa de prindere** / Fixing element
l 264mm
6 **Rigla inferioara** / Inferiour post
- l= 1990mm
7**Placa de fixare** / Fixing plaque
8 **Placa inglobata** / Embeded plaque
9 **Ancora** / Anchor



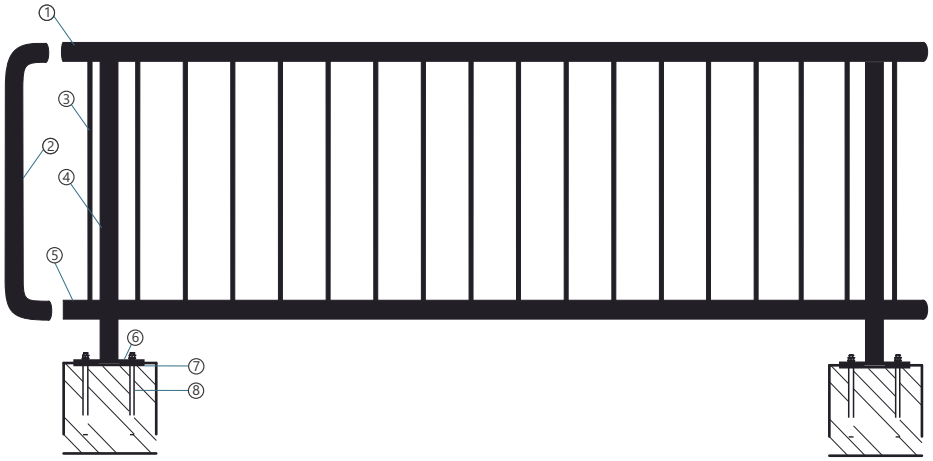
Greutate / *Weight*: ~37,20 kg/ml

Conform / *According*: SR 1948-2/1995

Amplasat in afara localitatilor
Placed outside residential areas

Tip / *Type*: II, l = 3000mm

1 **Mana curenta** / *Hand rail*
- l=2990mm
2 **Piesa de capat** / Terminal element
3 **Zabrea** / Railing, l= 725mm
4 **Stalp**/ Post - l= 1010mm
5 **Rigla inferioara** / Inferiour post
- l= 2990mm
6 **Placa de fixare** / Fixing plaque
7 **Placa inglobata** / Embeded plaque
8 **Ancora** / Anchor



Greutate / *Weight*: ~31,72 kg/ml

Conform / *According*: STAS 1948-1/1991, SR 1948-2/1995

Specifications

Materiale utilizate:
Teava rotunda φ6Ox3,5, OB 37 φ14;
Placi de fixare si ancore;
Panouri de rost.

Specifications

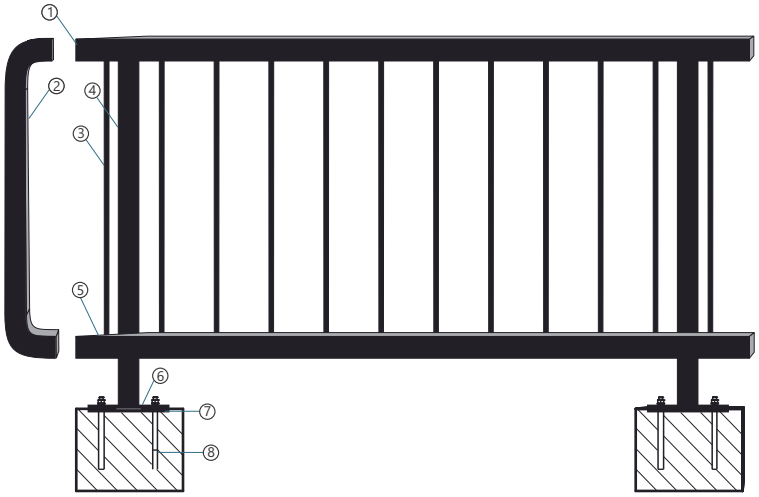
Used materials:
Round pipe φ6Ox3,5, OB 37 φ14;
Fastening plates and anchors;
Thrust panels.

