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Table of changes

NO.	FULL NAME	DEPT	DATE OF CHANGE	SCOPE OF CHANGE	NOTES
1	Piotr Abram	R&D	01.02.2021	Table 3	
2	Piotr Abram	R&D	20.04.2021	Point 3.9	
3	Piotr Abram	R&D	14.09.2021	Points: 3.3, 3.4, 3.6, 3.7	
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1. Introduction

Before starting work related to the assembly, transport and use of the unloading ramp, read the Operation and Maintenance Documentation and this assembly manual.

Assembly, transport, use not in accordance with the Operation and Maintenance Documents and the assembly manual is not allowed.

2. List of components

Working ramps consist of elements such as platforms, beams, posts. The components of the unloading ramp are presented in Table 1.

Table 1. List of components of unloading ramps.

No.	Name	Index	Weight [kg]	Quantity
1.	Right unloading ramp frame	TUP-RA1	180	1
2.	Left unloading ramp frame	TUP-RA2	180	1
3.	Unloading ramp platform 2.2	TUP-M1	103	3
4.	Unloading ramp platform 1.5	TUP-M2	78	3
5.	Unloading ramp 1.25	TUP-M3	69	3
6.	Right unloading ramp gate 2.2	TUP-FR1	17	1
7.	Left unloading ramp gate 2.2	TUP-FR2	17	1
8.	Right unloading ramp gate 1.5	TUP-FR3	14	1
9.	Left unloading ramp gate 1.5	TUP-FR4	14	1
10.	Right unloading ramp gate 1.25	TUP-FR5	13	1
11.	Left unloading ramp gate 1.25	TUP-FR6	13	1
12.	Support	E-400	27	2
13.	Clamping beam 2.2	TUP-B1	11	2
14.	Posts bolt 2.2	TUP-B2	10	1
15.	Posts bolt 1.5	TUP-B3	7	1
16.	Posts bolt 1.25	TUP-B4	6	1
17.	Beam connector	TUP-A5	0,65	2
18.	Bolt connector	TOP-A6	0,64	2
19.	Gate lock	TUP-Z1	1	1
20.	Empty platform panel 2.2	TUP-O4	0,8	2
21.	Empty platform panel 1,5	TUP-O5	0,5	2
22.	Empty platform panel 1,25	TUP-O6	0,4	2
23.	Gate panel P1a	TUP-P1a	2,9	2
24.	Gate panel P1b	TUP-P1b	1,9	2
25.	Gate panel P1c	TUP-P1c	1,5	2
26.	Side panel P2	TUP-P2	4,6	4

Table 2. List of fasteners.

No.	ID	Weight [kg]	Quantity
A.	Bolt ISO 4017 M10x35	0,032	4
B.	Bolt ISO 4017 M10x70	0,054	3
C.	Bolt ISO 4017 M10x80	0,060	2
D.	Bolt ISO 4017 M12x110	0,114	6
E.	Bolt ISO 4017 M12x45	0,056	8
F.	Bolt ISO 4017 M16x40	0,101	24
G.	Bolt ISO 4017 M16x90	0,180	2
H.	Self-locking nut ISO 10511 M10	0,009	9
I.	Self-locking nut ISO 10511 M12	0,013	14
J.	Self-locking nut ISO 10511 M16	0,029	26
K.	Washer ISO 7089 10	0,004	18
L.	Washer ISO 7089 12	0,006	16
M.	Washer ISO 7089 16	0,011	52
N.	Washer ISO 7093 12	0,022	12
O.	Self-tapping screw DIN 7504 4,8x16	0,004	8
P.	T-bolt	0,055	4

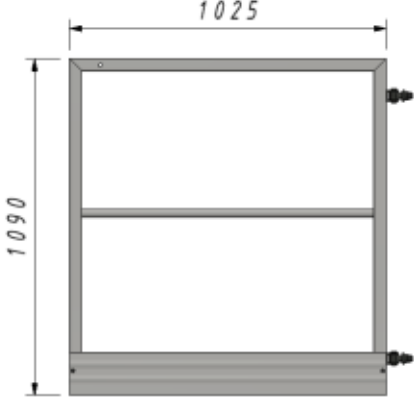
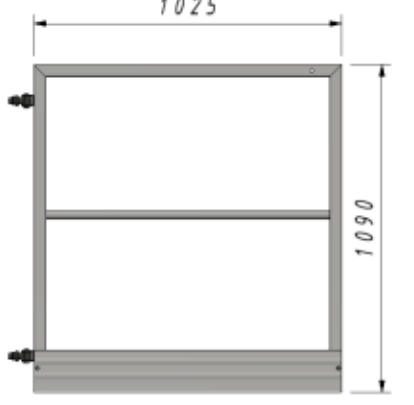
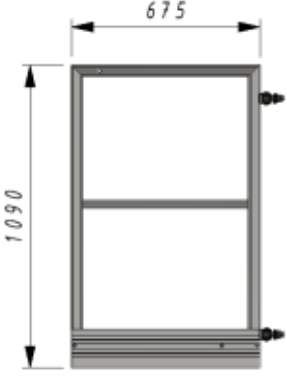
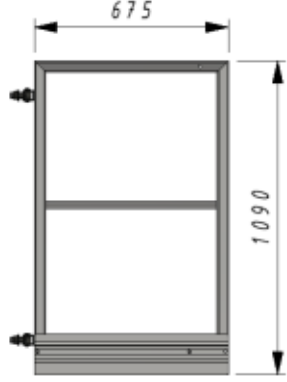
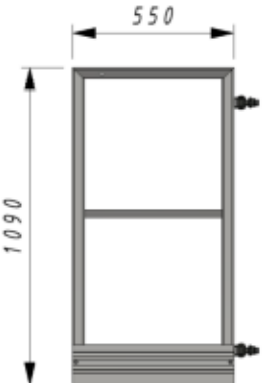

Fasteners should be tightened with the appropriate torque for the given size and class of the fastener.

Table 3. Table of bolt tightening torques.

Fastener size	Class 8.8
M10	46 Nm
M12	79 Nm
M16	198 Nm

Table 3. Graphical list of components.

TB-RA1	
Weight: 180 kg	
TB-RA2	
Weight: 180 kg	
TB-M1	
Weight: 103 kg	
TB-M2	
Weight: 78 kg	
TB-M3	
Weight: 69 kg	

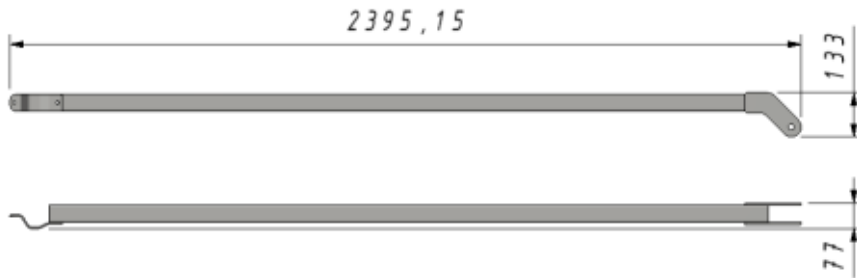
<p>TB-FR1</p>  <p>Weight: 17 kg</p>	<p>TB-FR2</p>  <p>Weight: 17 kg</p>
<p>TB-FR3</p>  <p>Weight: 14 kg</p>	<p>TB-FR4</p>  <p>Weight: 14 kg</p>
<p>TB-FR5</p>  <p>Weight: 13 kg</p>	<p>TB-FR6</p>  <p>Weight: 13 kg</p>

