

STEELBLOC®
SAFETY GUARDRAILS

MANUAL INSTALLATION & MAINTENANCE

PRODIGY 7.20s 400

N2 W3 A

pile driven into soil

K770153A



**TAKING
ANOTHER
PERSPECTIVE**

STEELBLOC® PRODIGY COMES CRASH TESTED FOR MODULAR ROAD SAFETY

Experience the unexpected versatility beyond traditional guardrail designs.

STEELBLOC® realizes the concept of modular design throughout its whole product range. The elimination of complexity has been achieved through a significant reduction of individual parts and bolts. Thus enabling the unbelievable safety performance of STEELBLOC® safety barriers – confirmed and certified by Europe's most reputable test facilities and accreditation bodies.



One Post Design,
One Pile-Driving Depth,
Three Containment Levels.
Eliminating Complexity
at N2, H1 and H2.



PRODIGY 7.20s 400

N2 W3 A

pile driven into soil

K770153A

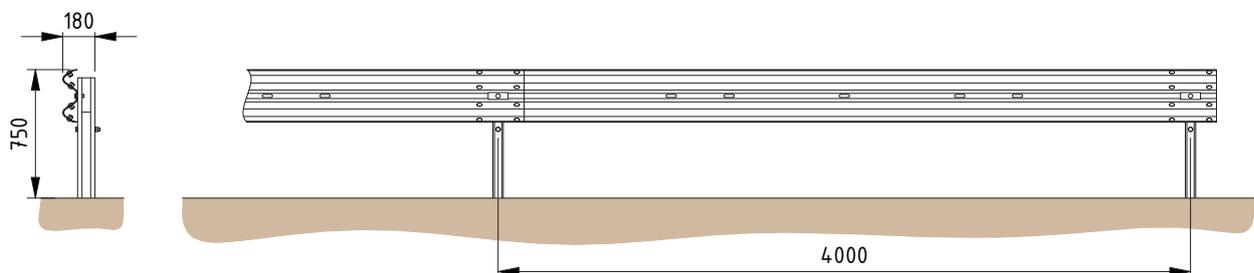
PRODUCT DATA SHEET

Performance class	N2 W3 NPD A
Working width W_N	W3 (1.0 m)
Vehicle intrusion VI_N	NPD (0.0 m)
Dynamic deflection	0.9 m
Tested system length	36.00 m
EC Certificate of Conformity	

System series	PRODIGY
Post spacing	4.00 m
Durability	S235JR; S355JR, galvanised acc. to EN ISO 1461

Element length	4.00 m
System height	0.75 m
System width	0.180 m

Mode of operation	single sided
Mode of installation	pile driven into soil
Installation drawing	K770153



DOCUMENT RELEASE AND STATUS

Date of issue: 15.12.2021



USEFUL INFORMATION

This technical manual was written in English.

All translations of this technical manual were carried out with greatest possible care. Translation errors particularly in technical terms and omissions are not excluded.

Specific national requirements are marked separately.

The figures and photographs in this manual do not always show the exact type of system described! The diagrams provide a corresponding explanation and description even when similar or other system types are shown for the purposes of illustration.

Errors and omissions excepted.

If there are obvious errors in the manual, please notify documentation@deltabloc.com. In the event of general questions, please consult the DELTABLOC® partner.

The documentation is continuously updated, the currently valid version is available in the DELTABLOC® Extranet (extranet.deltabloc.com). DELTABLOC® recommends the use of the DELTABLOC® extranet with mobile devices.

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1 GENERAL INFORMATION

1.1 AVAILABLE DOCUMENTATION

Each STEELBLOC® vehicle restraint system comes with comprehensive technical documentation. This technical documentation is structured in specific categories, enabling an efficient and up to date know-how transfer to authorities, contractors, producers, installers and operators.

The technical documentation consists of:

- ▶ Product Data Sheets
- ▶ Technical Manuals
- ▶ Technical Drawings



NOTE!

The latest versions of any technical documentation of STEELBLOC® Systems can be found on the DELTABLOC® Extranet website. Register on extranet.deltabloc.com to have access to the entire DELTABLOC® documentation!

This extensive documentation is required to ensure system conformity of the STEELBLOC® vehicle restraint system with European standard EN 1317-5.

1.1.1 TECHNICAL DRAWINGS

The following technical drawings are available on the DELTABLOC® Extranet website depending on the authorization of the DELTABLOC® installer, planer or stakeholder:

- ▶ **M-DRAWINGS SYSTEM**
M-DRAWINGS describe the respective basic general type of the DELTABLOC® vehicle restraint system. They contain the most important technical properties such as dimensions and safety performance.
M-DRAWINGS are available for all DELTABLOC® stakeholders.
- ▶ **K-DRAWINGS**
K-DRAWINGS describe the proper installation of the respective DELTABLOC® vehicle restraint systems and contain a list of all necessary components for proper assembly and order processing. It is the key-drawing for the unique identification of the specific DELTABLOC® restraint system.
K-DRAWINGS are available for all DELTABLOC® installers.
- ▶ **M-DRAWINGS COMPONENTS**
M-DRAWINGS COMPONENTS describe the quality standard, weight and main measures of the respective DELTABLOC® components. Depending on the respective DELTABLOC® system type the components might be patented or covered by industrial property rights.
M-DRAWINGS COMPONENTS are available for all DELTABLOC® installers.

► Q-DRAWINGSs

Q-DRAWINGSs or Quick Assembly Guides (QAG) are handy instructions to guide the installers through the installation process of the respective DELTABLOC® system types. It is meant to support the workers in order to achieve an efficient, accurate and safe assembly of the vehicle restraint system.

Q-DRAWINGSs are available for all STEELBLOC® installers.

1.2 NOTIFICATIONS, SIGNS AND SYMBOLS

The following notifications might be shown in the technical documentation:



USEFUL INFORMATION

This symbol indicates useful tips, recommendations as well as information for efficient and trouble-free operation.



NOTE!

This symbol indicates important hints and references to available documentation.



DANGER!

This combination of symbol and signal word indicates a possible or imminently hazardous situation that can cause damage, severe injury or death if not avoided.

The following signs and symbols are self-explaining and might be shown, amongst other such signs and symbols, in the STEELBLOC® technical documentation:



SAFETY NOTICE



WARNING NOTICE

2 PRODUCT DESCRIPTION

2.1 SCOPE

The vehicle restraint system described in this technical manual is part of the DELTABLOC® product family. It is tested according to the European standard EN 1317-1:2010 and EN 1317-2:2010 and was certified according to . It was developed as part of STEELBLOC® barrier series.

The product is made of components whose characteristic material is steel. It has a modular design and is intended for use in public road traffic areas. It serves to protect vehicle-occupants, in case their car is accidentally going off the road, the protection of third parties and the protection of objects.

The current document is valid for the STEELBLOC® product PRODIGY 7.20s 400 N2 W3 A.