Parapet pietonal MBS® din teava rectangulara
MBS® rectangular pipe pietonal guardrail

Amplasat in localitati
Used in residential areas

Tip / *Type*: I, l = 2000mm

1 **Mana curenta** / *Hand rail*
- l=1990mm
2 **Piesa de capat** / Terminal element
3 **Zabrea** / Railing, l= 725mm
4 **Stalp**/ Post - l= 1010mm
5 **Rigla inferioara** / Inferiour post
- l= 1990mm
6 **Placa de fixare** / Fixing plaque
7 **Placa inglobata** / Embeded plaque
8 **Ancora** / Anchor



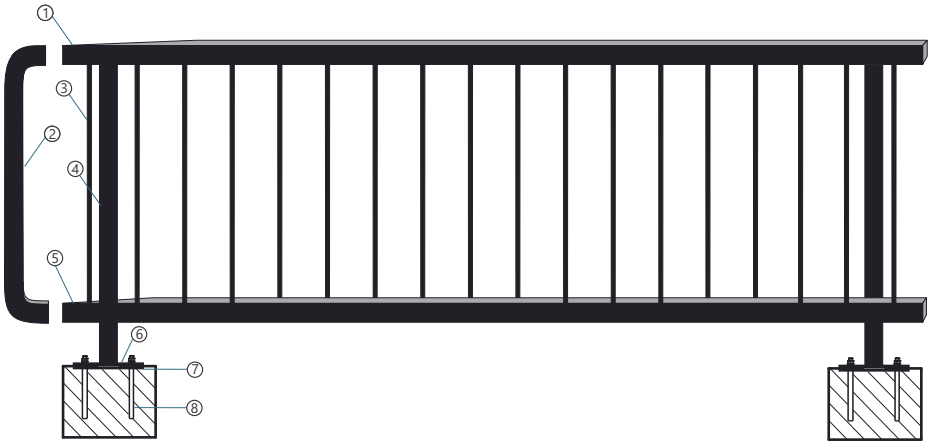
Greutate / *Weight*: ~47,41 kg/ml

Conform SR 1948-2/1995

Amplasat in afara localitatilor
Placed outside residential areas

Tip / *Type*: II, l = 3000mm

1 **Mana curenta** / *Hand rail*
- l=2990mm
2 **Piesa de capat** / Terminal element
3 **Zabrea** / Railing, l= 725mm
4 **Stalp**/ Post - l= 1990mm
5 **Rigla inferioara** / Inferiour post
- l= 1990mm
6 **Placa de fixare** / Fixing plaque
7 **Placa inglobata** / Embeded plaque
8 **Ancora** / Anchor



Greutate / *Weight*: ~44,65 kg/ml

Conform / *According*: SR 1948-1/1991, STAS 1948-2/1995

Specificatii

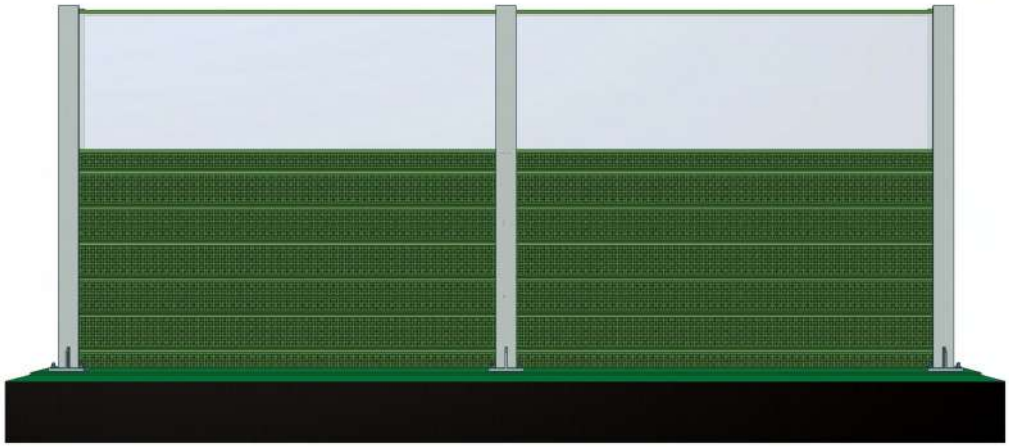
Materiale utilizate:
Teava rectangulara 106x60x6, teava rectangulara 30x20x3;
Placi de fixare a stalpilor si ancore;
Strat de protectie anticoroziva: grund 25µm.

