



TECHNICAL
HANDBOOK

ROAD BARRIERS



STAVBY JAKO Z KAMENE

CSBETON[®]

www.csbeton.cz



Road barriers

Types of road barriers

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Properties and characteristics

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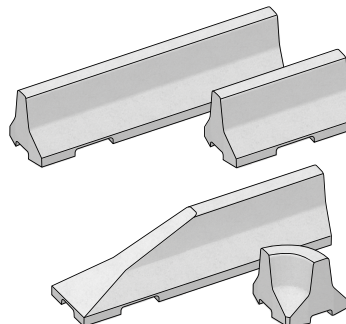
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Technical Product Data:

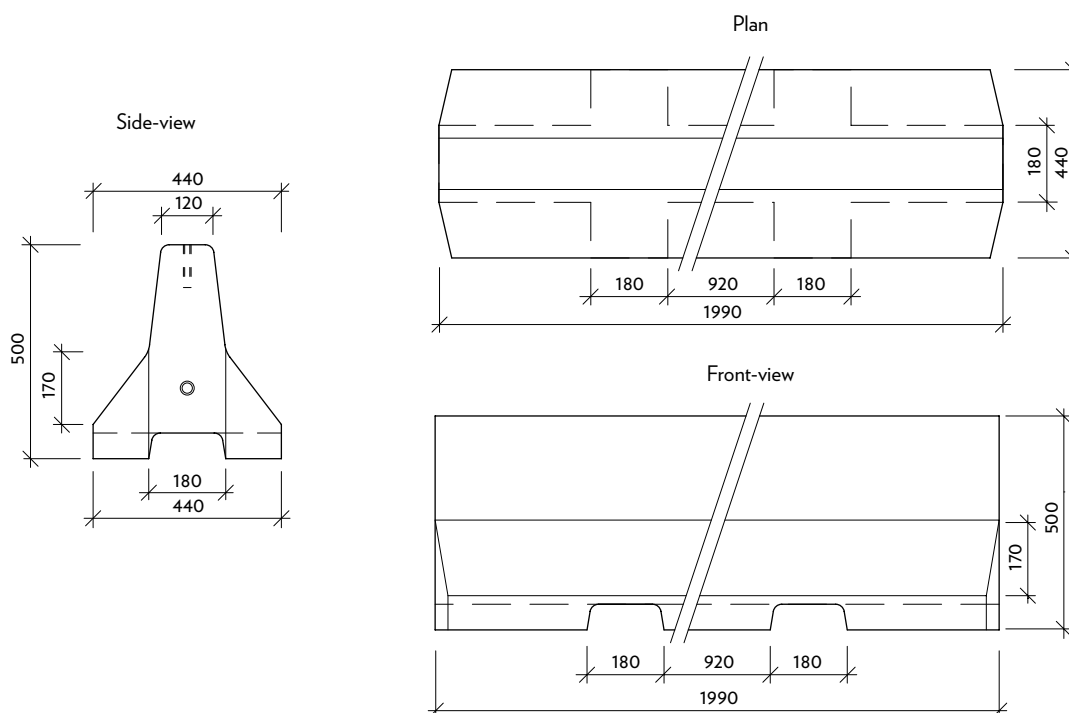
Our road barriers are designed for separating traffic lanes, securely dividing roads from pavements and securing traffic islands and roundabouts. Individual segments may be securely fixed to each other. Handrails can also be installed. Accessories such as end pieces and curved segments are available. The bottom contains openings to prevent water from accumulating in front of the barriers.



CSB - ROAD BARRIER 50	Nominal dimensions* mm			Quantity	Weight
	Height	Length	Width	ks/bm	kg/pcs
basic segments	500	2000	440	0,5	525
short segments	500	1000	440	1	260
end segments	500	2000	440	0,5	443
90° corner, outside	500	495	440	2	145
R 0.5 curve - 90°	500	790	440	-	119
R 1.0 curve - 90°	500	1575	440	-	330
Handrail for Jersey barrier	500	1940	-	-	-

Nominal dimensions - basic shapes:

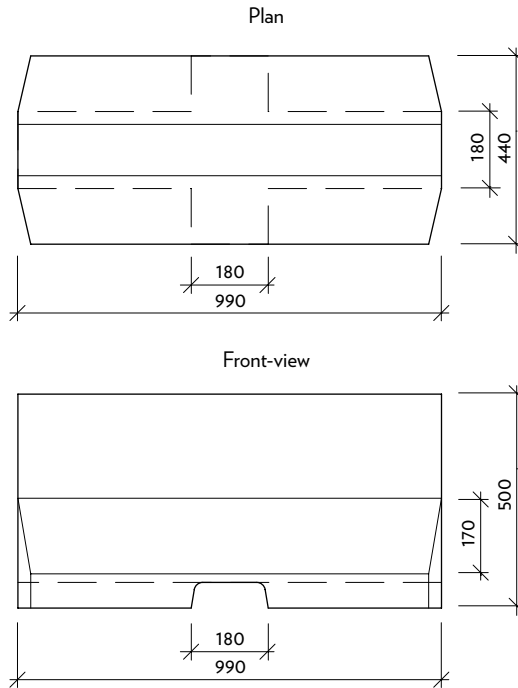
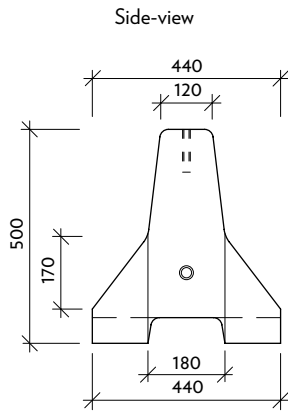
Basic segment



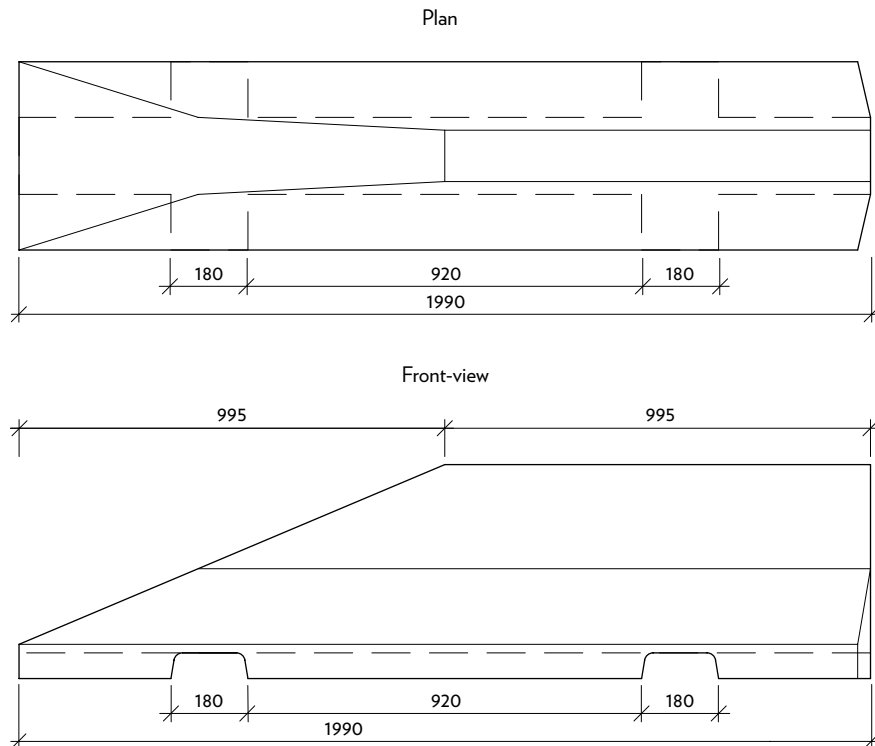
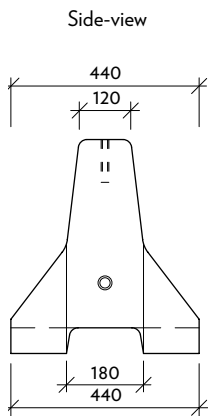
CSB - ROAD BARRIER 50

Nominal dimensions - basic shapes:

Short segments



End segments

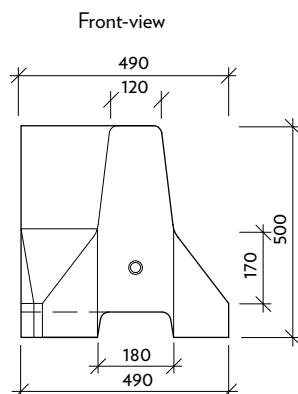
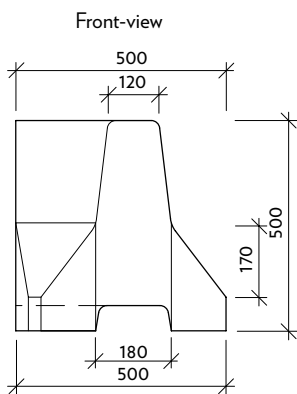
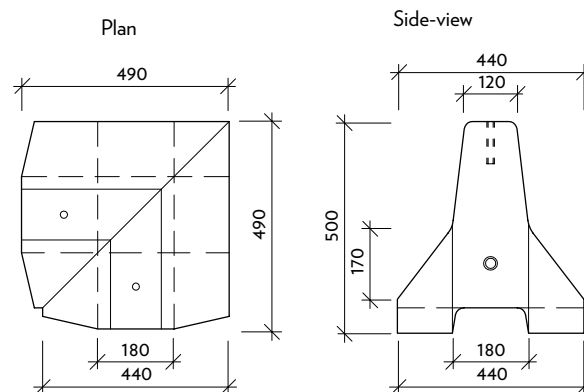
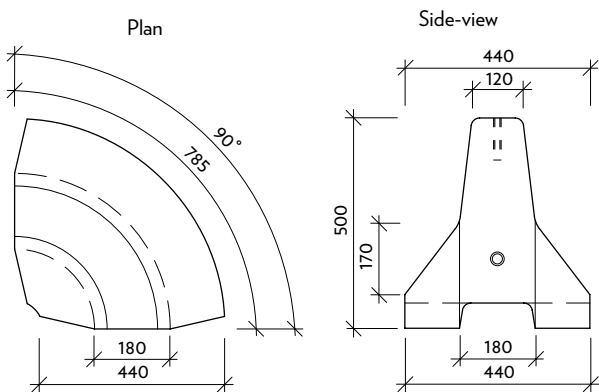


CSB - ROAD BARRIER 50

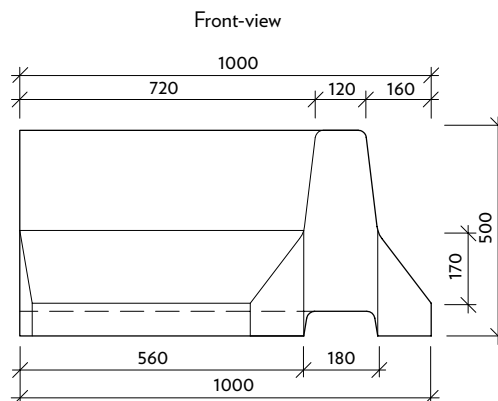
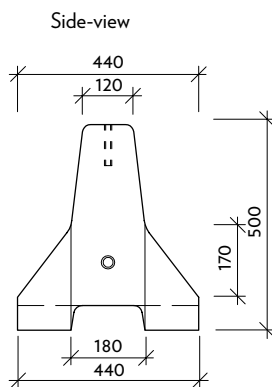
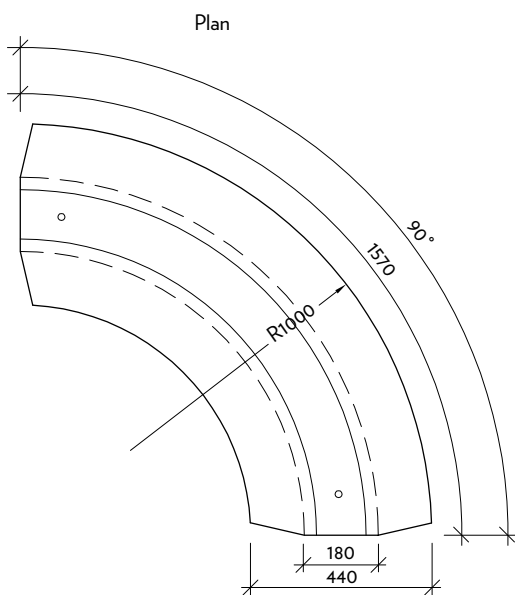
Nominal dimensions - basic shapes:

R 0.5 curve - 90°

90° corner, outside

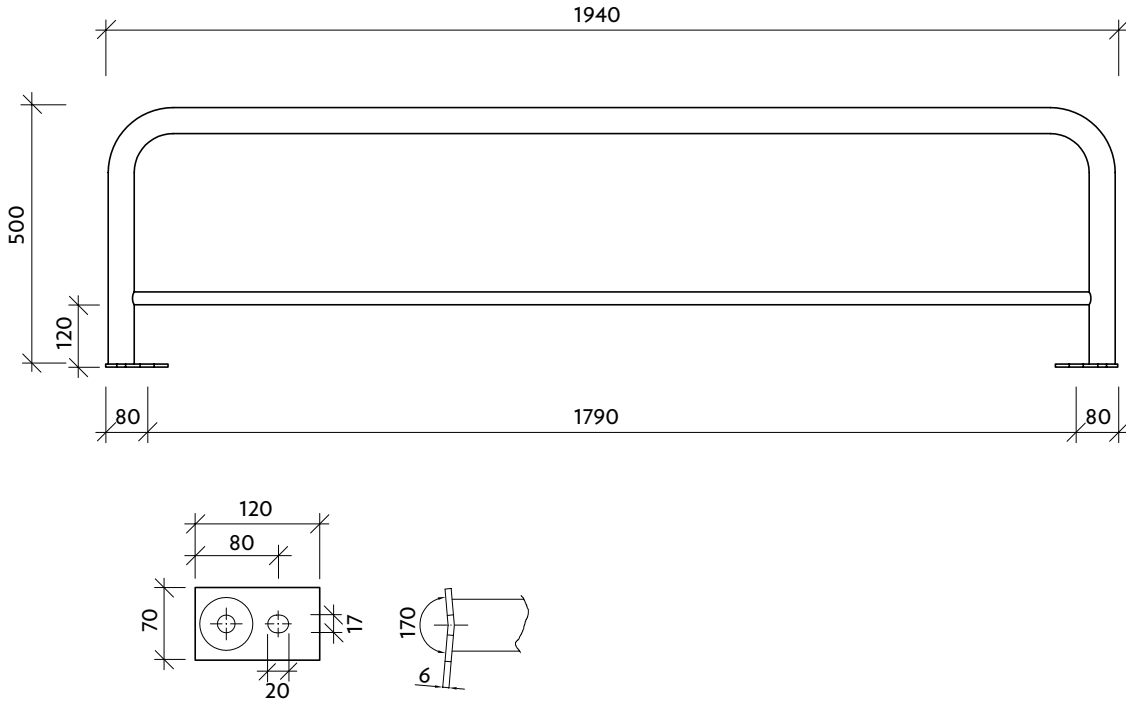


R 1.0 curve - 90°



CSB - ROAD BARRIER 50 - HANDRAIL FOR JERSEY BARRIER - **NEW!**

Nominal dimensions - basic shapes:



PROPERTIES AND CHARACTERISTICS

CSB - ROAD BARRIERS 50 - Jersey barriers are made of high-strength aerated cement (C45/55 class) and can withstand XF4, XD3 aggressive environments as per ČSN EN 206-1.

The use of high-strength concrete ensures:

- High compression and transversal tension strength
- Resistance to water and defrosting agents
- Minimum water absorption
- High-quality surfaces

Our manufacturing technology enables us to produce Jersey barriers with smooth surface, superior strength and extreme resistance to water and chemical defrosting agents. The standard surface treatment is natural concrete grey.