- ▶ Installation drawing: K770153



USEFUL INFORMATION

For detailed information about the whole STEELBLOC® product range visit steelbloc.com

2.2 DENOMINATION

The denomination of the system type ist made up through the following structure:

- ▶ Brand: STEELBLOC®
- ▶ Product series: PRODIGY
- ▶ System height: 7 (total height of 0.75 m, second decimal rounded down)
- ▶ Post technology: Typ 20
- ▶ Post fixation: s (pile driven into soil)
- ▶ Performance class: N2 W3 A
- ▶ Post spacing: 400 (4.00 m)
- ▶ Type of beam: A
- ▶ Product ID: K770153A
- ▶ K-drawing: K770153
- ▶ Mode of installation: pile driven into soil
- ▶ Mode of operation: single sided

The unique identification of the restraint system is made possible by the Product ID:

- ▶ Product ID: K770153A

COMPOSITION PRODUCT ID	
NUMBER OF THE K DRAWING	PRODUCT ID INDEX
K770153	A

Table 1 | Composition of the Product ID.



USEFUL INFORMATION

The K-drawing or installation drawing is a clear representation of how to properly install the system. Among other things, it contains one or more parts lists for all the components required for installation and order processing.

DELTABLOC® systems that are installed using the **same** K drawing can be tested for different performance classes. In other cases, several product variants can be shown in the same K-drawing. The Product ID Index is used in order to be able to differentiate between these and to identify them clearly.

The Product ID is therefore made up of the number of the K drawing and the Product ID Index, a sequential alphabetical index.

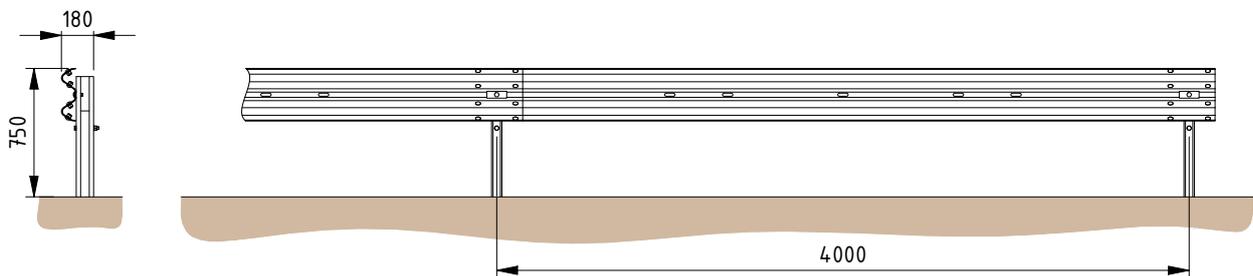


Figure 1 | System Overview. Refer to drawing K770153.

The installation drawing contains all necessary information for a proper installation in accordance to its CE-certification. It contains a list of all necessary components that are needed for the installation.



USEFUL INFORMATION

To provide the full safety performance of STEELBLOC® vehicle restraint systems, it is essential to maintain the requirements regarding installation and ground conditions. Always make sure that the system is installed according to the corresponding installation drawing.

2.3 APPROVED SYSTEM MODIFICATIONS

Approved system modifications often lead to new products which, as part of the documentation at DELTABLOC®,

receive their own product ID and their own product documentation (data sheet, manuals).

Only modifications which can be comparably used for several products are listed here.

2.4 DURABILITY

The STEELBLOC® products are galvanised according to EN ISO 1461 and EN ISO 10684. Their durability applies to the above mentioned standards.

Depending on the exposure to atmospheric corrosion, such as sea air, industrial air or exposure to thaw salt the expected durability of STEELBLOC® products may be reduced.

2.5 MATERIALS AND LABELLING

2.5.1 STEEL

The steel quality and coating properties are defined in the respective M-drawing components. It corresponds with the requirements of EN10025, EN10051 and EN ISO 1461.



USEFUL INFORMATION

STEELBLOC® safety guardrails are certified according to the regulations for durability established by EN 1317.

National regulations might require stricter durability regulations. Always make sure, that the used coating outreaches the required quality according to the specific national regulations!

2.5.2 LABELLING

For every STEELBLOC® safety guardrail will be a unique CE-Mark generated and provided. The document contains all necessary information according to EN 1317-5.

2.5.3 DISPOSAL AND RECYCLING

STEELBLOC® safety barrier elements consist of standard construction materials and are therefore fully recyclable.

- ▶ STEELBLOC® products do not contain any toxic substances or polluting materials.
- ▶ STEELBLOC® concrete elements do not contain any substances to be monitored.
- ▶ Recycle or dispose of individual parts of the safety barrier in accordance with applicable national regulations.

PRODIGY 7.20s 400

N2 W3 A



Waste is to be disposed of in an environmentally conscious manner by the STEELBLOC® assembly staff.



USEFUL INFORMATION

Remove waste, remaining materials and dirt during the entire construction and installation phase!



USEFUL INFORMATION

Always recycle or dispose in accordance with applicable national regulations!

3 SAFETY INSTRUCTIONS

The personal safety for all road workers and persons involved in the manufacture, transport and installation of STEELBLOC® vehicle restraint systems is of utmost importance. Always make sure to have trained personnel and follow respective safety instructions!

3.1 PERSONAL SAFETY

Personnel designated for the installation must be sufficiently qualified and trained to be able to perform the work to be carried out in a faultless manner and at a high level of quality.

All qualifications and know-how of personnel must be updated through regular training.



USEFUL INFORMATION

For proper training and education get in touch with the technical sales of DELTABLOC®!

STEELBLOC® recommends the deployment of "installation specialists for steel guardrails". The presence of a qualified supervisor, manager, foreman etc. for installation is necessary for the proper installation of STEELBLOC® vehicle restraint systems.

The responsibilities and authorities of the personnel for supervising, implementing or verifying works that may affect product conformity must be defined.

Works that may affect product conformity must be carried out by appropriately trained personnel. This training is obtained through suitable education, training, acquired skills and experience, proof of which must be documented and stored.



DANGER!

- ▶ Always carry out functional testing of installation equipment, power switches, emergency switches and the warning devices before each use!
- ▶ Always make sure to have complete and proper personal safety equipment available for the whole installation crew!
- ▶ Adjust capacity of lifting equipment to the characteristics of the load!
- ▶ Do not linger beneath suspended loads under any circumstances!



WEAR HEAD PROTECTION!

WEAR SAFETY FOOTWEAR!

WEAR HIGH-VISIBILITY CLOTHING!

3.2 CONSTRUCTION SITE SAFETY

All workers on site must be aware of all hazards! Identify sources of danger during the setup of the construction site and initiate suitable countermeasures.

Ensure the safety of all traffic participants on the installation sites in public road construction!



DANGER!

- ▶ Implement a standard construction site safety plan when setting up the installation site!
- ▶ Always wear a high-visibility waistcoat when working near road traffic!
- ▶ Pay attention to the coordination of construction site traffic!
- ▶ Always conform the minimum requirements according to the specific national regulations!



WEAR HEAD PROTECTION!

WEAR SAFETY FOOTWEAR!

WEAR HIGH-VISIBILITY CLOTHING!

4 APPLICATION

4.1 STANDARD CONFIGURATION FOR INSTALLATION

The following steps on the next pages serve as an assistance for the installation process.

4.1.1 PREPARATION FOR INSTALLATION

The following preparatory measures shall be taken into account before installing the STEELBLOC® vehicle restraint system.

