Instructions

DELTABLOC®

Slim temporary safety barriers SB 50

Installation and Maintenance Manual

Documentation for license partners

General information

Installation

The DELTABLOC® system to be used is selected according to the requirement specifications defined by the customer on the basis of the performance classes according to EN 1317-2 and in consideration of the installation situation.

Relevant national regulations as well as technical terms of delivery and contract have to be adhered to.

System SB 50

The vehicle restraint system SB 50/6M MW180 is tested according to EN 1317, provides the containment level T3, the working width class W2 and the impact severity level A.

The system SB 50/6M MW180 is primarily suited for the temporary securing of construction sites and areas on the verge and between oncoming traffic lanes. Because the system is very narrow with only 24cm it is also suitable as a permanent T3 installation where space is restricted.

Maintenance terminology

- **Maintenance** is the combination of all measures carried out to maintain the functionality of a system. It can be divided into the basic steps of *service, inspection* and *repair work*.
- **Service:** Service is a periodically recurring measure to maintain the target state.
- **Inspection:** Inspection is a measure carried out to ascertain the current state. It generally refers to an inspection in the sense of a check carried out by an inspector or supervisor. The aim is to determine that an object is of sound condition. Repair measures are to be initiated wherever necessary.
- **Repair work:** Measures to restore the target state of an object via refurbishment or replacement of parts on the basis of the inspection results.

Planning

In order to achieve the functionality according to EN 1317 parts 1 and 2, a minimum system length, according to the length specified in the approval, of 180m is necessary.

At both ends of the installation terminal elements or suited transition elements to adjacent restraint systems must be installed.

The customer is required to announce all fixed points for the installation and/or mark these on site in time before the commencement of work.

The system SB 50 requires no loose or small parts; it can be installed without any tools.

Base surface

The road surface is normally used as the base surface for the system. The elements may only be placed on a cooled asphalt surface with a sufficient stability (compaction rate 98%, surface temperature less than 40°C). The restraint system may not leave impressions in the base surface.

Any unevenness resulting in a height offset of more than ± 1cm in the area of the butt joint must be evened out.

To ensure the functionality of the safety barrier, good friction values are essential. It must therefore be ensured that the base surface is free of sand, oil and other soiling.

The impeccable state of the base surface must be ensured by the construction company or the road maintenance company for the duration of the temporary installation.

Minimum installation length

The tested minimum installation length (system length) of the safety barrier is found in the product data sheet. The actually installed length may never be less than the minimum installation length.

Installation position

The elements are set up vertically on the road surface.

Positional deviations are possible to a limited extent. For further information please contact your DELTA BLOC advisor or partner.

Drainage

The elements of the system SB 50 feature drainage openings in the base through which any water can drain off without obstruction.

Curve radii

Installing the system in curves with a radius of up to 360m is possible without special measures (Table 1). Coming from a straight stretch this means that the free end of a 6m element can be shifted by about 10cm out of line in the required direction.

Tighter curves and bends or greater shifting angles can be realized by exchanging the frontal pressure plates (with wedge-shaped plates) (Fig. 1 and Table 1).

Fig. 1: Installation of curves using SB 50

Curve, Crest and Sag Radii

Table 1: Curve, Crest and Sag Radii with different frontal pressure plates

	Curve		Crest		Sag	
frontal pressure plate	Radius	Articula-tion angle	Radius	Articula-tion angle	Radius	Articula-tion angle
4mm	> 130m	< 2.7°	> 300m	< 1.2°	> 150m	< 2.3°
6mm	> 200m	< 1.8°	> 410m	< 0.8°	> 150m	< 2.3°
8mm (standard)	> 360m	< 1.0°	> 660m	< 0.5°	> 150m	< 2.3°

Installation

The elements are delivered to the construction site in suitable transport vehicles and normally unloaded and installed with the on-board crane. In special cases, elements can be shifted and placed using a forklift. Elements are gripped and lifted using the tested special hydraulic concrete safety barrier grab (Fig. 2 and 3).

Weight of each 6m element = 750kg

Fig. 2: Delivery and handling

Fig. 3: Placing with the concrete safety barrier grab

The suspended element should be brought into a slightly tilted position when joining it with the standing element. In this way the male-female connectors can be easily slipped together without jamming (Fig. 4 and 5).

