CONCRETE ROAD BARRIERS
CS BETON

SPATIAL ARRANGEMENT

MANUFACTURER'S TECHNICAL CONDITIONS (MTC)

June 2025

CONTENTS

1 Introduction, subject of manufacturer's technical conditions (MTC)

These CS BETON MTC 239/2025 are a revised version of CS BETON MTC 239/2018.
The purpose of the revision is to bring the MTC into line with current regulations, in particular TC 114 and TC 139.
This revision contains the same road barriers as those listed in MTC 239/2018.
In accordance with CPR 305/2011 and CSN EN 1317-5+A2, a "certificate of constancy of performance" authorising the use of the CE marking has been issued for all road barriers.

The road barriers were placed on the market by CS BETON, s. r. o., Velké Žernoseky 184, 412 01 Litoměřice
Contact person Ing. Josef Matějka csbeton@csbeton.cz, www.csbeton.cz

The road barriers are manufactured at the following production plants:
- Production plant Velké Žernoseky, Velké Žernoseky 184, 412 01 Litoměřice
- Production plant Grygov, V Podlesí 258, 783 73 Grygov
- Production plant Lužec nad Vltavou, V Zanikadlech 260, 277 06 Lužec nad Vltavou

Subject of MTC - see Tab. 1.

Table 1 - Subject of MTC

No.	Road barrier designation *	Name according to certificate of constancy of performance	Containment level
1	BSJT08ZA400	concrete road barrier, type: CSB-Road barrier 80 single-sided	H3
2	BSOT08ZA400	concrete road barrier, type: CSB-Road barrier 80 double-sided	H3
3	BSJT10ZA400	concrete road barrier, type: CSB-Road barrier 100 single-sided	H3
4	BSOT10ZA400	concrete road barrier, type: CSB-Road barrier 100 double-sided	H4b
5	BSJT12ZA400	concrete road barrier, type: CSB-Road barrier 120 single-sided	H4b
6	BSOT12ZA400	concrete road barrier, type: CSB-Road barrier 120 double-sided	H4b
* Note on road barrier designation: This is how the road barriers are listed in the impact test reports. This is the designation used for standard sections (see graph 1 in these MTC) that are installed during impact tests. **This designation is used throughout the MTC.** Under the conditions specified in Section 5, certain road barriers may also be used on bridges			

The technical conditions apply to highways, motorways and local roads (hereinafter simply roads) and bridges, in accordance with regulations 1, 2 and 3, and, where appropriate, to special-purpose roads.

NOTE – the use of all road barriers specified in these MTC is subject to compliance with TC 114 and TC 139. This means that if the requirements for the level of restraint or any

other requirements are changed in TC 114 or TC 139, the use of road barriers specified in these MTC must also be adapted in line with these requirements.

1.1 Related standards and regulations

See TP 114

2 Design parameters of individual road barriers and their use

Table 2 - Design parameters

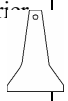
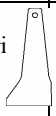
No.	Road barrier designation	Containment level	ASI Dynamic deflection D [m]	Working width W [m]; Vehicle deflection VI [m]; Position of det. parts weighing more than 2 kg behind face of barrier	Use
1	BSJT08ZA400 concrete road barri single-sided, height 0.80 m 	H3	ASI = 1.8 D = 2.0	W = 2.5 (W7) VI = 3.6 (VI9) Nothing detached	**Shoulder** width according to CSN 73 6101 up to containment level H1 **Central dividing strips** Not used*
2	BSOT08ZA400 concrete road barri double-sided, height 0.80 m 	H3	ASI = 1.4 D = 1.2	W = 1.9 (W6) VI = 2.9 (VI8) Not determined**	**Shoulder** width according to CSN 73 6101 up to containment level H3 **Central dividing strips** Not used*
3	SJT10ZA400 concrete road barri single-sided, height 1.00 m 	H3	ASI = 1.8 D = 1.6	W = 2.1 (W6) VI = 2.9 (VI8) Nothing detached	**Shoulder** width according to CSN 73 6101 up to containment level H2 **Central dividing strips** As two parallel road barriers according to TC 139
4	BSOT10ZA400 concrete road barri double-sided, height 1.00 m 	H4b	ASI = 1.4 D = 1.5	W = 2.2 (W7) VI = 2.9 (VI8) 2.7 m	**Shoulder** width according to CSN 73 6101 up to containment level H3 **Central dividing strips** Not used* As two parallel road barriers according to TC 139
5	BSJT12ZA400 concrete road barri single-sided, height 1.20 m 	H4b	ASI = 1.8 D = 1.4	W = 1.9 (W6) VI = 2.1 (VI6) 4.7 m	**Shoulder** width according to CSN 73 6101 up to containment level H3 **Central dividing strips** As two parallel road barriers according to TC 139
6	BSOT12ZA400 concrete road barri double-sided, height 1.20 m 	H4b	ASI = 1.4 D = 1.3	W = 2.0 (W6) VI = 2.2 (VI7) Nothing detached	**Shoulder** width according to CSN 73 6101 for all containment levels up to H4 **Central dividing strips** Width at least 2.20 m for containment level H4 Width at least 1.70 m for containment levels H2 and H3
***** The height of a separate concrete barrier in the CDS must be at least 1.10 m according to TC 114. ****** The position of the detached parts was not checked during the test.					

Table 3 – Distance of the face of the road barrier from a fixed obstacle

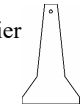
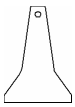
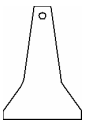
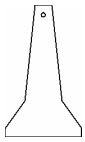
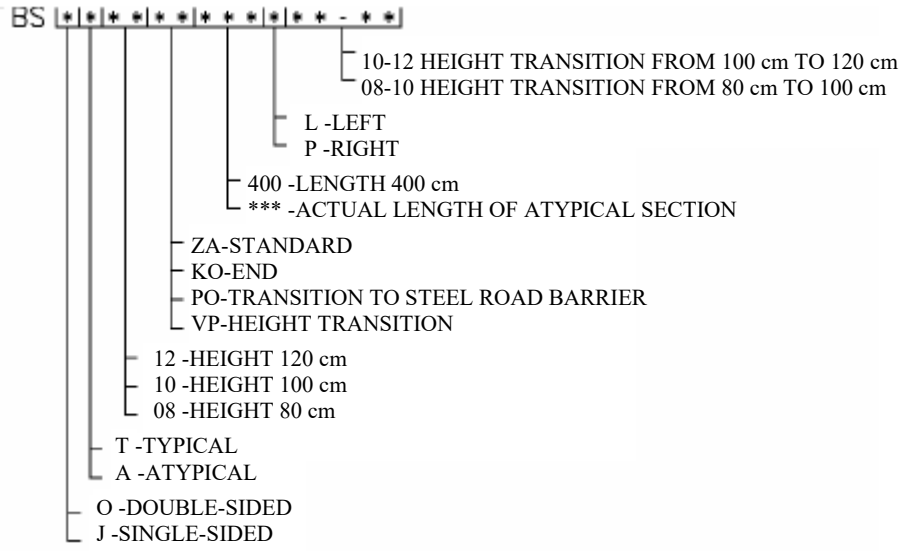
No.	Road barrier designation	Containment level	Distance of the face of the road barrier from a fixed obstacle [m]
1	BSJT08ZA400  single-sided concrete road barrier, height 0.80 m	N2 H1 H2 H3	0.85* 1.40* 2.00* 2.50
2	BSOT08ZA400  double-sided concrete road barrier height 0.80 m	N2 H1 H2 H3	0.80* 1.10* 1.40* 1.90
3	BSJT10ZA400  single-sided concrete road barrier, height 1.00 m	N2 H1 H2 H3	0.80* 1.30* 1.70* 2.10
4	BSOT10ZA400  double-sided concrete road barrier height 1.00 m	N2 H1 H2 H3 H4b	0.80* 1.20* 1.60* 1.90* 2.20
5	BSJT12ZA400  single-sided concrete road barrier, height 1.20 m	N2 H1 H2 H3 H4b	0.80* 1.10* 1.40* 1.60* 1.90
6	BSOT12ZA400 double-sided concrete road barrier height 1.20 m 	N2 H1 H2 H3 H4b	0.80* 1.15* 1.45* 1.65* 2.00
* Value determined by expert estimate.			

Table 4 – Overview of manufactured sections

No.	Road barrier designation, only standard sections are marked	Component type	Weight [kg]
1	BSJT08ZA400  concrete road barrier single-sided, height 0.80 m	standard end left end right transition to steel road barrier left transition to steel road barrier right	2465 2088 2088 2474 2474
2	BSOT08ZA400  concrete road barrier double-sided, height 0.80 m	standard end left end right transition to steel road barrier left transition to steel road barrier right	2703 2321 2321 2703 2703
3	BSJT10ZA400  concrete road barrier single-sided, height 1.00 m	standard end left end right transition to steel road barrier left transition to steel road barrier right height transition to height 0.8 m left height transition to height 0.8 m right	2920 2343 2343 2885 2885 2716 2716
4	BSOT10ZA400  concrete road barrier double-sided, height 1.00 m	standard end left end right transition to steel road barrier left transition to steel road barrier right	3158 2576 2576 3140 3140
5	BSJT12ZA400  concrete road barrier single-sided, height 1.20 m	standard end left end right left transition to steel road barrier transition to steel road barrier right height transition to height 1 m left height transition to height 1 m right	3350 2477 2477 3280 3280 3143 3143
6	BSOT12ZA400  concrete road barrier double-sided, height 1.20 m	standard end left end right transition to steel road barrier left transition to steel road barrier right height transition to height 1 m left height transition to height 1 m right	3587 2707 2707 3520 3520 3380 3380



Graph 1 – Method used to mark individual sections

3 Description of individual road barriers

3.1 Support system and lock for CS BETON road barriers

All CS BETON concrete road barriers have a uniform support system - see Fig. 1. It is ø 35 mm rod made from 42CrMo4+QT steel. The rod is located in the head of the road barrier, 87 mm axially from the upper edge.
At the ends of the rod there is a thread, onto which a connecting nut is screwed. The barrier is then concreted in like this (with the rod and nuts).
There is a recess (pocket) at the front of each barrier section, at the site of the rod. Before connecting two sections, a bolt is screwed onto the connecting nuts at the front, with nut 1 or nut 2 loosely threaded onto it. After fitting the two sections together, nut 2 is screwed into nut 1. This forms a joint lock. A polypropylene plastic cover is placed over the lock.
The advantage of the lock is that no part of it can be removed (stolen) without dismantling the sections.
Each component also contains a concrete reinforcement. There are clamps surrounding the support bar.