4.1.2 PERSONAL PROTECTIVE EQUIPMENT AND SAFETY MEASURES

When installing a STEELBLOC® vehicle restraint system, protective equipment must be worn in accordance with Regulation (EU) 2016/425 and national regulations.



DANGER!

- ▶ Implement a standard construction site safety plan when setting up the installation site!
- ▶ Always wear a high-visibility waistcoat when working near road traffic!
- ▶ Pay attention to the coordination of construction site traffic!
- ▶ Always follow national regulations respectively Regulation (EU) 2016/425!



WEAR HEAD PROTECTION!

WEAR SAFETY FOOTWEAR!

WEAR HIGH-VISIBILITY CLOTHING!

4.1.3 REFERENCE LINE

The installation is usually carried out with a standard distance to the reference line.

An exemplary application of the reference line can be found in the installation drawing (K-drawing). The norm distance between the system and the reference line must be adjusted according to the specifications of the national regulations. If you have any further questions, please contact the DELTABLOC® partner.

4.1.4 PREPARATION AND SETUP OF THE SITE

All required road safety measures need to be executed in accordance to national rules. Make sure that there is sufficient space in the installation area to be able to place and distribute the STEELBLOC® system components. Furthermore there must be sufficient space to be able to maneuver with the assembly machines, such as the post rammer, trucks with cranes. Always consider the relevant free moving space for the road workers.

Before starting installation work, check the subsoil for the suitability of pile driving and inquire about the location of supply lines, like sewage drain or electricity cables.

Mark the reference line used for the installation of the restraint system.

4.1.5 DELIVERY AND TAKEOVER OF COMPONENTS

The STEELBLOC® system components required for installing the vehicle restraint system must be visually inspected for damage and completeness immediately after delivery to the installation site. The presence of the required certificates must be verified. In case of a defect contact the DELTABLOC® partner immediately.



USEFUL INFORMATION

Always check delivery notes. Only use original STEELBLOC® system components.

If the STEELBLOC® system components provided for the installation of the vehicle restraint system must be temporarily stored, they must be stored professionally and safely against damage on a sufficiently load-bearing surface.

Components which have to be transported from the storage area to the installation area must be handled professionally and secured in accordance with national guidelines.

Components distributed in the work area need to be installed at short notice and within the duration of the traffic management.

4.2 FOUNDATION

In order to ensure the full capability of the STEELBLOC® vehicle restraint system, an adequate consistency and carrying capacity of the subsoil is necessary.

4.2.1 GROUND CONDITIONS

To assess the consistency and carrying capacity of the subsoil the following “Soil Condition Classes” may be considered as well as the respective suitability and measures:

SOIL CONDITION CLASSES			
CLASS	DESCRIPTION / CHARACTERISTICS	SUITABILITY	MEASURES
1	Surface soil with soft or weak consistency like grown earth, top soil or humus.	Not suitable	Soil replacement needed. Alternatively install a strip foundation and change to STEELBLOC® type c.
2	Soil which is easy/medium/hard to detach or separate. Mixture of sand, gravel, silt and clay with stones. The share of stones which are larger than 63 mm grain size and do not exceed a volume of 0.01 m ³ . is more than 30 % by weight.	Suitable	No measures required.
3	Easy detachable rock. Rocks that have an inner mineral-bonded cohesion but are very cleft, brittle, crumbly, schistous, soft or weathered.	Suitable	No measures required.
4	Rock which is hard to detach. Rocks that have an inner mineral-bonded cohesion and high structural strength, only slightly fissured or weathered.	Not suitable	Drilling to the required depth. Drill hole diameter min. 170 mm. Fill drill hole with suitable material and compact it before ramming the post.

Table 2 | Soil condition classes



USEFUL INFORMATION

All measures for producing a sufficient consistency and carrying capacity of the sub-soil must be coordinated with the client.

4.3 ADJUSTMENT TO LOCAL CONDITIONS

4.3.1 STANDARD CONFIGURATION FOR INSTALLATION

This STEELBLOC® vehicle restraint system is designed and certified for the application on public roads. The standard configuration for installation including all necessary parts and specifications is represented in the specific installation drawing.

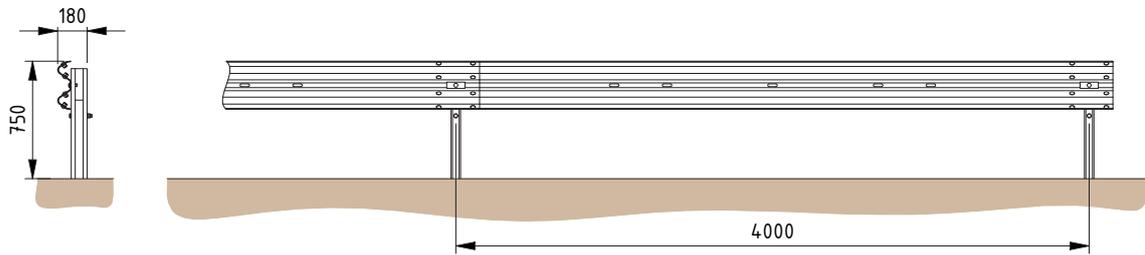


Figure 2 | Detail out of the installation drawing K770153.

4.3.2 LOCAL CONDITIONS

Due to specific local conditions, it may be necessary to adapt the STEELBLOC® restraint system to these specific local conditions. The following chapters cover the most common deviations from the standard arrangement.

For cases which are not mentioned here, the manufacturer shall be contacted for project support.



DANGER!

Adjustments might have an influence on the safety performance of the system.

Any adjustment to local conditions must meet national regulations and/or must be confirmed by the overseeing authority.

4.3.3 FITTING ELEMENTS

If local conditions require the installation of fitting parts, the following requirements must be considered:

- ▶ All cutting work on the longitudinal elements of the system must only be carried out with a cutting-off machine or saw.
- ▶ Drilling of bolt holes must be carried out professionally using a drilling machine and a suitable drill.
- ▶ Appropriate corrosion protection of any machined surface by applying zinc coating materials must follow EN ISO 1461.
- ▶ Given post spacing must not be exceeded.
- ▶ The pattern of the retro-fitted bolt holes in the overlapping area of the fitting elements must correspond to the patterns of the standard bolt holes.
- ▶ The mechanical properties of the retro-fitted connection of the fitting element must meet the technical specifications of the standard connection of original elements.
- ▶ The distance of any retro-fitted bolt hole to the cutting face of the fitting element must be minimum 40 mm.
- ▶ Hole diameter must be kept (no widened, thorned, burnt holes)



USEFUL INFORMATION

Components may only be machined professionally with drilling and cutting devices. Any cutting with welding or flame cutting equipment, punching tools or manual cutting is not allowed.

Fitting elements should be avoided in the area of transitions and adjacent to dilatation joints. The installation of these elements must be kept to a minimum quantity.

4.3.4 UNEVEN GROUND CONDITIONS

If the system is installed on an uneven ground surface, the position of the longitudinal elements must be adapted to the alignment of the continuous longitudinal system components.



USEFUL INFORMATION

- ▶ Installing the barrier on uneven ground conditions might result in longer installation time.
- ▶ Consider the tolerances for installation.