Fig. 4: Slight tilting of the element to be positioned when joining elements

Fig. 5: The male-female connection slips together

When assembling the elements on the ground only one technician is required at the joining position, who stabilizes the suspended element in the air and then guides the element into position, ensuring that the coupling end is always lower than the other one during the lowering process. Just before the free end reaches the base surface, the element is adjusted in its end position and set down.

When set down, the gap between the pressure plates should be between 0 and 2mm (Fig. 6). If in case of unevenness (crests, sags, split surfaces etc.) this is exceeded, the pressure plates can be exchanged (different thicknesses), thus adjusting the gap size.

Fig. 6: Element joint in the connected system

Special elements

Terminal constructions

Free standing ends of temporary safety barriers must be secured by means of terminal elements (or other suitable constructions). In these cases use the SB 50 terminal element with a length of 6m and a gradient of 1:12 (Fig. 7).

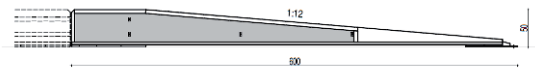


Fig. 7: Terminal construction

The system SB 50 was tested without terminal anchoring according to EN 1317. If, however, a terminal anchor is required, this can be implemented with the terminal element (with anchor plate). It can be fixed by means of two adhesive anchor rods M24 or respective asphalt bolts. Please observe the manufacturer's installation instructions.

System transitions

If, in unavoidable cases, two different safety barriers are to be connected, there are various transitions elements. For the transition from the SB 50 to other temporary T3 (or stationary H1 or H2) systems, also several transition elements can be strung together. A 3m long transition element can be directly connected to the SB 50 system as transition to the DB 50SL temporary safety barrier. Another transition to DB 65S can be connected to this transition and then a transition from DB 65S to DB 80.

Expansion joints

To compensate the thermal expansion of the SB 50 every 300 running meters an expansion joint element has to be planned. The expansion joint element has a length of 0.8m and a length compensation of ±12.5 cm – that means 25cm in total (Fig. 8).

Fig. 8: SB 50 expansion joint element for compensation of the thermal expansion

Expansion joints must also be provided when the safety barrier is used on bridges with greater lengths.

Tilting limitation elements

Tilting limitation elements are not required for the system SB 50.

Procedures after an impact

The system SB 50 is designed in a way that vehicle collisions with a flat angle will not create any damages on the elements. Steel parts at the fronts and the base provide protection against concrete spalling.

When observing the following recommendations, the functionality of the SB 50 is also ensured after impacts. If in doubt, the system supplier should be contacted for a specialist assessment of the damage.

No displacement of the safety barrier

Damage pattern:

- no visible damages to the elements, such as cracks, deformation, concrete break-outs etc.
- no damage to the stuck-on rubber mats
- tyre abrasion, scratching and paint tracks are the only indications for a vehicle impact

Measure to be taken: None.

Slight displacement of the safety barrier

Damage pattern:

- displacement < 50cm
- slight visible damages on elements, hair-line cracks, small concrete break-outs etc.
- minor detachments of the glued-on rubber mats < 2cm
- no permanent bending of elements
- rubber marks from tires and traces from scratches and lacquer

Measures: Slight damages not in the area of the connecting parts can be repaired on site with repair mortar. The affected elements can be shifted back into the original position with suitable installation tools.

In case of cracks near the coupling or of deformation of the steel base, the respective elements must be replaced.

Significant displacement of the safety barrier

Damage pattern:

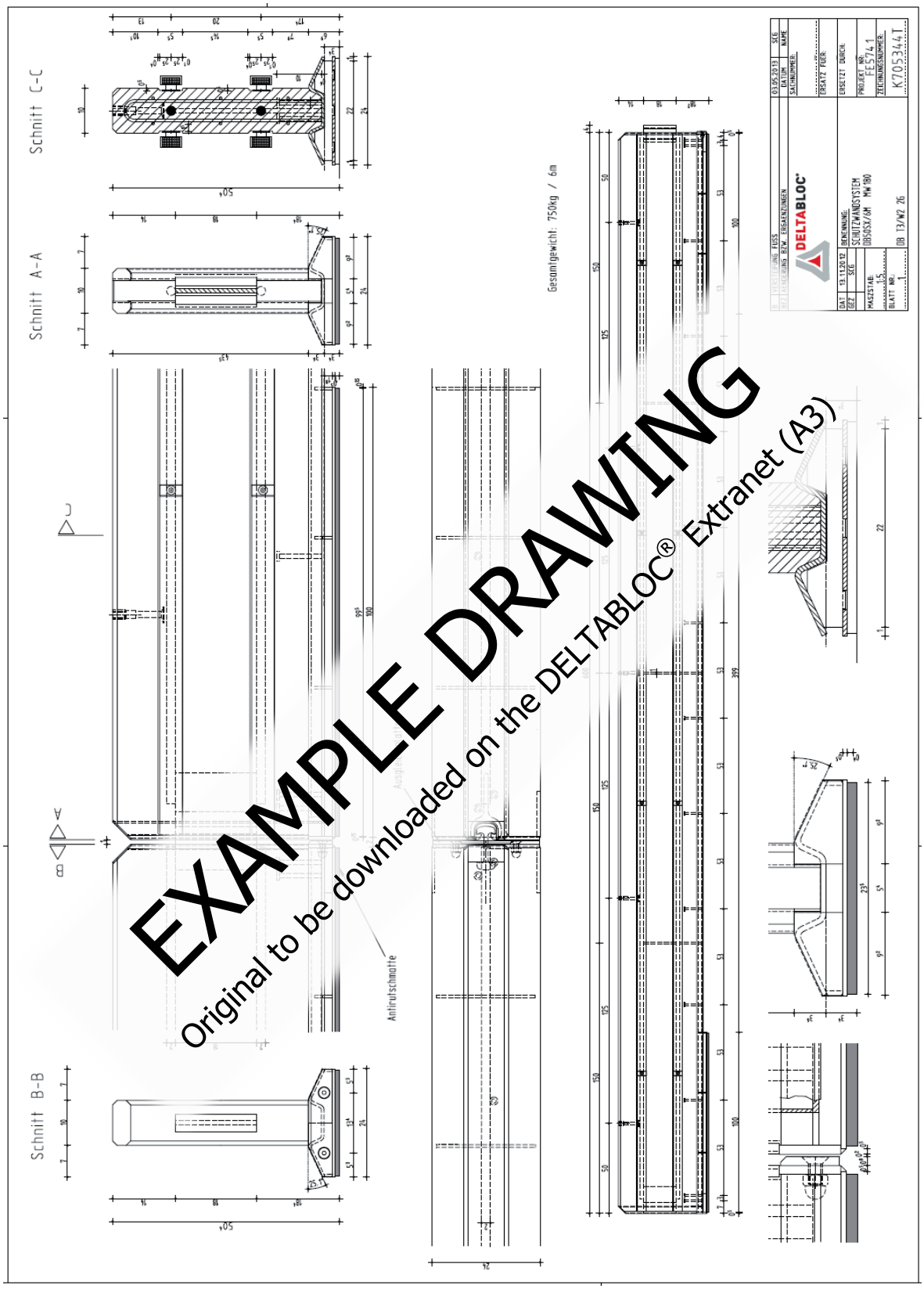
- displacement ≥ 50cm
- distinct damage to the elements, coarse cracks, concrete spalling etc.
- larger-scale detachments of the stuck-on rubber mats > 2cm
- non-temporary bending of elements

Recommendation: Replace the affected elements according to chapter *Installation* of these instructions.

Remark on the repair mortar to be used

For repairing smaller damages, commercial repair mortar is to be used. These are hydraulically hardening and plastic-reinforced dry mortars. Prepare the application surface and the mortar according to the application instructions provided by the manufacturer of the mortar.

System drawing



Further information

Other applicable documents

- Product information SB 50

Normative references

- European Standard EN 1317 part 1 “Road restraint systems – Terminology and general criteria for test method“
- European Standard EN 1317 part 2 “Road restraint systems – Performance classes, impact test acceptance criteria and test methods for safety barriers“

Internet

- For detailed information, photos and videos of the crash tests please visit **www.deltabloc.com**

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