

# **Installation Manual Easy-Rail NA 1.33**

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# **1 General Information**

## **1.1 Preliminary Notes**

The EasyRail NA 1.33 restraint system is made primarily of the following elements:

- Guardrail beam ER NA, perforated
- Post C-100-60-25
- Noise Absorption Panel
- Pressure Plate 150 x 650 x 3 mm
- Bolting material

which are then fitted together into a continuous stretch of guardrail.

In order that the declared performance of the original test report (ITT) can be achieved, assembly and installation are to be fulfilled exactly according to following requirements. In the case that there is a deviation from these requirements in the assembly and installation without consulting with the manufacturer, the liability for the defects of the building product is transferred from the manufacturer to the installation contractor.

## **1.2 Manufacturer**

VOLKMANN & ROSSBACH GmbH & Co. KG

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## **1.3 Intended Use**

The system is a vehicle restraint system for installation on roads with the ability to reduce traffic noise. It primarily serves for the protection of non-involved persons or areas besides the road in need of protection. It also serves to protect oncoming traffic on a dual-lane road as well as protecting vehicle occupants in the case the vehicle leaves the roadway.

## **1.4 Storage and Transport**

All guardrail construction parts are to be stored and handled in a technically correct manner. They are to be protected from dirt, corrosion and damage. Construction parts which are laid out for installation should be used within a short period of time. When shipping, the cargo must be securely fastened so that it does not shift. The personnel doing the shipping should be outfitted with personal protection equipment according to national regulations.

## 2 Technical Data

Containment Level	N2	H1	L1
Class of Working Width	W4 (W=1.3 m)		
Dynamic Deflection	D = 0.5 m	D = 0.7 m	D = 0.7 m
Vehicle Intrusion	-	VI3 (VI=1.0 m)	VI3 (VI=1.0 m)
Installation Length	60 m		
ASI Value	A		
System Height	Guadrail Beam: 75 cm +/- 3 cm tolerance Noise Panel: 90 cm +/- 3 cm tolerance		
Driving Depth	approx. 90 cm		
System Width	30 cm		
Post Center	1.33 m		
Weight per Meter	48.3 kg/m		
Material	steel S235 JR / S355 JR		
Galvanizing	In accordance with EN ISO 1461 and EN 1179. For the beams alternatively: pre-galvanized material		
Expected Durability	Approx. 20 years, shorter in the case of more severe atmospheric corrosion exposure		

## 3 Installation Guidelines

### 3.1 General Remarks

#### 3.1.1 Place of Installation

The system is a pile-driven guardrail system that has demonstrated the following performance classes in accordance with EN 1317-2:

- N2-W4-A • H1-W4-A • L1-W4-A

In choosing the place of installation the respective national regulations and the system performance, which resulted from the results of the crash tests according to EN 1317 (compare above: "technical data") are to be heeded.

According to regulations, the system can be used only if the available space behind the safety device is larger than the working width and / or is larger than the extremity lateral position of the vehicle on impact test according to EN 1317.

#### 3.1.2 Limits of Installation

General limits of installation cannot be specified because of varying local situations. Should the basic construction for any reason be deviated from because of the installation site, then the required changes should always take place in agreement with the customer and the manu-

facturer.

In the execution of the installation the general known rules of engineering are to be observed and adhered to.

### 3.1.3 Grounding

The ground must be plain and horizontally leveled to ensure sufficient noise shielding. The use of a banquet paver is recommended.

The noise panels have to be installed without any gap to the surface. Occuring gaps have to be filled with soil after installation. Please be aware that the noise panels themselves have to be leveled horizontally with a tolerance of  $\pm 30$  mm.

For the driving of the posts, the following instructions must be respected:

#### a. Soil Class 1 and 2 in Accordance with DIN 18300

The system is not suitable for this ground class and should not be installed under these conditions. An alternative would be to change the ground with suitable material.

#### b. Soil Class 3 to 5 in Accordance with DIN 18300

The system is suitable for this ground class and may be installed if the pile-driving time for each post does not exceed the reference times given in the table below. No deformation or damage to the post heads must occur, so that a flawless installation and functioning of the system is guaranteed. Damages to the hot dip galvanizing should be repaired in a technically correct manner. In the case that the posts are deformed or move from the correct position while pile-driving then proceed as in ground class 6/7.

Soil class 3 to 5 is characterized by the following piling times:

System	Piling Frame type	VR 100	VR 120	Hydraulic HRE 1000
	Power (Blows/min)	480	600	1000
	Energy (Nm)	420	480	770
EasyRail	Min	31 s	21 s	8 s
	Max	5,1 min	3,5 min	1,3 min
EasyRail OBB	Min	32 s	22 s	8 s
	Max	5,3 min	3,6 min	1,3 min
EasyRail XS / NA	Min	21 s	15 s	6 s
	Max	3,5 min	2,4 min	0,9 min
EasyRail 3n	Min	19 s	13 s	5 s
	Max	3,1 min	2,2 min	0,8 min

### **c. Soil Class 6 and 7 (DIN 18300) and Embedded Cinder**

In this case the post must be drilled. Drilled holes are to be filled with appropriate soil, followed by the pile-driving in of the posts. If necessary, bitumen material is to be used for the sealing of drilled holes. Embedding the post in concrete is not permitted.