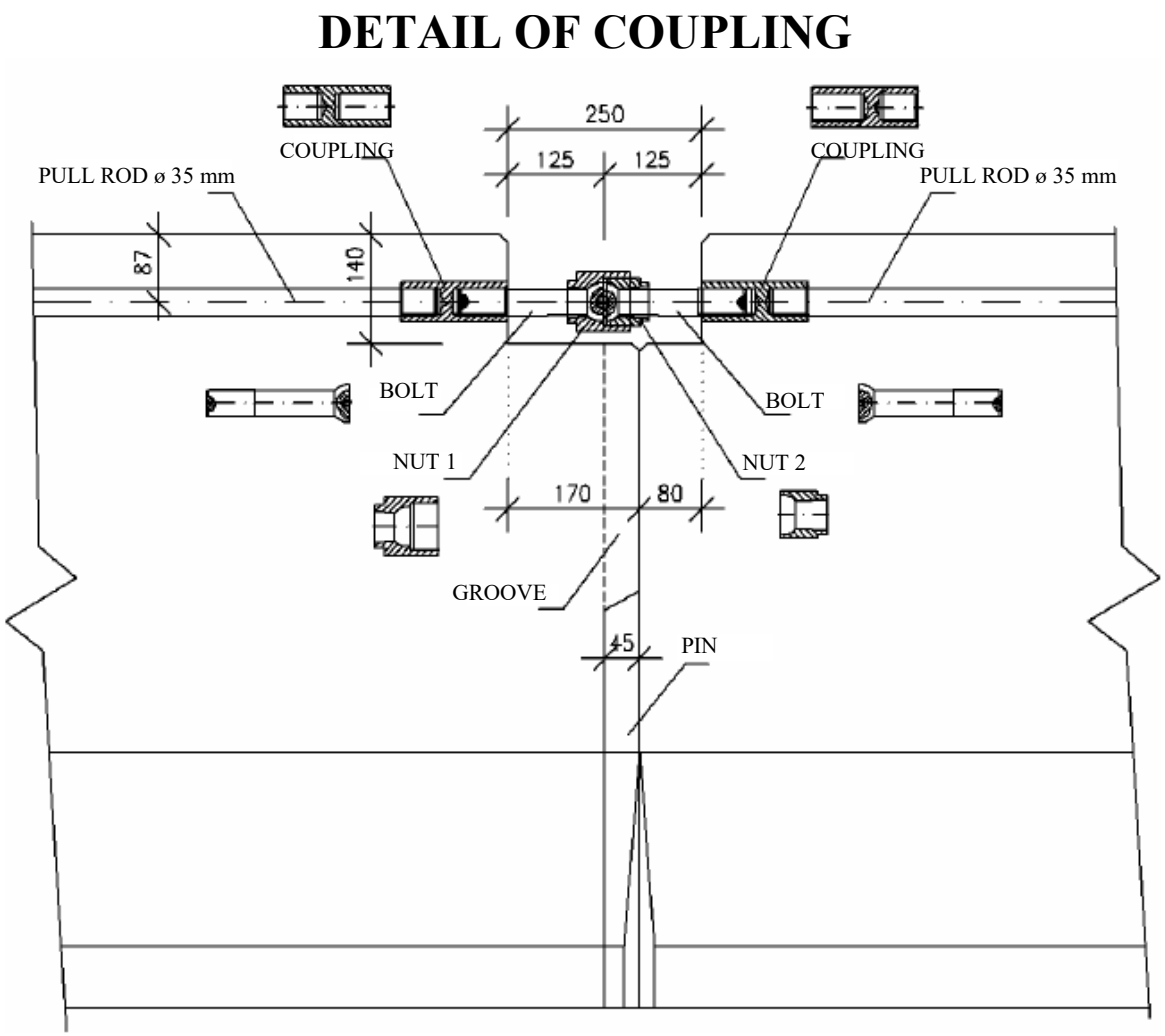


Figure 1 – Road barrier lock - connector

The road barrier is installed so that there is no play in the connector. This is to reduce dynamic impact, which could cause the connection to rupture.

3.2 Radii in which the road barriers can be installed

CS BETON road barriers can be installed in radii of 36 m or more.

3.3 CS BETON double-sided concrete road barriers

Sliding, double-sided prefabricated concrete road barriers are manufactured to heights of 0.80 m, 1.00 m and 1.20 m – see Figs. 3, 5 and 7. The road barriers are assembled from individual sections with a modular length of 4 m. The sections are reinforced with a concrete brace consisting of stirrups and longitudinal reinforcement. Each section has a tongue on one side and a groove on the other, making them easy to assemble. C 45/55 – XF4 concrete is used for all sections.
Drainage holes are drilled in the lower part of each section. Sections without drainage holes can also be ordered.
If necessary, i.e. not as part of the system (4-metre sections are not always sufficient), shorter sections can be manufactured – see 3.5. For bridge closures, a recess can be ordered in the lower part to match the size of the closure. All three types of double-sided road barriers are the same width at the base – 0.695 m.
The bottom part of the sections is bevelled by 25 mm at the front. This allows for a smaller radius when installing the barrier and, in the event of an impact with the barrier, reduces the leverage between the ends of the sections, mitigating the damage caused by the impact.

The manufacturer offers the standard sections shown in Table 4:
– **Standard section.** There is a groove on one side and a tongue on the other. It is irrelevant which way the barriers are installed, i.e. with the grooves on the left or right, as the double-sided barriers are identical on both sides.
– **Left and right end pieces**. The left end piece has a tongue at the front, while the right end piece has a groove at the front. Figs. 3, 5 and 7 show a diagram of how the parts are marked, assuming that the standard parts are placed with the groove on the left. If the standard sections are installed with the groove on the right, the left end piece is installed on the right and the right end piece is installed on the left (the tongue must always fit into the groove).
– **Left and right transition parts** for transition to a steel road barrier with a direct connection – see Fig. 9. The same goes for the left and right parts as for the end parts; the tongue must always fit into the groove. Holes for anchors are drilled into the transition section as required on site and the transition section of any steel road barrier, if supplied by the steel road barrier manufacturer, is bolted on.
Transition sections can be ordered according to Fig. 8 for transitions between different heights of CS BETON road barriers.
For handling the sections, bushings for screwing in the suspension rod are fitted in the head (top) of each section. However, the sections can also be installed by threading the suspension cable through the drainage holes.

3.4 CS BETON single-sided concrete road barriers

Sliding, single-sided prefabricated concrete road barriers are manufactured to heights of 0.80 m, 1.00 m and 1.20 m – see Figs. 2, 4 and 6. The road barriers are assembled from individual sections with a modular length of 4 m.

Everything stated in section 3.3 also applies, but since single-sided road barriers cannot be turned and therefore used on the other (back) side, it is crucial to know which section is right and which is left.

3.5 Principles for the modification of all types

Only modifications that do not affect the load-bearing system of the road barrier are permitted.
Any modification must be discussed with the road barrier manufacturer.
Modifications can be categorized as modifications to the road barrier as a whole and modifications to individual sections.

3.5.1 Modifications to the road barrier as a whole

These are:
a) Modifications caused by the transverse slope of the base on which the road barrier is installed (and changes to the transverse slope).
b) Modifications caused by installing the road barrier on a raised kerb.
c) Modifications caused by the need to modify or omit drainage holes, or to shorten standard sections (e.g. in connection with bridge closures where a 4 m module is not sufficient).
Note - it is not possible to shorten sections systematically, such as to achieve a smaller radius for road barrier installation.

Modifications a) and b) must comply with TC 139 and in such cases it is not necessary to request the manufacturer's consent in advance; however, these modifications must be specified in the order.
Modifications c) can normally be requested, but must also be discussed with the manufacturer in advance.

3.5.2 Modifications to a specific section

This mainly concerns end and transition sections and sections at the site of bridge closures. These modifications are not considered modifications to the road barrier, as they do not affect the road barrier as a whole, as a system, but only local areas that may require atypical modification (e.g. at the transition from a kerb to an area without a kerb).
A transition section can also be ordered to branch one road barrier into two parallel road barriers (e.g. around a bridge pier in the central dividing strip). This section is atypical as it depends on whether the road barrier is in the axis of the central dividing strip or is offset, and it also depends on the required length of the branch.
Each such modification must be discussed with the manufacturer, as it may be limited by the production capabilities of the mould or the support system, and agreed with the client/construction manager.

