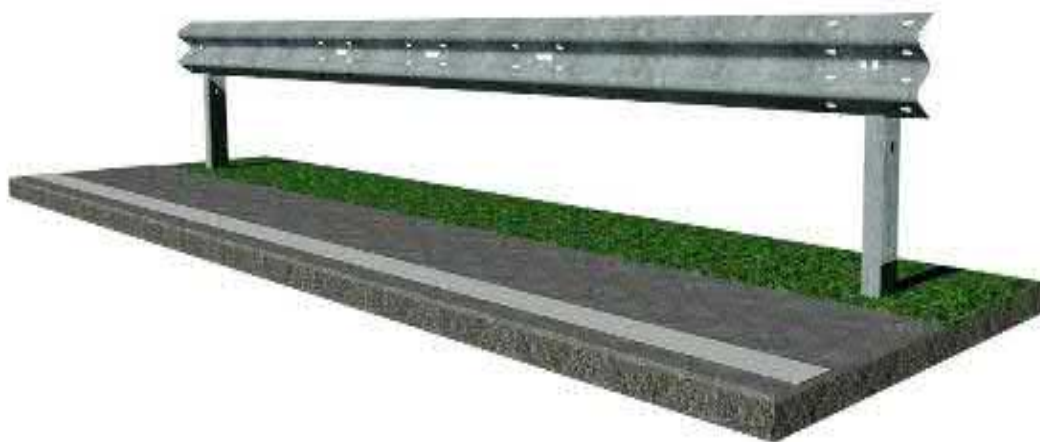


ASSEMBLY INSTRUCTIONS

KREMSBARRIER 2 RH1L

for pile drivable subgrades



Performance class in accordance with EN 1317-2:

Containment level	N2 / H1 / L1
Impact severity level:	A
Working width:	W4 / W5 / W5

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SAFETY INSTRUCTIONS

As working on vehicle barrier systems should generally be categorised as especially dangerous, such tasks should always be carried out under the supervision and instruction of applicably trained specialist personnel.

These assembly instructions assume that supervision and instruction is provided by such specialist personnel on-site.

All construction personnel must wear personal protective equipment in accordance with EC directive 89/686/EEC.

PROPER USE

The task of a vehicle barrier system is to restrain and redirect vehicles straying off of the carriageway and thereby minimise the consequences for passengers as well as for other road users and objects worthy of protection.

Note: Vehicle barrier systems are generally to be used only in situations where straying off of the carriageway is likely to result in more severe consequences for vehicles and their passengers as well as for third parties or objects worthy of protection than a collision with the barrier system.

TECHNICAL DESCRIPTION OF THE VEHICLE BARRIER SYSTEM

Performance class in accordance with ÖNORM, EN 1317-2:			
Containment level	N2	H1	L1
Impact severity level / ASI	A / 0,6		
Working width / level	W4 / 1,3 m	W5 / 1,6 m	
Test length	38,00 m		
System dimensions			
Systembreite	175 mm		
Systemhöhe	750 mm		
Rammtiefe	828 mm		

TRANSPORT

The following points are to be observed when transporting components of the vehicle barrier systems:

- A regulation load securing system is to be made available.
- When transporting on salt-treated roads, the components must be transported on enclosed / tarpaulin-covered truck trailers.
- Avoid contact with other aggressive transported materials (e.g. residual chemicals on the loading space).
- The lifting gear is to be designed for a maximum package weight of 2.5 t.

Note: A proper load securing system must also be used when transporting equipment for installation of vehicle barrier systems.

REQUIREMENTS FOR INSTALLATION

The executing contractor (=installation firm) must have the professional aptitude and general qualifications for the undertaking of such installation work.

The installation firm must be in possession of the technical equipment required for the professional and proper undertaking of the installation work. This includes, in addition to a fleet of vehicles adapted for this type of work, especially the pile-driving equipment for the required post segments with adapted drive heads and guides as well as drilling equipment, impact screwdrivers, mandrels and measuring equipment, etc.

The installation firm must maintain all relevant national and international laws, regulations, directives, etc. and ensure that the required permits are available and have been submitted in good time.