When pile-driving hindrances are encountered, beyond the defined soil class, special arrangements need to be agreed upon.

#### **3.1.4 Minimum Installation Length**

The minimum installation length is specified above in Section 2 "Technical Data". Should the required tested length of the construction not be able to be met, the tested construction would then not meet the required system demands. With such a change of (shortened) construction, the construction in question should be agreed upon as a special onetime construction.

#### **3.1.5 Permissible Assembly Temperatures**

When the construction is taking place in Germany, it is not dependent upon the outside temperature at the time of the assembly. In regions where the minimum outdoor temperature  $T_{\min}$  according to EN 1991-1-5/NA is under  $-24^{\circ}\text{C}$ , the assembly may only take place with the written approval of the manufacturer.

#### **3.1.6 Requirements for Installation Personnel**

The construction is to be carried out exclusively by schooled and qualified personnel. The appointed installation team is to be led and watched over by a competent member with the appropriate expertise. Within Germany, section 5.2.1. of ZTV-FRS 2013 applies.

#### **3.1.7 Personal Protective Gear or Equipment**

Protective and reflective clothing, according to the rules and regulations of the respective countries are to be worn at all times.

#### **3.1.8 Control of Delivery / Labelling of Parts**

The delivered system components are to be compared with the delivery note, examined for completeness, faults, and damages at the construction site. Also consult the parts lists in the Appendix.

The main components of the system (beams and posts) have the labelling mentioned in the Appendix.

Damages, defects or wrong deliveries are to be reported immediately to the deliverer. Packaging material is to be disposed of according to the local rules and regulations.

### **3.1.9 Cable Clarification**

Before beginning construction, the contractor should be informed of the place and the running of cables, pipes, wires etc. In the area of the underground lines no pile-driving is allowed. It is also understood that the instructions of the cable owners are to be followed.

### **3.1.10 Traffic Safety**

The construction zones are to be secured according to the requirements of the respective countries.

### **3.1.11 Tools**

For installation, the following tools are recommended:

- Crane
- Piling frame
- Drill machine
- Pneumatic wrench/Spocket wrench
- Drill Ø 15 mm (depth min. 160 mm)
- Drilling template (for positioning drill holes in noise panel)
- Sockets

## **3.2 Installation**

The installation of the system is to be carried out in general according to the drawings and assembly instructions in the Appendix.

Damages to the galvanized surfaces are to be avoided. When setting the posts always use a post protection attachment. Hitting galvanized surfaces directly with a hammer is not permitted.

Small defects on the galvanized surface are to be touched up after careful preparation through the application of a suitable zinc dust coating according to EN ISO 1461.

For the installation (new and rebuilt), as well as for repair work on guardrail construction, only new bolting materials are to be used.

### **3.2.1 Installation Heights**

The installation height of the system is specified above in Section 2 "Technical Data". It is measured from the top edge of the road surface, when the distance between the front edge of the system and the edge of the solid road surface is not larger than 0.6 m and slope of the side area is not more than 12%. In the case that the distance between the front edge of the system and the edge of the solid road surface is greater than 0.6 m, or if the shoulder has an inclination of more than 12%, the installation height is to be measured directly from the system at the place of installation.

Curbs with a height difference of more than 7.5 cm are to be avoided. In the case that higher curbs already exist and cannot be removed, then the system can be adjusted locally as an untested special construction.

Proceed in the process as follows:

The front edge of the beam must run flush with the front edge of the curb. The installation height is then to be correlated to the top edge of the driving surface. With a distance > 30 cm to the front edge of the curb correlate the height of the guardrail beam to the top edge of the curb height.

Installation heights that differ from the given values should be coordinated with the customer and require the written consent of the manufacturer.

### **3.2.2 Posts**

The posts of the system are to be inserted in the ground with an air or hydraulic pile driver and an appropriate striking attachment. The pile driver needs to have sufficient power and/or driving pressure.

The posts are to be driven in vertically. Deviations of up to 7 cm on each side of the post over the area are permissible. In the case that there are objects in the ground that hinder the driving (e.g. rocks, roots etc.) it can happen that individual posts may become quite out of line or be twisted. If this should be the case with more than 20% of the posts, the corresponding soil class 6 and 7 procedure must be used to drill.

When installing the system at the road side, the closed sides of the posts must face the oncoming traffic.

The designated post distance (see Chapter 2 "Technical Data") may not be exceeded. In the case that a post cannot be set at the designated place because of adverse conditions at the construction site (cables, shafts, tunnels, tree roots et cetera) then it is to be set in the shortest possible distance from the designated position and an additional post is to be driven in the next "field".

### **3.2.3 Fittings**

For a proper connection to be achieved, the screws should be set perpendicular in the connecting construction parts and are to be tightened according to regulations. The drilling tools need to be adjusted accordingly. When tightening the nuts, a washer should be placed under each nut to protect the zinc surface. Fishplates must not be used to substitute washers.

The required tools for bolting are suitable socket wrenches or screw wrenches.