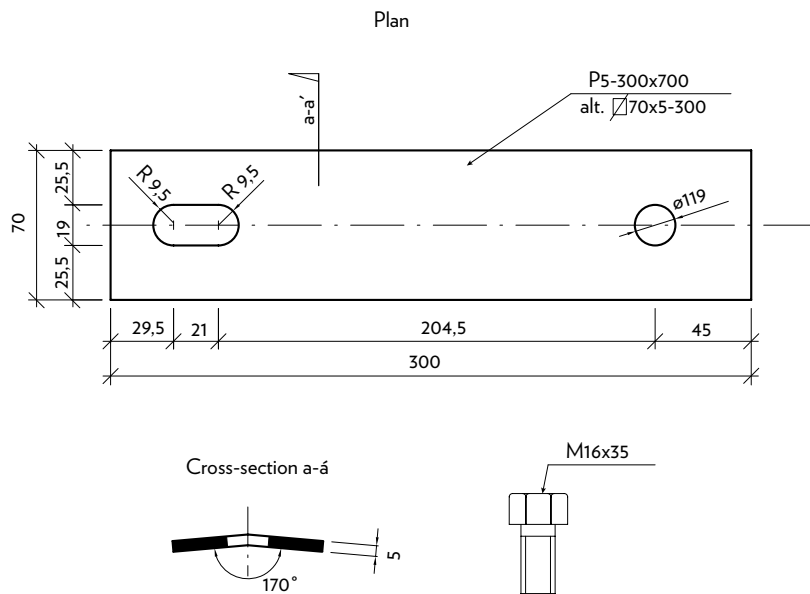
CSB - ROAD BARRIERS 50 - Jersey barriers consist of individual steel-reinforced concrete blocks with an inverted Y cross section (similar to the original Jersey barriers), which provides protection and division of different types of road users (pedestrian, cyclists, car drivers). It is designed to separate roads from pedestrian areas or cycling paths, to separate traffic lanes, create protected islands and roundabouts, slow traffic in residential and pedestrian zones and outline diversions and closures in city traffic. The Jersey barriers are not compliant with ČSN EN 1317-5. The individual segments are laid onto surfaced areas. After they are joined by steel joints, the barrier becomes in effect a link chain, which provides the required deformation zone. Curved segments may be used to create roundabouts and other similar structures. The height of all components is 50 cms.

CS-BETON produces the following basic Jersey barrier components:

- CSB - ROAD BARRIER 50 basic segments - straight segment - 2 m long
- CSB - ROAD BARRIER 50 short segments - straight segment - 1 m long
- CSB - ROAD BARRIER 50 end segments - end segment (sloping) -2 m long
- CSB - ROAD BARRIER 50 curve - radius 0,5 m
- CSB - ROAD BARRIER 50 curve - radius 1,0 m - 90°
- CSB - ROAD BARRIER 50 corner 90° outside corner

The top surface of each segment contains two anchors with Rd 16 inside threads to enable handling of the segments. These are used to attach lifting eyes for the lifting device's hooks. This type of handling is quick and easy and enables installation of the Jersey barriers directly from a transport vehicle with a lifting arm. Each line starts with an end/sloped segment, continues with the necessary number of basic segments and ends in another sloped segment. Each segment contains a number of longitudinal and transversal channels, which prevent surface water from being trapped behind the line. The transversal channels may be used for transporting the segments on a forklift truck. Suitable steel handrails can be fitted to the barriers after they are completed. The system is intended for use in city traffic and roads with limited speeds of up to 50 kms per hour.

Joint - shop drawing:



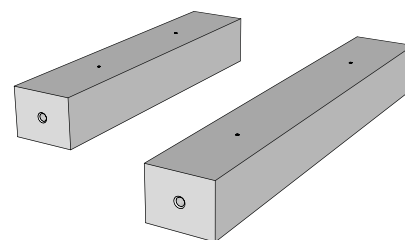


CSB - GROUND PLATE FOR ROAD BARRIERS

NEW!

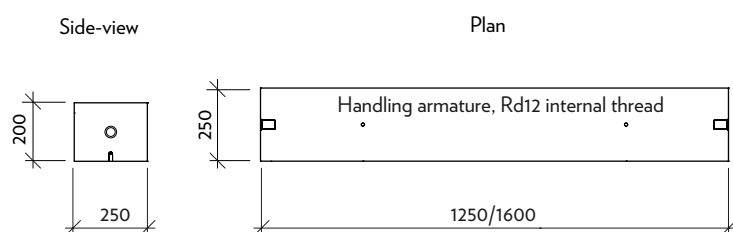
Technical Product Data:

The ground plate is designed to provide a stable base for NEW JERSEY - type concrete road barriers when they are installed on non-compacted surface. The plates are located under the ends of the prefabricated barrier segments and/or under the centre as well. They ensure that the barrier moves out upon impact and thus the proper performance of the restraint system. The upper surface of the ground plates must always be higher than the filler material in between. See TP 139 Concrete Barriers for more information. This product has XF4 environmental resistance as per ČSN EN 206-1 and TPK 18.



CSB - GROUND PLATE FOR ROAD BARRIERS	Nominal dimensions* mm			Quantity	Weight
	Height	Length	Width	pcs/m	kg/pcs
Ground plate for road barriers, 125 cm	200	1250	250	0,800	144
Ground plate for road barriers, 160 cm	200	1600	250	0,625	184

Nominal dimensions - basic shapes:



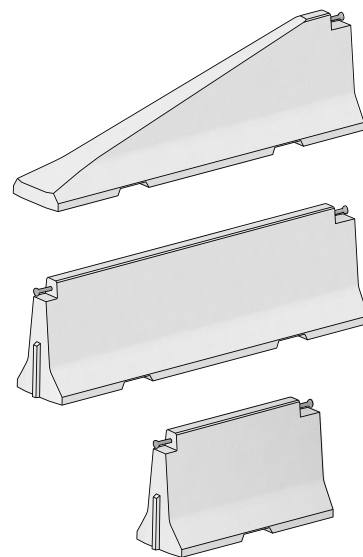
CSB - ROAD BARRIER 120 - double-sided

Technical Product Data:

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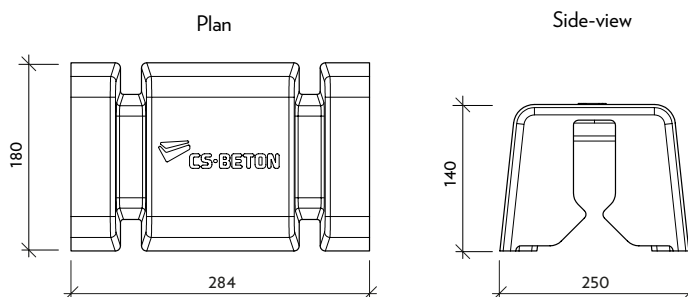
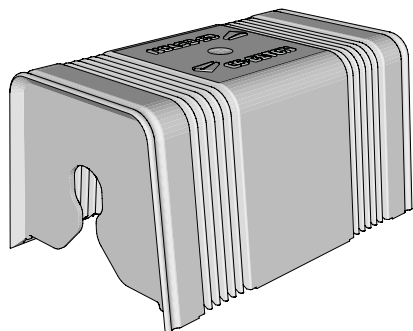
This reduces the g forces in a vehicle crashing into the barrier. Our barriers may be used as permanent or temporary.

They are designed as flexible barriers and are permanently deformed upon impact. This product line includes single- or double-sided barriers with a height of 1,200 mm. These barriers are a road restraint system as defined in ČSN EN 1317-1 and TKP Chapter 11. 1,200 mm-high concrete barriers are currently the best-quality and most-efficient road restraint system. They are functionally classified as H4, which is the highest restraint level according to ČSN EN 1317-2.



CSB - ROAD BARRIER 120 - double-sided	Nominal dimensions* mm			Quantity	Weight
	Height	Length	Width	pcs/m	kg/pcs
Double-sided basic unit	1200	4000	695	0,25	3587
Double-sided end piece - left	1200	4000	695	0,25	2707
Double-sided end piece - right	1200	4000	695	0,25	2707
Double-sided transition piece (steel/concrete)	1200	4000	695	0,25	3520
Double-sided transition piece right (concrete/steel)	1200	4000	695	0,25	3520
Double-sided transition piece left (high to 1 m)	1000 - 1200	4000	695	0,25	3380
Double-sided transition piece right (high to 1 m)	1200 - 1000	4000	695	0,25	3380
Double-sided short unit	1200	2000	695	0,50	1790

Joint cover:

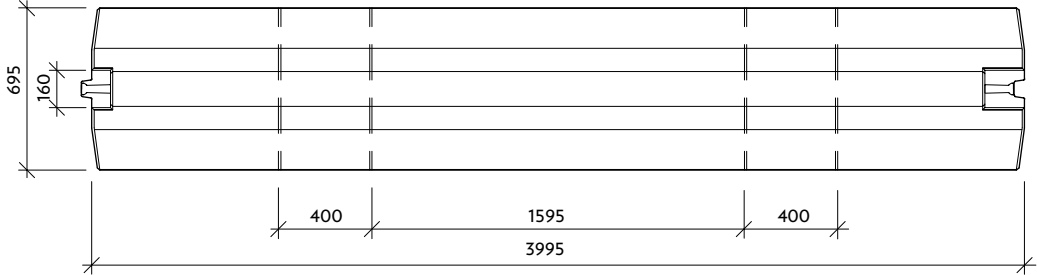


CSB - ROAD BARRIER 120 - double-sided

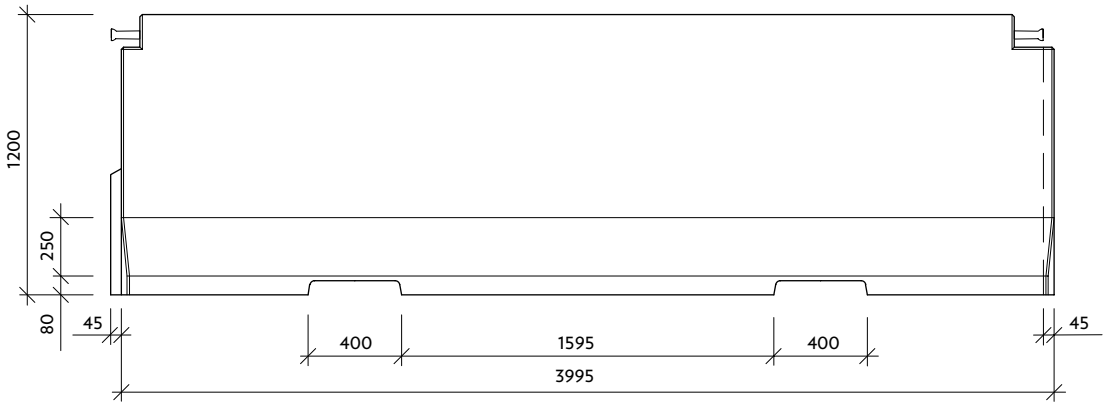
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - double-sided - Basic segment

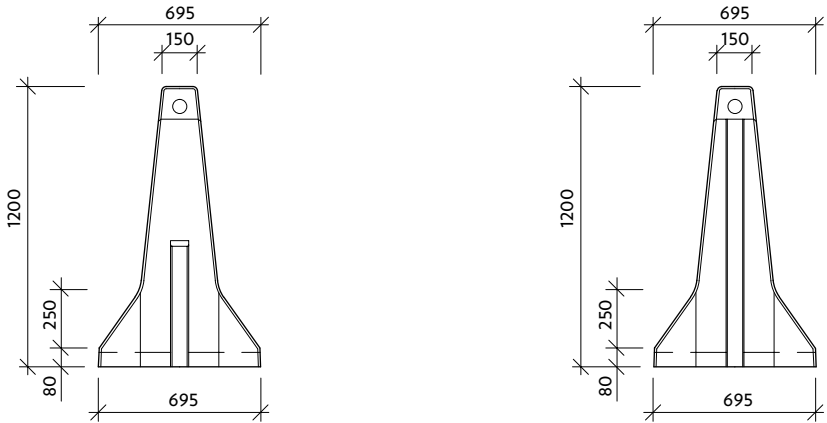
Plan



Front-view



Side-view

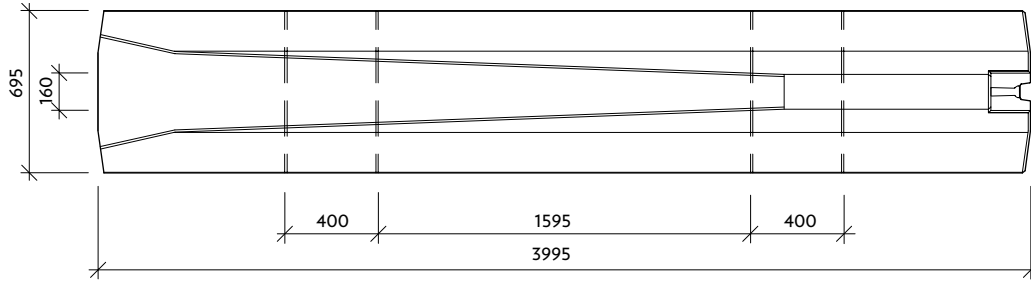


CSB - ROAD BARRIER 120 - double-sided

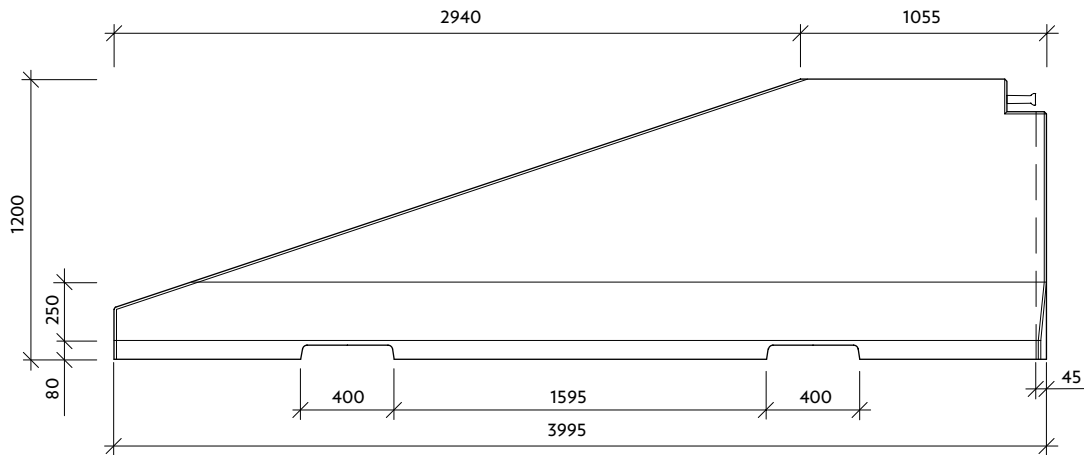
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - double-sided - End segments (right)

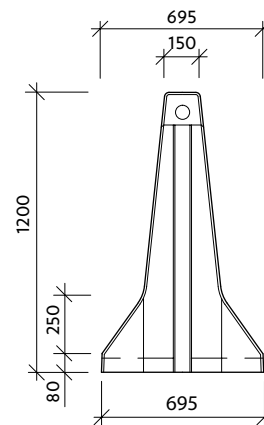
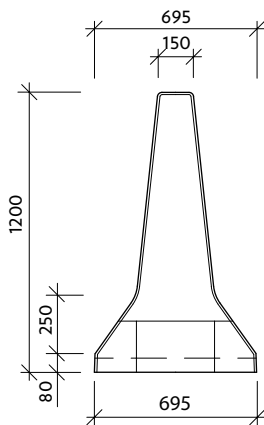
Plan



Front-view



Side-view

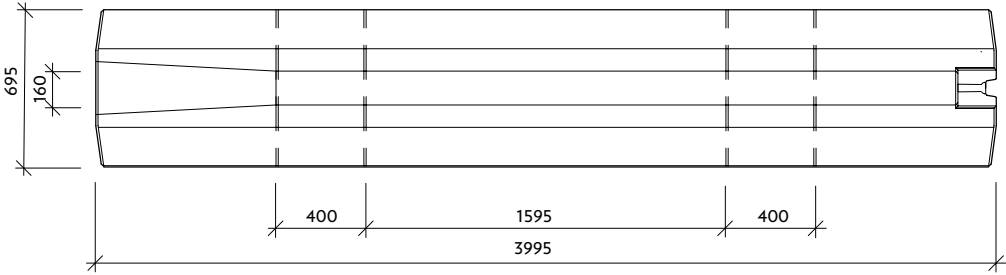


CSB - ROAD BARRIER 120 - double-sided

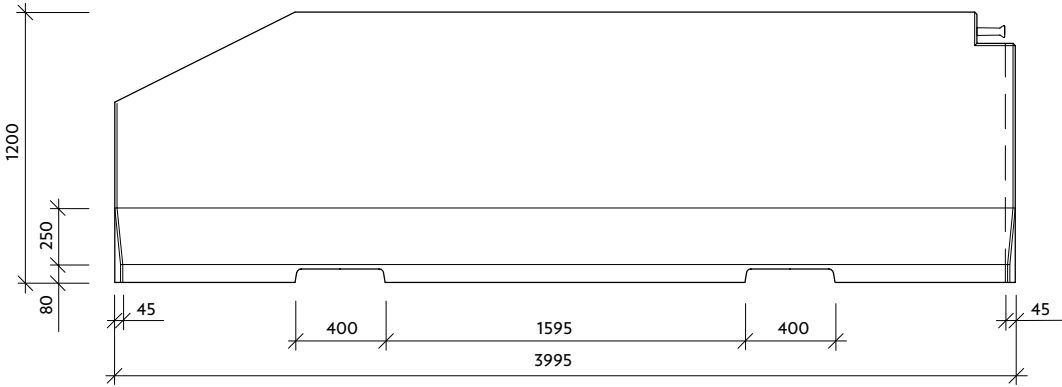
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - double-sided - transition piece (concrete/steel - right)