Peri PEP Ergo D-400



Weight: 27 kg

TB-B1



Weight: 11 kg

TB-B2

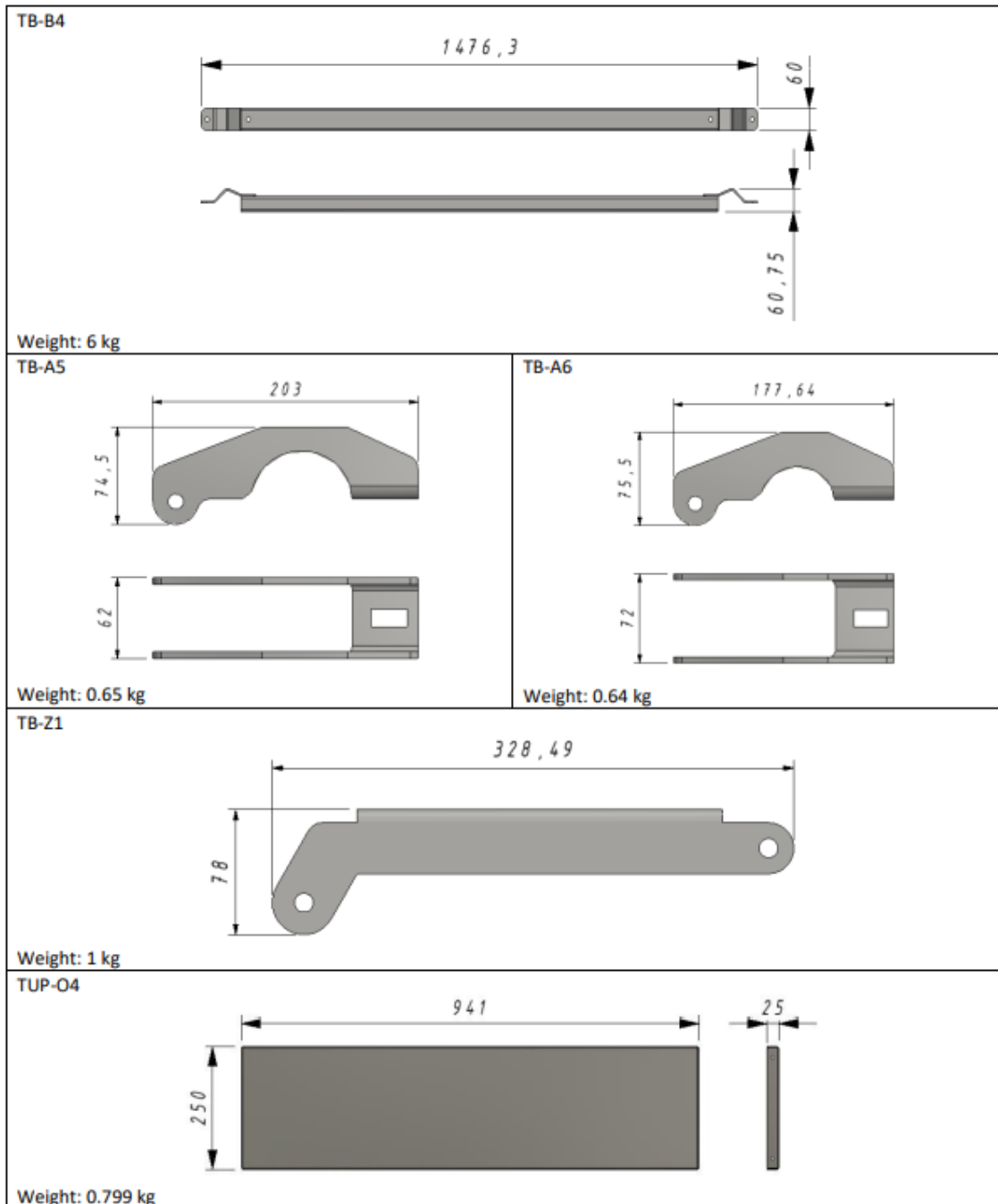


Weight: 10 kg

TB-B3



Weight: 7 kg



TUP-O5



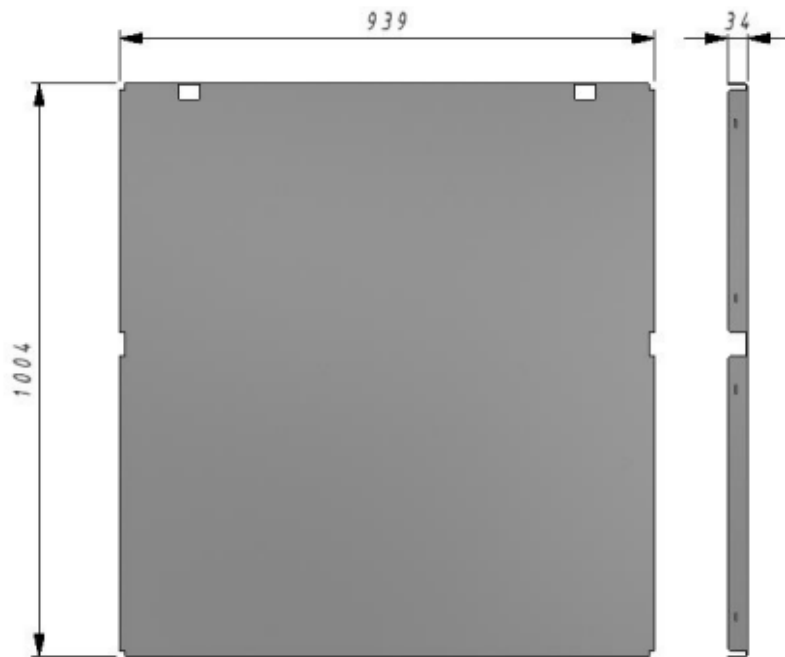
Weight: 0.518 kg

TUP-O6

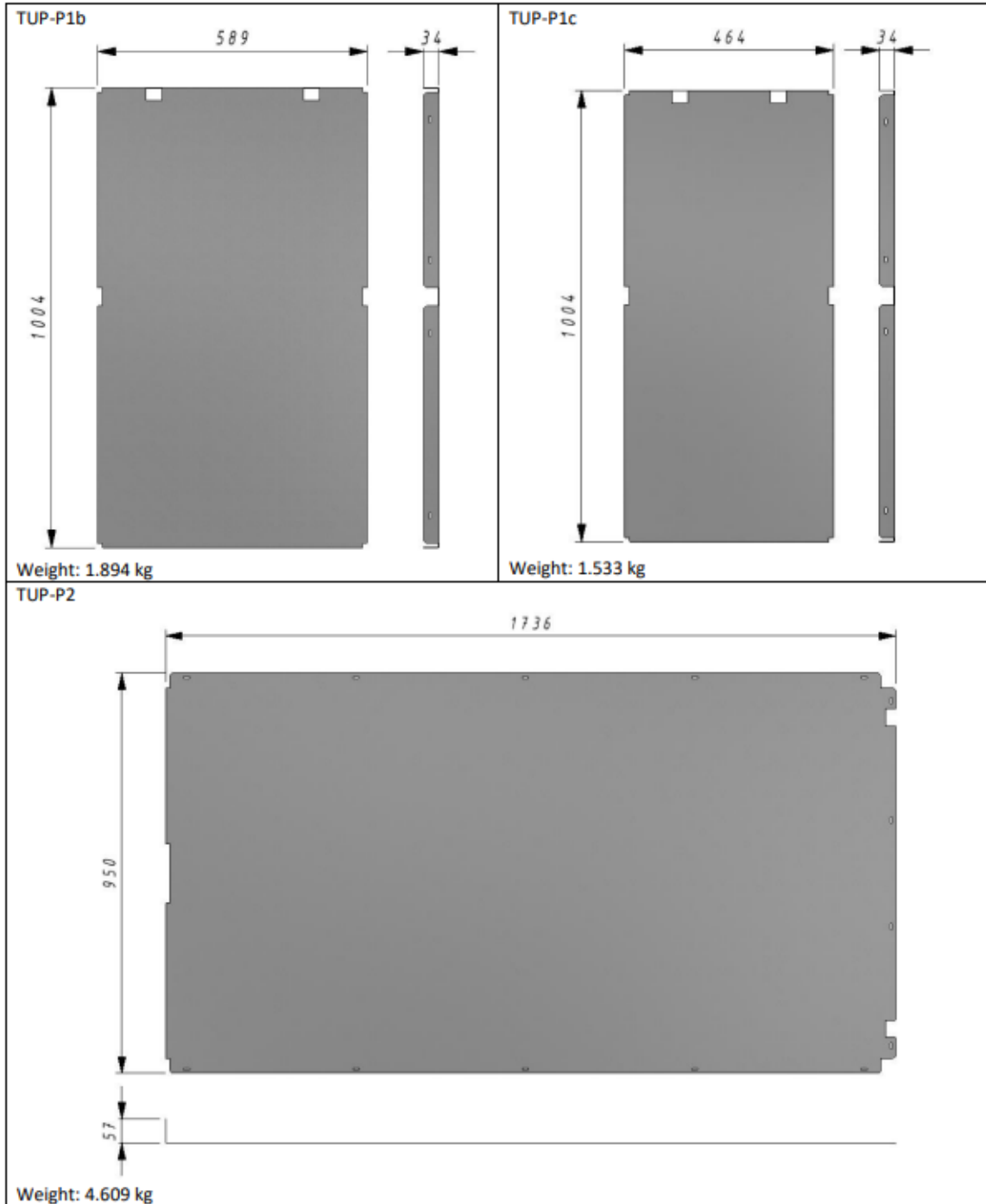


Weight: 0.418 kg

TUP-P1a



Weight: 2.911 kg



3. Assembly

3.1 General notes

The ramp should be assembled in accordance with the attached assembly manual and current health and safety guidelines.

The structure of the unloading ramp allows for two assembly methods. Assembly by strutting between the floors of the building and assembly by anchoring to the ceiling.

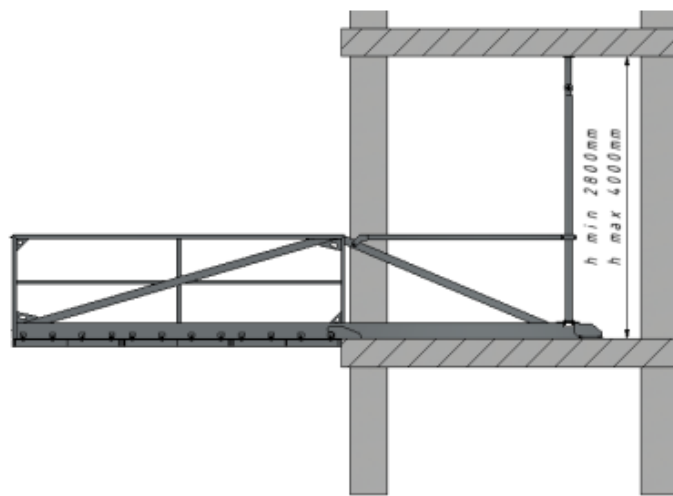


Fig. 1. Assembly between floors.

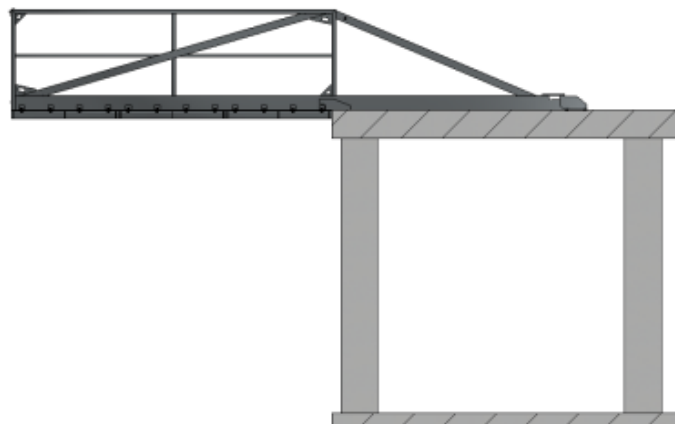


Fig. 2. Assembly by anchoring to the ceiling.