For torques see the following table:

<i>Item No.</i>	<i>Bolt</i>	<i>Torque</i>
040.00	HRK (button head) Bolt with Nib M 16x27, 4.6 incl. Nut	70-140 Nm*)
040.54	Hex-head Bolt M 10x45, 8.8 incl. Nut	10-17 Nm (hand-tight)
040.99-057	Hexhead bolt M 12 x 150 Mu, 8.8, hot dip galvanized, DIN 931/DIN 934	10-17 Nm (hand-tight)

\*) Note: Position the nose of the button head screw in the tip of the drop hole.

### 3.2.4 Beams

At their joints, the beams must overlap in the direction of traffic, so that no sharp edges face the oncoming traffic.

### 3.3 Deviations from Basic Construction

The system has been tested according to EN 1317 as a straight running guardrail along leveled ground. Should there be a need to deviate from the basic construction in some way because of local conditions; this can only be done as an untested special construction that does not have the same qualities as the tested straight running guardrail system. In any case this requires the approval of the customer and the manufacturer.

In the execution of the installation the general known rules of engineering are to be observed and adhered to. Changes, which clearly lead to impairments to the functioning of the guardrail system, are to be avoided.

In the case that subsequent work on the guardrail parts is necessary, no deviations from the standard parts should be performed, which could impair their way of functioning. This especially applies to the making of fitted pieces (hole spacing, hole diameter, number of bolts, overlapping) and the shortening of posts. Cut edges are to be protected from corrosion with sufficient coating (zinc dust paint).

#### 3.3.1 Fitted Pieces

In order to make the length of the guardrail in accordance with local conditions, it may be necessary to install beams or panels which are shorter in length than the standard building parts.

##### a. Noise Panels

Cutting noise panels at the work site should be avoided. If required in specific situations, special noise panels of different lengths are available.

In any case, each noise panel must be connected to two posts, so that non-standard panels may require additional posts. Apart from that, the general post spacing is to be maintained to

minimise the deviation from the basic construction.

## **b. Guardrail Beams**

Fitted pieces of guardrail beams can be cut at the work site.

The following requirements are to be observed:

- Minimum length of 750 mm (profile overlapping 300 mm minimum)
- No exceeding of the given post spacing of the guardrail construction when installing.
- Cutting to length with a cutting machine or saw in a technically correct manner
- Drilling the holes of the bolt connections in a technically correct manner
- Touching up of the cut surfaces and the drilled holes of the bolt connections through the application of zinc dust paint.

The installation of such fitted parts is to be reduced to a minimum. Only in exceptional cases (e.g. between two bridge structures), fitted parts should be installed.

In the case of particular building measures in medians such as vehicle crossings, tunnels or bridge structures, transitions to concrete barriers, etc. more than 1- 2 fitted parts between such measures should not be used.

The same applies to bridge structures. In this case, a maximum of one fitted part per stretch between two roadway crossings should be made. It is to be noted here that the guardrail beam expansion joints may in no case be shortened.

In the case of maintenance and repair work it should be attempted to be done without any fitted parts, even when an increased effort for the mounting and dismounting of the undamaged connection ranges arises because of this.

Construction parts are only to be changed using drills and cutting machines in a technically correct manner. Work on the construction parts using welders, cutting devices, mandrel and striking and bending tools are not permissible.

### **3.3.2 Radii**

With the installation of radius guardrail beams it should be heeded that they are built in without tension.

In the case of curves with radii  $< 35$  m pre-bent beams (so-called radii beams) must be used.

Convex radii beams should be used for outside curves and concave for inside curves. It is not permissible to bend the guardrail beams during installation at the work site to the point that permanent deformation occurs.

Especially with concave radii beams (inside curves) care must be taken, that the edge overlapping is not far apart when bolting together. It is recommended to first bolt the edge overlapping and only afterwards fastening the beam. Enlarging the holes, e.g. by means of reaming is not permissible.

Noise panels can not be bent at work-site. Radii of 35 m and more can be achieved by putting straight panels polygonally. For tighter radii, curved versions of the panel are available.

Please be aware that especially tight radii have to do with untested special constructions, which do not have the same characteristics as the tested guardrail system. In this case it is definitely necessary to obtain the permission of the customer and the manufacturer.

### **3.3.3 Deviations**

Deviations with an inclination of 1:20 – in exceptional cases of 1:12 – are permissible. When the beginning of the guardrail stretch occurs in the area of an ascending slope, the system could be shifted to the side. It can however be embedded into a slope if the installation height does not exceed 90 cm.

This also applies to a stretch of guardrail in the transition area ditch/talus. At the same time, the spacing of the posts may not exceed the systems general post distance (see Section 2).

However, on uneven surface it may be necessary to raise up the ground. In case the system is embedded into a slope, the last noise panels of a stretch may have to be left out.

In the case that deviations need to be implemented on the basis of national regulations, then these national regulations take effect.

### **3.3.4 Additional Attachments**

The following complementary attachments may be mounted to the system:

- Attached guiding posts, which can be mounted on posts.
- Attached guiding posts, which can be mounted together with the joint-bolting on the beam. Deviating from the drawings, the bolt M 16x45 HRK (button head) with a nib (Item-No. 040.01) must be used at that place instead of the bolt M 16x27 HRK (button head) with a nib (Item-No. 040.00).
- Guardrail reflectors, which are attached to the beam with HRK (button head) bolts at the lower middle punched hole.

For the mounting of additional attachments (e.g. anti-glare shield, under-ride protection, etc.) a written consent of the manufacturer is required.