3.6 Design of road barrier modifications in the construction execution documentation (CED)

Road barriers are “specified” products for which the manufacturer bears full responsibility. For this reason, the road design engineer only provides the road barrier manufacturer with documentation for any modifications.
Such documentation includes a drawing of the road barrier section layout (especially on bridges), which may indicate the need for certain sections to be of atypical lengths. It is also necessary to specify the size of expansion movements and the width of the bridge closure at the bridge and at the connection to the steel road barrier, the type of steel road barrier, etc.
The road barrier manufacturer will provide the production and technical documentation (if necessary) at its own expense.

ROAD BARRIER BSJT08ZA400

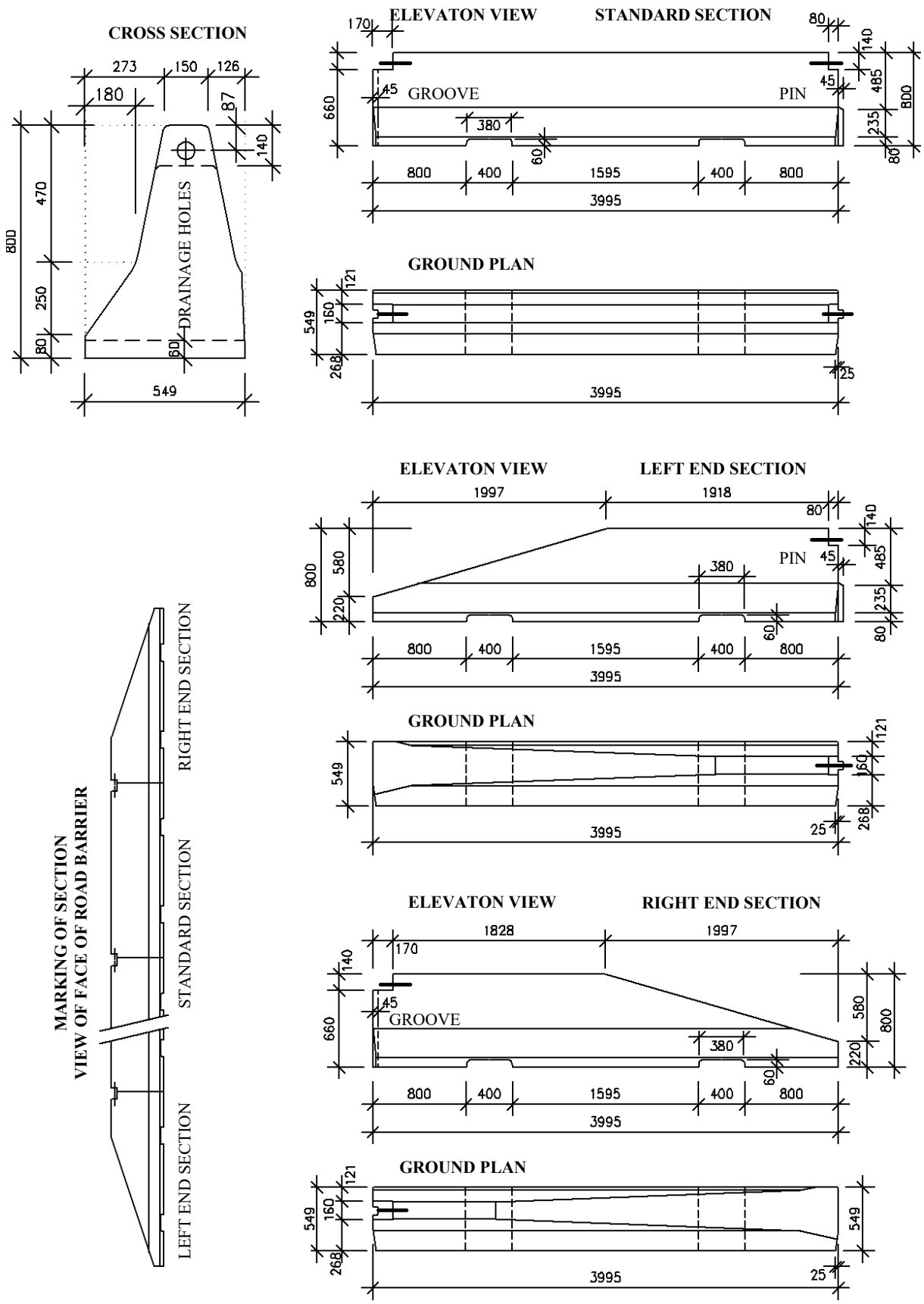


Figure 2 – Single-sided concrete road barrier, height 0.8 m – standard and end section

ROAD BARRIER BSOT08ZA400

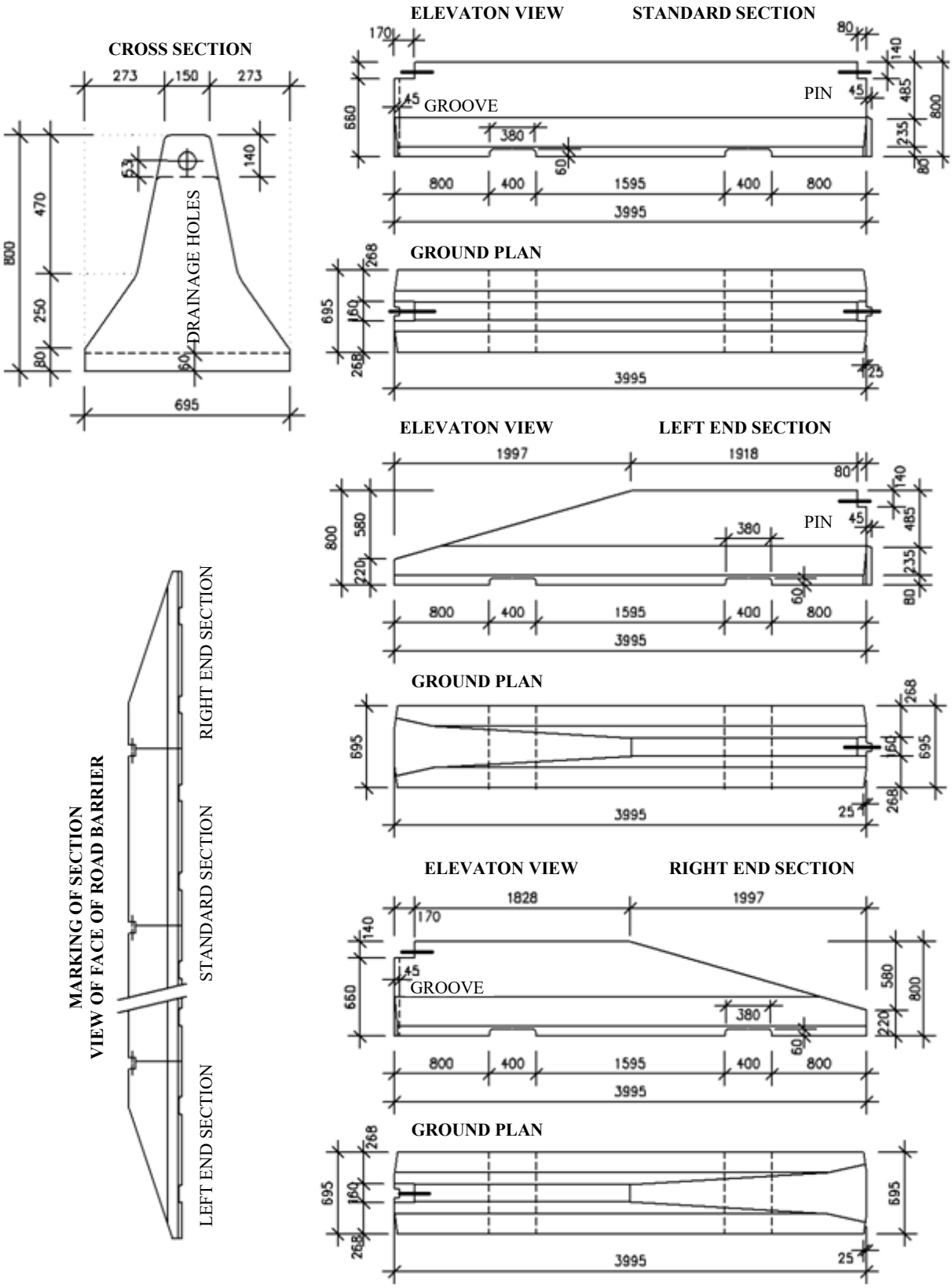


Figure 3 – Double-sided concrete road barrier, height 0.8 m – standard and end section

