

INSTALLATION INSTRUCTIONS

REBLOC[®] ANCHORED PRECAST CONCRETE BARRIER

for:

REBLOC RB80A_8_H2/W1

REBLOC RB100A_8_H2/W1



1. Important remarks

The following installation instructions serve as a support for the erection of the REBLOC[®] restraint systems by the customer. Before commencing any erection work it is essential to familiarise oneself thoroughly with the compliance of all relevant specific regulations and National / European Standards (construction, installation, safety, etc.), to inspect all lifting equipment (crane and other lifting systems), and to review all lifting and safety requirements. When the elements can't be placed for intermediate storage on a level or paved carriageway / surface for short or long time periods (e.g. for intermediate storage during system installation), appropriate measures must be taken in order to prevent toppling / overturn of the elements (e.g. use levelling shims / wedges to ensure a level foundation). Ensure that this installation instruction is the current valid edition (version number / date).

2. General

When the individual elements are connected to each other as described in this instruction manual the system is fully functional. It must be ensured that only matching elements are connected with each other to secure system efficiency in accordance with EN 1317. The combinable and matching elements are presented in the info sheets "Product Overview" and the respective data sheets. In the case of exceptional local conditions it is important to refer to the national regulations and / or to consult the project contractor and / or the safety barrier manufacturer.

3. Choice of appropriate system

The selection of the appropriate REBLOC[®] system is undertaken by the contractor or road designer according to the national requirements, the local conditions and the tender requirements on the basis of the EN 1317. The principal criteria are the containment level, the working width and the impact severity level.

4. Minimum installation length

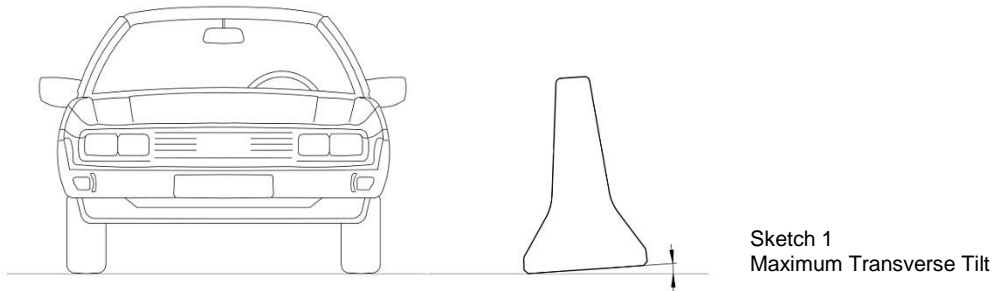
The minimum installation length is required to secure the efficiency of the REBLOC[®] systems in accordance with EN 1317. This minimum installation length is dependent on the chosen safety barrier system and containment level, and is indicated in the data sheets.

5. Foundation / Underlay

The system is to be erected on a continuously level steel reinforced concrete surface, with a minimum concrete compressive strength of C25/30 (bridge caps or steel reinforced concrete fulfilling similar technical requirements, according to national regulations and standards.)

- The levelness of the underlay shall not exceed $\pm 1,5$ cm per 8 m measuring length (longitudinal).
- Maximum element transverse tilt relative to the carriageway:
6 % to traffic flow side and 3% to opposite side of traffic
(see Sketch 1 Maximum Transverse Tilt)
- Minimum crest radius: 550 m
Minimum sag radius: 200 m
- It should be ensured that there is no foreign particle under/close to the barriers which may cause uneven coupling meshing or unnecessary twisting of the barrier.

- The continuity of height and alignment of the barrier system is to be assured.



6. Anchorage

The RB80A_8_H2/W1 and RB100A_8_H2/W1 are anchored systems. Additional to the restraining function achieved through the patented REBLOC coupling, each element is anchored to the concrete foundation with five M20 adhesive anchors and the associated washers and nuts as described in point 5 above. The restraining capacity is achieved through the interconnected tension-bar and the anchoring. Both systems do not require any start / end anchorage. The safety barriers should be positioned, adjusted and aligned, along the marked / desired contour. The safety barrier system should achieve a steady and attractive appearance.