The attaching of traffic signs is not permitted. Traffic signs may be erected within the area of work, as long as on impact they bend over or break off.

## **3.4 Controls and Self-Monitoring**

After installation the construction is to be tested with the aid of the general known rules of engineering and the self-monitoring reports in the Appendix in agreement with this manual. Adherence to staying within tolerances of installation should be particularly taken into account.

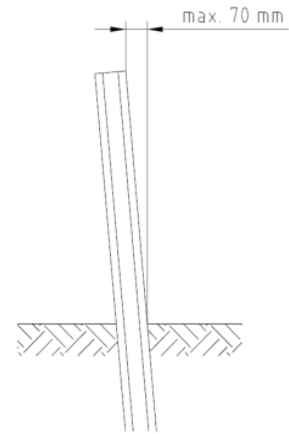
Compliance to installation tolerances, the fixed position of the bolted joints and the technically

correct alignment of the stretches of guardrails are in particular to be heeded.

### 3.5 Installation Tolerances

The installation tolerances are as follows:

<i>Measurement</i>	<i>Tolerance</i>
Spacing of the posts lengthwise	$\pm 21$ mm
Deviation of Alignment of posts, beams	$\pm 70$ mm (see sketch)
Deviation of Alignment of noise panels	$\pm 30$ mm
Deviation of top edge of beam vertically	$\pm 30$ mm
Deviation of noise panel longitudinally	$\pm 16$ mm
Surface height differences / maximum space under noise panel	$\pm 30$ mm



Please make always sure that no gaps occur between two noise panels or a noise panel and the ground.

## 4 Inspection and Maintenance

Though maintenance is not required, it is recommended to inspect the systems regularly for damages and deformations.

## 5 Repair

As a basic principle all guardrail parts are to be replaced, which show obvious (plastic) permanent deformation.

When the parts of a considered stretch of guardrail are out of alignment up to approx. 30 cm, but not permanently deformed, then an alignment of the guardrail construction should be made.

In doing so, corresponding and enlarged postholes are to be filled and sufficiently packed.

When damaged guardrails parts are replaced, special care must be taken when working in areas connected to the undamaged beams.

The beams remaining after removal may not be damaged (e.g. through the use of an angle grinder, mandrel or a hammer). Due to temperature determined length changes or larger sags

from difficult drives to the building site, lengthwise hole patterns often do not coincide when connecting new beams with existing guardrails.

In the case that the distance between hole axes amounts to less than 5 cm, then the difference can usually be compensated by the loosening of the bolts with several strikes. Otherwise proceed as follows.

As a general rule when repairs are undertaken in lower temperatures, the new beams are too short, so that the installation length between the post axes becomes greater than the element length of a beam and the overlapping would amount to less than 30 cm. This is not permissible.

As a result two fitted beam pieces must be cut to replace the beam which is now too short. These pieces together must always be longer than the standard beam. Also an additional post then needs to be set in order to not exceed the maximum spacing of the posts.

In the case of high temperatures or bigger sags the overlapping of the beams is as a general rule greater than 30 cm. In this case no fitted pieces need to be made. Instead new holes need to be drilled. This, however, is only permissible when the spacing between the new outer edges and the drilled holes is 40 mm or more.

As a basic principle however both fitted pieces and the drilling of new holes should be avoided, even when it means an additional effort through the removal or installation of adjoined sections.

Enlarged postholes in the shoulder of the road must be packed so that the newly rammed post is sufficiently stable. In the case that several damages at the same place due to accidents have occurred, then when necessary either the shoulder must be newly fortified or an additional post must be mounted if it is needed. This should be done in consultation with the contracting authority.

For replacing noise panels, follow the installation instructions. Fitted pieces should be avoided (see Section 3.3.1.b.).

## **6 Reusability**

In the case of refitting and/or building alterations guardrail parts may be reused if:

- the building parts show no visible deformations and/or damages (e.g. torn out, reamed out or burned out holes)
- the zinc layer of hot-dip galvanised parts is 30 µ or more. Other zinc layers must show at least 50% of their original thickness.
- at labelled parts, the manufacturing identification and the test period identification can be clearly seen

Materials for mounting (bolts, nuts, washers, fishplates, connecting plates) that have already been built in at one time, may not be reused. New materials should always be used for instal-

lation. When repairing damages due to accidents only new materials may be used.

Construction parts that cannot be used any more should be made unusable. So, too, the utilization of dismantled bolting materials should be applied to the corresponding national regulations.

## **7 Disposal and Recycling**

Damaged building parts and building parts that cannot be used, are to be subjected completely to utilization / recycling or be installed in other areas of use (for example: farming, solar standing supports, private business)

## **8 Toxic Substances**

The individual guardrail components consist of 2 main building substances:

- steel
- zinc (hot dip galvanizing)
- stone wool (Rockwool™)
- plasticized polyvinylchloride (PVC-P)
- ethylene propylene diene monomer rubber (EPDM)
- high-density polyethylene (HDPE)

All components are not toxic and are not in need of any special treatment or operation.