Specifications

Used materials:
Rectangular pipe 106x60x6, rectangular pipe 30x20x3;
Pole fastening plates and anchors;
Corrosion protection layer: primer 25µm.

Bariere acustice MBS® - Informatii generale
MBS® acoustical barriers - General information

Specificatii tehnice generale / *General technical specifications*



Componente barierele acustice MBS®

- structura de sustinere din profile metalice tip HE140A sau HE140B;;
- panouri fonice MBS® ABSORB, panouri fonice MBS® PMMA15 sau, la cerere, panouri fonice combinate.

Proprietati bariere acustice MBS®

- izolare acustica: >23 dB;
- putere de absorbtie: 12 dB;
- rezistenta mecanica: 235 kg/mp;
- rezistenta foarte mare la factorii pedoclimatici;
- gama variata de culori;
- posibilitatea combinarii cu panouri din policarbonat;
- imbinare fara suruburi;
- schimbarea rapida a panourilor in caz de deteriorare;
- panouri ignifuge;
- protectie la actiunea rafalelor de vant si actiunea zapezii.

Domenii de utilizare

- delimitarea cailor de acces rutier si feroviar din zonele locuite;
- delimitarea zonelor aeroporturilor, aerogarilor, pistelor de aterizare;
- delimitarea zonelor industriale cu utilaje producatoare de zgomot intens;
- delimitarea santierelor de constructii, etc.

MBS® acoustic barriers components

- a supporting structure of steel profiles HE140A or HE140B type;
- MBS® ABSORB acoustical panels and MBS® PMMA15 acoustic panels or, on request, combined acoustic panels.

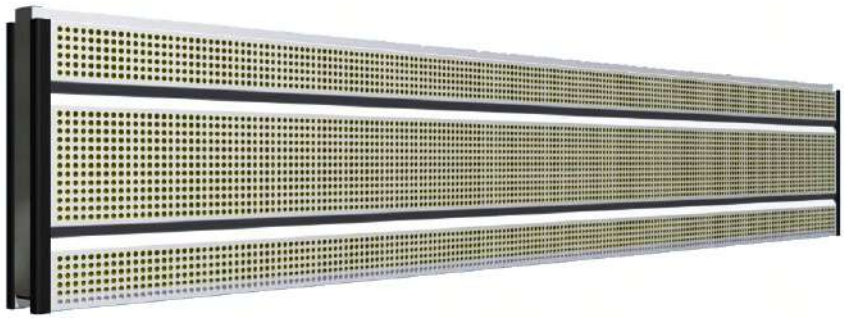
MBS® acoustical barriers properties

- acoustic insulation: >23 dB;
- acoustic absorption: 12 dB;
- strength: 235 kg/sqm;
- very high resistance to pedoclimatic factors;
- variety of colors;
- combining panels of polycarbonate;
- erection without screws;
- the rapid change in case of damaged panels;
- fire resistant panels;
- protective action of wind gusts and snow action.

Applications

- delimitation of road and rail access routes from residential areas;
- delimitation of areas of airports, air station, landing areas;
- delimitation of industrial areas with noisy heavy machinery;
- delimitation of construction sites, etc.