7. Applicable documentation

Data sheet REBLOC RB80A_8_H2/W1
Data sheet REBLOC RB80A_2EXM
Data sheet REBLOC RB100A_8_H2/W1

8. Installation process

8.1. Delivery of the elements

The elements are delivered to the construction site on suitable vehicles (articulated trucks preferred), whereby all associated road safety requirements must be fulfilled. Site-access roads should be checked / inspected. Construction sites on busy motorways must conform to the minimum mandatory road security, and load carrying / transport securing system requirements must be ensured. Installation work should be carried-out in the direction of the traffic flow.



Photo 1

8.2. Unloading the Elements

After the removal of the transport securing belts / devices, the elements are taken from the truck with suitable lifting gear, with sufficient lifting capacity (gripping tongs, belts) and with a loading crane, mobile crane or JCB. Construction sites on busy roads must ensure adequate safety for the erection team and the motorway / road users – no erection vehicle / crane / or part of the safety barrier is allowed to protrude into the active traffic lanes.

Overhead electric cables adjacent to the erection site must be inspected and all work planned to avoid any contact with these cables. The element to be installed should be manipulated horizontally and vertically, while avoiding any swinging of the element



Photo 2



Photo 3

8.3 Integration and positioning of the elements

The elements are positioned and adjusted along the previously marked road alignment. The element, which is to be connected to the already placed barriers, is positioned so that the lower face of the coupling is directly above the upper face of the coupling of the pre-positioned element. At this stage the end face of the to be positioned element is aligned with the end face of the pre-positioned element to ensure the connection of the concrete groove (concrete cut-out) and tongue (concrete protrusion) surfaces (see photo 4-6). It is important to avoid collision of neighbouring elements during installation and manipulation, in order to reduce any concrete damage or breakage.



Photo 4



Photo 5



Photo 6

In a further step the element is lowered and the adjoining couplings are slowly and evenly interconnected (see photos 7-9). The mating of the tongue/groove concrete profiles simplifies the final element positioning. The positioning of the elements should comply with the predefined alignment of the system and achieve a continuous and attractive appearance.



Photo 7



Photo 8



Photo 9

8.4. Anchoring of the elements

Required accessories / tooling:

- Threaded bolt DIN 976-M20x240-8.8 hot-dipped galvanised
- Hexagonal nut DIN 934-M20-8 hot-dipped galvanised
- Round washer DIN 125-A21-140HV hot-dipped galvanised
- Rectangle washer RW50_65 hot-dipped galvanised
- Injection adhesive (HILTI HIT-HY 200-A or technical equivalent)
- Drill hammer
- ø22 concrete hammer-drill bit
- Compressed air
- Steel brush
- Torque wrench

Important: The technical specifications and terms of usage of the injection adhesive manufacturer, described in the user's manual of the accompanying adhesive cartridge, are to be imperatively followed.

Following positioning and inspection of the alignment, the anchoring bore holes are drilled in the foundation to a depth of 120mm.using a concrete drill hammer with a \varnothing 22mm concrete hammer-drill bit

The bore hole should be cleaned and prepared according to the injection adhesive manufacturer directions. Attention should be taken that the bore hole is free from all dust, dirt particles and water.



Photo 10

The injection adhesive paste is injected into the prepared bore hole following the adhesive paste manufacturer's directions. The M20 threaded steel bar is fitted with rectangular (RW50_65) and round washers and nut and is inserted as group into the adhesive-filled bore hole. The already affixed M20 nut can be used as an end-point contact indicator for the correct steel bar insertion depth.



Photo 11



Photo 12



Photo 13

Only after expiration of the required curing time (see instructions of adhesive manufacturer) the nut is tightened to a torque of 100Nm using a torque-wrench.