For on-site installation auxiliary substances are needed for the operation of machines and tools. For example these could be:

- diesel (e.g. compressor)
- pneumatic oil (e.g. operation of air pressure tools)
- gasoline (e.g. cutting off machine)
- grease or cutting paste (for the drilling of holes in guardrail parts)

In these cases the relevant data from the manufacturer and the requirements of the individual countries should be considered and heeded to.

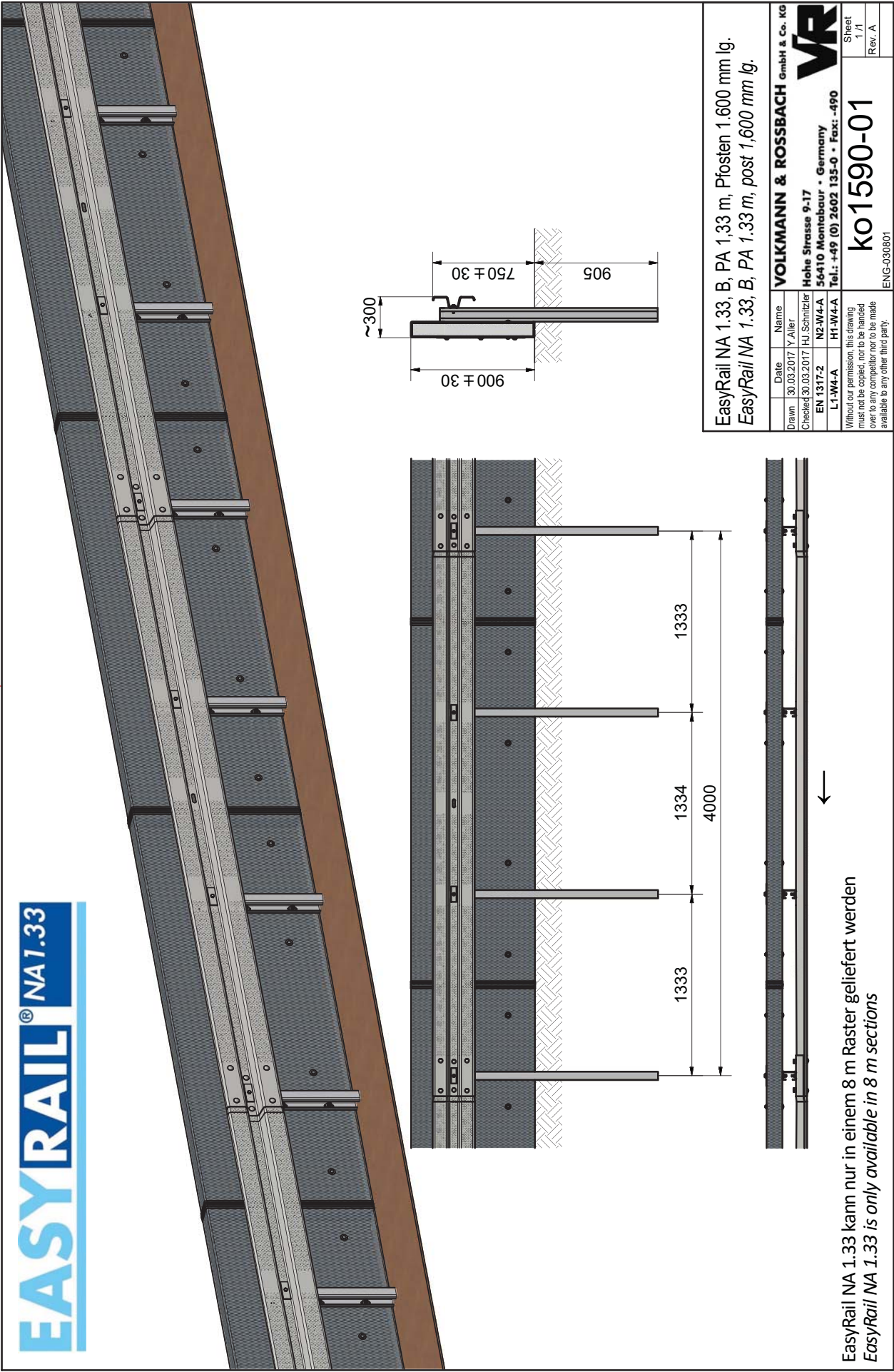
## Appendix 1 - Parts List (4.0 m Section)