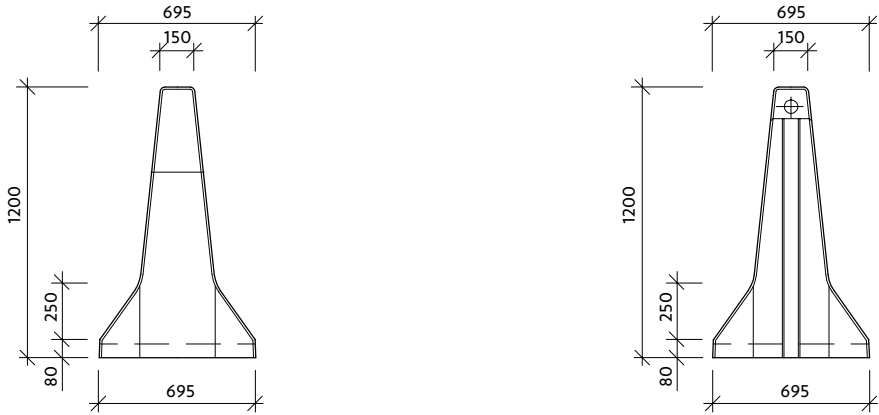
Plan



Front-view



Side-view

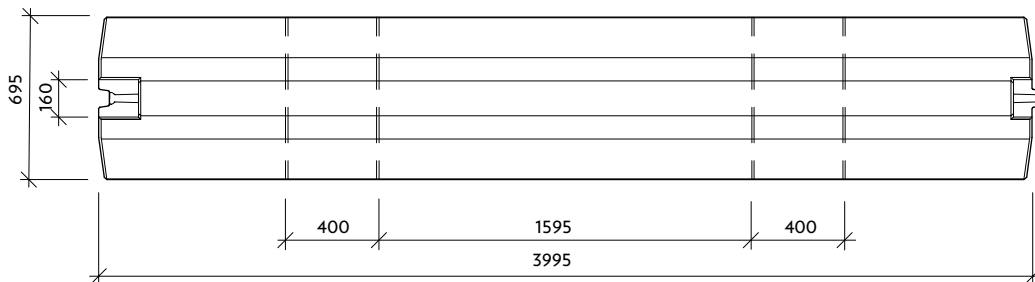


CSB - ROAD BARRIER 120 - double-sided

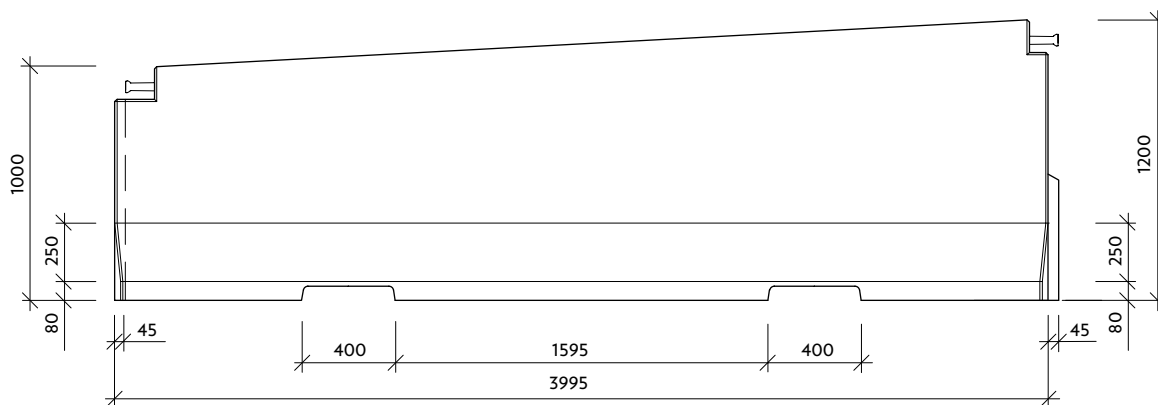
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - double-sided transition piece left (high to 1 m)

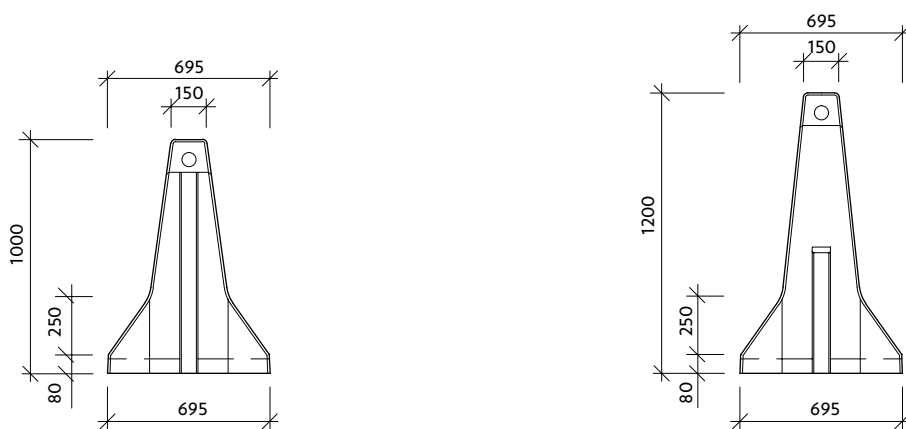
Plan



Front-view



Side-view

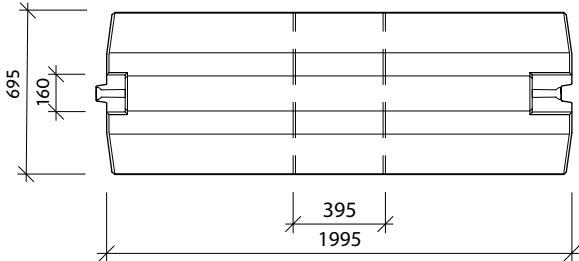


CSB - ROAD BARRIER 120 - double-sided

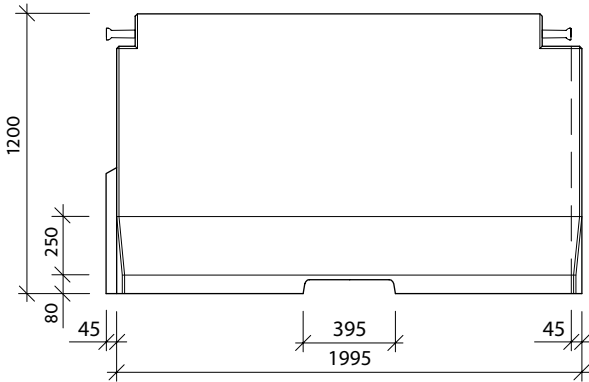
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - double-sided short unit

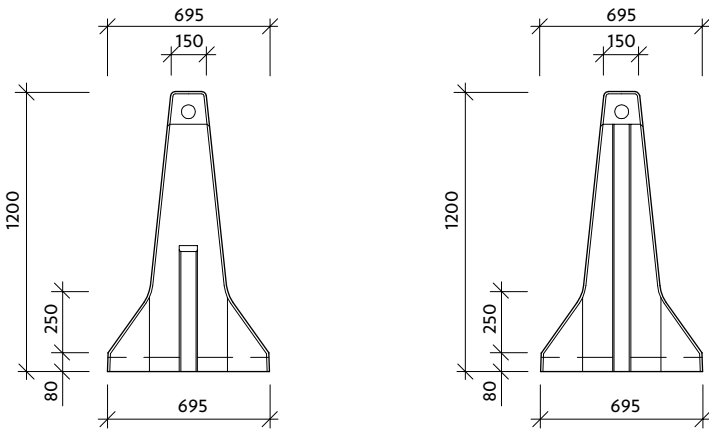
Plan



Front-view



Side-view



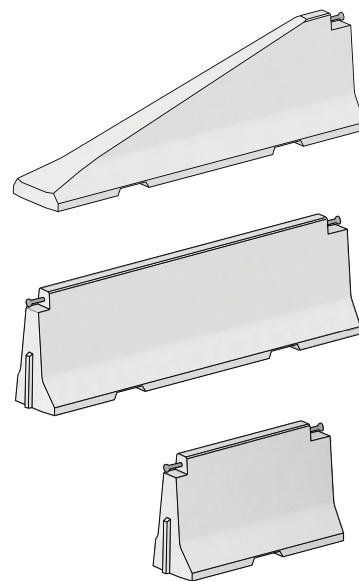
CSB - ROAD BARRIER 120 - single side

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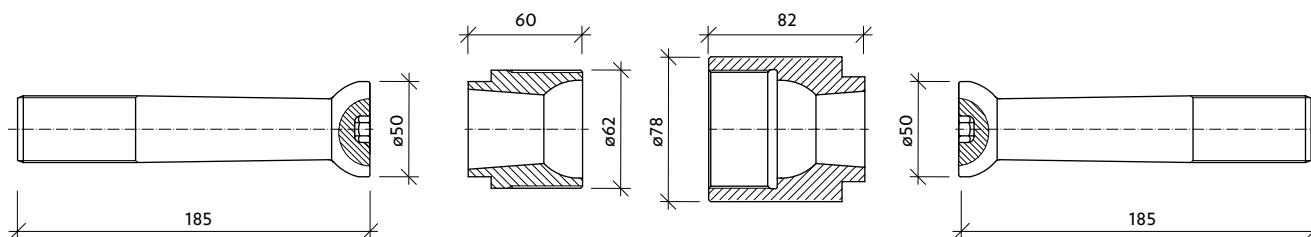
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They are designed as flexible barriers and are permanently deformed upon impact. This product line includes single- or double-sided barriers with a height of 1,200 mm. These barriers are a road restraint system as defined in ČSN EN 1317-1 and TKP Chapter 11. 1,200 mm-high concrete barriers are currently the best-quality and most-efficient road restraint system. They are functionally classified as H4, which is the highest restraint level according to ČSN EN 1317-2.



CSB - ROAD BARRIER 120 - single side	Nominal dimensions* mm			Quantity pcs/m	Weight kg/pcs
	Height	Length	Width		
Single side basic unit	1200	4000	549	0,25	3350
Single side end piece - left	1200	4000	549	0,25	2477
Single side end piece - right	1200	4000	549	0,25	2477
Single side transition piece left (steel/concrete)	1200	4000	549	0,25	3280
Single side transition piece right (concrete/steel)	1200	4000	549	0,25	3280
Single side transition piece left (high to 1 m)	1000 - 1200	4000	549	0,25	3143
Single side transition piece right (high to 1 m)	1200 - 1000	4000	695	0,25	3143
Single side short unit	1200	2000	695	0,50	1672

Joint diagram: Patented

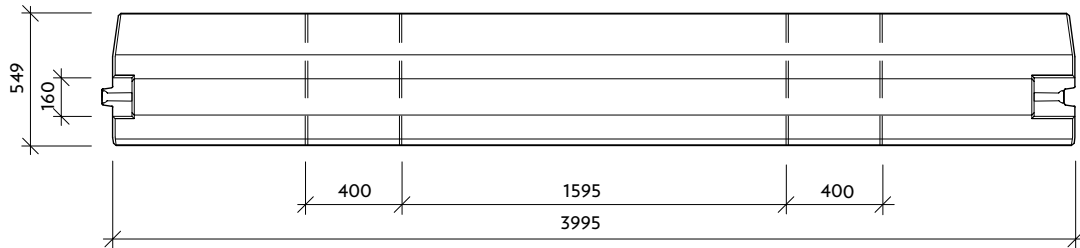


CSB - ROAD BARRIER 120 - single side

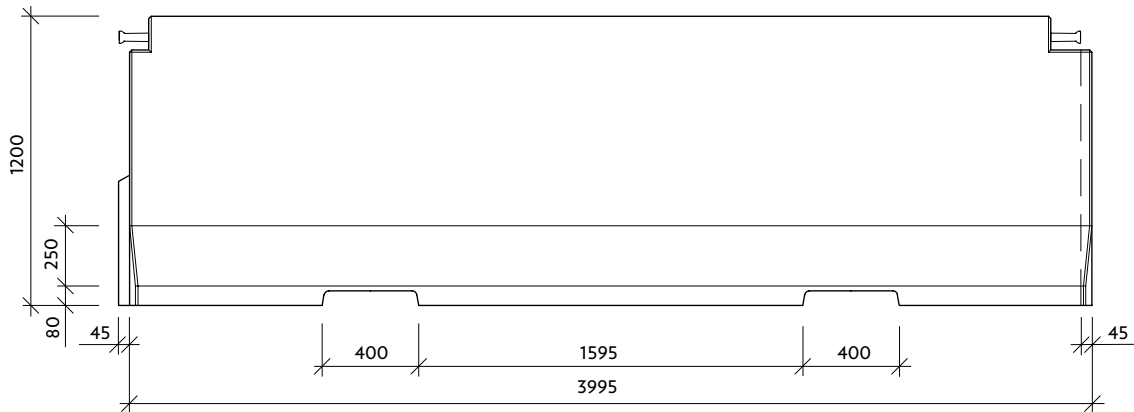
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - single side - Basic segment

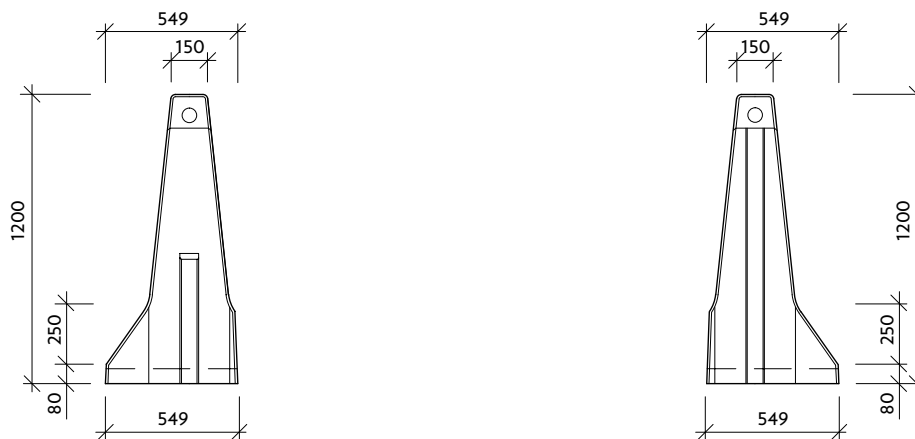
Plan



Front-view



Side-view

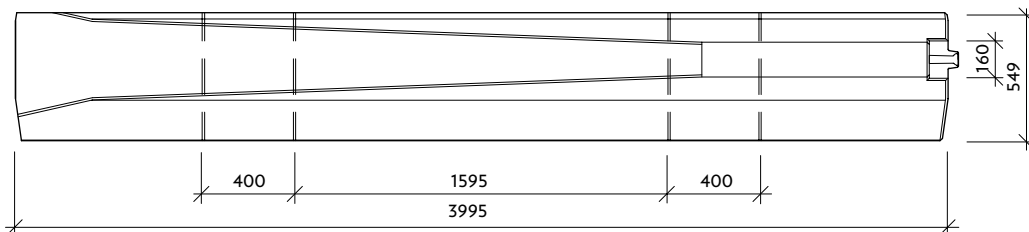


CSB - ROAD BARRIER 120 - single side

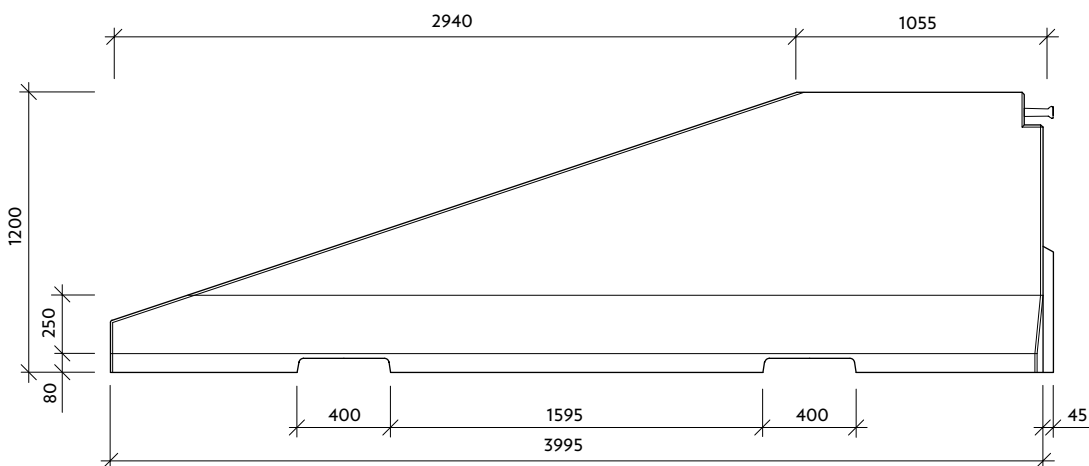
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - single side - End segments (left)