4.3.5 SLOPES

Longitudinal slopes of the road do not have a significant influence on the safety performance of STEELBLOC® safety barriers. For cross slopes instead it is necessary to follow the instructions below for optimum performance.

4.3.6 FALLING SLOPE

In case of installing on slopes (falling inclination up to 12 % within a distance of up to 0.6 m from the edge of the carriageway) the height reference of the restraint systems is the edge of the carriageway. Therefore the restraint system must be adjusted in height. To ensure the minimum ramming length of the posts there might be the need for longer STEELBLOC® posts.



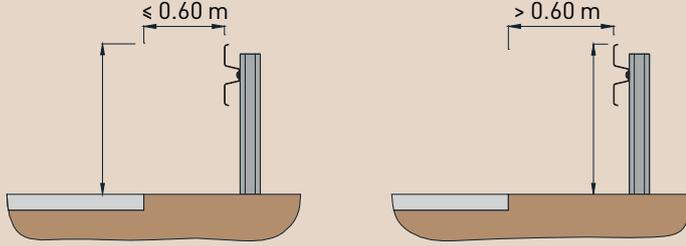
USEFUL INFORMATION

- ▶ To confirm the pile ramming depth please refer to the K-drawing.
- ▶ Tolerances must be observed according to the national regulations.

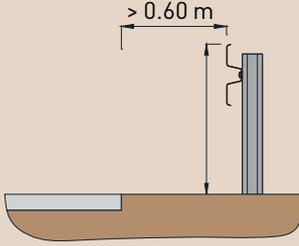
If the distance from the edge of the carriageway is more than 0.6 m, the installation height does refer to the verge level directly in front of the STEELBLOC® vehicle restraint system.

If the inclination is more than 12 % and the distance from the edge of the carriageway is more than 0.3 m, it is recommended to contact the project manager.

The posts must be installed vertically.



Original system height to road level



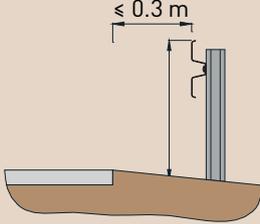
Original system height to ground level

FALLING SLOPE
 $\leq 12\%$

System arrangement on falling slopes at inclinations $\leq 12\%$

Box 1

Symbolic drawing



Original system height to ground level

FALLING SLOPE
 $> 12\%$

System arrangement on falling slopes at inclinations $> 12\%$

Box 2

Symbolic drawing

INSTALLATION ON FALLING SLOPES		
INCLINATION	DISTANCE FROM REFERENCE LINE	MEASURE
$\leq 12\%$	$\leq 0.6\text{ m}$	height of the system has to be aligned with the edge of the carriageway
	$> 0.6\text{ m}$	height of system has to be aligned with the verge level in front of the system
$> 12\%$	$\leq 0.3\text{ m}$	height of system has to be aligned with the verge level in front of the system
	$> 0.3\text{ m}$	contact the project manager

Table 3 | Installation on falling slopes

4.3.7 RISING SLOPE

In case of a rising slope (rising inclination up to 12%), the installation height is directly related to the verge level in front of the vehicle restraint system.

The posts must be installed vertically.

If the inclination is more than 12%, please contact your local DELTABLOC® partner for project support.

INSTALLATION ON RISING SLOPES

INCLINATION	DISTANCE FROM REFERENCE LINE	MEASURE
≤ 12 %	any	height of system has to be aligned with the verge level in front of the system
> 12 %	any	contact the project manager

Table 4 | Installation on rising slopes



USEFUL INFORMATION

National regulations might define stricter requirements regarding the maximum inclination of slopes.

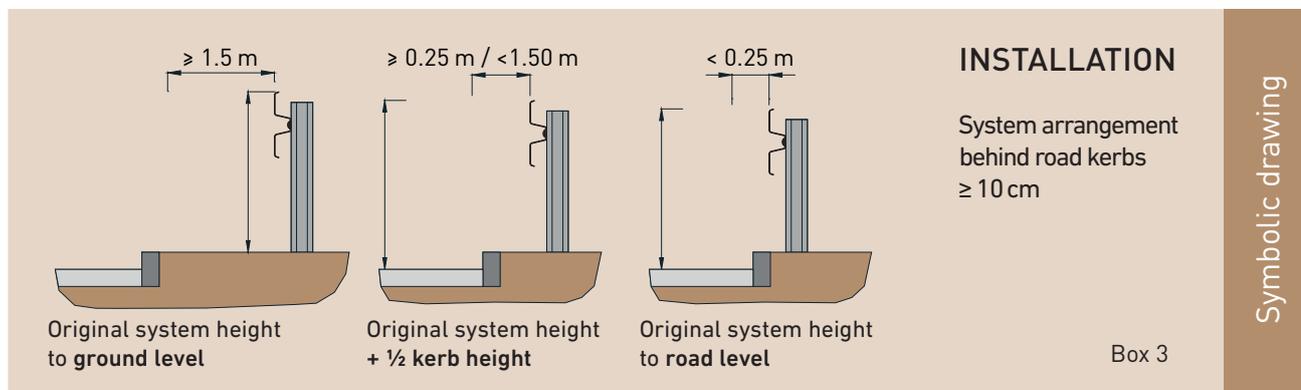
4.3.8 INSTALLATION BEHIND KERB STONES

Depending on the height of road kerbs in front of a STEELBLOC® vehicle restraint system and the distance between the road kerb and the system, specific measures have to be taken into consideration to allow full safety performance.

INSTALLATION BEHIND KERB STONES

ROAD KERB HEIGHT	SETBACK	MEASURE
< 10 cm	any	no measure required
≥ 10 cm	< 0.25 m	height of the system has to be aligned with the edge of the carriageway
	≥ 0.25 m and < 1.5 m	height of the system has to be aligned with the edge of the carriageway plus half of the road kerb height
	≥ 1.5 m	height of system has to be aligned with the ground level in front of the system

Table 5 | Installation behind road kerbs



4.3.9 RADII AND CURVED SECTIONS

When installing the STEELBLOC® vehicle restraint system in curved sections, specific measures have to be taken into consideration to allow full safety performance.

INSTALLATION OF CURVED SECTIONS	
CURVE RADIUS	MEASURE
≤ 30 m	pre-bend all longitudinal parts according to the curve radius (concave and convex)
> 30 m	realize the curve radius by elastic bending of the longitudinal parts along the posts

Table 6 | nstallation of curved sections

It is important to ensure that the overlapping section of any curved longitudinal elements provide a tight fit and do not diverge.



USEFUL INFORMATION

If the STEELBLOC® vehicle restraint system includes specific longitudinal parts or beams with high stiffness pre-bending might not result in the needed curve radii. In this case these longitudinal elements must be installed in shortened lengths or with angled connectors to realize the respective curves.



DANGER!

In general internal stress through elastic bending of longitudinal parts has to be minimized. In case of doubt always prefer pre-bending of longitudinal parts.

4.3.10 ADJUSTMENT OF THE POST SPACING

According to the EN 1317 impact test and the respectively certified system arrangement, the distance between posts must be observed. If this distance can not be met on a short length the distance between the posts adjacent to the obstacle can be reduced.