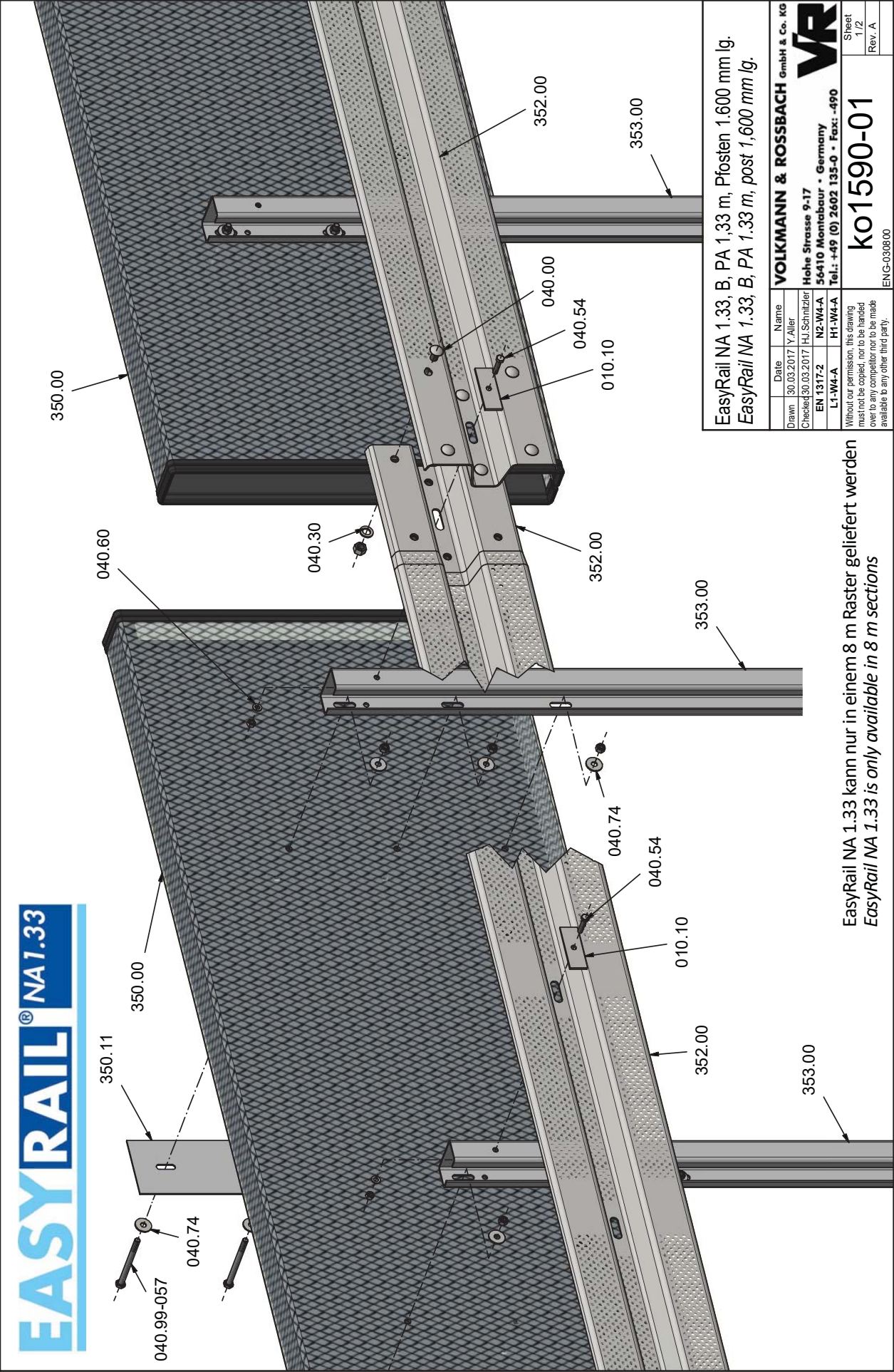
### Easy-Rail NA 1.33, driven posts

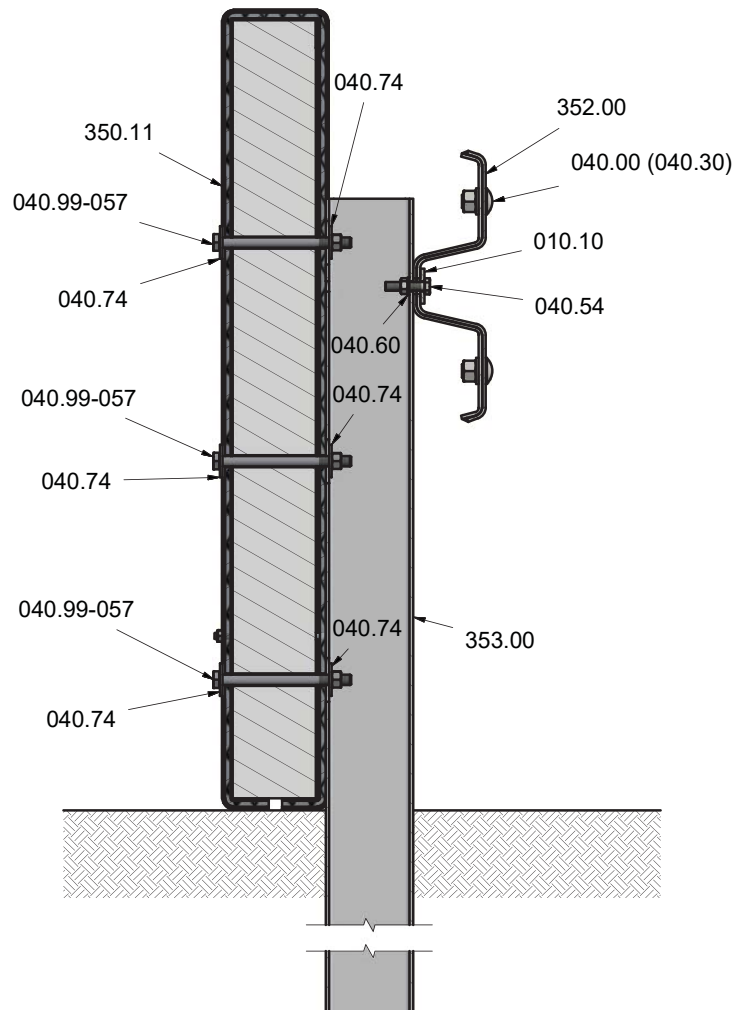
Qty./4.0m	Order No.	Item	Weight
3	010.10	Fishplate M 10	0,18 kg
6	040.00	HRK (button head) Bolt with nib M 16x27, 4.6 incl. Nut; ISO 4032-5	0,12 kg
6	040.30	Flat washer 18; DIN 126	0,01 kg
3	040.54	Hex head bolt M 10 x 45, 8.8 with nut	0,05 kg
3	040.60	Flat washer Ø 11, ISO 7091	0,01 kg
18	040.74	Flat washer M 12 (37/13/3) ISO 7091	0,05 kg
9	040.99-057	Hex head bolt M 12 x 150, 8.8 with nut	0,01 kg
1,5	350.00	Noise Absorption Panel, 2,666 mm	59,60 kg
3	350.11	Pressure Plate 150 x 670 x 3 mm	1,32 kg
1	352.00	ER NA Guardrail beam, profile B, t = 4 mm with perforation	57,32 kg
3	353.00	Post C-100-60-25, 1.600 mm f. ER 3n	12,75 kg