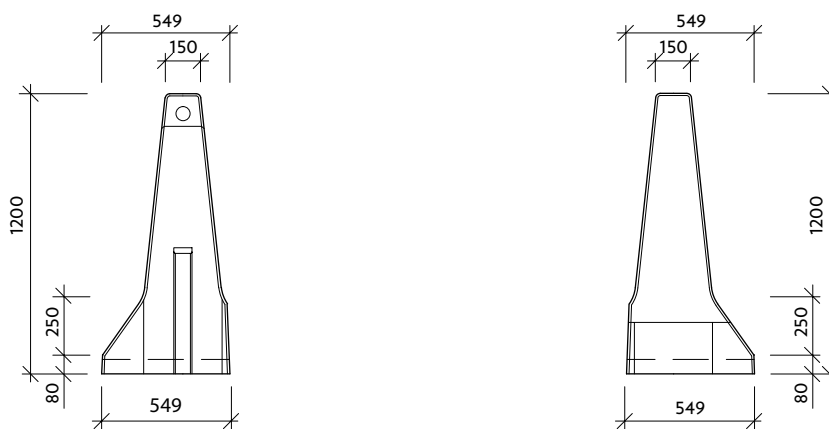
Plan



Front-view



Side-view

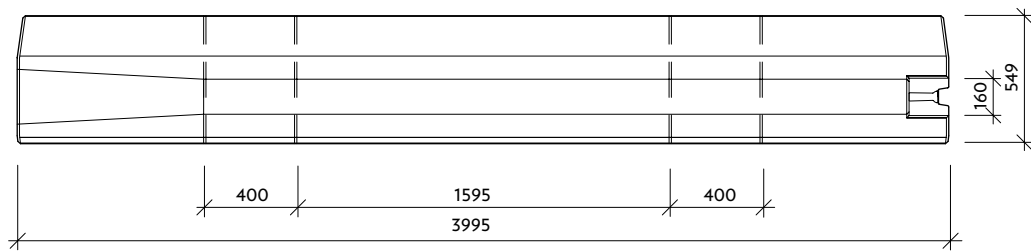


CSB - ROAD BARRIER 120 - single side

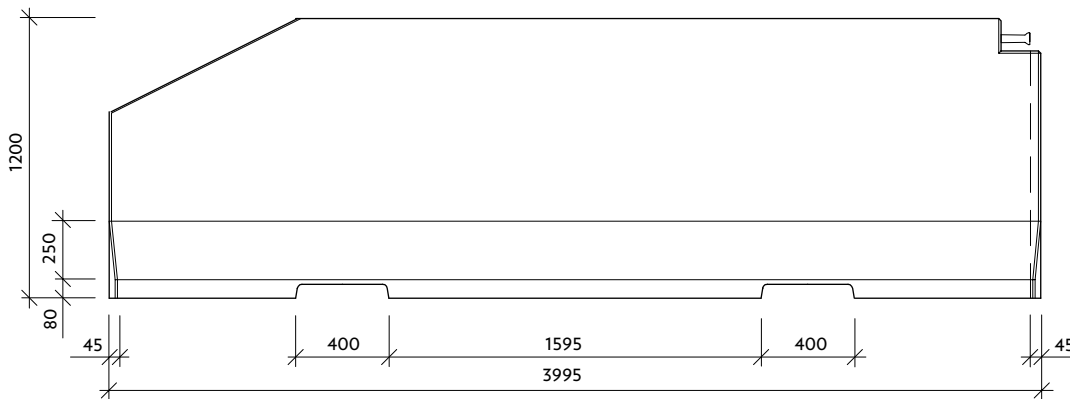
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - single side - transition piece (concrete/steel - right)

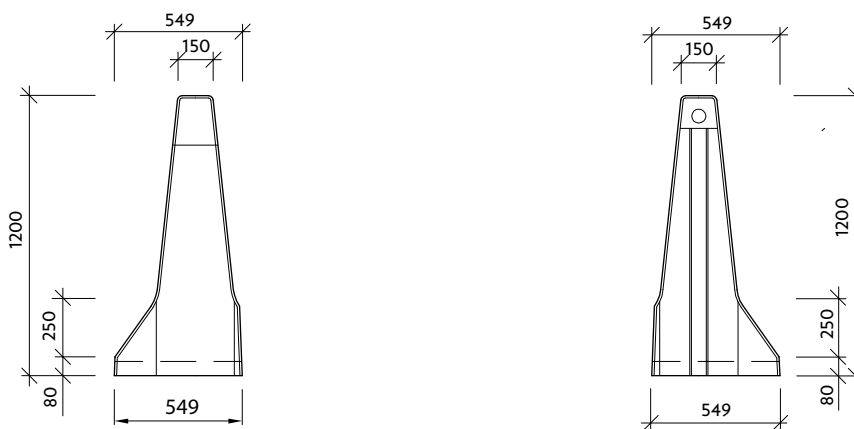
Plan



Front-view



Side-view

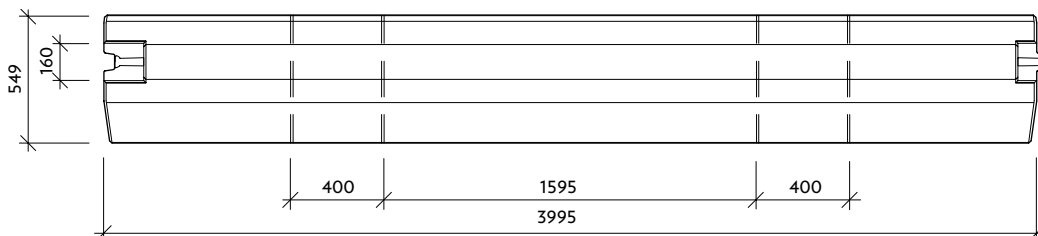


CSB - ROAD BARRIER 120 - single side

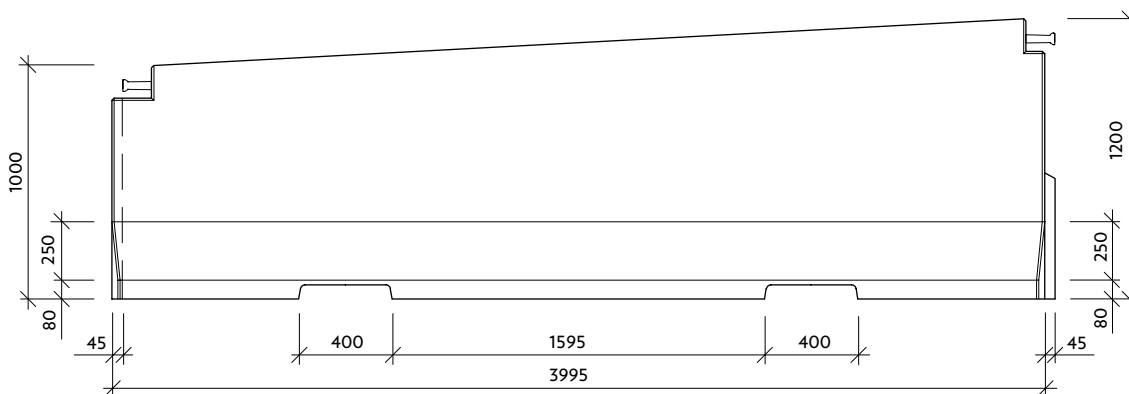
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - single side transition piece left (high to 1 m)

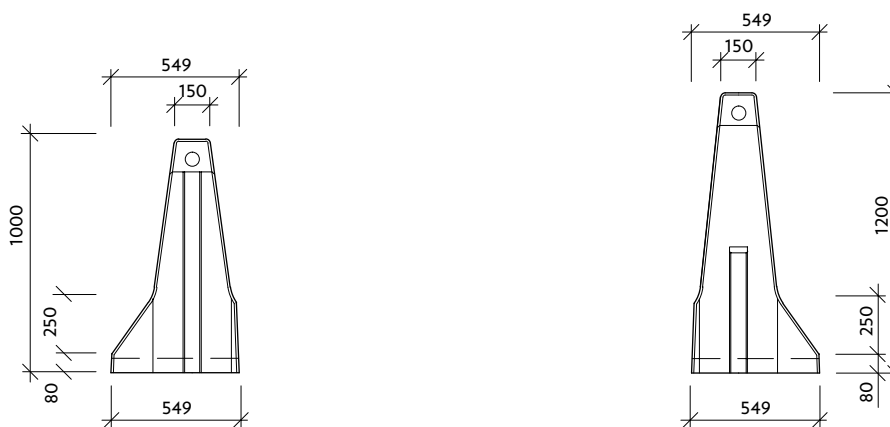
Plan



Front-view



Side-view

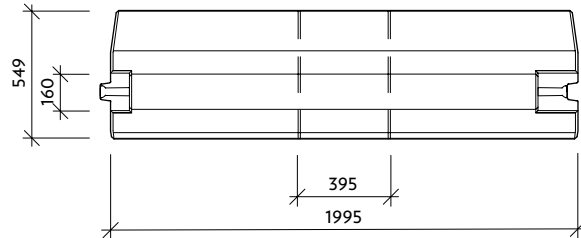


CSB - ROAD BARRIER 120 - single side

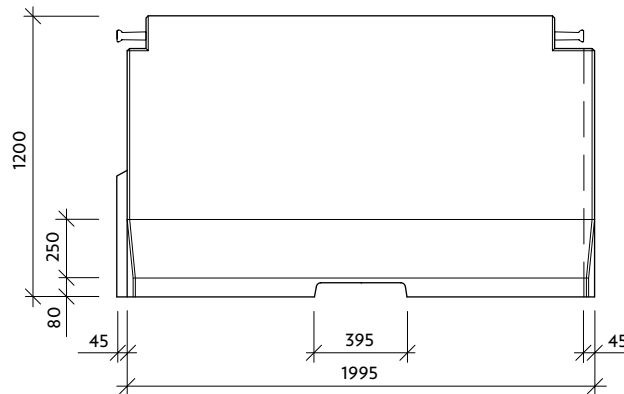
Nominal dimensions - basic shapes:

ROAD BARRIER 120 - single side short unit

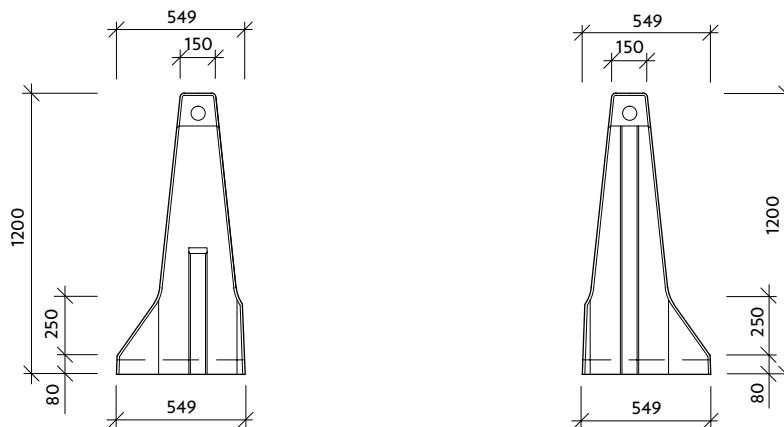
Plan



Front-view



Side-view



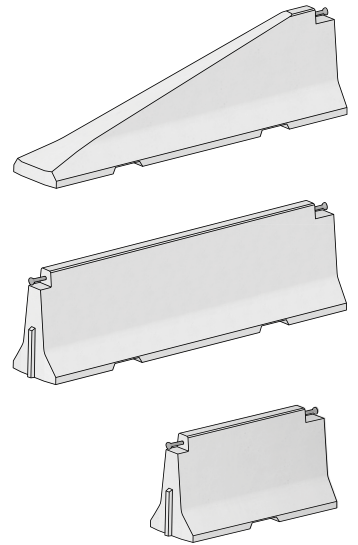
CSB - ROAD BARRIER 100 - double-sided

Technical Product Data:

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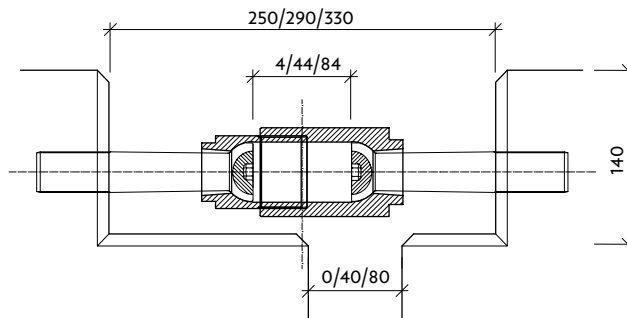
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CSB - ROAD BARRIER 100 - double-sided	Nominal dimensions* mm			Quantity	Weight
	Height	Length	Width	pcs/m	kg/pcs
Double-sided basic unit	1000	4000	695	0,25	3158
Double-sided end piece - left	1000	4000	695	0,25	2576
Double-sided end piece - right	1000	4000	695	0,25	2576
Double-sided transition piece (steel/concrete)	1000	4000	695	0,25	3140
Double-sided transition piece right (concrete/steel)	1000	4000	695	0,25	3140
Double-sided transition piece left (high to 1.2 m)	1000	4000	695	0,25	3380
Double-sided transition piece right (high to 1.2 m)	1000	4000	695	0,25	3380
Double-sided transition piece left (high to 0,8 m)	1000 - 800	4000	695	0,25	2954
Double-sided transition piece right (high to 0,8 m)	1000 - 800	4000	695	0,25	2954
Double-sided short unit	1000	2000	695	0,50	1575

Joint diagram:

Patented

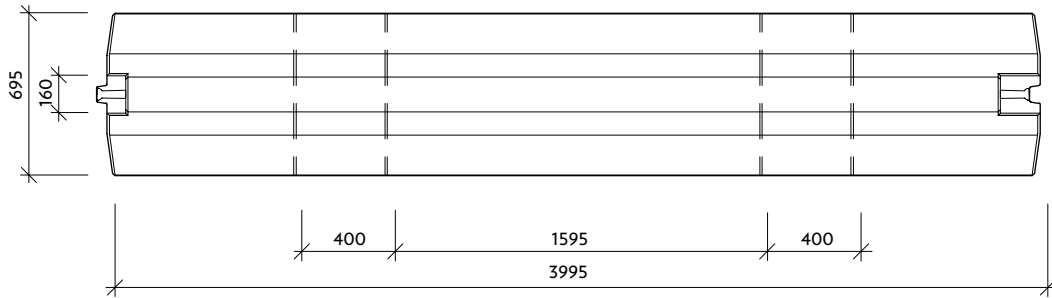


CSB - ROAD BARRIER 100 - double-sided

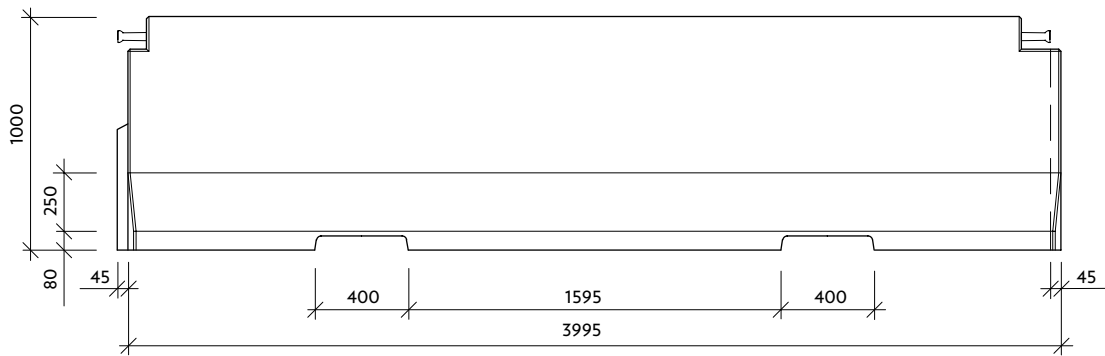
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - double-sided - Basic segment