In the case of assembly between floors, the minimum height between the floors should not be less than 2800 mm, and the maximum height should not exceed 4000 mm. In the case of assembly by anchoring to the ceiling, use the mounting elements indicated in the manual. In both cases, the thickness of the ceiling/floor should not be less than 200mm and the concrete it is made of should reach the designed load capacity.

Before starting the assembly, it is necessary to:

- Visually check the condition of the ramp components in order to detect any damage.
- Make sure that the ground is clean and levelled to ensure proper adhesion.
- Make sure that the structure element to which the ramp will be attached will withstand the load according to Figures 3 and 4.
- Select the appropriate anchors for the load.

Reactions in points A - 42kN

Reactions in points B - 54kN

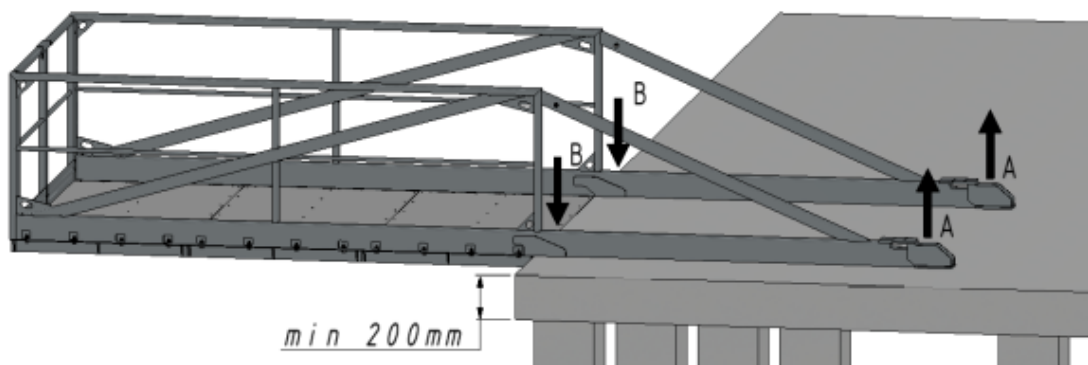


Fig. 3 Reactions during assembly by anchoring.