ROAD BARRIER BSJT10ZA400

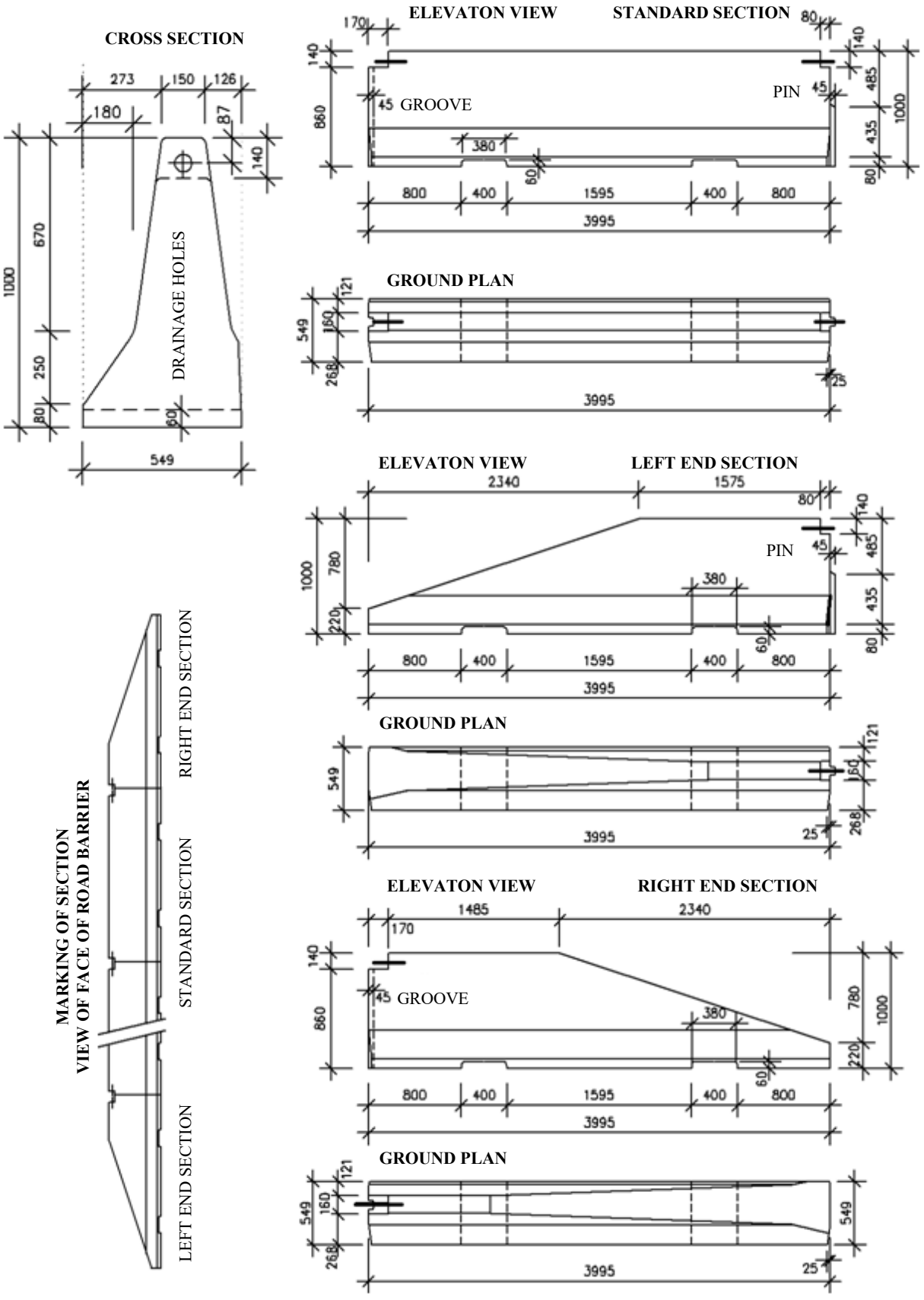


Figure 4 – Single-sided concrete road barrier, height 1 m – standard and end section

ROAD BARRIER BSOT10ZA400

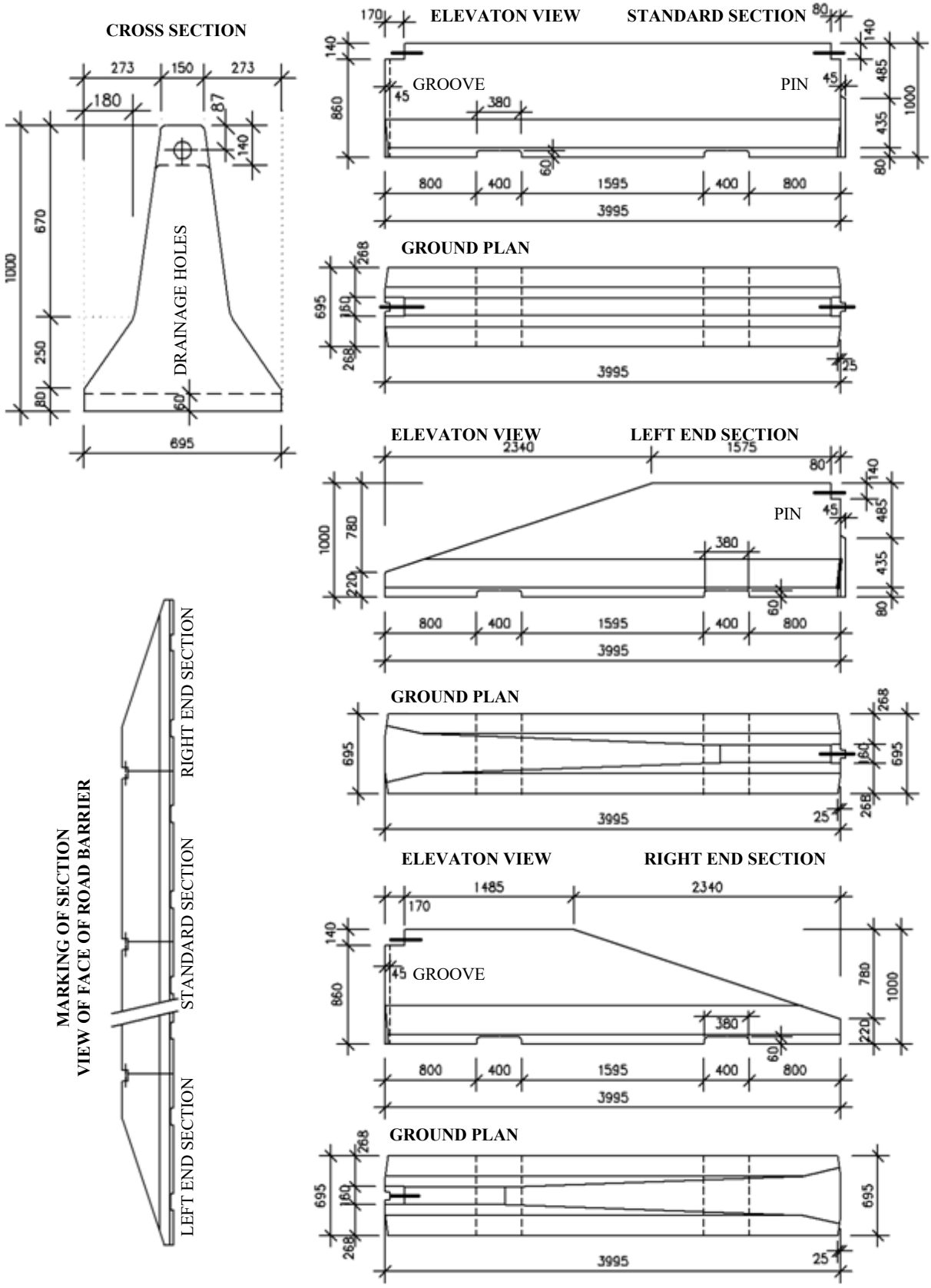


Figure 5 – Double-sided concrete road barrier, height 1 m – standard and end section