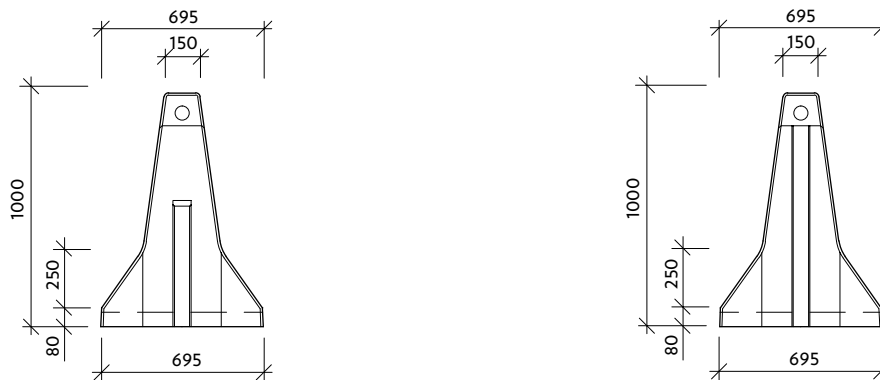
Plan



Front-view



Side-view

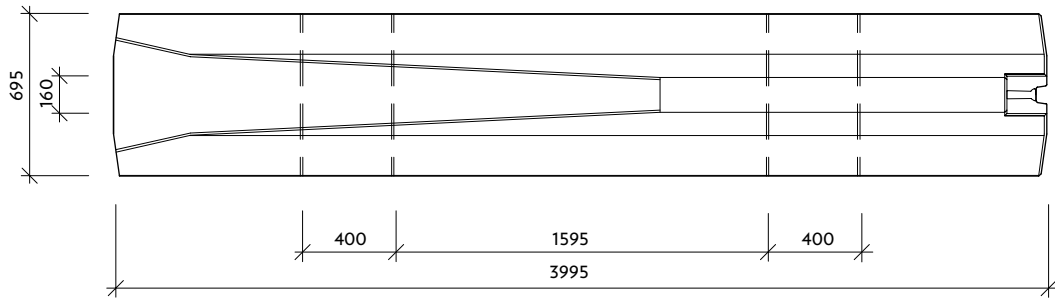


CSB - ROAD BARRIER 100 - double-sided

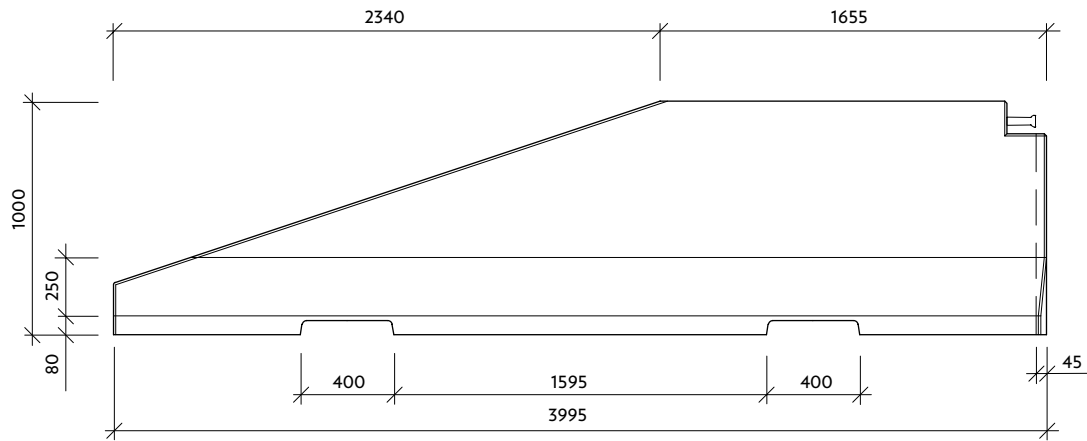
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - double-sided - end segments (right)

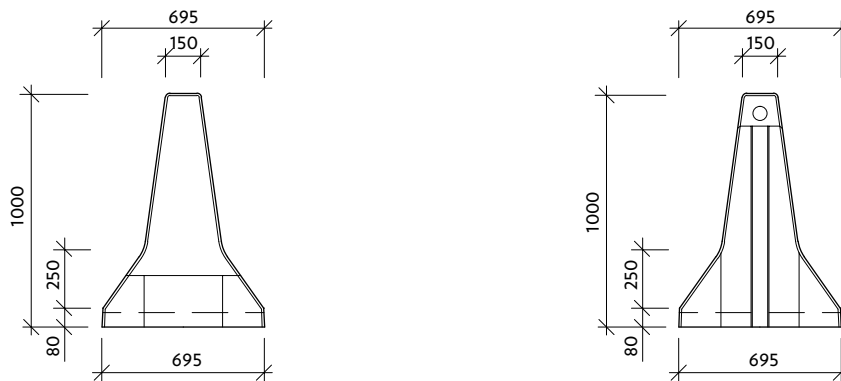
Plan



Front-view



Side-view

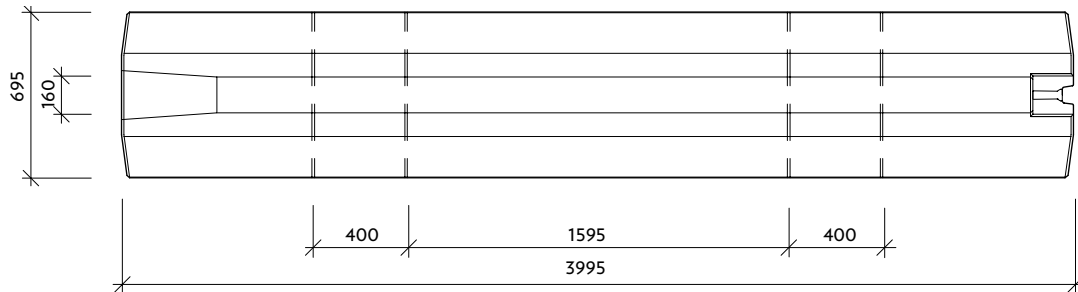


CSB - ROAD BARRIER 100 - double-sided

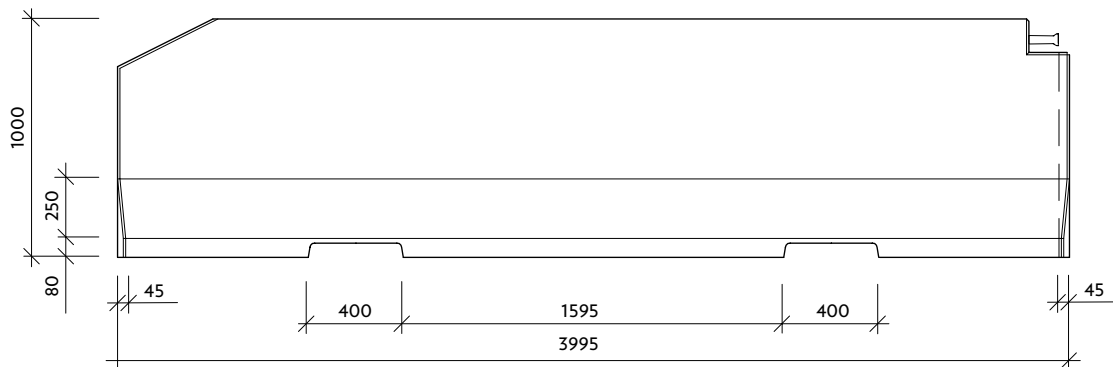
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - double-sided - transition piece (concrete/steel - right)

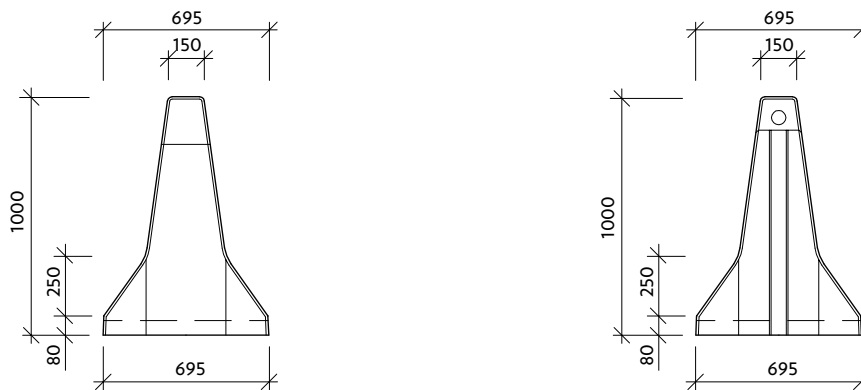
Plan



Front-view



Side-view

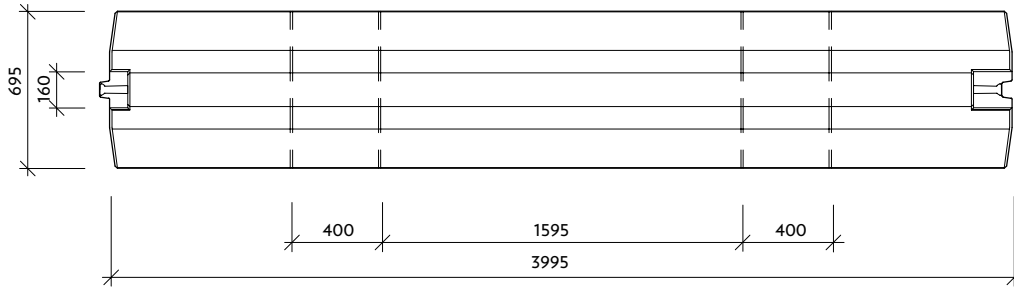


CSB - ROAD BARRIER 100 - double-sided

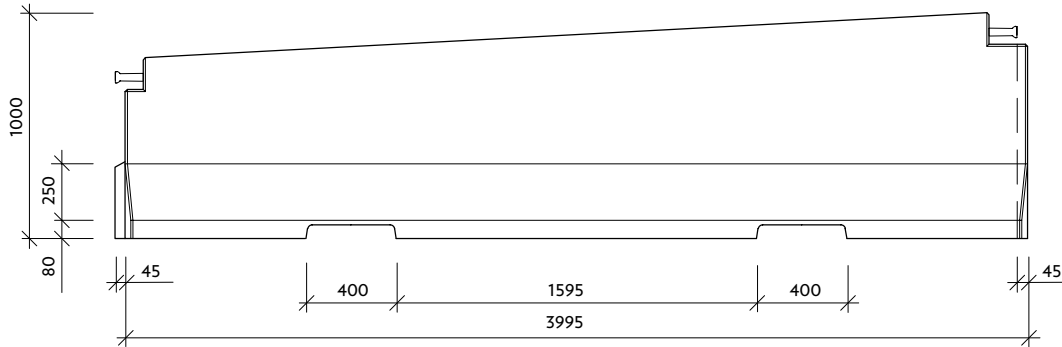
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - double-sided transition piece right (high to 1 m)

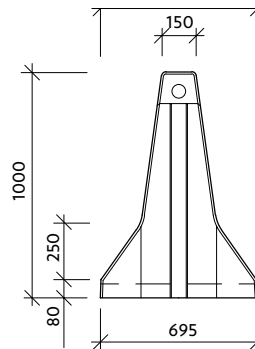
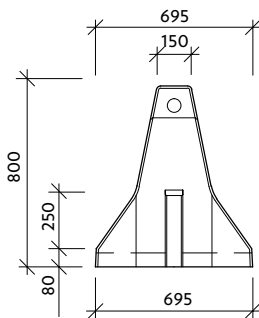
Plan



Front-view



Side-view

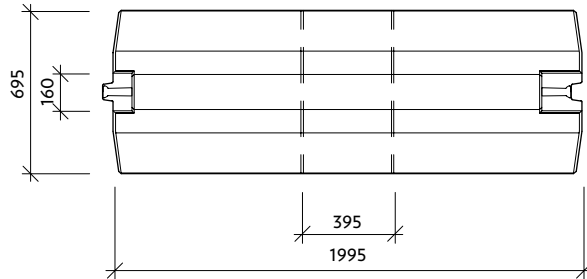


CSB - ROAD BARRIER 100 - double-sided

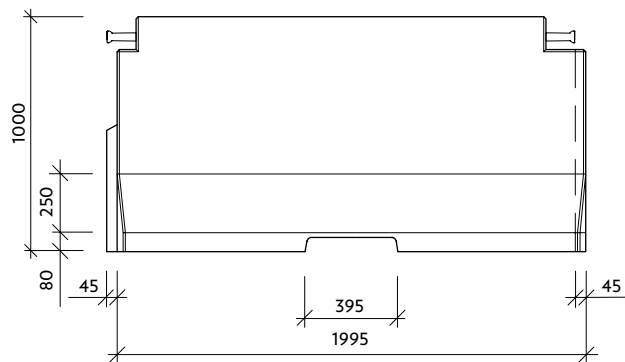
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - double-sided short unit

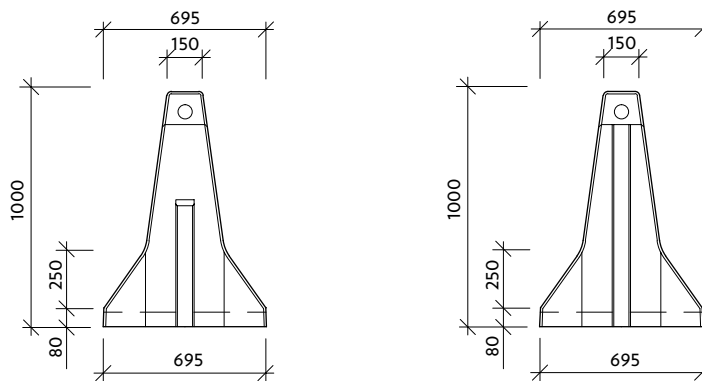
Plan



Front-view



Side-view



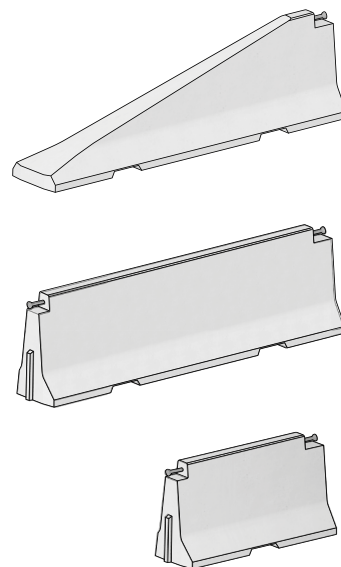
CSB - ROAD BARRIER 100 - single side

Technical Product Data:

Our road barriers are a modern and highly efficient way of controlling traffic and preventing vehicles from entering the opposite lanes, or leaving the road. Road barrier systems consist of individual prefabricated components, connected by patented articulated joints into a transversal load-bearing catenary (which also uses friction and shear forces at the base of each component).

This reduces the g forces in a vehicle crashing into the barrier. Our barriers may be used as permanent or temporary.

They are designed as flexible barriers and are permanently deformed upon impact. This product line includes single- or double-sided barriers with a height of 1,000 mm. These barriers are a road restraint system as defined in ČSN EN 1317-1 and TKP Chapter 11. Concrete barriers are currently the best-quality and most-efficient road restraint system. They are functionally classified as H4 or H3, which is the highest restraint level according to ČSN EN 1317-2.