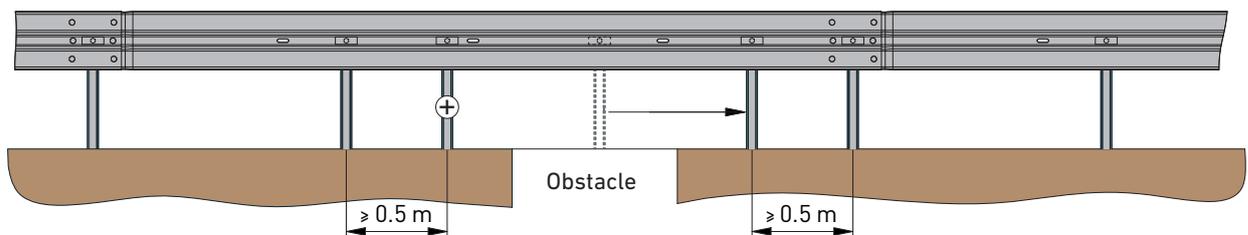


Figure 3 | Adjustment of post spacing. Symbolic drawing.



USEFUL INFORMATION

It is only allowed to move one post out of its dedicated position according to the certified system arrangement.

- ▶ Move the post to the side of the obstruction.
- ▶ Check the distance to each neighbouring post.
- ▶ The offset of the post is to be kept as low as possible. An additional post is to be rammed within the area where the original post spacing was increased.
- ▶ The minimum post spacing is 0.50 m.
- ▶ The modified post spacing must not exceed the original post spacing.
- ▶ In case the maximum post spacing can not be kept, contact the manufacturer..

4.3.12 INSTALLATION OF TERMINALS

Realignments must be arranged with a maximum inclination of 1:20. Only in exceptional cases a steeper inclination is allowed in accordance with the overseeing authority.



USEFUL INFORMATION

If national regulations or guidelines prescribe other angles of inclination for realignments, these regulations shall apply.

4.3.13 INSTALLATION IN TARMACKED UNDERGROUND

If it is necessary to install the STEELBLOC® vehicle restraint system on a paved surface due to specific local conditions, the installer has to foresee drill holes with a diameter of ≥ 200 mm for every post. After filling the hole with gravel and compacting, the post can be rammed equivalent to the standard ramming procedure

4.3.14 MINIMUM INSTALLATION LENGTH

The minimum installation length of the STEELBLOC® vehicle restraint systems corresponds to the system length which was verified during the impact test according to EN 1317-2. The connection or lowering **elements are not included** in the minimum installation length.

In case of a shorter installation length in a specific project, please contact the manufacturer.



USEFUL INFORMATION

A shortening of the minimum installation length is not permitted for the protection of individual hazards, where compliance with the working width is absolutely necessary.

The protection of hazards is generally regulated in the national regulations for the planning of vehicle restraint systems. If the approach length and departure length are not defined in the national regulations, the following recommendations can be used.

In principle, full system performance can be guaranteed after 1/3 of the test length.

The approach length of the vehicle restraint system in front of the area to be protected must be planned so that full system performance can be guaranteed in the area in need of protection (at least 1/3 L_t approach length and 1/3 L_t lag length) and vehicles cannot drive behind the area in need of protection if the system drives behind reachable.

Overall, the minimum installation length of the system must be adhered to as described above!

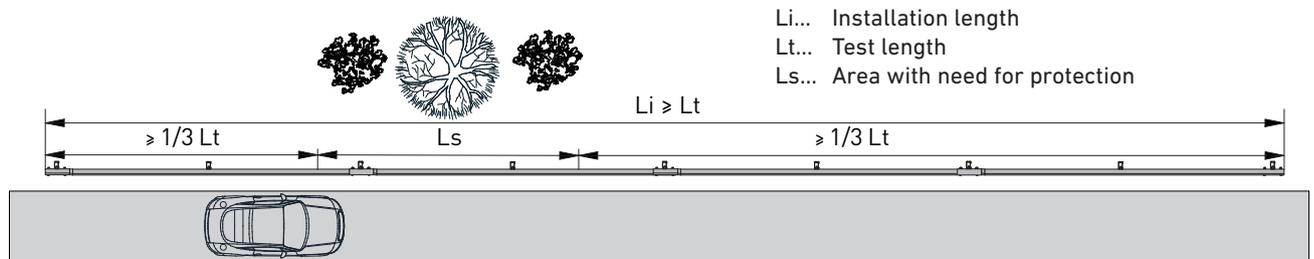


Figure 4 | Approaching and departing length.



USEFUL INFORMATION

National regulations or special applications may require different lead or lag lengths.

4.3.15 TAPERS

Tapers should be carried out in a ratio of 1:20 (width: length) and as flat as possible.

The vehicle restraint system should not be tapered in the area of obstacles.

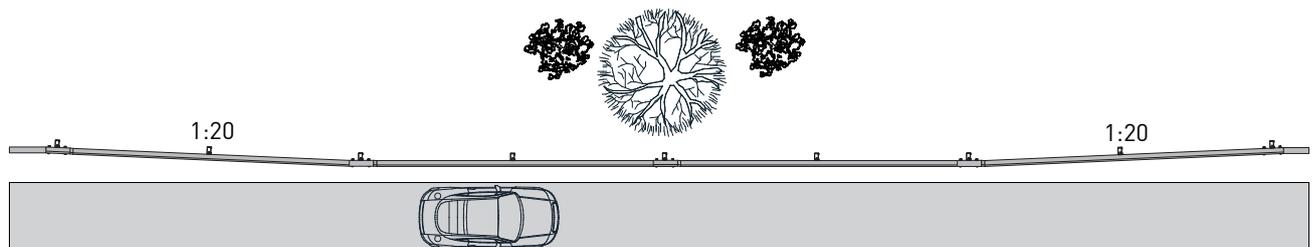


Figure 5 | Tapers.


USEFUL INFORMATION

National guidelines and regulations must be followed.

4.3.16 OBSTRUCTIONS WITHIN THE WORKING WIDTH

The distance between the STEELBLOC® vehicle restraint system and the reference line for live traffic might be reduced if an obstacle or obstruction exists within the working width of the system.


USEFUL INFORMATION

National guidelines and regulations must be followed.

4.3.17 EMBANKMENTS

Embankments might influence the safety performance of the STEELBLOC® vehicle restraint system if they are located within the working width.

Take account of all descending and ascending embankments in the layout plans!

EMBANKMENTS		
TYPE	LOCATION	MEASURE
Ascending embankment	Outside the working width	No measure required.
	Within the working width	Acceptable influence on the safety performance has to be expected, contact the project manager or select a safety barrier with a lower working width.
Descending embankment	Outside the working width	No measure required.
	Within the working width	Influence on the safety performance has to be expected, contact the project manager or select a safety barrier with a lower working width.

Table 7 | Embankments.

The material of ascending and descending embankments must meet general requirements in terms of consistency, load capacity and drainage capability.

4.3.18 CLIMATIC CONDITIONS

This STEELBLOC® vehicle restraint system is suitable for all basic climatic conditions covered by EN ISO 1461. The safety performance is not influenced by basic climatic conditions.