ROAD BARRIER BSJT12ZA400

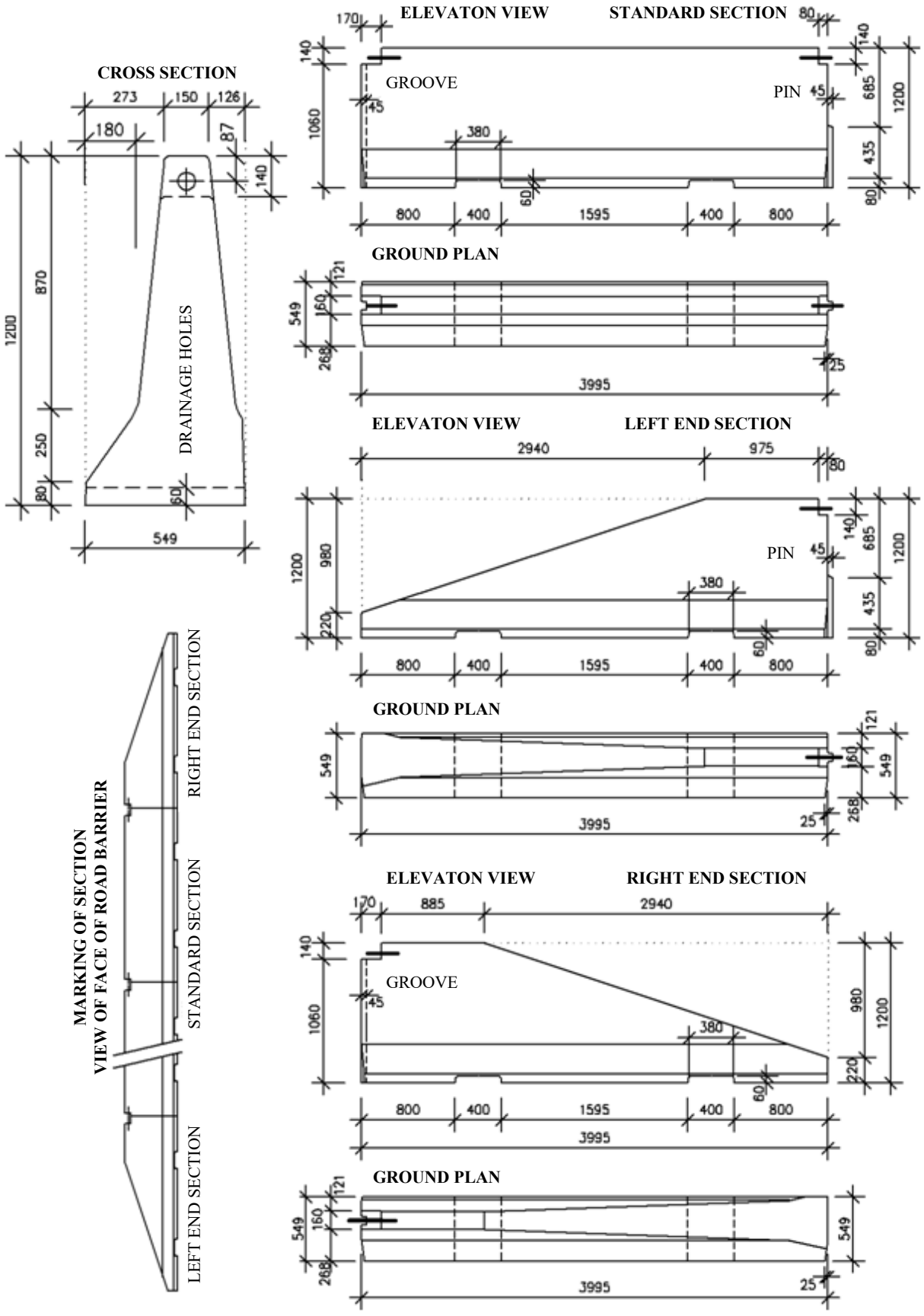


Figure 6 – Single-sided concrete road barrier, height 1.2 m – standard and end section

ROAD BARRIER BSOT12ZA400

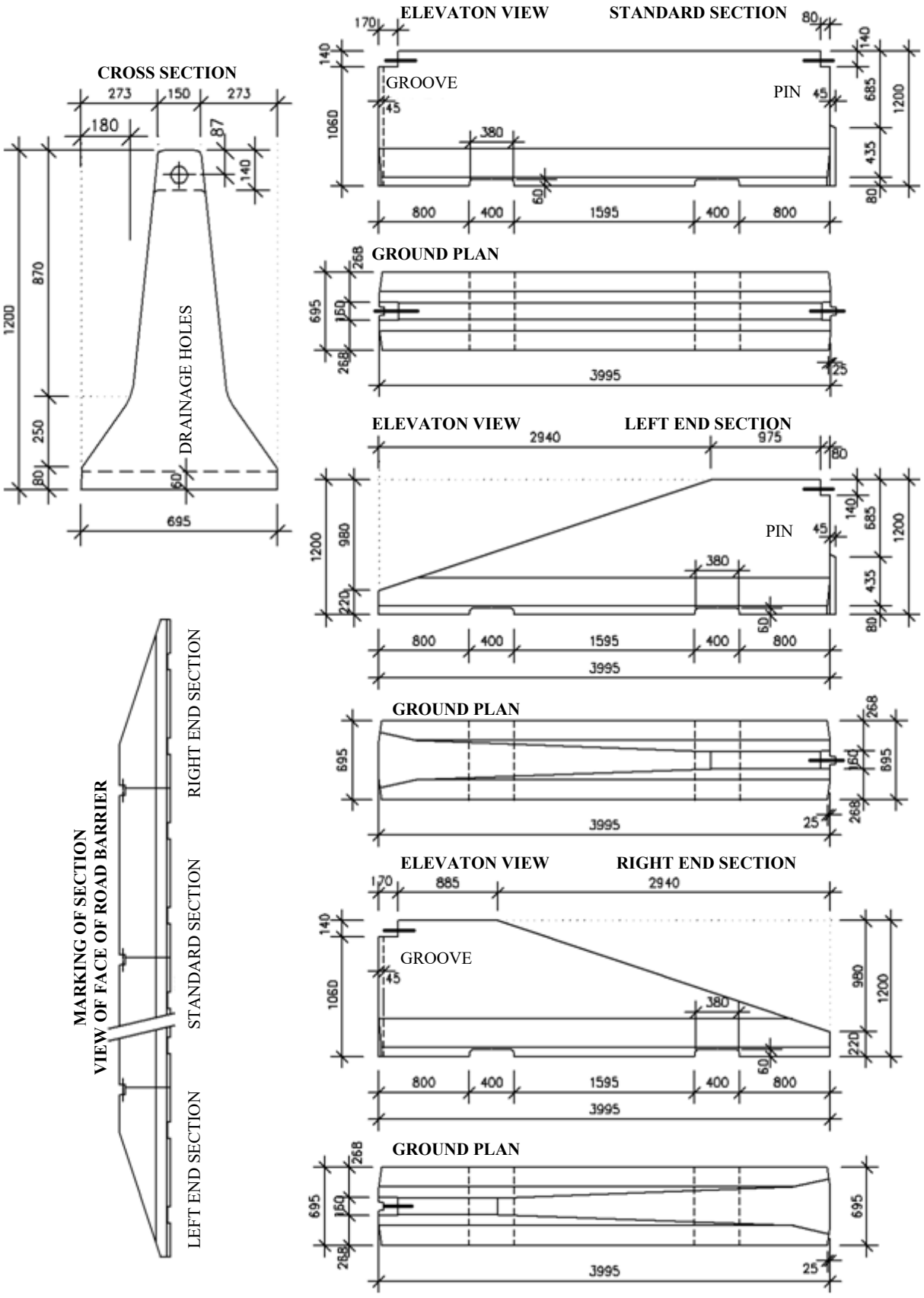


Figure 7 – Double-sided concrete road barrier, height 1.2 m – standard and end section