Panouri fonice MBS® ABSORB
MBS® ABSORB acoustical barriers



Panoul fonic MBS® ABSORB

Asigura absorbtia undelor sonore datorita perforatiilor executate pe suprafata anterioara. Energia acustica patrunde prin perforatii, o parte din aceasta transformandu-se in vibratii iar o alta parte fiind absorbita de stratul de vata minerala.
Puterea de absorbtie este >10 dB.

Specificatii tehnice

Panourile fonice MBS® ABSORB sunt produse din tabla profilata de otel, zincata si prevopsita, de 1 mm grosime, cu dimensiunile standard de 2975 x 500 x 105 mm, perforate pe partea dinspre sursa de zgomot, cu diametrul gaurii de 10 mm si pasul de 15 mm, pe 35% din suprafata. Pentru prevenirea vibratiilor, panourile fonice MBS® ABSORB sunt prevazute cu capace de inchidere laterale din taba zincata, etansate cu garnituri din polipropilena (optional se pot prevedea cu capace din plastic).

Panourile fonice MBS® ABSORB au in interior un element absorbant din vata minerala cu grosimea de 60 mm si densitatea de 90-100 kg/mc, protejata impotriva umiditatii si impuritatilor cu o folie din fibra de sticla aplicata prin caserare.

MBS® ABSORB accoustical barrier

The phenomenon of sound wave absorption is ensured by the perforations performed on the previous surface. The acoustic energy penetrates through the perforations, some of which transform into vibrations and another part is absorbed by the mineral wool layer.
Absorption power> 10 dB.

Technical specifications

MBS® ABSORB acoustical barriers are made of profiled sheet steel, galvanized and prepainted, with 1 mm thickness, standard sizes of 2975 x 500 x 110 mm, perforated on the side toward the noise source, a hole diameter of 10 mm and 15 mm step, 35% of the area. To prevent vibration, noise MBS® ABSORB panels are provided with closing caps galvanized side, sealed with sealing polypropylene (optionally provided with plastic caps).

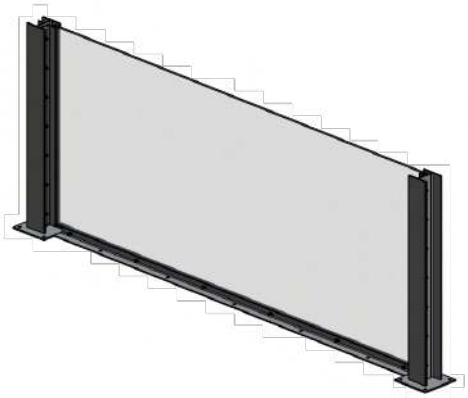
MBS® ABSORB acoustical barriers have on the inside an absorbent element of mineral wool with a thickness of 60 mm and 90-100 kg /cm density, protected from moisture with anti fiberglass foil, vided with plastic caps).

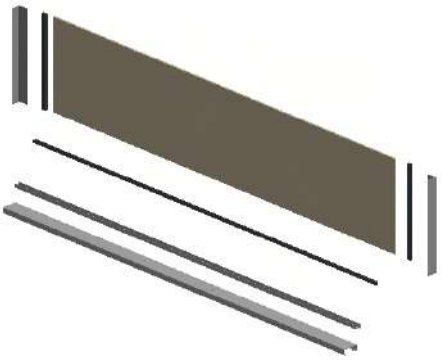
Panouri fonice MBS® REFLEX / *MBS® REFLEX acoustical barriers*

MBS® REFLEX *este o varianta de panou fonic cu caracteristici aproapiate de cele ale MBS® ABSORB.*
Diferenta o reprezinta faptul ca peretii casetei sunt compacti, mare parte din energia acustica fiind reflectata si dispersata in atmosfera. Prin instalarea panourilor fonice, nivelul zgomotului scade cu peste 25 dB.