The following must be checked by the installation firm prior to the start of installation

- Possible existing installations in the area of the anchoring must be assessed and correspondingly taken into consideration
- The suitability of the subgrade (soil class, sufficient bore depth, evenness, etc.) is to be checked.
- The definitive reference line must be marked for installation of the vehicle barrier system.
- The delivery of materials must be checked for correctness and completeness and complaints must be immediately forwarded to the supplier.
- It must be ensured that the building site is properly secured.

The customer is to be informed immediately in writing in the event that deviations are determined and the matter is to be clarified.

If components for the vehicle barrier system are to be intermediately stored, then the following warehouse conditions are to be fulfilled:

- The storage area must be capable of bearing the load and must be accessible with an HGV truck.
- Galvanised components may not be stored on tall, damp grass, in standing water or mud.
- The packages are to be stored in the original packaging on wooden slats with approximately 150 mm gap to the ground.
- The components should be stored at a slight angle, so that water can drain off.
- The formation of puddles (collection of moisture) is to be avoided.
- Foil used for purposes of securing the layers during transportation is to be removed.
- The storage area may not be treated with defrosting agents.

Long-term storage of bundled components outdoors is to be avoided.

SUITABLE SUBGRADE

The subgrade is considered suitable for the installation of the vehicle barrier system if the following conditions are fulfilled:

- Soil classes 3, 4 and 5 of ÖNORM B 2205 and compacted subgrade which can be graded into these soil classes.
- Degree of compaction $D_{pr} \geq 97\%$
- The subgrade is suitable for pile driving.

Soil classes 1, 3, 4 and 5 of ÖNORM B 2205 and compacted subgrades which can be graded into these soil classes and which contain no blocks are suitable for pile driving.

Note: If the subgrade is unsuitable for pile driving, then there is the option to drill boreholes to the required depth or install suitable empty pipes, which can subsequently be filled and compacted with suitable material.

INSTALLATION OF THE VEHICLE RETENTION SYSTEM IN ACCORDANCE WITH DATA SHEETS D124/2 AND D124/3 (SEE APPENDIX)

It is not necessary to pre-assemble the components of the vehicle barrier system in the factory.

Due to the fact that the vehicle barrier system is not pre-stressed, the ambient temperature at the time of installation is irrelevant.

1. Ramming the C100x60 posts

Each C100x60 post must have a minimum length of 1,500 mm and must be vertically driven into the subgrade using a suitable piledriver until the upper edge of each post is 696 ± 40 mm above the baseline. The open side of the post cross section must face in the direction of travel, and the hole pattern with elongated holes must be located on the upper end (head) of the post end (see Figure 3).

The piledriver must be equipped with a driving head suitable for the C100x60 cross section in order to prevent any deformation of or damage to the hot-dip galvanised coating on the heads of the posts. A guide adapted to the C100x60 cross section of the posts must be mounted on the piledriver near ground level to ensure precise positioning of the posts during piledriving.

The standard centre distance of the posts is 3,800 mm.

Please note: The driving head must have a suitable groove (see Fig. 1) to ensure that the post section is properly supported on both sides during piledriving.



Figure 1



Figure 2



Figure 3



Figure 4

2. Installing the S2L guardrail

In the joint area, the S2L guard rails must be mounted so they overlap in relation to the direction of travel in such a way that the vehicle will not get caught. The end of each guard rail that faces towards the carriageway (upper part) will have teardrop-shaped holes. The end of each guard rail that faces away from the carriageway (lower part) will have elongated holes.

The guard rails are bolted to each C100x60 post every ~3,800 mm using one M16x35 FK 4.6 round-headed screw each (see Fig. 2 through 4).

In order to do so, the elongated 78x20 mm hole must be positioned on the axis of the guard rail in the middle before the first elongated 18x36 mm hole on the narrow side of the C100x60 post. The round head screw M16x35 FK 4.6 is then inserted through the guard rail, the washer R19 placed between the guard rail and the upright (see Fig. 4 and 5) and the upright. The rounding on the back of the screw head must fit the rounding of the guard rail. A 40x18x4 washer must be placed on the inside of each post, and the connection must be tightened using an M16 FK 5 hexagon nut.