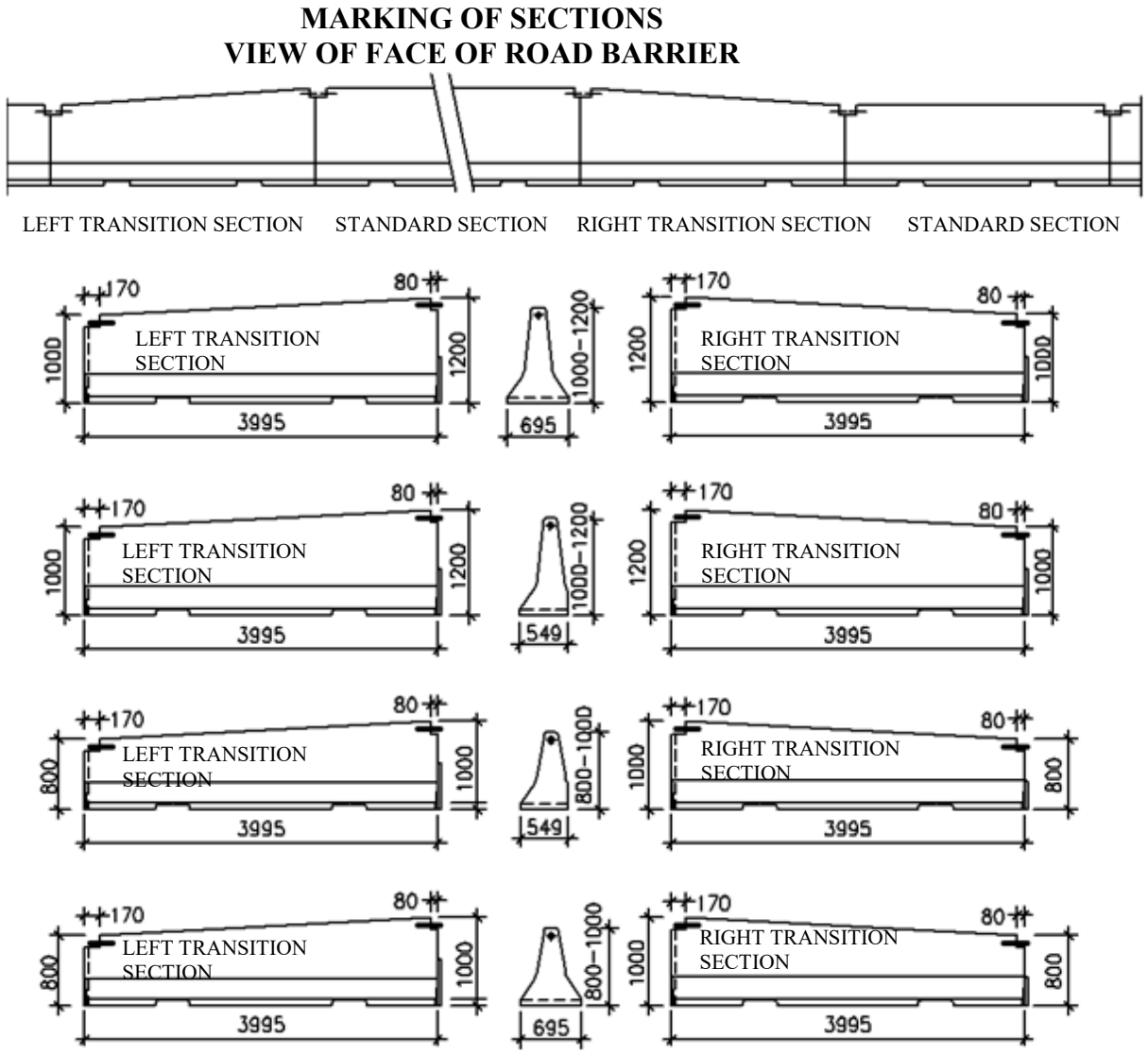


Figure 8 – Height transition between CS BETON road barriers

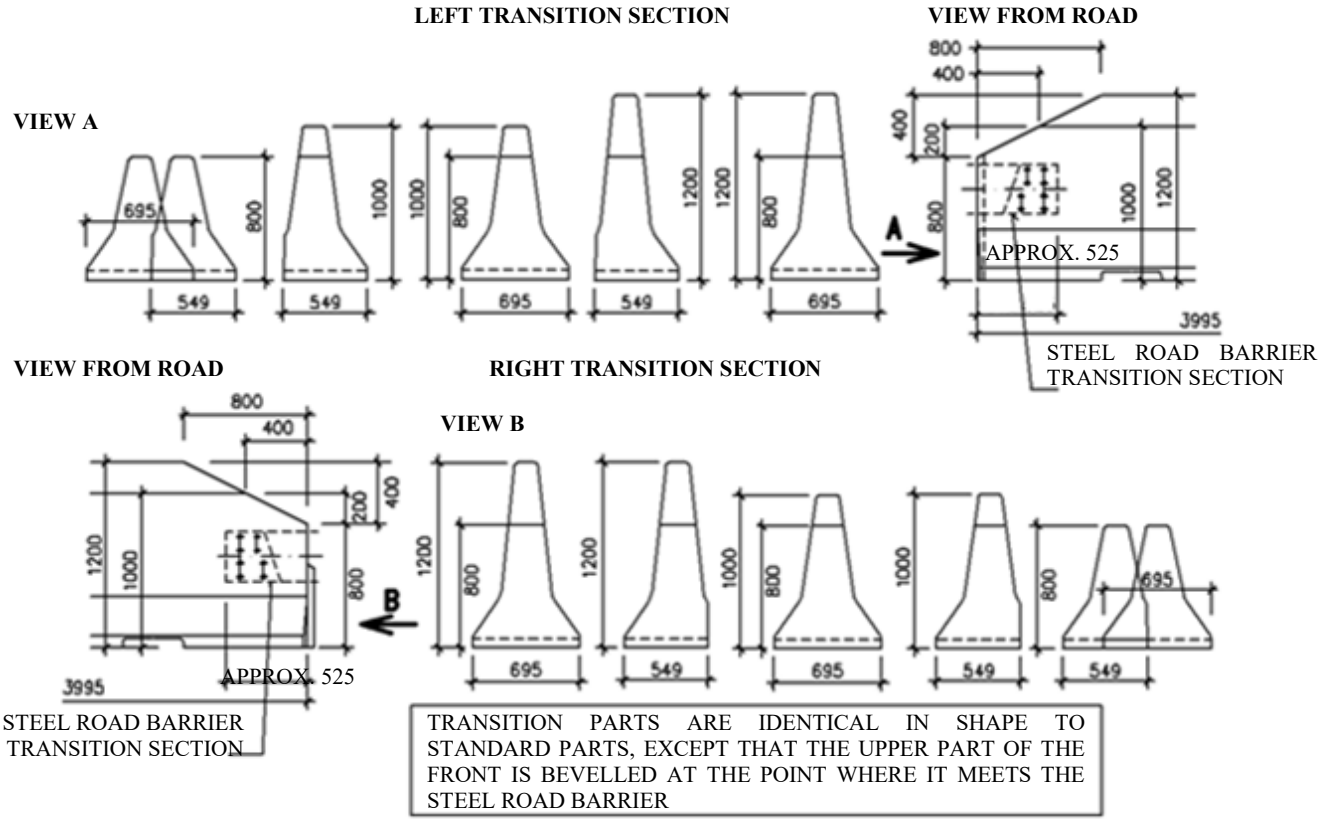


Figure 9 – Transition sections for steel road barrier

4 Road barrier on roads

4.1 General information

TC 114 specifies the minimum possible height of concrete road barriers in certain locations.
Each type of CS BETON road barrier has its own height (and all other dimensions) – see Figs. 2 to 7. In the execution documentation (CED), the road contractor selects a specific type that meets the containment level requirement, has sufficient height according to TC 114 or according to the project requirements, and is suitable for specific road locations according to Table 2, "Use" column and Table 3 (these tables are consistent with one another).

4.2 Location of the road barrier on the shoulder

CS BETON offers a sufficient range of road barriers for all locations on the road.
Table 2 of these MTC specifies the containment level. The "Use" column of this table specifies the containment level for which the road barrier can be used on shoulders of widths according to CSN 73 6101.
TC 139 applies to the installation of all CS Beton road barriers (in terms of free road width, reinforcement, slopes, etc.).
TC 139 provides an overview of the possible installation of concrete road barriers on road shoulders.
Both double-sided and single-sided road barriers can be installed on shoulders. It is not possible to determine whether a single-sided or double-sided road barrier is more suitable. The only decisive factors are the price and specifications of the road barrier, or the width of the road barrier in confined spaces.

4.3 Location of the road barrier in the central dividing strip

Road barriers are installed in accordance with TC 139. The minimum width of the central dividing strip for individual road barriers is specified in the "Use" column in Table 2 of these MTC.

4.4 Reinforcement under the road barrier

Regardless of the required containment level, the ground under the road barrier is reinforced on unpaved shoulders and in the CDS in accordance with TC 139.

4.5 Full effectiveness and minimum length of the road barrier

The requirements specified in TC 139 apply.

4.6 Road barrier in front of obstacles and danger spots (mountain gulleys, culverts)

Proceed in accordance with TC 139.

4.7 Beginning and end of the road barrier

The beginning and end of the road barrier must always be fitted with an end (lead-in) section. The road barrier may end in a standard section if the end is covered by another concrete road barrier so that it cannot be impacted (e.g. in the case of emergency call points).
End/lead-in sections according to Figures 2 to 7 are classified as classic lead-ins. CS Beton is also able to supply so-called slight lead-ins on request – see TC 139.

4.8 Road barrier at an emergency call point

Proceed in accordance with TC 139.

5 Road barrier on bridges

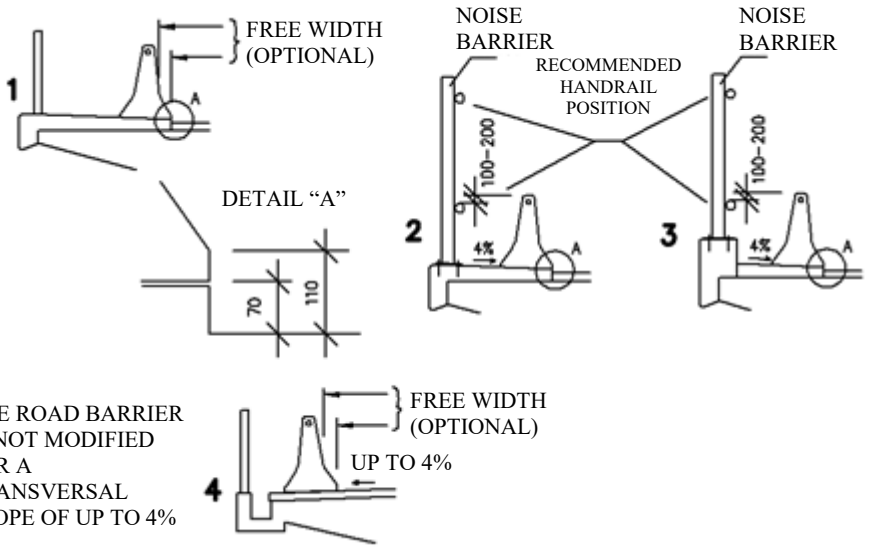
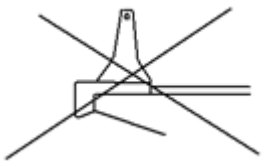
5.1 Placement of a road barrier on the outer edge of a bridge

In accordance with the requirements of TC 114 on the height of road barriers on bridges, road barriers with a height of 0.80 m are not used on bridges.
As they are made up of separate parts weighing more than 2 kg, only single-sided road barriers with a height of 1 m and double-sided road barriers with a height of 1.2 m may be used on bridges.
In accordance with TC 139, both of the above road barriers may only be used if there is a gap behind the road barrier (inspection or public walkway, or ordinary gap) and behind it a bridge railing or noise barrier in accordance with TC 139 – see Table 5.

Table 5 – Overview of the placement of road barriers on the outer edge of the bridge

<table>
<tr><th>ROAD BARRIER DESIGNATION</th><th>ROAD BARRIER POSITION – OUTER EDGE OF BRIDGE</th></tr>
<tr><td>ONLY THE FOLLOWING ROAD BARRIERS MAY BE USED ON BRIDGES

BSJT10ZA400
BSOT12ZA400

THE ROAD BARRIERS ARE MODIFIED ACCORDING TO DETAIL “A”</td><td> 
</td></tr>
<tr><td>NO ROAD BARRIER LISTED IN THESE MTC MAY BE USED IN THIS WAY</td><td>  </td></tr>
</table>

Road barrier on a parapet with a pavement
There are no restrictions on the width of the pavement (inspection or public) (according to the standards, railings do not constitute a solid obstacle). No minimum pavement width is specified in connection with the use of road barriers.

Road barrier on a parapet with a noise barrier
Proceed in accordance with TC 139.

Road barrier on a parapet-free superstructure with a drainage channel
This option is only possible if there is a bridge railing behind the road barrier – see Fig. 4 in Table 5. In this case, the distance between the face of the road barrier and the railing must

comply with the figures given in Table 3.

5.2 Placement of the road barrier in the central dividing strip on a bridge

Proceed in accordance with TC 139.