Photo 14



Photo 15

8.5. Installation of the expansion joint elements and the expansion joint coupling (if required)

Additionally required accessories / tooling:

- Lifting coupling (Rd16 thread)
- Mushroom headed bolt ISO 7380-M12x30-A2
- Washer DIN 9021-13-A2

The expansion joint elements are installed (positioned) similar to the RB80A_8_H2/W1 (the standard elements) as described in points 8.3 and 8.4. Hence the elements are firstly positioned and then anchored. Ensure that between the two expansion joint elements there is a gap of X, to allow for the thermal expansion (see photo 17). The gap X is determined by the local specifications and requirements (gap of the bridge expansion joint), and by the ambient installation temperature. The precise gap length X between the expansion joint elements is provided by the contractor and in accordance with a characteristic temperature tables.



Photo 16



Photo 17

Following the positioning and anchoring of the expansion joint elements the correct positioning and alignment of the expansion-joint coupling is important: The side with the shorter chamfer should be placed over the in-concrete placed steel plate (see photos 18-20).



Photo 18

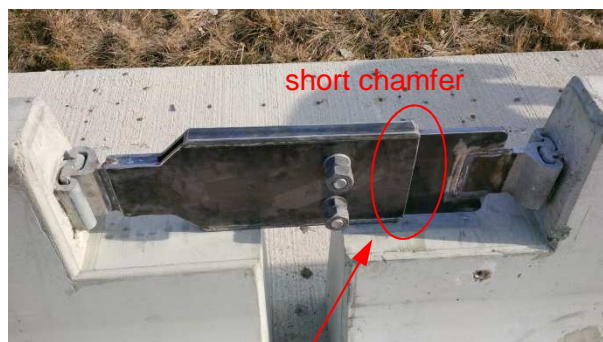


Photo 19

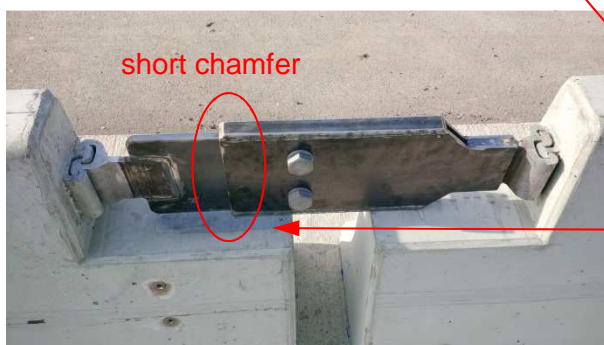


Photo 20

in-concrete steel plate

Now the cover plate is placed over the expansion joint system, using a lifting coupling (Rd16 round thread). The cover plate is fixed on both sides, using 6 pcs. mushroom headed screws ISO 7380-M12x30-A2 and washers DIN 9021-13-A2. Should the cover plate overlay the anchor bolts, it must be checked prior to the placing of the cover plate, that the nuts are tightened to the correct torque.



Photo 21



Photo 22



Photo 23

9. Further information

- 9.1. Before any lifting operation it is essential to check the safety barriers lifting anchors and all lifting equipment for wear or reduced lifting capacity.
- 9.2. Only experienced and suitably trained operators should carry-out this installation work.
- 9.3. A minimum working area width of 7 m for cranes and installation work is recommended, not including the minimum safety distance according to the national requirements and regulations for construction work on highways and expressways. In minimum 5 m on the crane side/installation side of the safety barriers and in minimum 2 m clearing on the far side of the safety barrier.
- 9.4. The location and the lengthwise alignment for the placing of the safety barriers should be identified by the roads/highways construction company.
- 9.5. There should be no obstacles within the working width.
- 9.6. The underlay must be level and free from foreign particle, ice and snow.
- 9.7. Lift and manipulate only one barrier at a time, in no circumstance should two or more barriers be simultaneously manipulated.
- 9.8. Barriers should remain in a horizontal plane when lifted, and it must be ensured that no part of the barrier or the lifting system/crane project into the active traffic-flow.
- 9.9. Barriers should be lifted and positioned avoiding any barrier damage.
- 9.10. Barriers should be installed according to the system plan (when provided).
- 9.11. Work from the traffic-free side of the barrier and at a safe distance from the traffic flow.
- 9.12. Technical drawings (including tolerances) for the installation of elements are available upon customer request.
- 9.13. All work sites with increased danger of falling from a height require safety measures for installation personnel, machines and work tools.