***MBS® REFLEX** is a acoustical panel version with features close to those of MBS® ABSORB. The difference is that the walls of the cassette are compact, much of the acoustic energy being reflected and dispersed in the atmosphere. By installing these panels, the noise level drops by more than 25 dB.*

Panouri fonice MBS® PMMA15
MBS® PMMA15 acoustical barriers





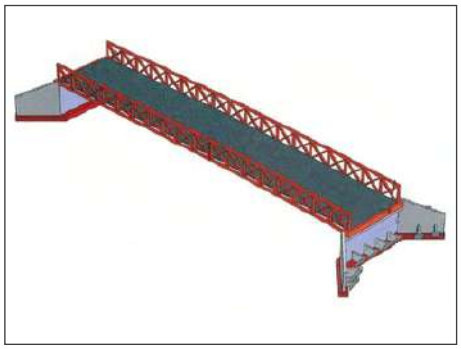
Panoul fonic de tip MBS PMMA15 (polimetylmetacrylat) transparent sau opac asigura un grad de izolare fonica >24dB.

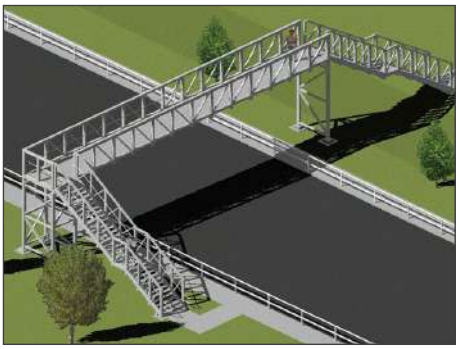
Caracteristici tehnice:
- panou din PMMA15, transparent sau opac, cu grosime de 15 mm, dimensiuni standard 3000x2000x15mm, suprafetele panoului fiind acoperite termic cu un strat protector cu grosime de 60 µm;
- rama metalica de sustinere formata din profile tip cornier, imbinate prin organe de asamblare;
- garnitura din EPDM necesara pentru etansarea panoului si eliminarea vibratiilor.

The MBS PMMA15 (polymethylmethacrylate) acoustic panel – transparent or opaque, provides a sound insulation> 24dB.

Technical characteristics:
- PMMA15 transparent or opaque panel, with a 15 mm thickness, standard sizes of 3000x2000x15 mm, the panel surfaces being thermally coated with one protective layer with a 60 m thickness;
- supporting metal frame made of cornier profiles, fastened by assembly organs
- one EPDM seal needed to seal the panel and eliminate vibrations.

Poduri, pasarele si console rutiere
Bridges, walkways and road consoles





Divizia Sisteme pentru Infrastructura a Proinvest Group asigura la cerere solutii complete pentru poduri metalice

Proiectare
- echipa de proiectare specializata, recunoscuta pe plan intern si international;

Executie
-utilaje automate de ultima generatie pentru taiat, gaurit si sudat; personal cu inaltă calificare, autorizat pentru sudura in mediu protector; operatiuni procedurate; control de calitate a sudurilor prin metode nedistructive - lichide penetrante, pulbere magnetica, UV - asigurat de personal autorizat;

Certificare:
- SR EN ISO 9001:2008, SR EN ISO 14001:2005, SR OHSAS 18001:2008.

The Infrastructure Division of Proinvest Group provides on-demand complete solutions for metallic bridges.

Design
-specialized design team, nationally and internationally recognized;

Execution
-automatic cutting machines for cutting, drilling and welding; highly qualified personnel, authorized for welding in protective environment; processed operations; quality control of welds by non-destructive methods - penetrating liquids, magnetic powder, UV - provided by authorized personnel;

Certification
-SR EN ISO 9001: 2008, SR EN ISO 14001: 2005, SR OHSAS 18001: 2008.