The guard rail joint should also be screwed together using eight M16x30 FK 6.8 round-headed screws. When tightening the corresponding M16 FK 6



Figure 5



Figure 6

hexagon nuts, it is important to ensure proper positioning on the teardrop-shaped torsional safety catch of the screw head in the elongated hole of the guard rail.

One 40x18x4 washer must be placed under each M16 FK 5 hexagonal nut (see Fig. 3).

3. Shims

Generally, the vehicle barrier system should be installed so that shims are not required. However, if shims are required due to conditions on site, then the following points must be observed:

- » The regulation centre distance of the posts is to be retained as far as possible.
- » If the longitudinal elements have to be sawn, it is to be ensured that the cut is made clearly.
- » The cut is to be executed so that the swarf cannot damage the hot-dip galvanised sections (risk of extraneous rust or damage to the coating).
- » The burrs are to be removed and the cut area is to be protected against corrosion with cold-galvanizing paint in accordance with EN ISO 1461.
- » The hole pattern for joining a shim must correspond to the regulation design and the gaps to the corners may not be smaller than those of the regulation design.
- » The screw connection of the guide rail S2L with the C100x60 stay may only be made at the slotted hole 78x20 mm (see Fig. 5).
- » Flame cutting is generally not permitted during assembly work!

4. Tightening torques for the screw connections

Thread / strength class	Torque			
	min.		max.	
M16 / 4.6	35	Nm	70	Nm
M16 / 6.8	35	Nm	150	Nm

It is to be ensured that a sufficiently large bearing surface is given in the clamped area for tightening unscheduled prestressed threaded connections when applying the above specified torques.

5. Conformity checks

The following checks are to be undertaken during the installation process and by way of final inspection:

- Correct alignment and bolting of the structural components
- Vertical gap between the barriers and upper edge of the tension bar and reference level
- Horizontal gap between the front edge of the protective barrier post and the respective reference line for the installation
- Continuous line of the longitudinal elements (protective barrier post, tension bar)

Suitable corrective measures are to be undertaken in the event of deviations outside the range of permissible tolerances.

It is to be checked that the system has been installed correctly in accordance with the installation instructions upon completion of the installation work and this should be documented in the acceptance certificate.

6. Clearing the construction site

All residual materials (including connecting devices), packaging and supporting timber, screw boxes, foil, packaging straps, etc. and any other rubbish must be removed from the site.

The construction site is subsequently to be swept clean.

REPAIRING THE VEHICLE BARRIER SYSTEM

All components which exhibit mechanical damage or deformation subsequent to an accident are to be replaced by new components. The installation of these components is to be undertaken in accordance with the installation instructions.

New connecting devices are generally to be used when repairing a vehicle barrier system.

DURABILITY OF CORROSION PROTECTION

The vehicle barrier system's components are hot-dip galvanised in accordance with EN ISO 1461 to ensure its operational lifetime / durability of protection.

The duration of protection for galvanised coatings is defined under EN ISO 14713 and is essentially dependent on the thickness of the coating. Generally, it can be assumed that the zinc coating will erode continuously over the entire area. Due to the known effective macroclimatic corrosion load for roads, corrosion category C4, zinc corrosion amounting to 2.1 to 4.2 µm per year is to be expected. Therefore, calculating with the average zinc layer thickness of minimum 70 µm in accordance with EN ISO 1461, a protection duration of minimum 15 years is given.

Note: The above specified calculated duration of protection applies to macroclimatic effective corrosion loads only. Special macroclimatic conditions could lead to a reduced duration of protection.

INSPECTION AND MAINTENANCE

Vehicle barrier systems manufactured by voestalpine Krems Finaltechnik GmbH are fundamentally maintenance free.

The vehicle barrier system is to be visually inspected as part of the continuous inspection trips carried out by the carriageway maintenance authority, however, this must be realised at least once per year, preferably after the winter season. In doing so, it is to be checked, among other things, that there are no deformed segments and that the bolting is correct.

RECYCLING / DISPOSAL

Dismantled vehicle barrier systems or exchanged components replaced during the repair process are to be disposed of and recycled in accordance with statutory requirements. All vehicle barrier system components manufactured by voestalpine Krems Finaltechnik GmbH are 100% recyclable.

Packaging and other waste is to be recycled or disposed of in accordance with statutory requirements.