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5 INSTALLATION

5.1 GENERAL

The assembling of a STEELBLOC® vehicle restraint system requires trained and qualified specialist personnel. Specific training and preparation are required to ensure a safe and efficient installation.

Contractors and installers can ask for project-related technical support from the manufacturer as needed.

The K-drawing contains the parts list, main dimensions and the specific information needed to correctly install the STEELBLOC® vehicle restraint system.

In the next pages the Q-drawing (Quick Assembly Guide) can be found. This drawing serves as a step-by-step guide. It gives additional information and mounting tips to reduce installation times and avoid possible mistakes during the installation process.

The M-Drawings of the single STEELBLOC® vehicle restraint system components can be found on the DELTABLOC® Extranet website.



DANGER!

- ▶ The Q-drawing is only valid in use with the corresponding K-drawing.
- ▶ Please consider national regulations for possible stricter and/or additional requirements!

Please check the correct version of your product.

The current document is valid for:

- ▶ Vehicle restraint system name: PRODIGY 7.20s 400 N2 W3 A
- ▶ Installation drawing: K770153



NOTE!

- ▶ After the installation always check the system and full conscientiously the STEELBLOC® self monitoring form.

5.1.1 COMPONENTS

STEELBLOC® safety guardrails are equipped with premium quality components. All components are produced according to the respective product standards at highest quality. A full traceability is guaranteed according to EN 1317-5.



NOTE!

A list of all components needed for installation of the specific STEELBLOC® safety guardrail is included in every K-drawing.

NO.	PCS/M	ART. NO	
1	1.50	FS16.0027.46-01	HRK-Schraube
2	0.75	FS16.0045.88-03	HRK-Schraube
3	0.75	FS16.0130.88-02	Sechskantschrau
4	0.75	FP16.0115.50-00	Decklasche M16,
5	2.25	FW16.7091.10-00	Scheibe M16, 30
6	0.75	FW18.0000.20-00	Scheibe M18, 40
7	0.25	LE01.4000.30-00	Schutzplanken
8	0.75	PD12.1500.40-00	Pfosten C100
9	0.75	PS32.0900.40.00	Pfosten U9

COMPONENTS PARTS LIST

Refer to the parts list in the K-drawing.

K-drawing

Box 4

5.1.2 EQUIPMENT AND TOOLS

The correct installation of the STEELBLOC® vehicle restraint system requires the provision of appropriate tools and machinery. This includes:

- ▶ Post rammer with associated equipment
- ▶ Post pulley
- ▶ Drill up to 24 mm and appropriate drill bits
- ▶ Angle grinder with corresponding cutting wheel
- ▶ Level
- ▶ Measuring tape or folding rule
- ▶ Sledgehammer
- ▶ Impact wrench
- ▶ Torque wrench



USEFUL INFORMATION

Please inform yourself before beginning the assembly whether additional tools or machines are necessary for a correct installation.



DANGER!

Before using tools, machines or hydraulic, pneumatic or electric equipment, identify and consider potential hazards for safe handling. Always read manuals and instructions first.

All tools, machines and vehicles which are necessary for the installation of the product must be reliable and safe in operation. Furthermore they need to be capable of performing their respective tasks.

5.2 DIMENSIONS, GEOMETRY AND TOLERANCES

The installation of STEELBLOC® vehicle restraint systems requires a specific accuracy to ensure a proper safety performance. The following geometrical tolerances must be considered when installing a STEELBLOC® vehicle restraint system.

5.2.1 TOLERANCES FOR INSTALLATION

For the installation of the STEELBLOC® vehicle restraint system, the following tolerances should not be exceeded.

TOLERANCES FOR INSTALLATION		
REFERENCE	TOLERANCE	REMARKS
Distance of the posts in longitudinal direction	± 100 mm	
Vertical angle deviation of the post	± 10 %	
Deviation of the longitudinal post alignment	± 20 mm	on 4 m system length
Height alignment deviation of the system	± 20 mm	on 4 m system length
System height deviation	± 30 mm	

Table 8 | Tolerances for installation.



USEFUL INFORMATION

- ▶ The STEELBLOC® vehicle restraint system needs to be installed as tested and certified. The installing tolerances listed above should only be used in exceptional cases.
- ▶ Always consider to strictly follow the specific national regulations.

5.2.2 TIGHTENING TORQUE FOR BOLTS

All tightening torques must correspond to the values listed in the following table.

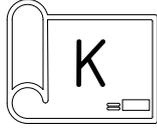
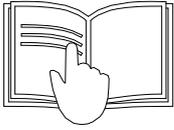
TIGHTENING TORQUE FOR BOLTS	
TYPE	TIGHTENING TORQUE
M10	min. 15 Nm
M12	min. 20 Nm
M14	min. 40 Nm
M16	min. 70 Nm
M20	min. 130 Nm

Table 9 | Tightening torque for bolts.

5.3 INSTALLATION STEPS

The next pages serve as a guide to the installation process.

1



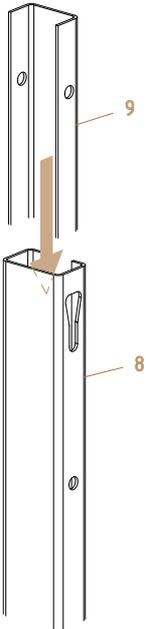
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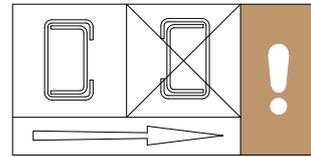
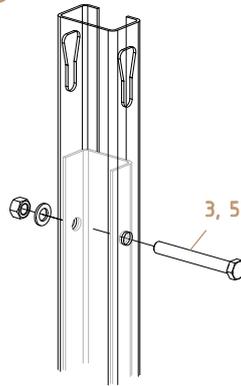
$\geq Nm_{min}$