Appendix 2 - Drawings

System Drawing







Stk./8m	Art.-Nr.	Benennung	Description
6	010.10	Decklasche M 10	Fishplate M 10
12	040.00	HRK-Schraube m. Nase M 16 x 27 Mu, 4.6	Buttonhead bolt with catch M16 x 27, 4.6 with nut
12	040.30	U-Scheibe Ø 18, DIN 126	Flat washer 18; DIN 126
6	040.54	6-kt.-Schraube M 10 x 45 Mu; 8.8	Hexhead bolt M 10 x 45, 8.8 with nut
6	040.60	U-Scheibe Ø 11, ISO 7091	Flat washer Ø 11, ISO 7091
36	040.74	U - Scheibe M 12 (37/13/3) (RAL 40.73)	Flat Washer M 12 (37/13/3)
18	040.99-057	6-kt.-Schraube M 12 x 150 Mu, 8.8, feuerverzinkt, DIN 931/DIN 934	Hexhead bolt M 12 x 150 Mu, 8.8, hot dip galvanized, DIN 931/DIN 934
3	350.00	Schallschutzelement, 2.666 mm lg.	Noise absorbing panel, 2,666 mm lg.
6	350.11	Druckplatte 150 x 650 x 3 mm	Pressure plate 150 x 650 x 3 mm
2	352.00	ER NA-Holm, Profil B, t=4 mm, mit Perforierung	ER NA-Guardrail beam, profile B, t= 4 mm, with perforation
6	353.00	Pfosten C-100-60-25, 1.600 mm lg. f. ER NA, re.	Post C-100-60-25, 1.600 mm f. ER NA, right

EasyRail NA 1.33 kann nur in einem  
8 m Raster geliefert werden  
*EasyRail NA 1.33 is only available in  
8 m sections*

EasyRail NA 1.33, B, PA 1,33 m, Pfosten 1.600 mm lg.  
*EasyRail NA 1.33, B, PA 1.33 m, post 1,600 mm lg.*

Drawn	30.03.2017	Y. Aller	<b>VOLKMAN &amp; ROSSBACH GmbH &amp; Co. KG</b> <b>Hohe Strasse 9-17</b> <b>56410 Montabaur - Germany</b> <b>Tel.: +49 (0) 2602 135-0 • Fax: -490</b> 
Checked	30.03.2017	HJ. Schnitzler	
EN 1317-2	N2-W4-A		
L1-W4-A	H1-W4-A		
Without our permission, this drawing must not be copied, nor to be handed over to any competitor nor to be made available to any other third party.			<b>ko1590-01</b> Sheet 2/2 Rev. A ENG-030800

## Appendix 3 - Assembly Instructions

### Montagebeschreibung Installation Manual



### EasyRail NA 1.33 - **EasyRail NA 1.33**

1. Das Einbauhandbuch ist zu beachten und einzuhalten. Für die Fertigung der Einzelteile gelten folgende Einzelteilzeichnungen:

*The manual of the EasyRail NA 1.33 is to be obeyed. The following drawings apply for the production:*

010.10	040.00	040.30	040.54
040.60	040.74	040.99-057	350.00
350.11	352.00	353.00	

2. Der Zusammenbau der Stahl-Einzelkomponenten ist im Einzelnen den folgenden Zeichnungen zu entnehmen:

*Assembly of the components according to the following drawings:*

e2015_03 - 001	Prüfaufbau ER NA 1.33	Layout ER NA 1.33
e2015_03 - 003	Systemquerschnitt B-B	Cross section B-B
e2015_03 - 004	Systemzeichnung ER	System drawing
e2015_03 - 005	Montagezeichnung	Assembly drawing

3. Die Montage und die bauliche Ausführung erfolgen gemäß dem Einbauhandbuch.

*The mounting has to be carried out according to the manual.*

4. Die Montageschritte im Einzelnen - **Installation details**



4.1 Abladen des LKW's  
*Unloading the truck*

**VR**  
**VERBODEN TOEGANG VERBODEN**  
 VERBODEN TOEGANG VERBODEN

Het document 217  
 Het document 217  
 Het document 217

Verpakkingen en materialen voor de productie van...

interieur (aluminium  
 nr. 2009/363)

Verpakkingen en materialen voor de productie van...