Poduri, pasarele si console rutiere
Bridges, walkways and road consoles

Divizia Sisteme pentru Infrastructura a Proinvest Group asigura la cerere solutii complete pentru poduri metalice

Aplicatii / *Applications*

Sisteme de parapet EN 1317
Guardrail Systems EN 1317

Aplicatii / *Applications*

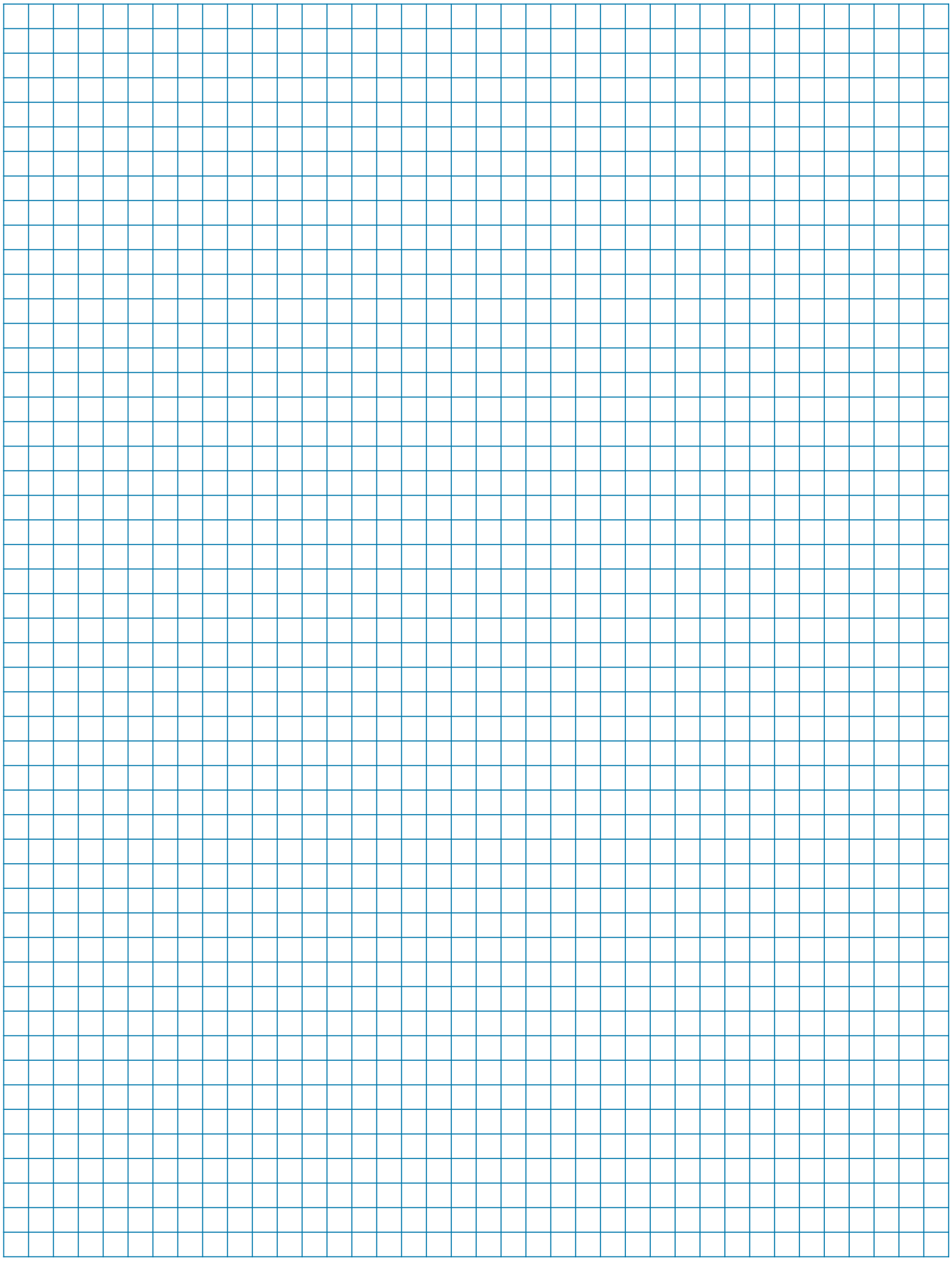
Sisteme parapet STAS 1948
STAS 1948 guardrail systems