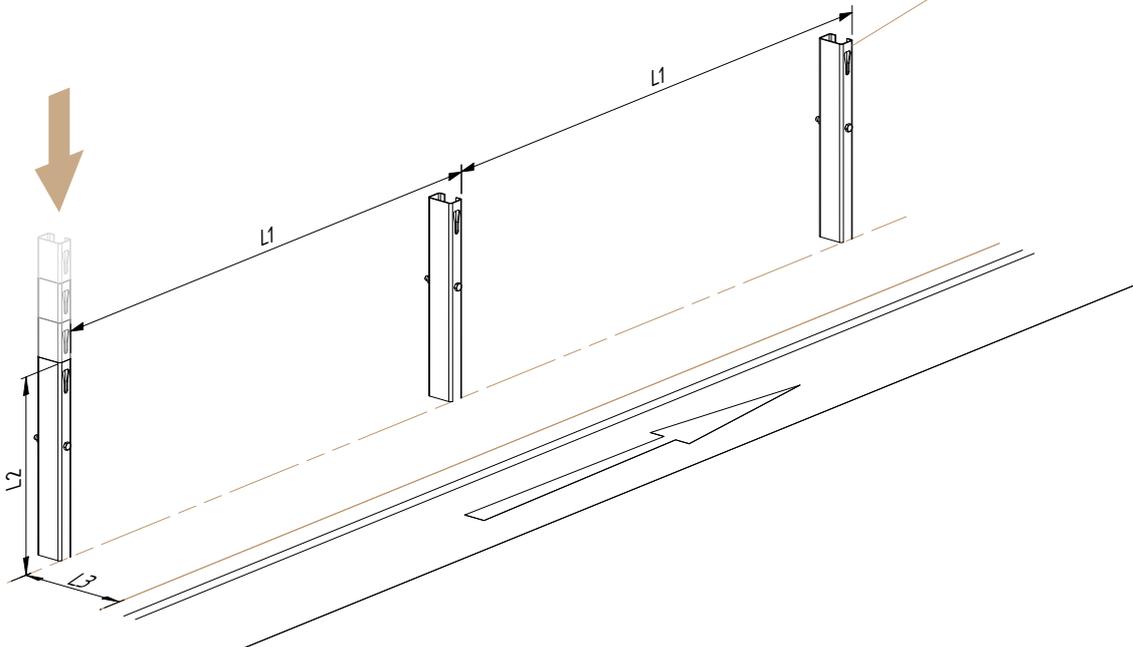
2



3



4

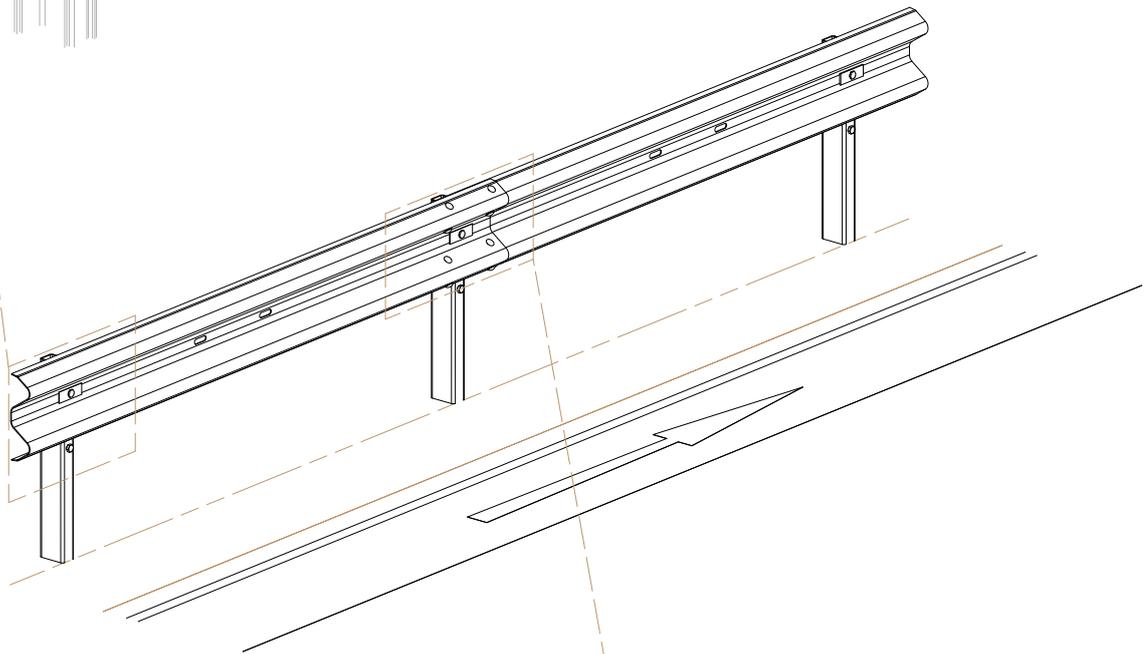
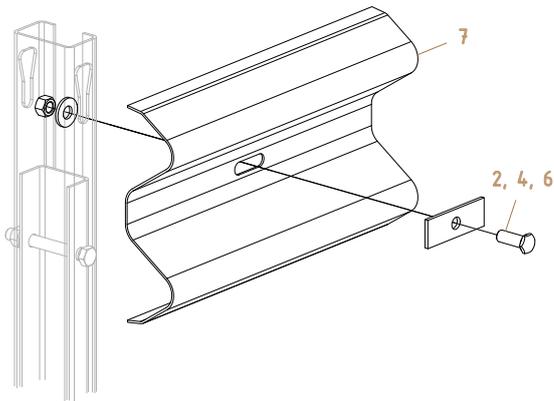


PRODIGY 7.20s 400

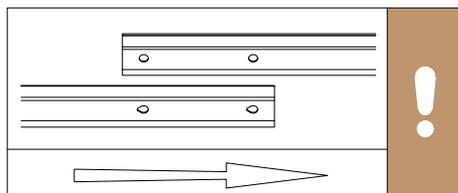
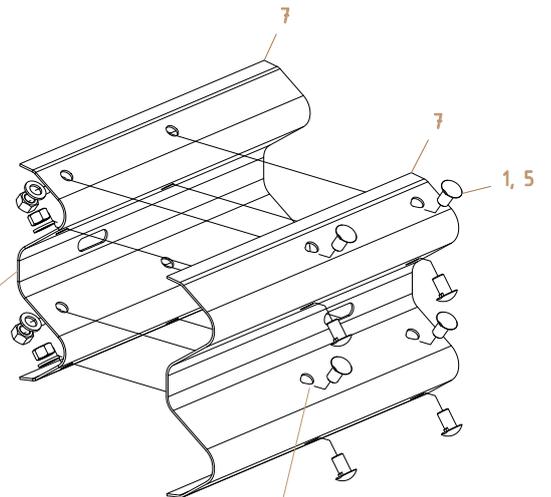
N2 W3 A



5



6



6 OPERATION & MAINTENANCE

6.1 INSPECTION

Every 12 months a visual inspection of the STEELBLOC® vehicle restraint system is required. For documentation purposes the STEELBLOC® self monitoring form in the annex should be used.

6.2 MAINTENANCE

The system is maintenance free. However, every 12 months a visual inspection is required. The areas in front of and behind the steel barriers should be cleaned on demand and also checked annually.

6.2.1 REPAIR

If repair of a STEELBLOC® vehicle restraint system is required, it has to follow specific rules to ensure the original safety performance.

- ▶ All components which have a permanent (plastic) deformation must always be replaced.
- ▶ Deviation up to 30 cm from the line:
An alignment of the construction can be repaired if the restraint system or any component is not permanently deformed. As a result the expanded post holes must be filled and sufficiently compacted after aligning. While aligning the construction damage to the zinc surfaces must be avoided. Discontinuity on the zinc coating must be remedied by professional application of zinc coating materials according to EN ISO 1461.
- ▶ Deviation more than 30 cm from the line:
Replace all components related to the affected section.

When repairing the restraint system, only new and untapped components must be used as well as fixing material.



USEFUL INFORMATION

Always use the STEELBLOC® self-monitoring form after reparation works.
Please consider national regulations for possible stricter requirements.



USEFUL INFORMATION

Application of longitudinal fitting pieces for repair:

- ▶ In the repair process, fitting pieces are only in exceptional cases allowed, even if this results in increased disassembly and assembly costs.



DANGER!

The reuse of components can result in reduction or loss of the safety performance.