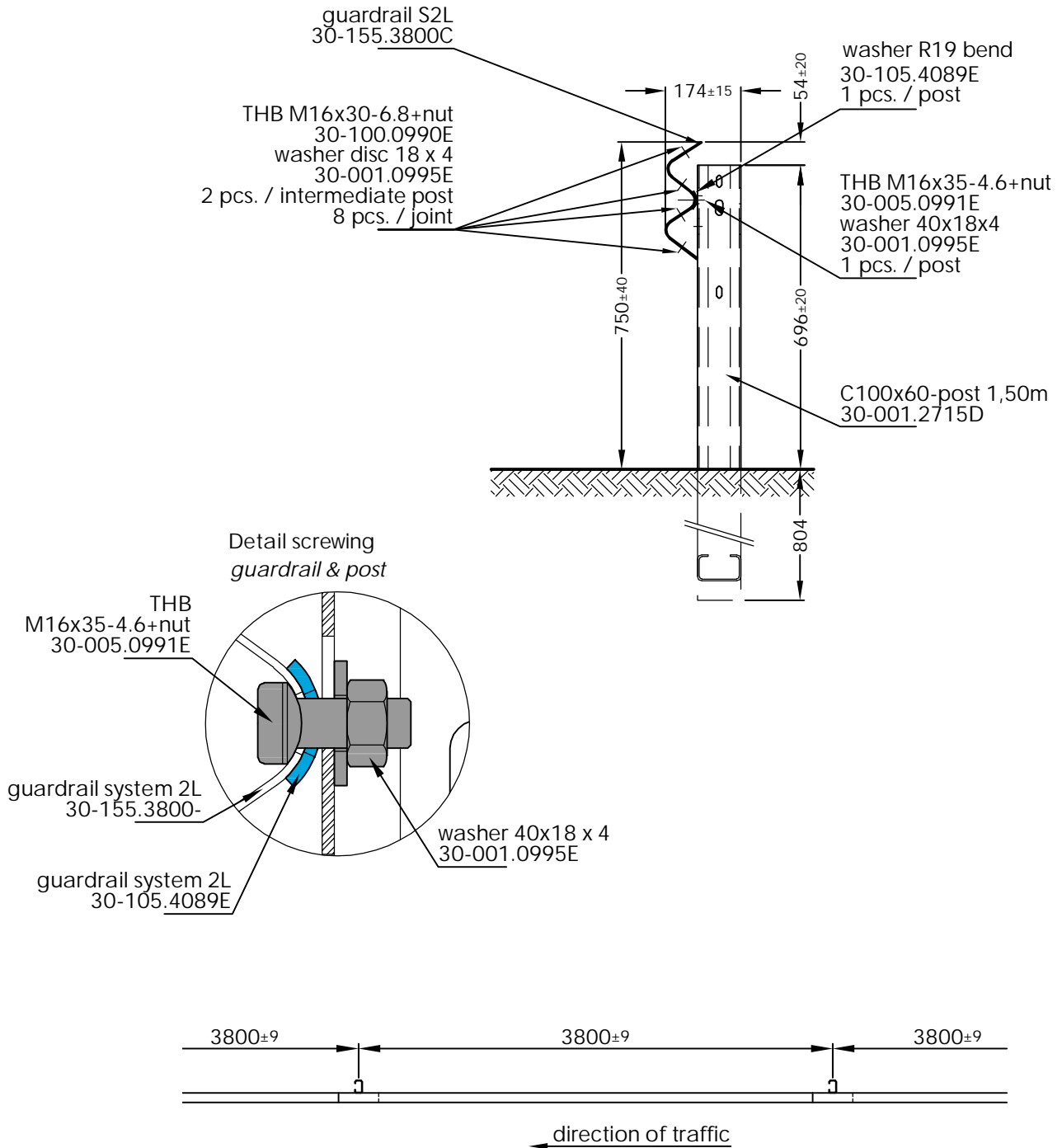
Vehicle barrier systems manufactured by voestalpine Krems Finaltechnik GmbH do not contain toxic or potentially hazardous materials.