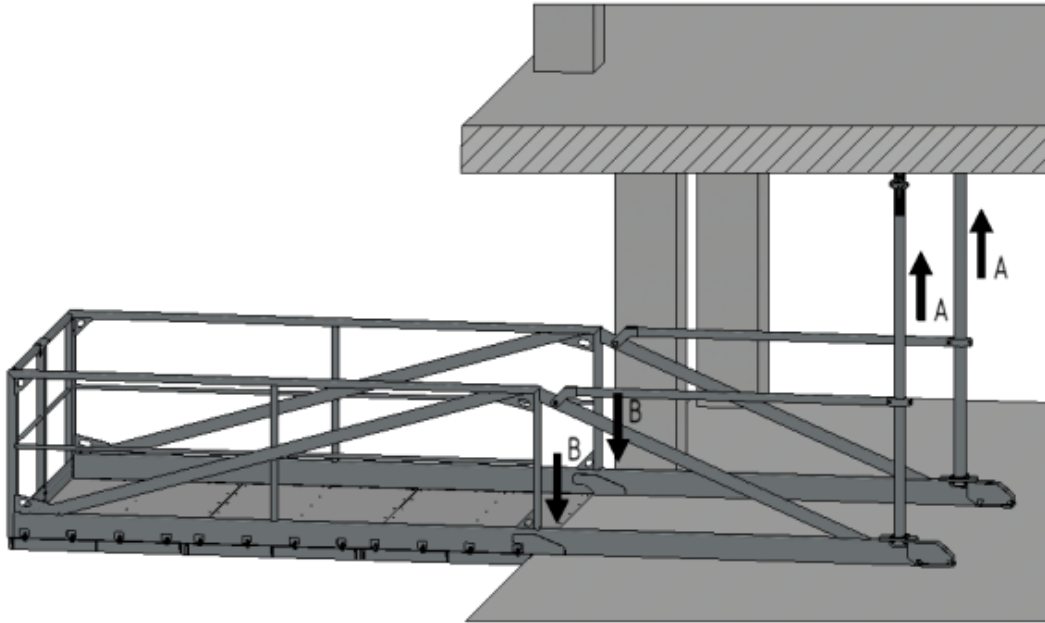
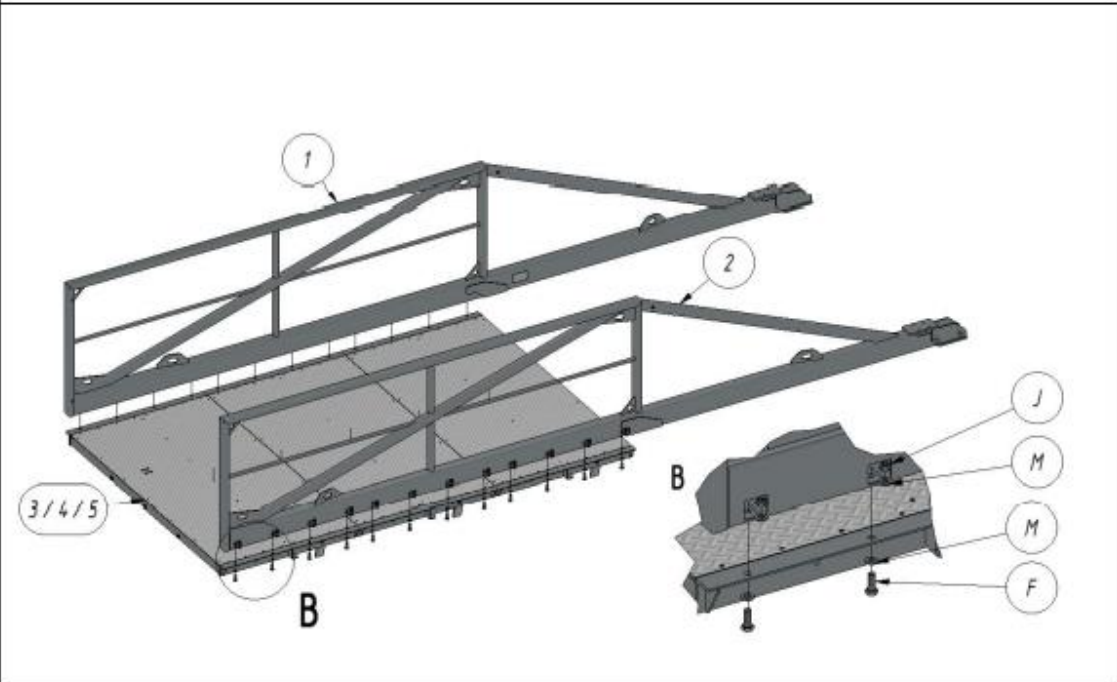
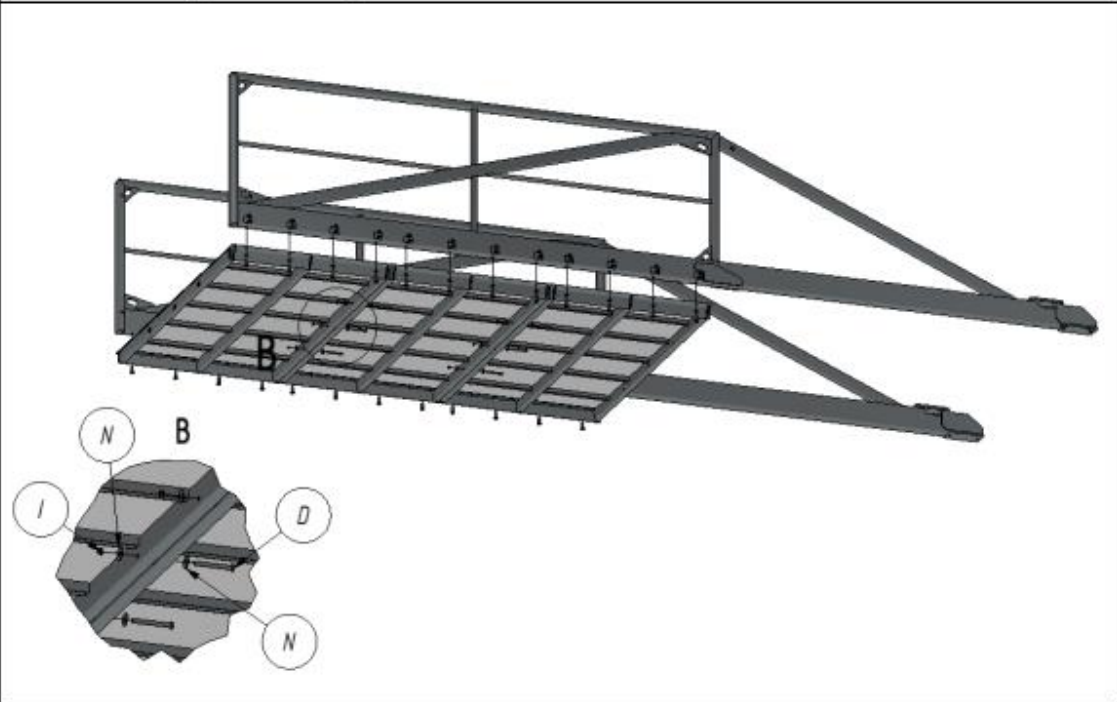
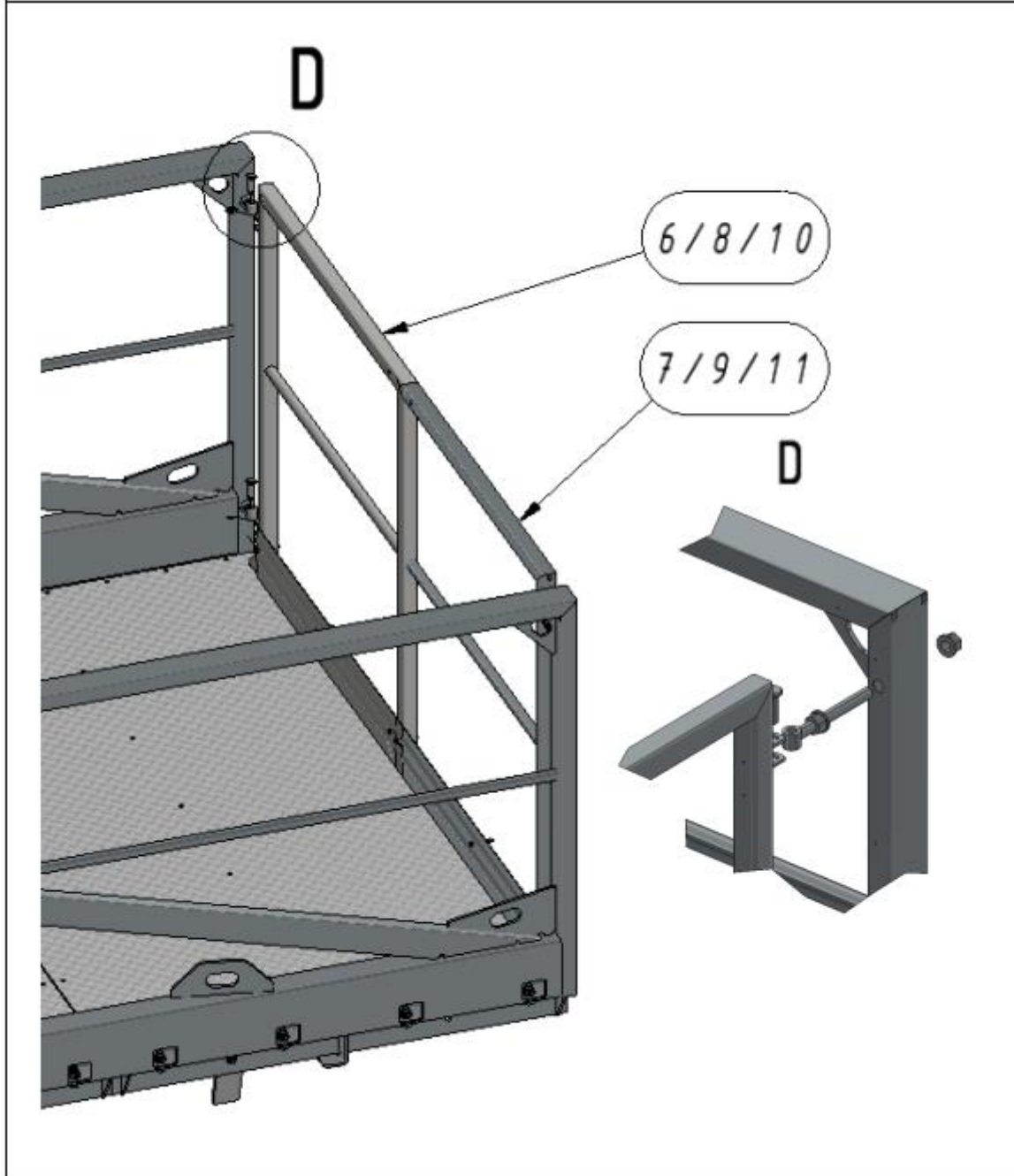