- ▶ The reusability of components may only be carried out after consultation with the client and within a construction project.
- ▶ The use of reconditioned components by means of retro-galvanizing is not allowed.
- ▶ The fixing material, such as bolts, washers and nuts which has been disassembled during repair must not be reused.
- ▶ Always check national regulations before reusing any components.

Requirements for the reusability of components for repair are:

- ▶ Comply with the installation instructions for the newly constructed restraint system
- ▶ The manufacturer's identification and the traceability marking are still recognizable
- ▶ The year of manufacture is not older than 15 years
- ▶ No visible deformations
- ▶ No visible damage
- ▶ Zinc coating thickness on batch galvanized components must be at least 30 µm
- ▶ Other zinc coatings must reach at least 50% of the original minimum thickness.



USEFUL INFORMATION

The restraint system cannot receive a new CE mark when reusing components.

6.2.2 REPLACEMENT, DISASSEMBLING AND DISPOSAL

The safety barrier must not be disassembled without previous approval.

The entire STEELBLOC® vehicle restraint system is recyclable and does not contain any polluting materials or toxic substances. The system has to be exploited or disposed according to the specific national regulations.



DANGER!

The re-use of damaged or withdrawn components is prohibited!

7 TRANSPORT & STORAGE

The STEELBLOC® system components required for installing the restraint system must be checked for completeness and potential transport damage immediately upon receive. In case of an irregularity contact the manufacturer immediately.

If STEELBLOC® system components must be temporarily stored, it is recommended to store them professionally and safely against damage on a sufficiently load-bearing surface. Always make sure to protect any STEELBLOC® system components against environmental influence when storing.

Components which have to be transported from the storage area to the installation area must be expertly handled and secured in accordance with European and national guidelines.

Components deposited in the work area need to be installed directly within the duration of the work-zone traffic management.



DANGER!

- ▶ Always ensure safe handling, transport and storage of STEELBLOC® system components.
- ▶ Follow national regulations on transport safety when securing and fixing STEELBLOC® system components on trucks and transport vehicles.



WEAR HEAD PROTECTION!
WEAR SAFETY FOOTWEAR!
WEAR SAFETY CLOTHING!
WEAR GLOVES!



USEFUL INFORMATION

National regulations might require other or additional safety equipment!

7.1 RECOMMENDED EQUIPMENT

- ▶ Forklift, crane
- ▶ Load-handling devices (belts, chains, etc.)
- ▶ Timber skids

7.2 TRANSPORT



USEFUL INFORMATION

The following information to the transportation process describes the minimum requirements. National regulations might define stricter requirements.

- ▶ Place longitude elements on timber skids.
- ▶ Place post elements on timber skids or pallets.
- ▶ Load smaller components collectively in transport carrier boxes.
- ▶ Weight information about the components can be found on the M-drawing components.



DANGER!

- ▶ Consider the maximum permissible axle weight of the transport vehicle.
- ▶ Consider the maximal deviation of the base area.
- ▶ Adjust the capacity of the lifting equipment to the characteristics of the load (weight, centre of gravity and point of contact).

7.2.1 REQUIREMENTS TO THE STORAGE YARD

A covered and clean storage of mounting parts is recommended to avoid the developing of rust and to provide a longer durability. The storage place must be even and stable.

Consider acceptable stacking height.

7.3 STORAGE REQUIREMENTS

7.3.1 STORAGE REQUIREMENTS MOUNTING PARTS & FASTENERS

- ▶ Store mounting parts on timber skids or pallets.
- ▶ Store smaller mounting parts and fasteners collectively in transport boxes. Make sure to label the transport boxes well visible.

7.3.2 LONGITUDE ELEMENTS AND POSTS



STORAGE OF LONGITUDE ELEMENTS

Use timber skids for longitude elements storage. Distribute them evenly for a safe and stable storage.

Box 5

Longitude elements



STORAGE OF POST ELEMENTS

Use timber skids or pallets for the storage of post elements. Distribute them equally and fasten them to prevent from falling over.

Box 6

Post elements



USEFUL INFORMATION

Weight specifications can be found in the specific M-drawing components.

8 APPENDIX

In the following appendix a STEELBLOC® self monitoring form can be found.

STEELBLOC® SELF MONITORING FORM
INFORMATION

Customer:

Executing company:

 Contract / Repair contract number. /
 from:

Construction site:

 Person in charge
 (Name, direct mobile number):

Name of employees:

Installed vehicle restrain system:

Type of work:	Delivery	<input type="checkbox"/>	Installation / Conversion	<input type="checkbox"/>
	Delivery and installation	<input type="checkbox"/>	Installation / Repair	<input type="checkbox"/>

APPROVAL CERTIFICATION, CHOICE AND POSITIONING OF THE SYSTEM

a	Valid certificate of consistency of performance [EC Certificate of Conformity] available?	<input type="checkbox"/>
b	Installation instructions available?	<input type="checkbox"/>
c	System assembly corresponds to the installation instructions?	<input type="checkbox"/>
d	Additional national regulations checked and fulfilled ?	<input type="checkbox"/>

SYSTEM ASSEMBLY

a	Guard rail joints overlapping in direction of traffic?	<input type="checkbox"/>
b	Post closed in direction of traffic?	<input type="checkbox"/>
c	Post distance maintained?	<input type="checkbox"/>
d	Installation height according to installation instructions?	<input type="checkbox"/>

FITTINGS

a	All screws plus washers assembled?	<input type="checkbox"/>
b	Screws according to installation instructions?	<input type="checkbox"/>
c	Tightening torque for screws observed?	<input type="checkbox"/>

SUBSEQUENT PROCESSING ON SITE (FURTHER FITTINGS)

a	Minimum length of fitting pieces (750 mm) observed?	<input type="checkbox"/>
b	Beam overlap (no exceptions) at least 300 mm?	<input type="checkbox"/>
c	Outer drilled holes 40 mm distant from safety barrier beam end?	<input type="checkbox"/>
d	Hole diameter observed (no widened, mechanically expanded or burnt holes)?	<input type="checkbox"/>

OPTICAL LINE GUIDANCE AND OTHERS

a	System aligned in height?	<input type="checkbox"/>
b	System aligned in the longitudinal direction?	<input type="checkbox"/>
c	Distance to the edge of the track observed?	<input type="checkbox"/>
d	Obstructions in the working width eliminated?	<input type="checkbox"/>

Remarks:

Name and signature of the contractor:

Place and date:

STEELBLOC[®] COMES FROM KIRCHDORFER

KIRCHDORFER ROAD & TRAFFIC.
We stand for road safety since 1995.



The Austrian family owned industry group has a long history in cement production, construction minerals and concrete. Since the introduction of DELTABLOC[®] concrete safety barriers in 1995 KIRCHDORFER is a pioneer in the field of vehicle restraint systems.



STEELBLOC® PROTECTS YOU WITH MODULAR ROAD SAFETY

The holistic safety concept for the roadside
developed by DELTABLOC®.



KIRCHDORFER
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DELTABLOC®

DELTABLOC INTERNATIONAL GMBH

Kirchdorfer Platz 2
A-2752 Wöllersdorf, Austria
office@deltabloc.com
+43 57715 / 470 – 0
steelbloc.com

HOME OF ROAD SAFETY