KREMSBARRIER 2 RH1L

Roadside Restraint System suitable for pile driving ground conditions

product specification sheet D214/2

for driving see D215 and D216



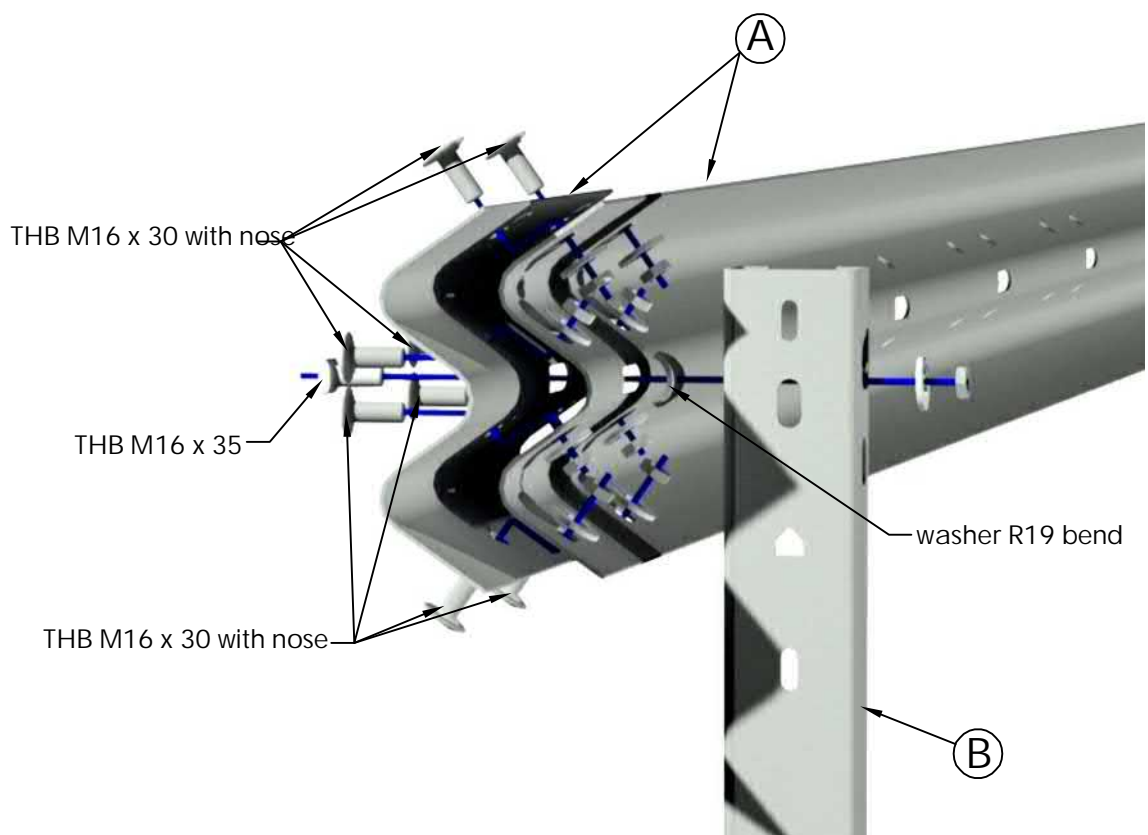
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KREMSBARRIER 2 RH1L

Roadside Restraint System suitable
for pile driving ground conditions

product specification sheet D214/3

installation drawing



- | | |
|-----|---------------|
| (A) | guardrail S2L |
| (B) | C100x60-post |

02/2022

Parts list KREMSBARRIER 2 RH2K

Road Restraint System
for pile driving ground



Requirements for a field with a 3,80 m length

part	name of the item	weight [kg]	drawing- number	material / quality	corrosion protection
1	guardrail S2L 3,80	33,64	30-155.3800C	S355JO	acc. to EN ISO 1461
1	C100x60-post 1,50 m	11,61	30-001.2715D	S355JO	acc. to EN ISO 1461
8	THB M16x30-6.8 with nose +nu	0,11	30-100.0990E	6.8	acc. to EN ISO 10684
1	THB M16x35-4.6 +nut	0,14	30-005.0991E	4.6	acc. to EN ISO 10684
1	washer R19 bent	0,04	30-105.4089E	100HV	acc. to EN ISO 10684
9	washer 40x18x4	0,03	30-001.0995E	100HV	acc. to EN ISO 10684

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