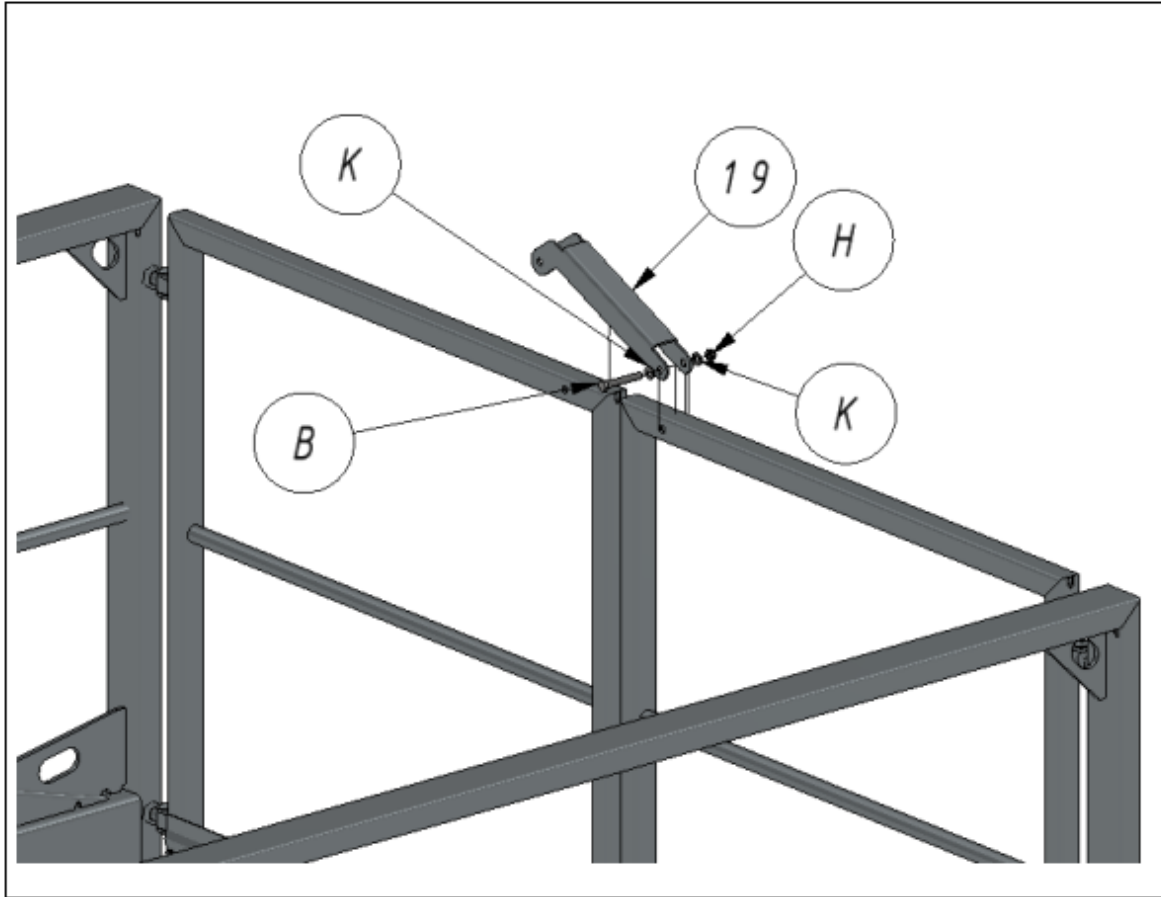
Fig 4 Reactions during assembly between floors.