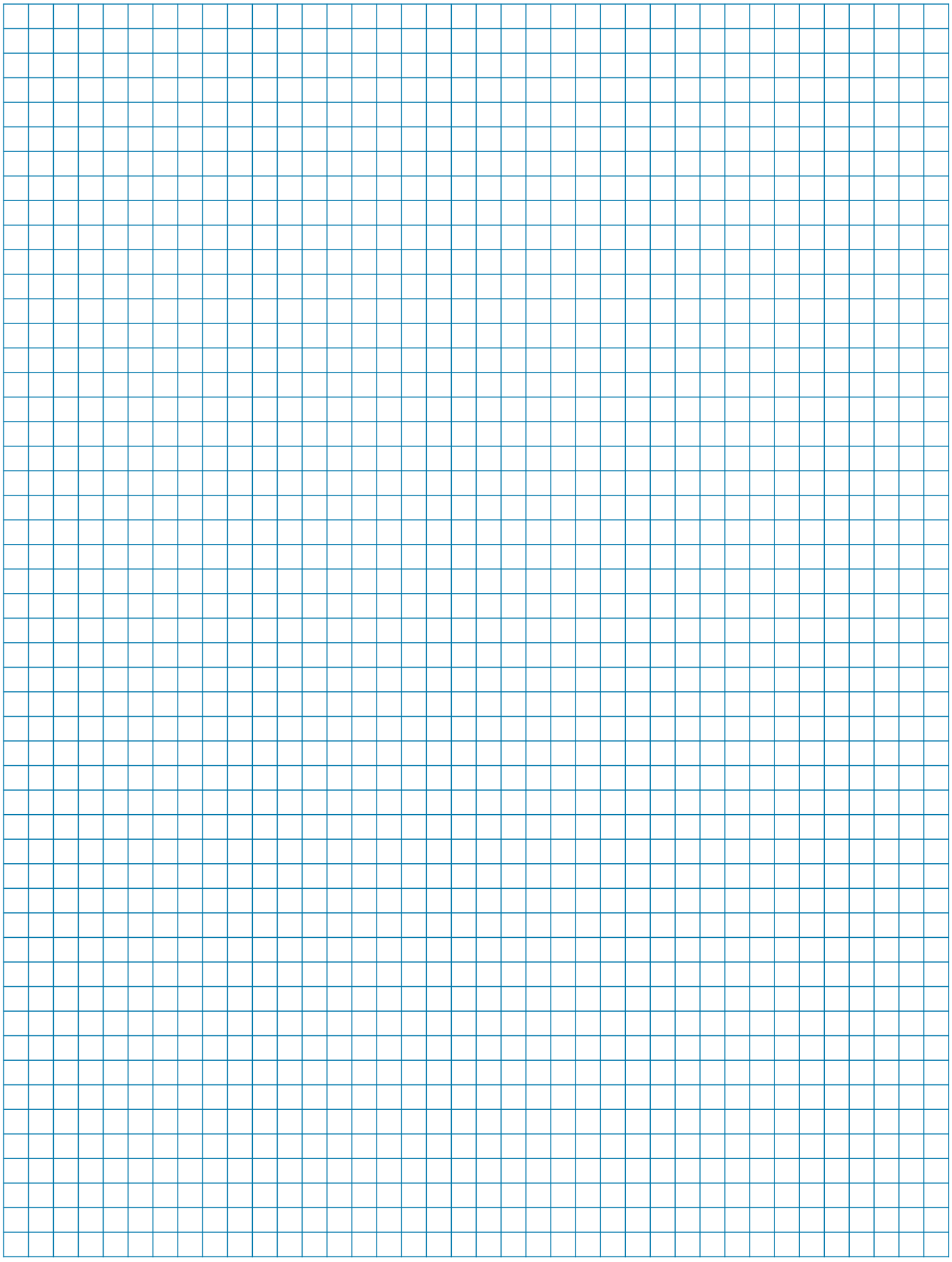
Aplicatii / *Applications*

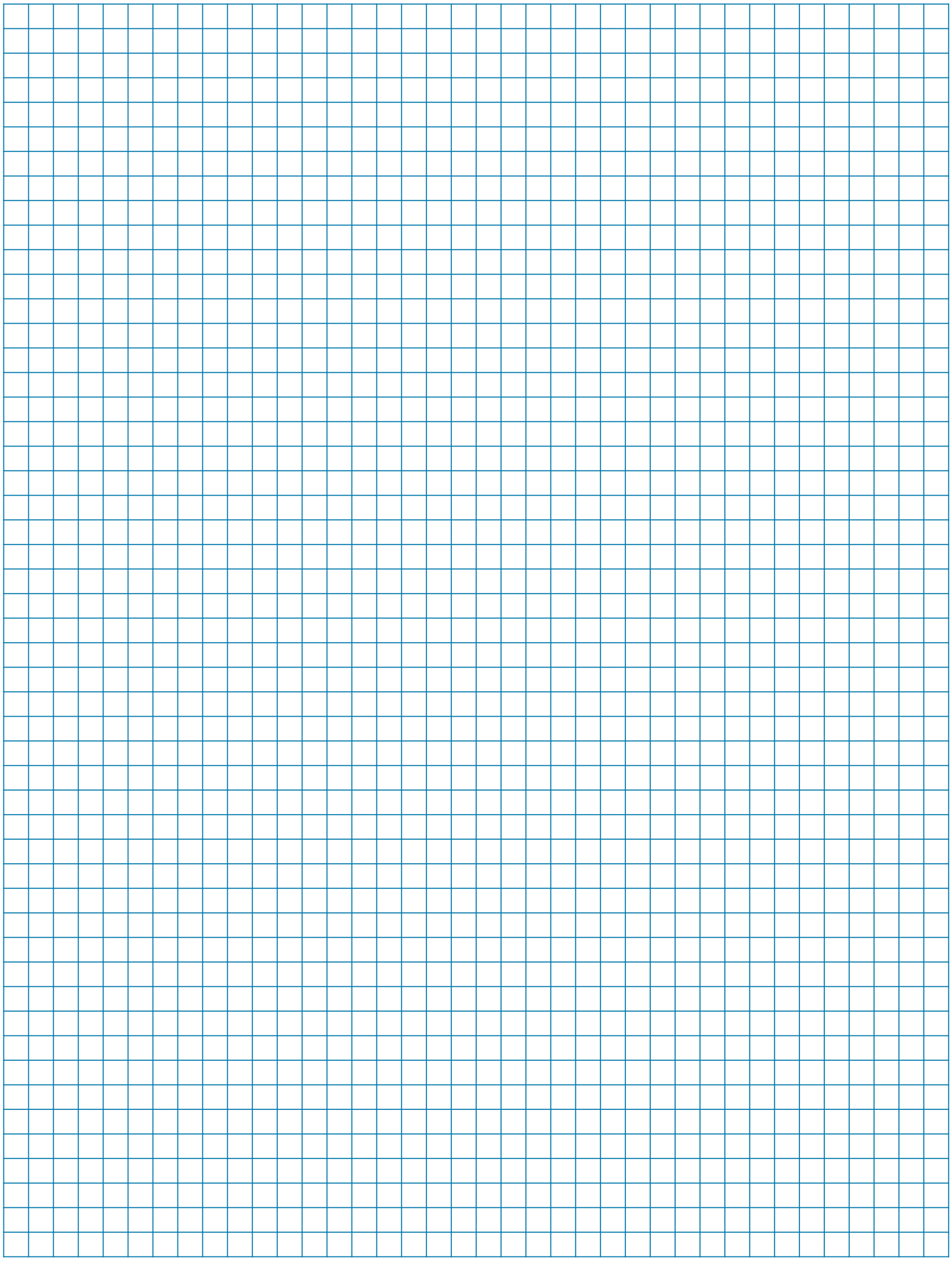
Bariere acustice
Accoustical barriers

Console rutiere
Road consoles

Referinte / *References*







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