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4.3 Auslegen von SP-Holmen  
als Schiene für Ramme  
*Placing the beams for piling  
frame*



4.4 Ausrichten der SP-Holme  
*Aligning the beams*



Hinweis: Bei Verwendung einer Ramme mit Kettenantrieb kann auf das Auslegen und Ausrichten der SP-Holme verzichtet werden. Eine gerade Streckenführung wird hier mittels Markierung per Schnur sichergestellt (parallel zum Fahrbahnrand). Werden die Holme dabei Stoß auf Stoß übereinandergelegt, können die Langlöcher in den Holmen, als Markierung für den Pfostenabstand genutzt werden.

*Remark: By using a pile driver with chain-drive there is no need for a positioning and adjusting of the beams. A straight guiding of the pile-driver is realized by an optical line (parallel to the edge of the asphalt track). If the overlapping joints of the beams match correctly, the longholes of the beams can be used as an indicator for the post spacing.*



4.5 Auslegen der Pfosten  
*Placing of the posts*



4.6 Aufbauen der Ramme  
*Preparing the pile driver*



4.7 Lotrechtes ausrichten der Ramme  
*Adjusting the pile driver vertically to the track*



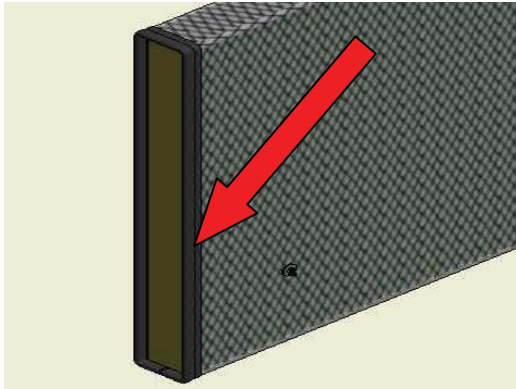
4.8 Rammen der Pfosten auf Höhe  
*Pile driving of the posts and adjusting to the right height*



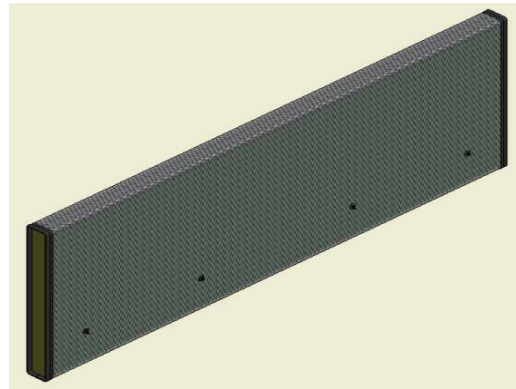
4.9 Anhängen der SP-Holme  
*Fixation of the beams*



4.10 Vormontage der Verschraubung per Hand  
*Pre-mounting the system*



4.11 Gummidichtung zur Vermeidung von Systemlücken und zum Längenausgleich  
*Rubber profile to avoid system interruptions and to compensate different lengths*



4.12 Vormontiertes Schallschutzelement (SSE) mit Gummidichtung  
*Pre-mounted noise absorbing element (NAE)*



4.13 Bohrschablone für SSE  
*Drilling-Template for NAE*



4.14 Benötigter Bohrer Ø 15 mm  
*Needed drill Ø 15 mm*



4.15 Ggf. Gummidichtung beidseitig auf Stoßkante des Streckmetallkorbs  
*If necessary – push rubber profile on both ends of the stretched metal edge*



4.16 Aufstellen und Bohren der SSE mit Bohrschablone  
*Pre-positioning and drilling of the NAE with drilling-template*



4.17 Vormontage der SSE  
*Pre-mounting NAE*



4.18 Montage erfolgt Zug um Zug  
mit dem Rammen der Pfosten  
*Mounting follows step by step  
the piling frame*



4.19 Festziehen der Schrauben...  
Achtung! Schallschutzelement  
nicht quetschen!  
*Tightening the screws...  
Attention! Do not squeeze NAE !*



4.20 Festziehen der Schrauben mittels Schlagschrauber und anschließende  
Kontrolle mit Drehmomentschlüssel.  
*Tightening the screws by impact wrench and checking by torque key.*

Schrauben Kategorie <i>Bolt class</i>	Drehmoment <i>torque</i>
M10	handfest (10-17 Nm) <i>hand-tightened</i>
M12	handfest (10-17 Nm) <i>hand-tightened</i>
M16	70 Nm

5. Fertig gestellte Absturzsicherung ER NA 1.33

*Finished installation of ER NA 1.33*



5.1 Vorderansicht - *Front view*



5.2 Rückansicht - *Rear view*



5.3 Verschraubung vorne am SP-Stoß  
*Front side – fixing at beam joint*



5.4 Verschraubung vorne zwischen Pfosten  
*Front side - fixing between joint*



5.5 Verschraubung des SSE  
(Pfostenseite)  
*Fixing NAE (post-side)*



5.6 Verschraubung des SSE  
(Rückseite)  
*Fixing NAE (backside)*