3.2 Assembly of beams, platform

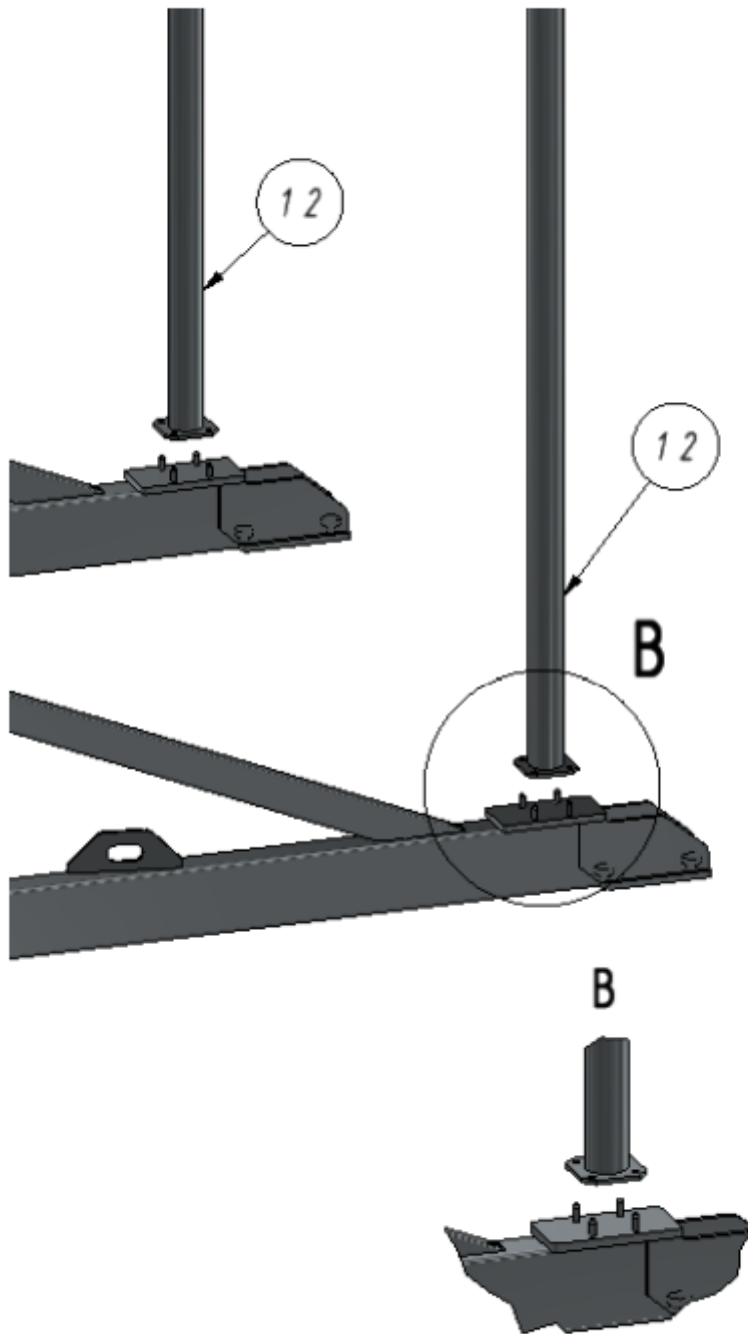


3.3 Gate assembly

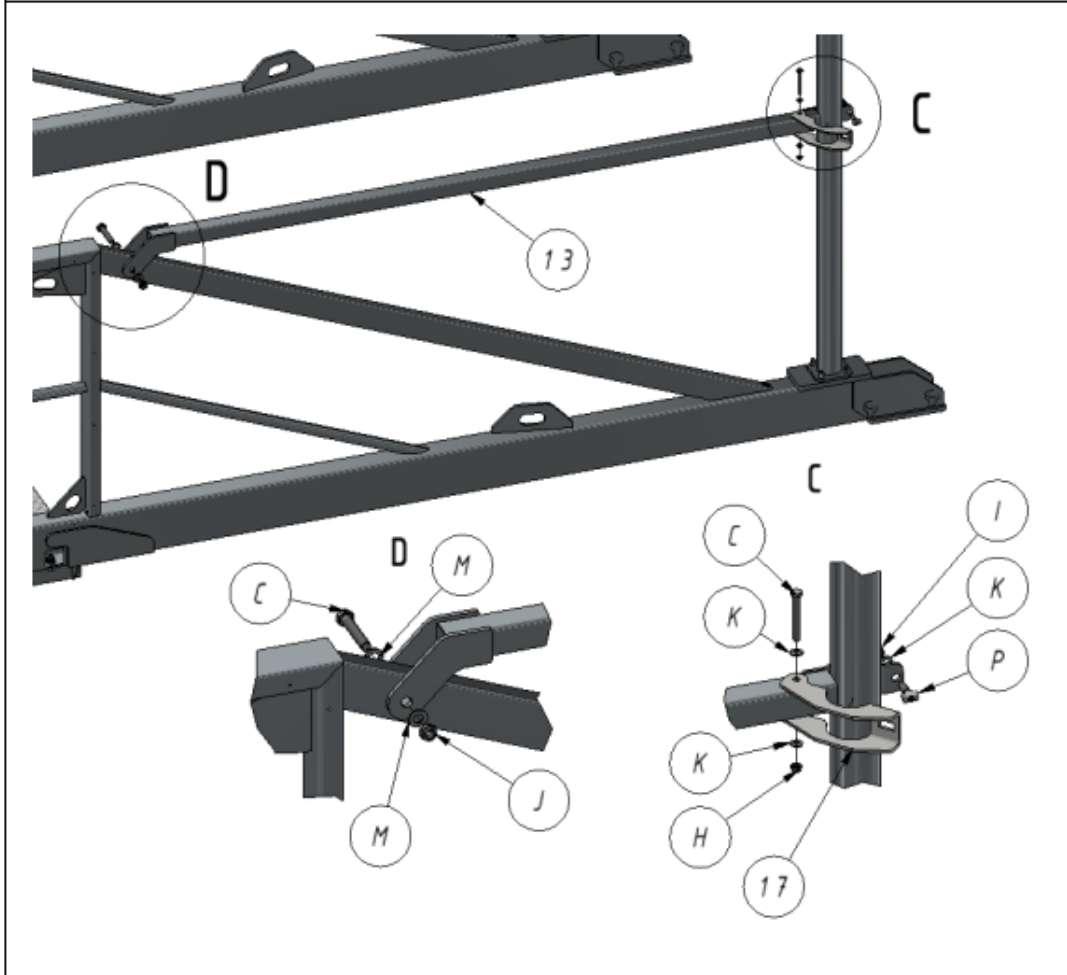




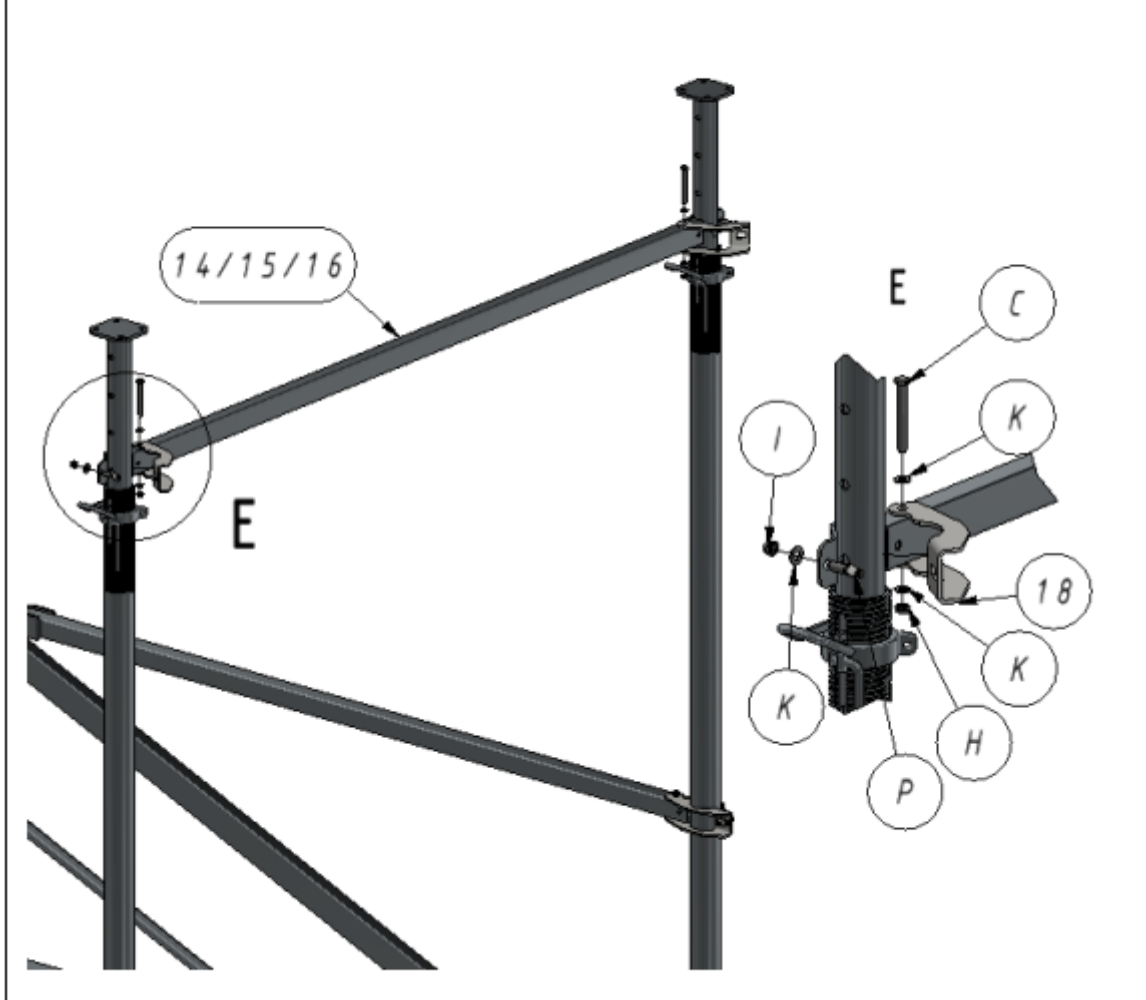
3.4 Posts assembly



3.5 Assembly of the clamping beam