5.3 Road barrier in front of and behind a bridge

Proceed in accordance with TC 139. The area immediately behind the parapet is problematic in terms of the transverse slope of the parapet (usually 2–4% to the carriageway) and the transverse slope of the shoulder (usually 6–8% to the crown of the road). In these cases, atypical sections or an atypical monolith must be installed 4–8 m behind the end of the parapet to ensure a smooth transition from the position on the road to the position on the bridge. The atypical part must always have the same load-bearing system as the manufactured sections, the same coupling and at least the same reinforcement. The atypical part is designed in accordance with the production and technical documentation prepared (or outsourced) by the road barrier manufacturer – CS Beton – in cooperation with the bridge designer. The prerequisite is that the load-bearing system, which consists of a steel bar, can be connected with a coupling (see 3.1 of these MTC), i.e. that the ends of the bars are always facing each other, allowing the coupling to be installed. From the perspective of the view from the carriageway, it is not always possible to ensure that the upper edge of the road barrier on the bridge is at the same height as the upper edge of the continuing road barriers on the road. Any height difference between the road barrier on the parapet and the road barrier on the road must be made in an atypical section, i.e. over a length of 4–8 m.

5.4 Expansion joint

The manufacturer offers a standard expansion joint of ± 40 mm, for which a specially modified coupling is used. Fig. 10 shows a schematic diagram of the expansion joint. This does not require any modification of the pockets for the coupling. In accordance with TC 139, expansion joints of this type (extended coupling up to ± 40 mm) do not have to overlap.
Expansion joints over ± 40 mm are resolved in accordance with TC 139. This is an atypical detail, the documentation for which is provided by the road barrier manufacturer as part of its production and technical documentation in cooperation with the bridge designer. This larger expansion joint is covered by a plate in accordance with TC 139.

DETAIL OF EXPANSION COUPLING
± 40 mm

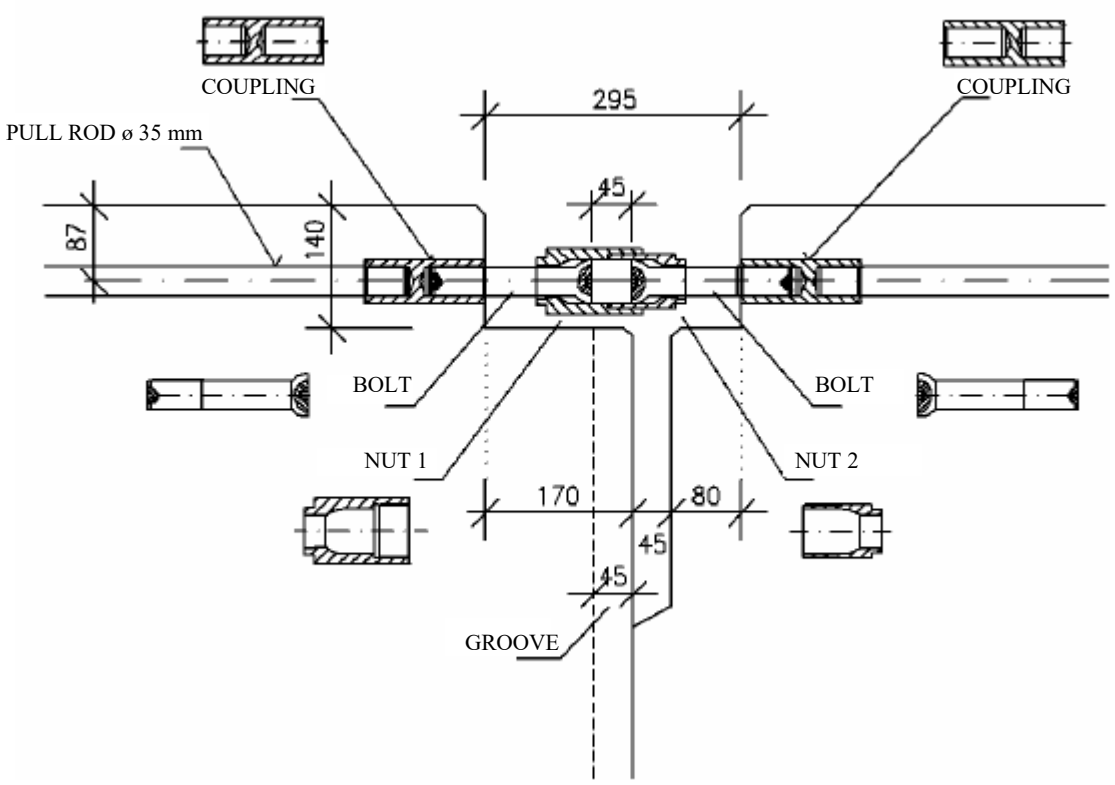


Figure 10 – Road barrier lock – expansion coupling for movement ± 40 mm

5.5 Expansion joint – electrically insulated

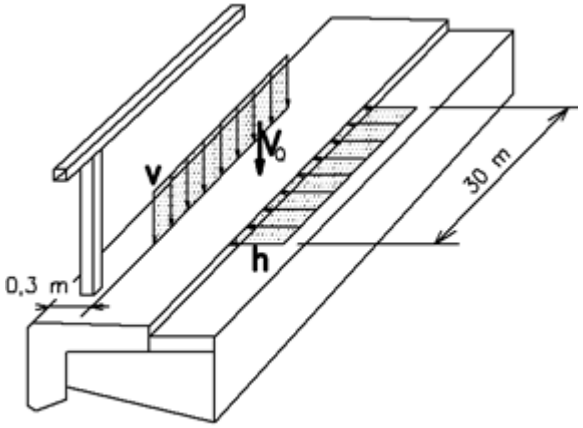
The electrical insulation at the expansion joint ± 40 mm (with a modified coupling) is done by applying an electrical insulation coating (spray) – Rilsan – to screws and nuts 1 and 2. This prevents current from entering the pins and travelling further into the next section.
The electrical insulation at the expansion joints carried out in accordance with TC 139 is also to be done in accordance with the instructions in TC 139. As this is an atypical detail, its documentation is to be provided by the manufacturer of the road barrier, CS Beton, in cooperation with the bridge designer.

5.6 Loading of the parapet and supporting structure

The **parapet load** is given in Table 6. The supporting structure can be directly loaded with the same load.
The parapet is anchored on the basis of a static calculation. If the parapet is anchored to the supporting structure from above, at least M 20 anchors must be installed every 2 metres, even if the static calculation indicates that less anchoring is required. It is assumed that this anchoring will be at least 0.3 m from the edge of the supporting structure. For parapets anchored to the wings by brackets protruding from the wing, brackets with a diameter of R 12 every 0.40 m are sufficient.
The impact on the supporting structure is small. This load is an extraordinary load.
CS Beton, the road barrier manufacturer, emphasizes the need to consider the safety of the

noise barrier or drainage channel (if these structures are behind the road barrier) – see TC 114.

Table 6 – Parapet load

PARAPET LOAD	ROAD BARRIER DESIGNATION	
	SINGLE-SIDED HEIGHT 1.0 m  BSJT10ZA400	DOUBLE-SIDED HEIGHT 1.2 m  BSOT12ZA400
HORIZONTAL FORCE **h** (kN/m)	6.0	7.2
VERTICAL FORCE FROM MOVED ROAD BARRIER'S OWN WEIGHT **V** (kN/m)	7.5	8.9
VERTICAL FORCE FROM VEHICLE WHEEL PRESSURE $\mathbf{V_Q}$ (kN)	SEE TC 114	

6 Transition to other road barriers

6.1 Transition to steel road barrier

A steel road barrier can only be directly connected to a concrete road barrier using a special transition piece. These transition pieces ensure the transition of the vertical road barrier to the sloping surface of the New Jersey-shaped concrete cross-section. This means the transition piece ends in an inclined plate that has the same number of holes as a standard road barrier connection.
As standard, CS BETON offers transition pieces for concrete road barriers for direct connection to steel road barriers – see sections 3.3 and 3.4 and Figure 9 of these TC.
CS BETON road barriers have varying slopes on the surface to which the steel road barrier transition pieces are anchored. The sheet metal that is to rest on this surface is lubricated with grouting (repair) compound before being bolted in place. In places where the grouting compound is more than 15 mm thick, after the steel road barrier has been bolted into place, the grouting is shaped to form a smooth transition to the concrete road barrier with no sharp edges (1:5 or gentler slope) – see detail in Figure 11. The second option is to use steel, galvanised washers or spacer rings placed on the bolts (no underlay or lubrication is required), but this solution must be approved by the investor.

Fig. 11 shows an example of a direct connection to a JSAM-2/H1 steel road barrier. All details and reinforcement of the posts behind the concrete road barrier are to be provided by the steel road barrier manufacturer.

The transition from a concrete to a steel road barrier and vice versa can also be done by simply overlapping the two barriers. In this case, the concrete barrier must be of the same height as the full height of the steel road barrier. It is permissible for the concrete barrier to touch the steel barrier; no gap is required.

6.2 Transition to concrete road barriers from other manufacturers

The transition from a CS BETON concrete barrier to a concrete barrier from another manufacturer can be done in two ways:
- By overlapping the height ramps. The condition is that the full heights of both road barriers that pass each other must be next to one another so that the full height of the road barrier is maintained at every point along the road.
- By direct connection. The condition is that the height transition must be smooth and the tensile strength at the transition point must be in accordance with the strength of the barrier with the lower containment level. For this purpose, a transition piece must be manufactured with a lock from one manufacturer on one side and a lock from the other manufacturer on the other side, and these locks must be interconnected. The transition piece is non-standard and is included in the manufacturing documentation of the manufacturer of the road barrier to which it is connected. This solution requires the consent of the manufacturers of both road barriers to be connected.