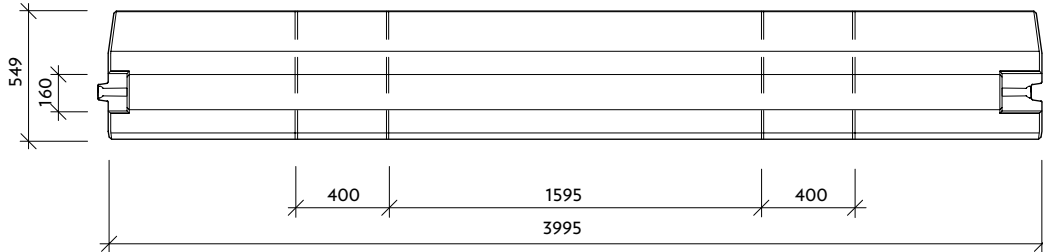
CSB - ROAD BARRIER 100 - single side	Nominal dimensions* mm			Quantity pcs/m	Weight kg/pcs
	Height	Length	Width		
Single side basic unit	1000	4000	549	0,25	2920
Single side end piece - left	1000	4000	549	0,25	2343
Single side end piece - right	1000	4000	549	0,25	2343
Single side transition piece left (steel/concrete)	1000	4000	549	0,25	2885
Single side transition piece right (concrete/steel)	1000	4000	549	0,25	2885
Single side transition piece left (high to 1.2 m)	1000	4000	549	0,25	3143
Single side transition piece right (high to 1.2 m)	1000	4000	549	0,25	3143
Single side transition piece left (high to 0.8 m)	1000 - 800	4000	549	0,25	2716
Single side transition piece right (high to 0.8 m)	1000 - 800	4000	549	0,25	2716
Single side short unit	1000	2000	549	0,50	1457

CSB -ROAD BARRIER 100 - single side

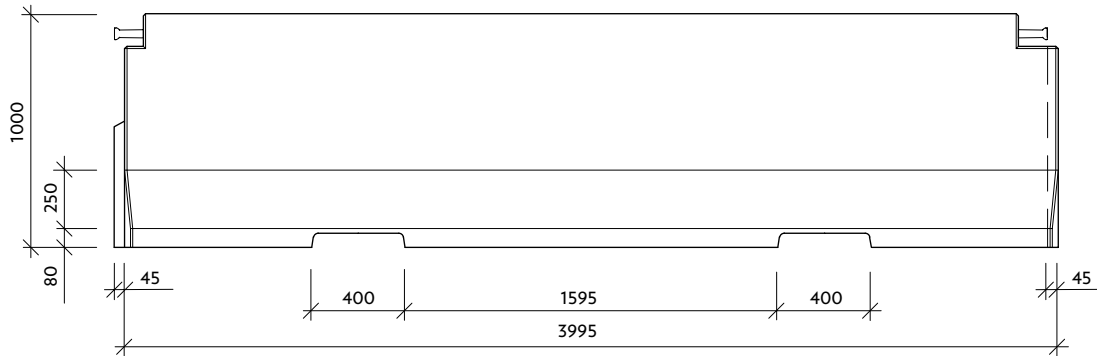
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - single side basic unit

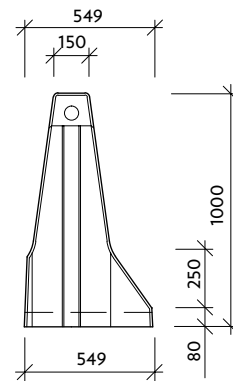
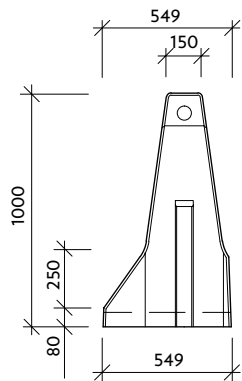
Plan



Front-view



Side-view

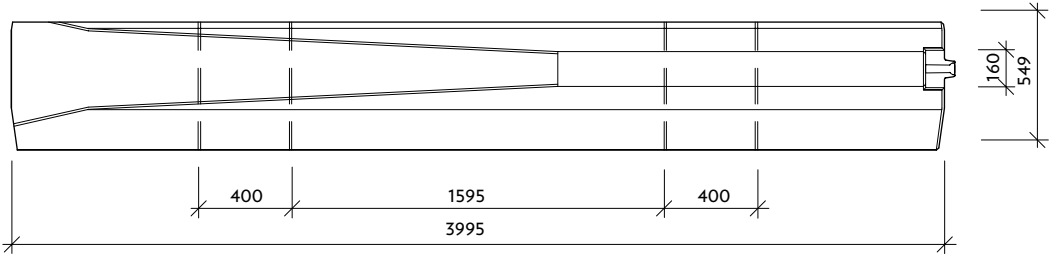


CSB - ROAD BARRIER 100 - single side

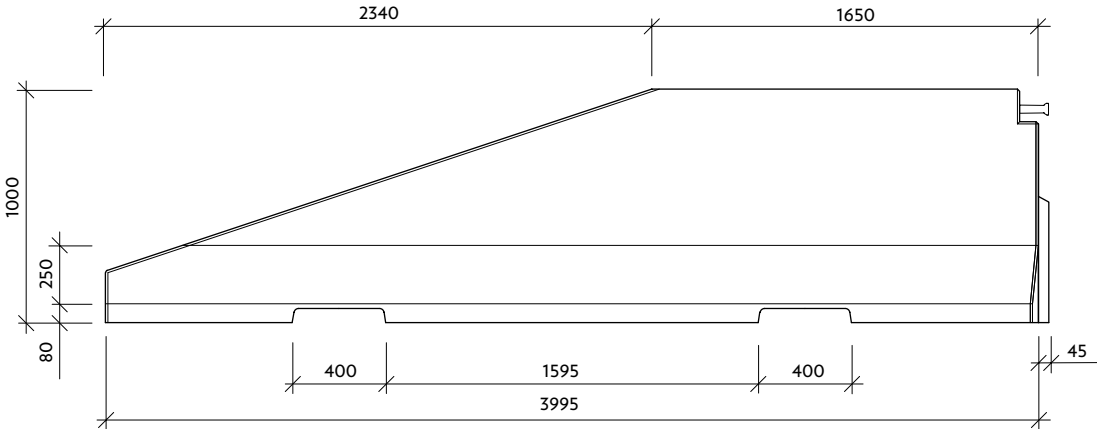
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - single side - End segments (left)

Plan



Front-view



Side-view

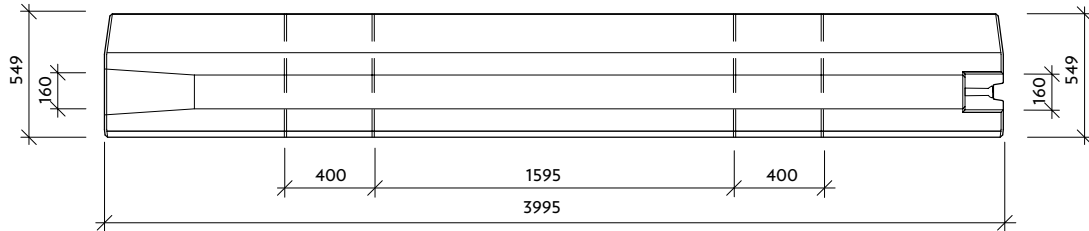


CSB - ROAD BARRIER 100 - single side

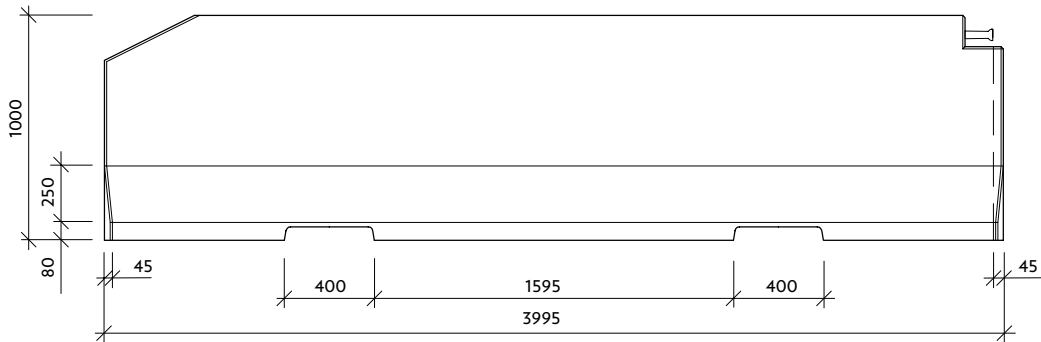
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - single side - transition piece (concrete/steel - right)

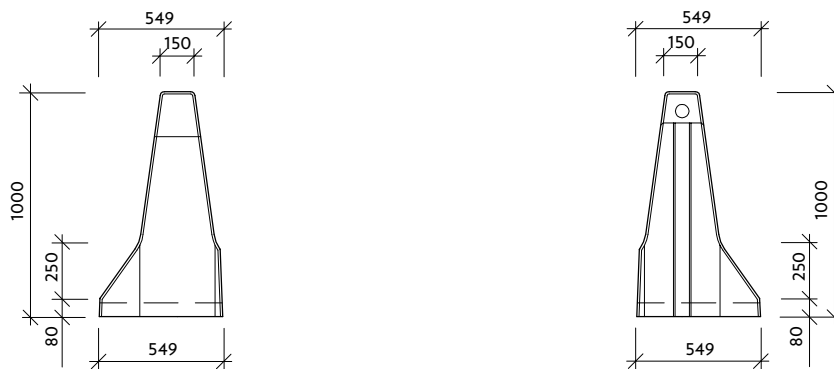
Plan



Front-view



Side-view

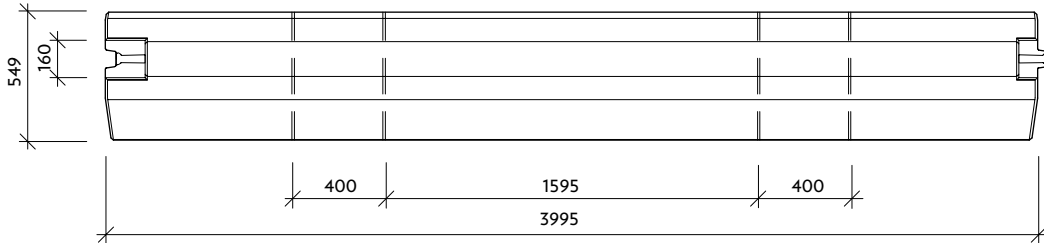


CSB - ROAD BARRIER 100 - single side

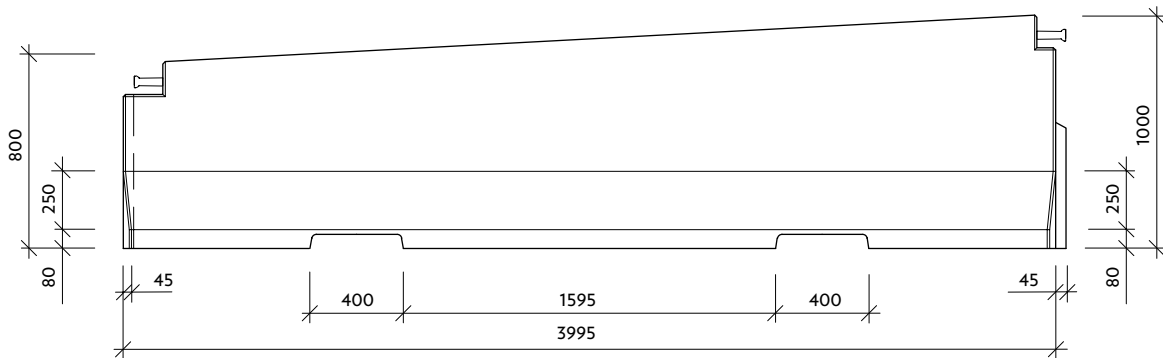
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - single side transition piece left (high to 0,8 m)

Plan



Front-view



Side-view

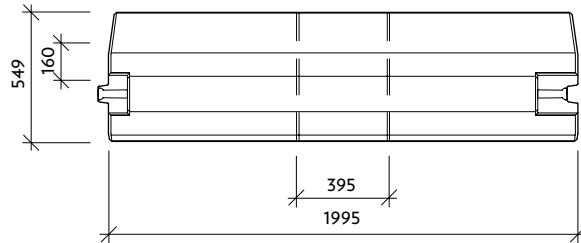


CSB - ROAD BARRIER 100 - single side

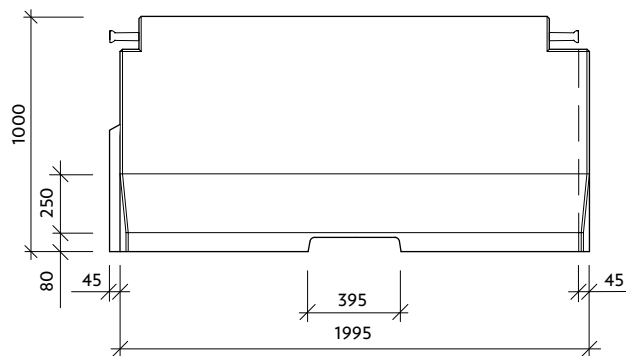
Nominal dimensions - basic shapes:

ROAD BARRIER 100 - single side short unit

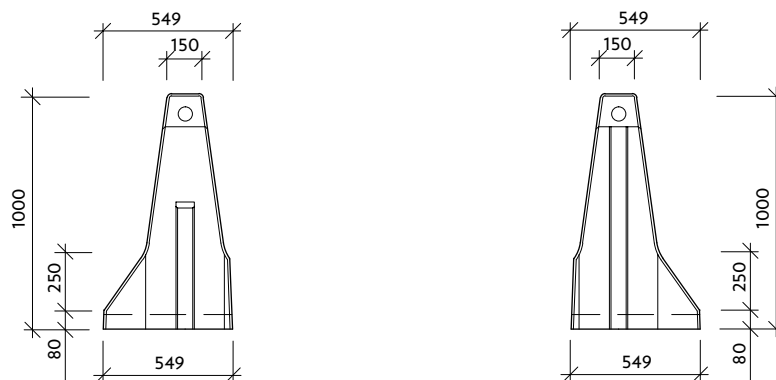
Plan



Front-view



Side-view

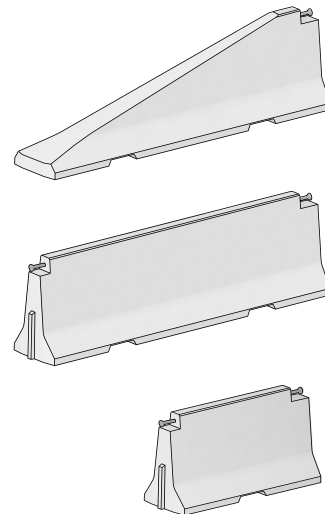


CSB - ROAD BARRIER 80 - double-sided

Technical Product Data:

Our road barriers are a modern and highly efficient way of controlling traffic and preventing vehicles from entering the opposite lanes, or leaving the road. Road barrier systems consist of individual prefabricated components, connected by patented articulated joints into a transversal load-bearing catenary (which also uses friction and shear forces at the base of each component). This reduces the g forces in a vehicle crashing into the barrier. Our barriers may be used as permanent or temporary.

They are designed as flexible barriers and are permanently deformed upon impact. This product line includes single or double-sided barriers with a height of 800 mm. These barriers are a road restraint system as defined in ČSN EN 1317-1 and TKP Chapter 11. Concrete barriers are currently the best-quality and most-efficient road restraint system. They are functionally classified as H3, which is the highest restraint level according to ČSN EN 1317-2.