7 Corrosion protection

All non-built-in steel structural parts are coated twice with DELTA PROTEKT KL 100 metal coating (zinc-laminate inorganic coating) in accordance with CSN EN 13858. Corrosion resistance of at least 600 hours to red rust formation, tested by NSS according to CSN EN

ISO 9227.

CONNECTION OF ARCELORMITTAL JSAM-2/H1 SINGLE-SIDED ROAD BARRIER TO CS BETON CONCRETE ROAD BARRIERS

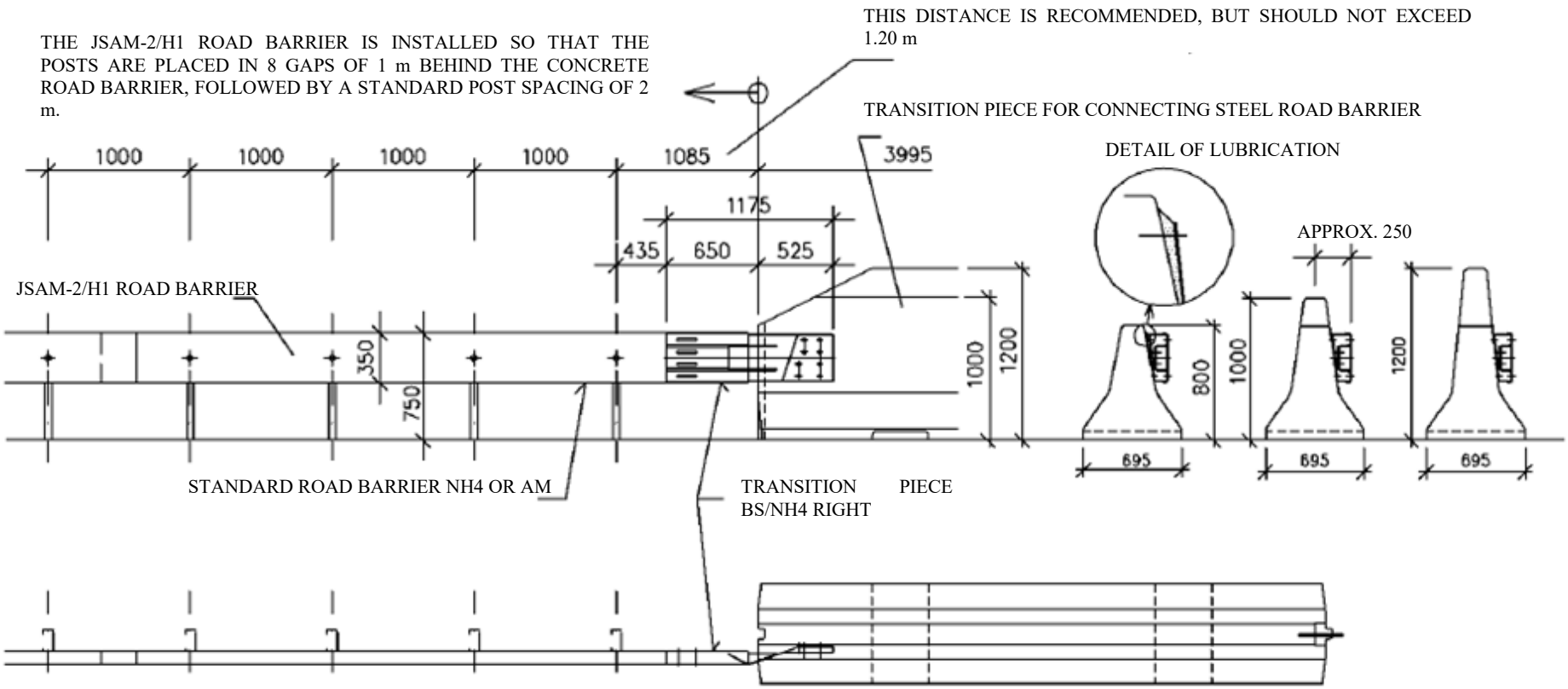


Figure 11 – Example of connecting the JSAM-2/H1 steel road barrier

8 Design, installation and maintenance

Proceed in accordance with TC 139.
All CS Beton road barriers are products within the meaning of Act No. 22/1997 Coll. and Government Regulation No. 163/2002 Coll., therefore they are not designed and may not be modified in any way except for the modifications specified in these MTC or mandatory local modifications – see section 3.5 of these MTC. However, modifications may only be carried out with the manufacturer's consent.

The manufacturer supplies installation instructions with the concrete road barriers.

9 Marking

The manufacturer shall affix an identification label to each concrete road barrier section, embedded in the front side of the section – see Figure 12. The label is 40 mm x 80 mm in size and made of brass. The general label marking method is shown in Table 7, with an example in Table 9.
The CE label - see Figure 12 - is a paper label that does not have to be affixed to the road barrier but may be included in the accompanying documentation. The content of this label is prescribed by CSN EN 1317-5+A2.
Each section has colour coding on one end – see Figures 13 and 15.

The coupling parts are marked with the letter C stamped approximately 5 mm high to a depth of 1 mm – see Figure 14.

Table 7 - Label marking method

dd mm rr CSB D AA BB Y XXXX RR

dd mm rr (dd mm yy) - date of manufacture, e.g. 21 04 17 means 21 April 2017
CSB - name of manufacturer.
Explanation of numerical series marking - D AA BB XXXX RR - see Table 8

Table 8 - Explanation of numerical series marking

D	Type of road barrier	J	Single-sided
		O	Double-sided
AA	Road barrier type	12	Road barrier height 1.20 m
		10	Road barrier height 1.00 m
		08	Road barrier height 0.80 m
BB	Section type	ZA	Standard section length 4 m
		KO	End piece

		PO	Transition piece to steel road barrier
		VP	1 Height transition from 1 m to 1.2 m
			2 Height transition from 0.8 m to 1.0 m
Y	Containment level		
X	Serial number		
RR	Last two digits of year of manufacture		

Table 9 - Example of label marking

01 01 12 CSB O 12 ZA H4 125 12

Figure 12 – CE label and brass label marking CS BETON concrete barriers

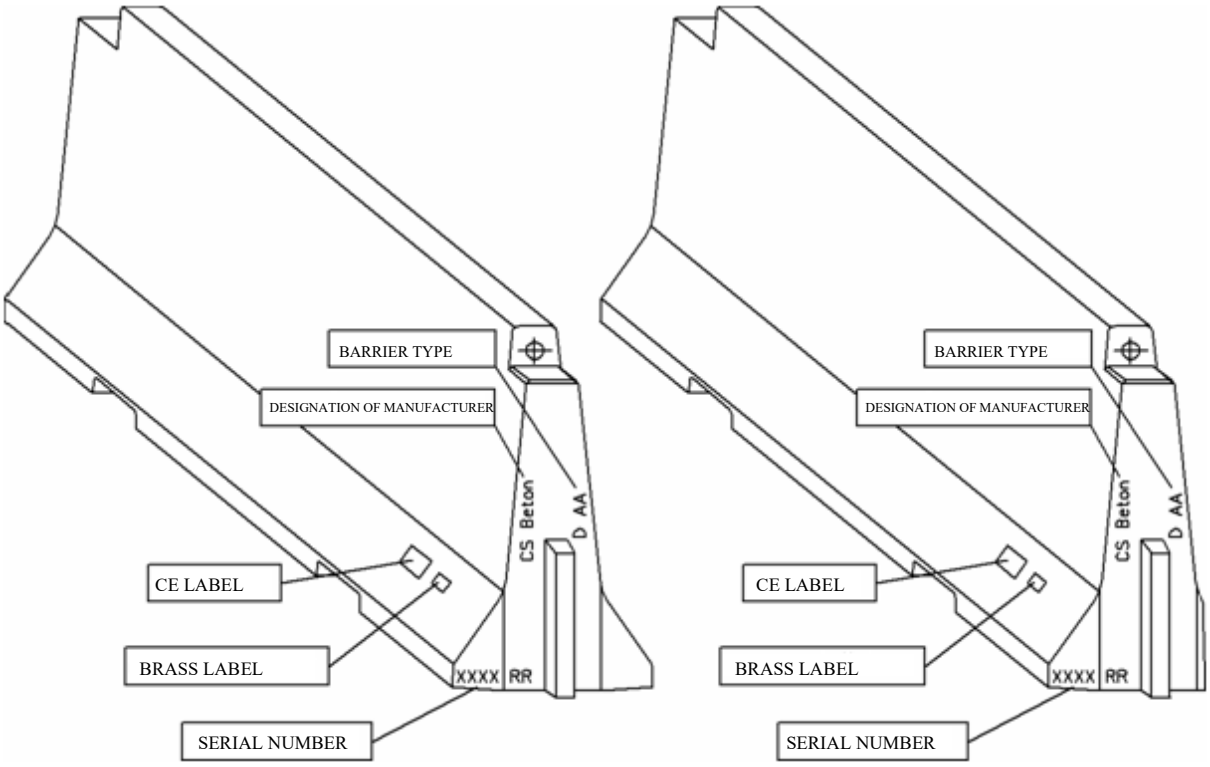


Figure 13 – Location of labels and colour coding of barriers at one end of each section

Figure 14 – Marking of coupling parts

Figure 15 – Colour coding at one end of each section

Title: CS BETON Concrete Road Barriers

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