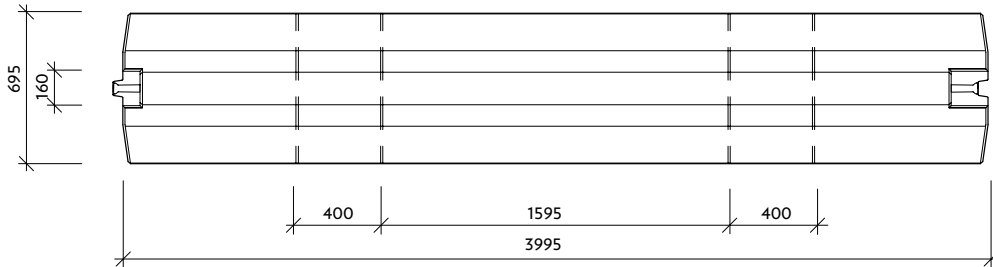
CSB - ROAD BARRIER 80 - double-sided	Nominal dimensions* mm			Quantity	Weight
	Height	Length	Width	pcs/m	kg/pcs
Double-sided basic unit	800	4000	695	0,25	2705
Double-sided end piece - left	800	4000	695	0,25	2330
Double-sided end piece - right	800	4000	695	0,25	2330
Double-sided transition piece (steel/concrete)	800	4000	695	0,25	2712
Double-sided transition piece right (concrete/steel)	800	4000	695	0,25	2712
Double-sided transition piece left (high to 1 m)	800	4000	695	0,25	3140
Double-sided transition piece right (high to 1 m)	800	4000	695	0,25	3140
Double-sided short unit	800	2000	695	0,50	1350

CSB - ROAD BARRIER 80 - double-sided

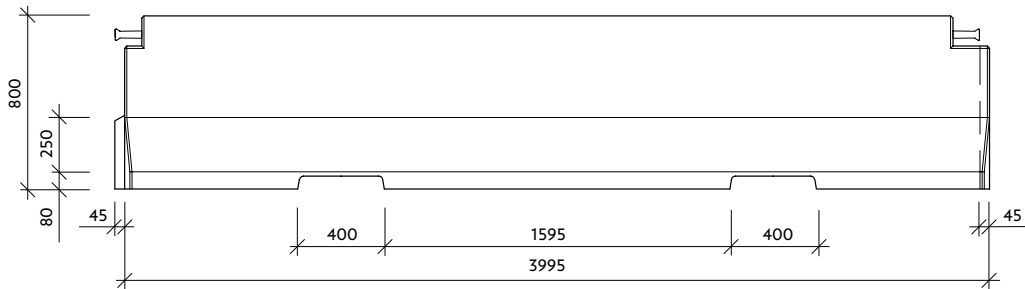
Nominal dimensions - basic shapes:

ROAD BARRIER 80 - double-sided basic unit

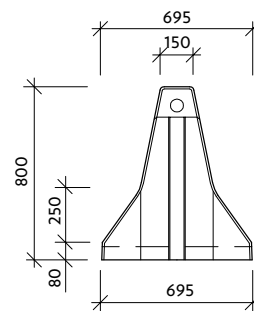
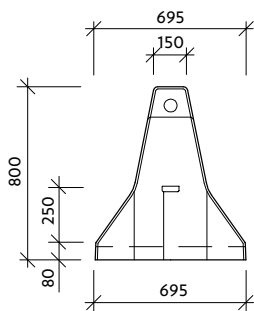
Plan



Front-view



Side-view

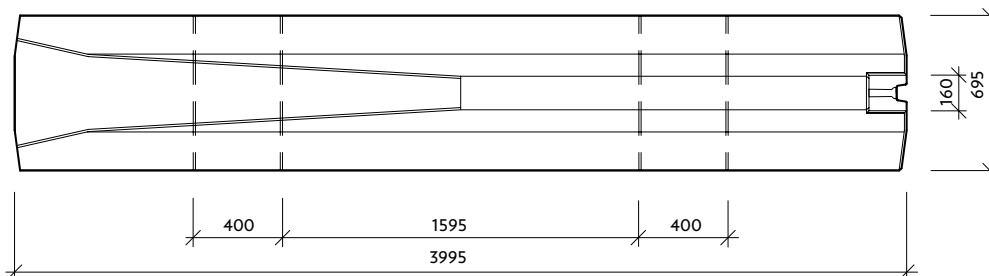


CSB - ROAD BARRIER 80 - double-sided

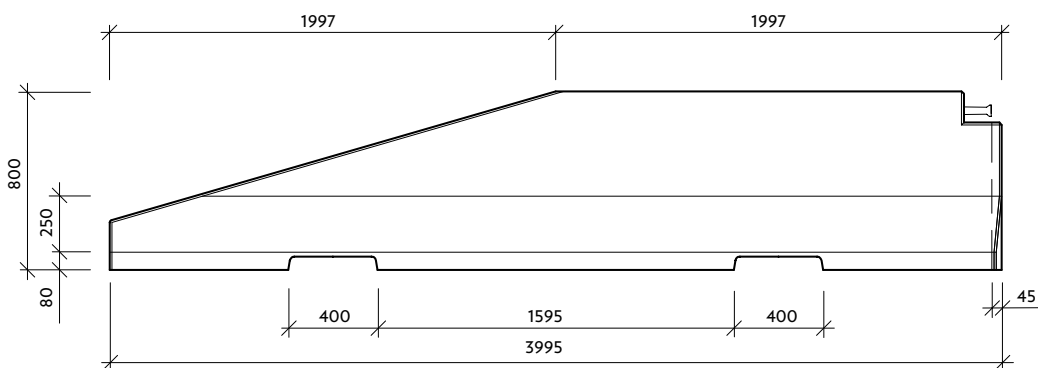
Nominal dimensions - basic shapes:

ROAD BARRIER 80 - double-sided - end segments (right)

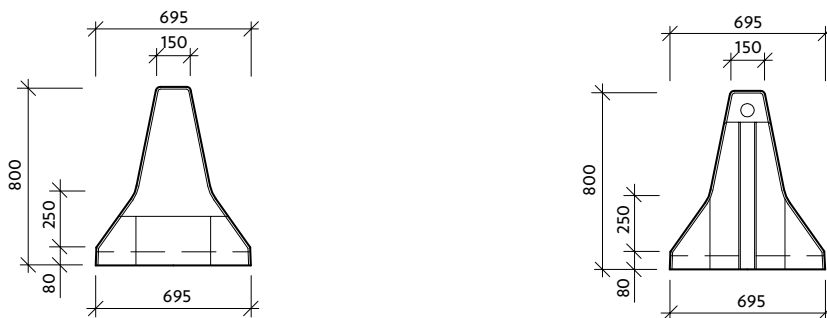
Plan



Front-view



Side-view

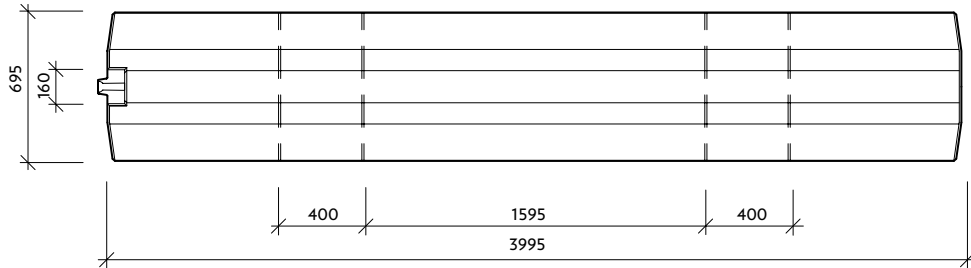


CSB - ROAD BARRIER 80 - double-sided

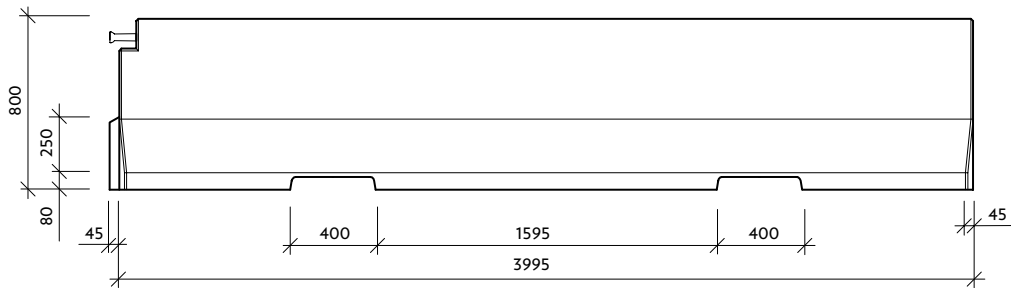
Nominal dimensions - basic shapes:

ROAD BARRIER 80 - double-sided - transition piece (concrete/steel - left)

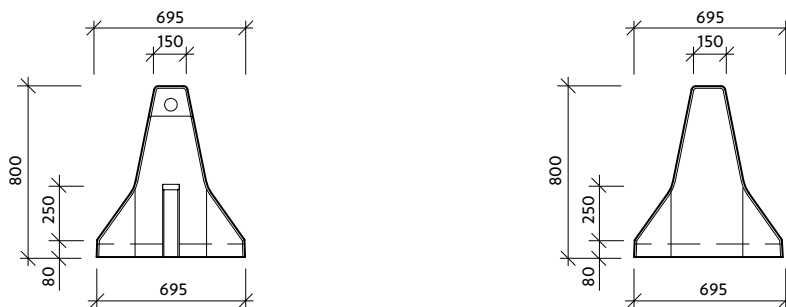
Plan



Front-view



Side-view

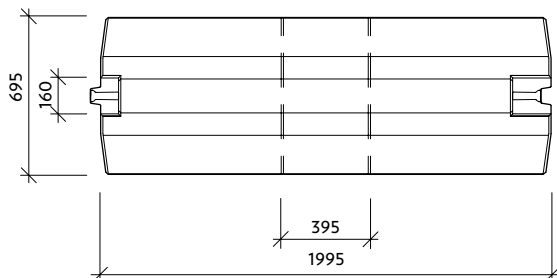


CSB - ROAD BARRIER 80 - double-sided

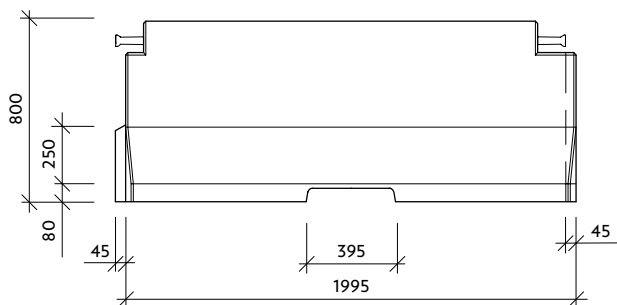
Nominal dimensions - basic shapes:

ROAD BARRIER 80 - double-sided short unit

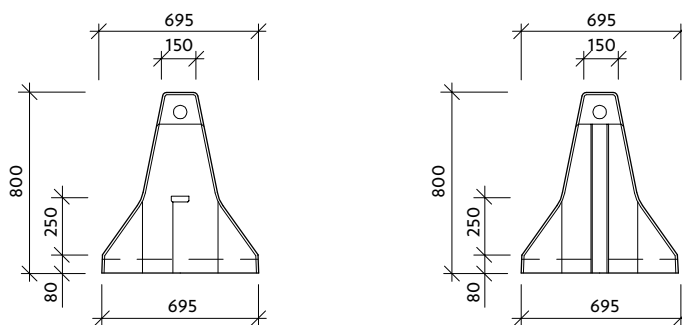
Plan



Front-view



Side-view

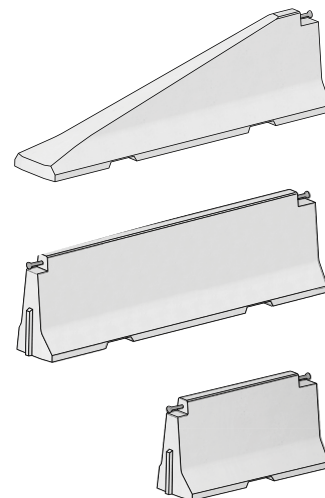


CSB - ROAD BARRIER 80 - single side

Technical Product Data:

Our road barriers are a modern and highly efficient way of controlling traffic and preventing vehicles from entering the opposite lanes, or leaving the road. Road barrier systems consist of individual prefabricated components, connected by patented articulated joints into a transversal load-bearing catenary (which also uses friction and shear forces at the base of each component). This reduces the g forces in a vehicle crashing into the barrier. Our barriers may be used as permanent or temporary.

They are designed as flexible barriers and are permanently deformed upon impact. This product line includes single or double-sided barriers with a height of 800 mm. These barriers are a road restraint system as defined in ČSN EN 1317-1 and TKP Chapter 11. Concrete barriers are currently the best-quality and most-efficient road restraint system. They are functionally classified as H3, which is the highest restraint level according to ČSN EN 1317-2.



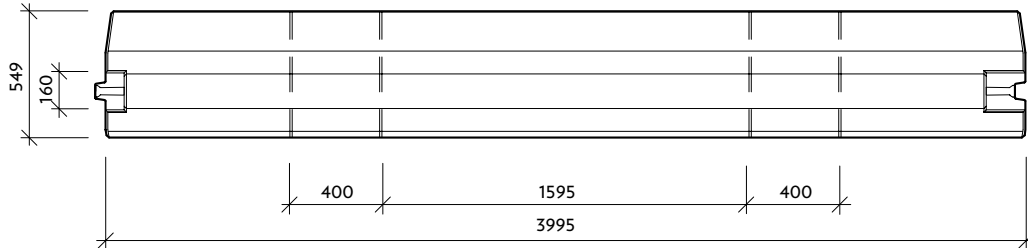
CSB - ROAD BARRIER 80 - single side	Nominal dimensions* mm			Quantity	Weight
	Height	Length	Width	pcs/m	kg/pcs
Single side basic unit	800	4000	549	0,25	2465
Single side end piece - left	800	4000	549	0,25	2088
Single side end piece - right	800	4000	549	0,25	2088
Single side transition piece left (steel/concrete)	800	4000	549	0,25	2088
Single side transition piece right (concrete/steel)	800	4000	549	0,25	2088
Single side transition piece left (high to 1 m)	800	4000	549	0,25	3143
Single side transition piece right (high to 1 m)	800	4000	549	0,25	3143
Single side short unit	800	2000	549	0,50	1230

CSB - ROAD BARRIER 80 - single side

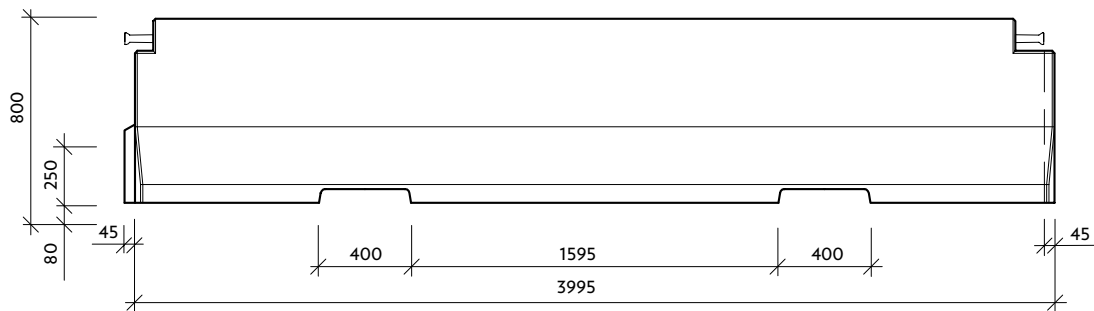
Nominal dimensions - basic shapes:

ROAD BARRIER 80 - single side - basic until

Plan



Front-view



Side-view

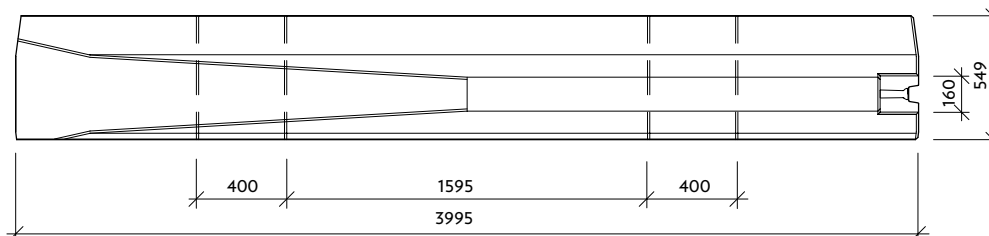


CSB - ROAD BARRIER 80 - single side

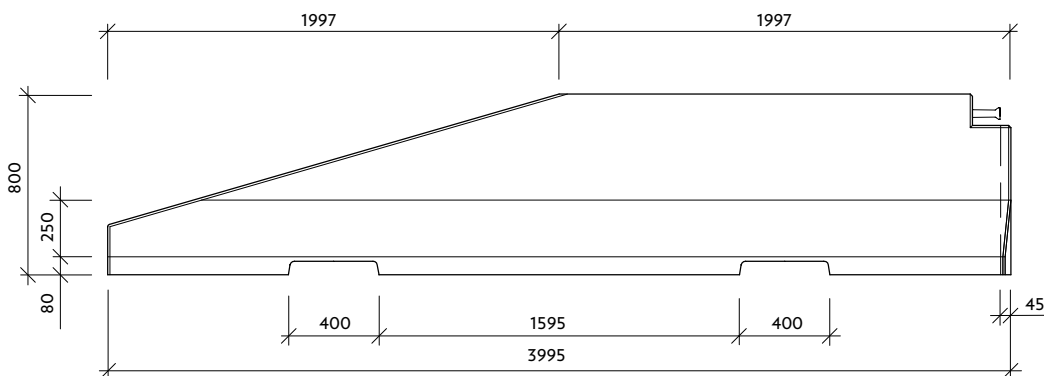
Nominal dimensions - basic shapes:

ROAD BARRIER 80 - single side - end segments (right)

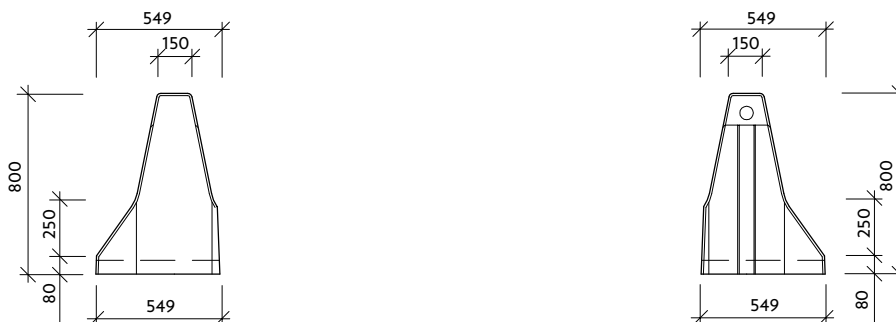
Plan



Front-view



Side-view

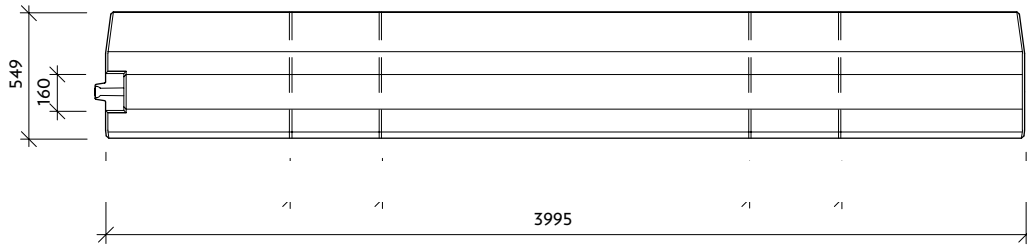


CSB - ROAD BARRIER 80 - single side

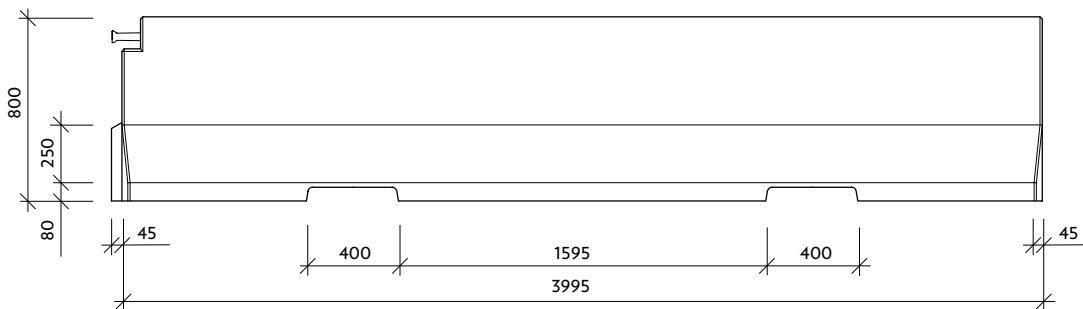
Nominal dimensions - basic shapes:

ROAD BARRIER 80 - single side - transition piece (concrete/steel - left)

Plan



Front-view



Side-view

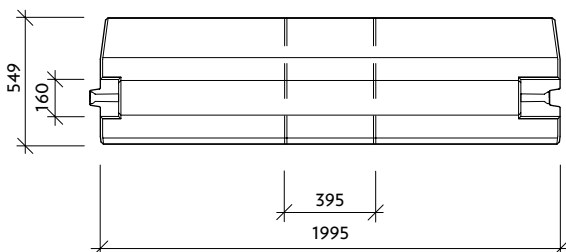


CSB - ROAD BARRIER 80 - single side

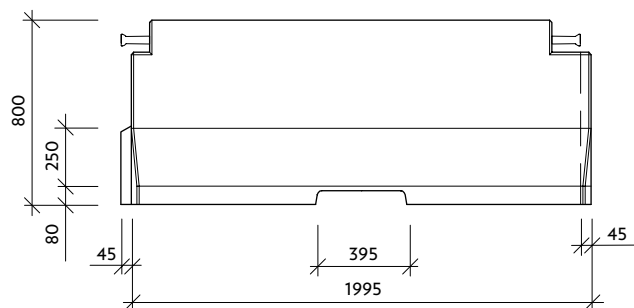
Nominal dimensions - basic shapes:

ROAD BARRIER 80 - single side short unit

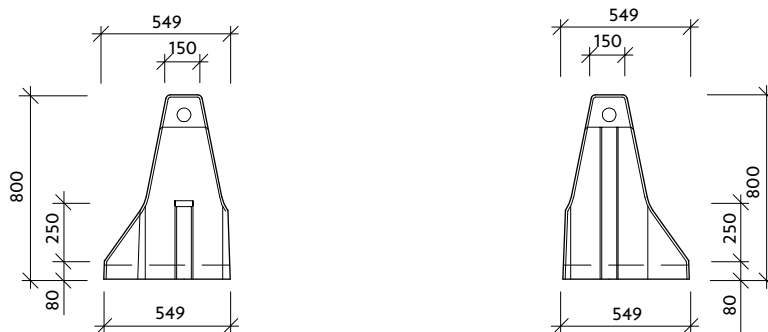
Plan



Front-view



Side-view



PROPERTIES AND CHARACTERISTICS

CSB - ROAD BARRIERS 120 are a modern and highly efficient way of controlling traffic and preventing vehicles from entering the opposite lanes, or leaving the road.

CS-BETON produces the following road barriers 120 components:

- CSB - basic road barrier, 4 m long
- CSB - end piece, 4 m long
- CSB - transition piece (steel/concrete), 4 m long
- CSB - transition piece left (high to 1 m), 4 m long
- Additional segments, left or right versions.

Our barriers may be used as permanent or temporary. They are designed as flexible barriers and are permanently deformed upon impact. This product line includes single or double-sided barriers with a height of 1,200 mm. These barriers are a road restraint system as defined in ČSN EN 1317-1 and TKP Chapter 11. 1,200 mm-high concrete barriers are currently the best-quality and most-efficient road restraint system. They are functionally classified as H4, which is the highest restraint level according to ČSN EN 1317-2.

Road barrier systems consist of individual prefabricated components, connected by patented articulated joints into a transversal load-bearing catenary (which also uses friction and shear forces at the base of each component). This reduces the g forces in a vehicle crashing into the barrier.

The CSB – ROAD BARRIER SYSTEM consists of elements of the same basic cross-section as other conventional road barrier systems. Its other details, however, are radically different. The system uses a number of new and revolutionary solutions, which eliminate the drawbacks of other current systems:

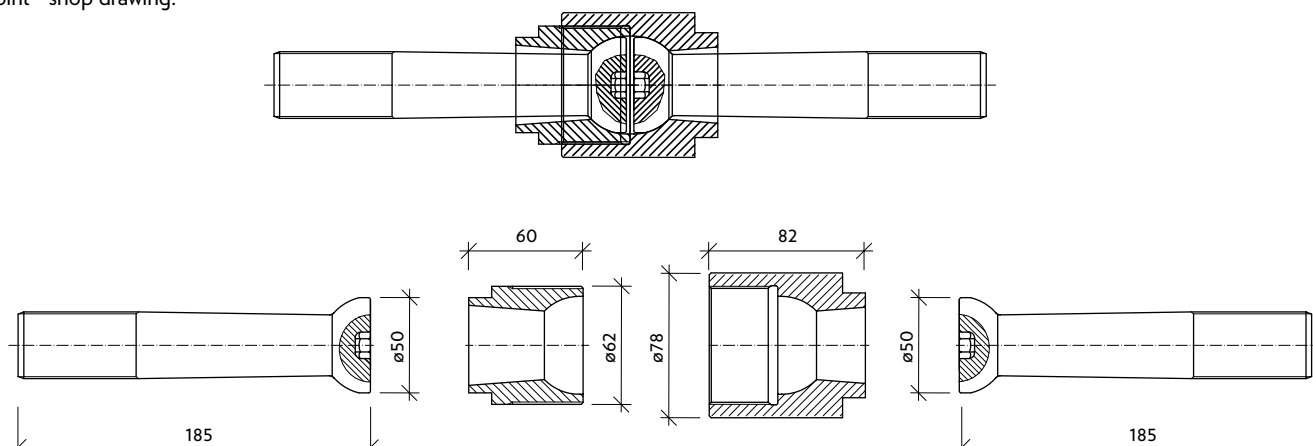
- A new and patented articulated bolted joint is used to connect the segments. It allows both longitudinal and directional rectification while maintaining full strength. Its unique feature is simple removal and replacement of destroyed barrier segments.
- The reinforcement in each segments ensures its integrity even after it is damaged by an impact. The reinforcement includes plastic fibres, which prevent volume cracks from appearing on the surface of the segment and also limit chipping away of concrete under destruction.
- The road barriers are made of high-strength aerated concrete with an admixture of non-crystalline silicon oxide, which creates an augmented crystal lattice to provide superior resistance to frost and defrosting agents. Our concrete parameters are significantly better than those required for the C40/50 class concrete and is resistant to XC4, XD3, XF4 and XA1 environments as per ČSN EN 206-1. This is in line with the requirements provided in Chapter 18 of the TKP documents.
- The concrete mix is made with a low-alkali cement, which prevents alkaline-silica reactions.

The articulated bolted joint includes a proprietary DELTA PROTECT surface treatment, which ensures easy dismantling even after years of exposure to aggressive environments. The joints are also protected with plastic covers, which are not subject to theft of metal components.

The CSB - ROAD BARRIER 120 SYSTEMS is suitable for separation of vehicles on motorways and other roads with a requirement for road restraint systems. They are classified as H4a and H4b restraints and are thus suitable for all the applications listed below.

The unique rectifiable ball joint enables the barriers to be installed with up to 8° degree angle in each joint without an impact on the static performance of the connection. Unlike other barrier systems, CSB - Road barriers 120 may be installed in both vertical and horizontal arcs (the latter with a maximum angle of 4°).

Joint - shop drawing:



PROPERTIES AND CHARACTERISTICS

CSB - ROAD BARRIERS 100 are a modern and highly efficient way of controlling traffic and preventing vehicles from entering the opposite lanes, or leaving the road.

CS-BETON produces the following road barriers 100 components:

- CSB - basic road barrier, 4 m long
- CSB - end piece, 4 m long
- CSB - transition piece (steel/concrete), 4 m long
- CSB - transition piece left (high to 0,8 m), 4 m long
- Additional segments, left or right versions.

Our barriers may be used as permanent or temporary. They are designed as flexible barriers and are permanently deformed upon impact. This product line includes single or double-sided barriers with a height of 1,000 mm. These barriers are a road restraint system as defined in ČSN EN 1317-1 and TKP Chapter 11. 1,000 mm-high concrete barriers are currently the best-quality and most-efficient road restraint system. They are functionally classified as H4, which is the highest restraint level according to ČSN EN 1317-2.

CSB - ROAD BARRIERS 80 are a modern and highly efficient way of controlling traffic and preventing vehicles from entering the opposite lanes, or leaving the road.

CS-BETON produces the following road barriers 100 components:

- CSB - basic road barrier, 4 m long
- CSB - end piece, 4 m long
- CSB - transition piece (steel/concrete), 4 m long
- CSB - transition piece left (high to 1 m), 4 m long
- Additional segments, left or right versions.

Our barriers may be used as permanent or temporary. They are designed as flexible barriers and are permanently deformed upon impact. This product line includes single or double-sided barriers with a height of 800 mm. These barriers are a road restraint system as defined in ČSN EN 1317-1 and TKP Chapter 11. 800 mm-high concrete barriers are currently the best-quality and most-efficient road restraint system. They are functionally classified as H4, which is the highest restraint level according to ČSN EN 1317-2.

PROPERTIES AND CHARACTERISTICS

The CSB - ROAD BARRIER SYSTEM may be used in applications where both vertical and horizontal angles between individual segments are required (less than 7° and 4° respectively). After initial installation and survey, the segments may be rectified at the joints by tightening or loosening the anchor bolts. The shape is obtained from the angle between individual segments. After completing an entire line, the joints are tightened using an anchoring matrix. Installation requires a truck crane, lifting eyes and self-balancing and rectifiable lifting beams.

The CSB - ROAD BARRIER SYSTEM was designed to comply with the following binding technical documents (TKP=Technical Quality Specifications, TP=Technical Specifications):

- ČSN EN 206-1
- TKP staveb pozemních komunikací/traffic infrastructure structures, Chapter 18 Beton pro konstrukce/Structural concrete (effective from 1/10/2005)
- ČSN EN 1317-1, 2 a 5
- TKP staveb pozemních komunikací /traffic infrastructure structures, Chapter 11 Svodidla, zábradlí a tlumiče nárazů/Barriers, handrails and impact absorbers (effective from 1/ 4/2010)
- TP 114 Svodidla na pozemních komunikacích/Road barriers
- TP 139 Betonové svodidlo/Concrete barriers

The system has been tested as per requirements in the above documents and has fully passed the tests – see certificates and barrier test results. The CSB - ROAD BARRIERS are subject to demanding testing performed by independent accredited test labs.

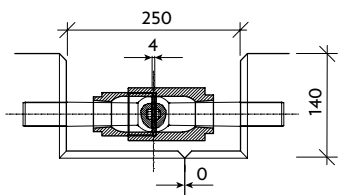
The continuous high quality of our products is ensured by our long experience, top-quality manufacturing equipment, superior source materials, continuous production testing and CS-BETON's ČSN EN ISO 9001 certification, regularly audited by independent quality system auditors.

At bridge expansion joints, the CSB - ROAD BARRIER SYSTEMS can be equipped with special expansion joints. These enable movements of ± 40 mm while maintaining full static strength. The unique design of these joints does not require the segment faces to be modified in any way and still enables the joint to be easily dismantled when a segment is destroyed. The joint is protected by a special electrical insulation paint, (RILSAN), which prevents stray currents from entering the concrete segments. The RILSAN coating also provides excellent corrosion and mechanical resistance.

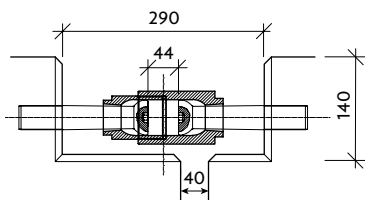
Since 2008, CS - BETON is also certified under the ČSN EN ISO 14001 environmental management system.

In 2010, we included health and safety into our certified management systems and currently hold certificates for the following:

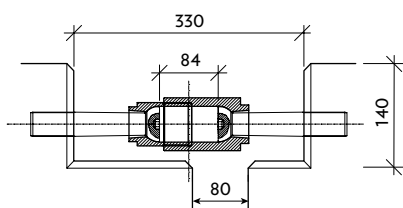
Expansion joint 0 mm



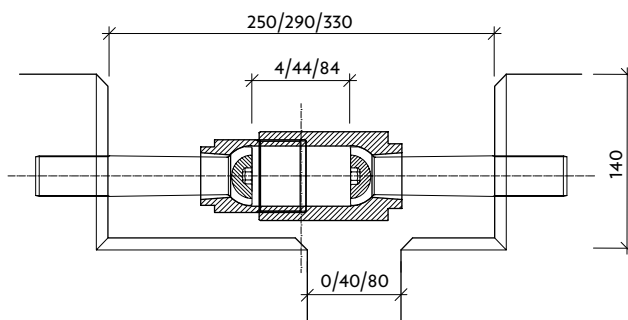
Expansion joint 40 mm



Expansion joint 80 mm



Expansion joint





CS-BETON

MOLBA-53



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