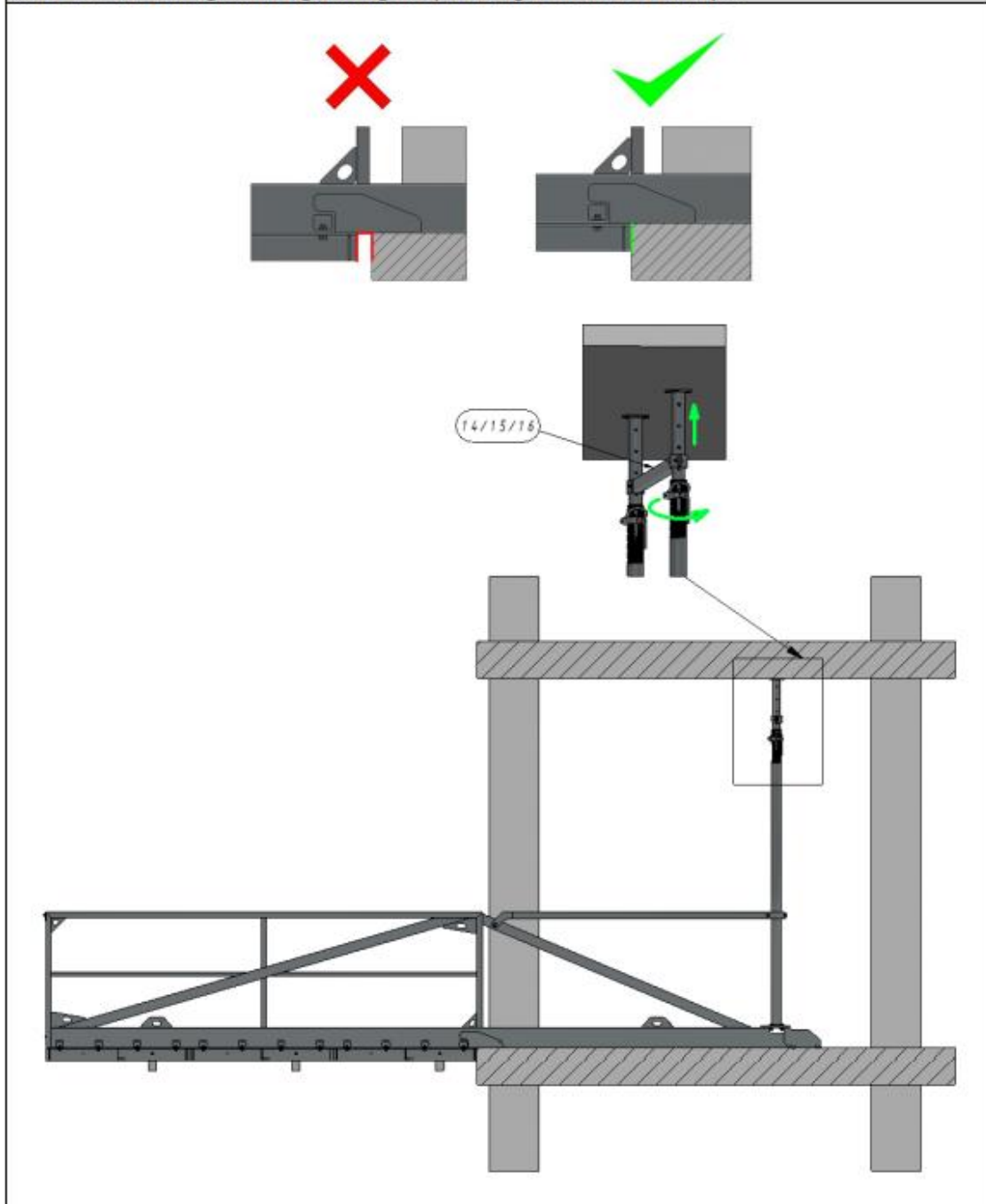


3.6 Bolt assembly

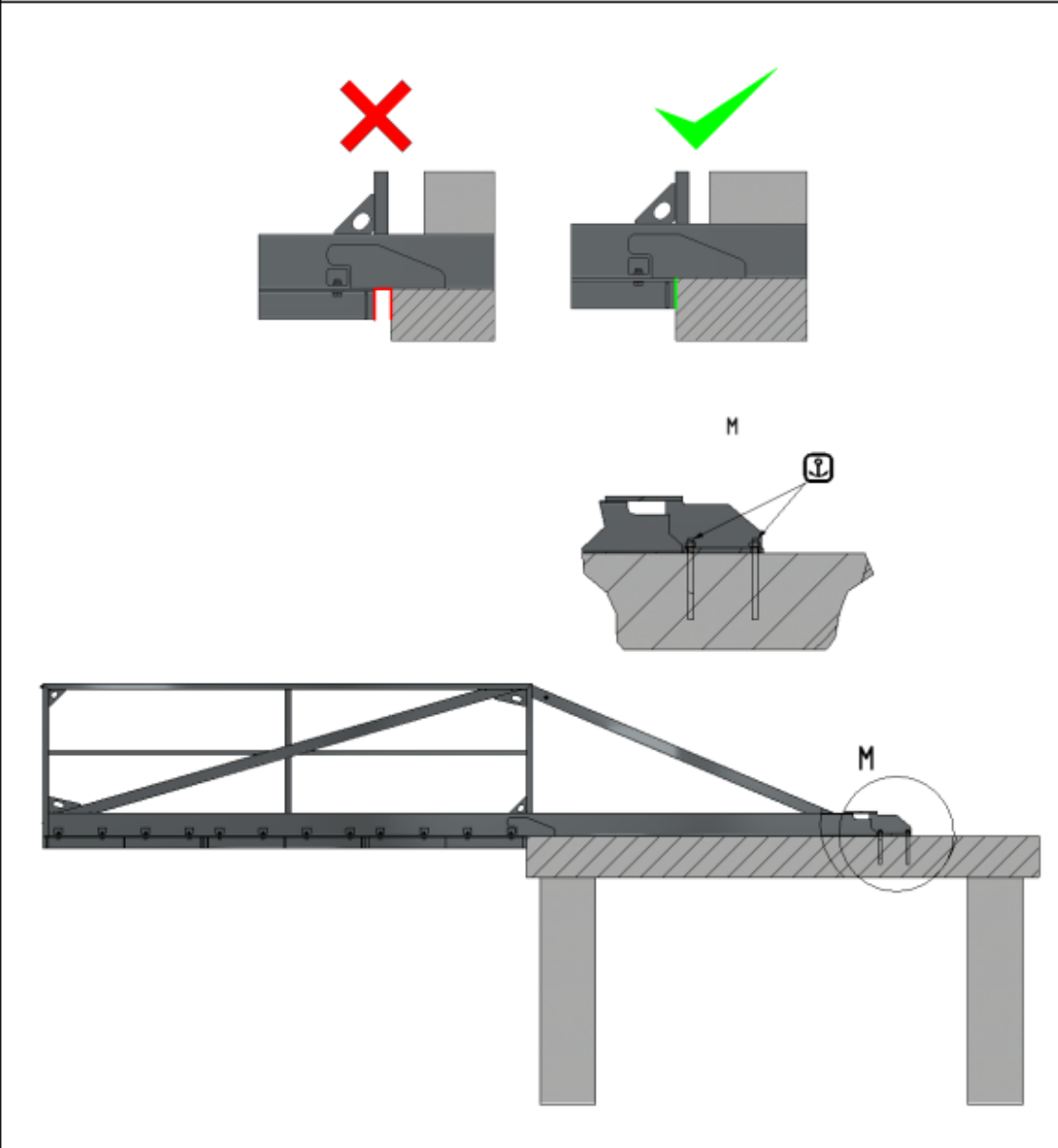


3.7 Ceiling assembly with the use of posts

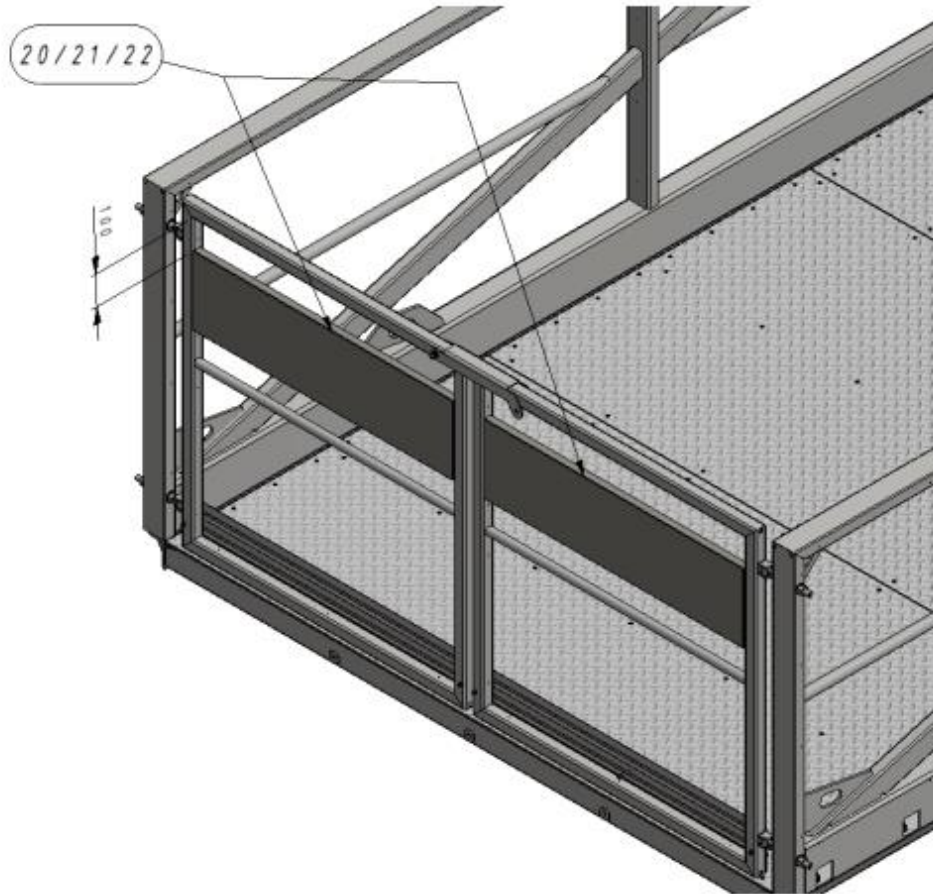
The clamps fastening the bolt should be screwed loosely, allowing for easy adjustment of the height of the posts. Before tightening, the posts should be positioned perpendicular to the floor and the ceiling. After tightening the posts, tighten the bolt clamps.



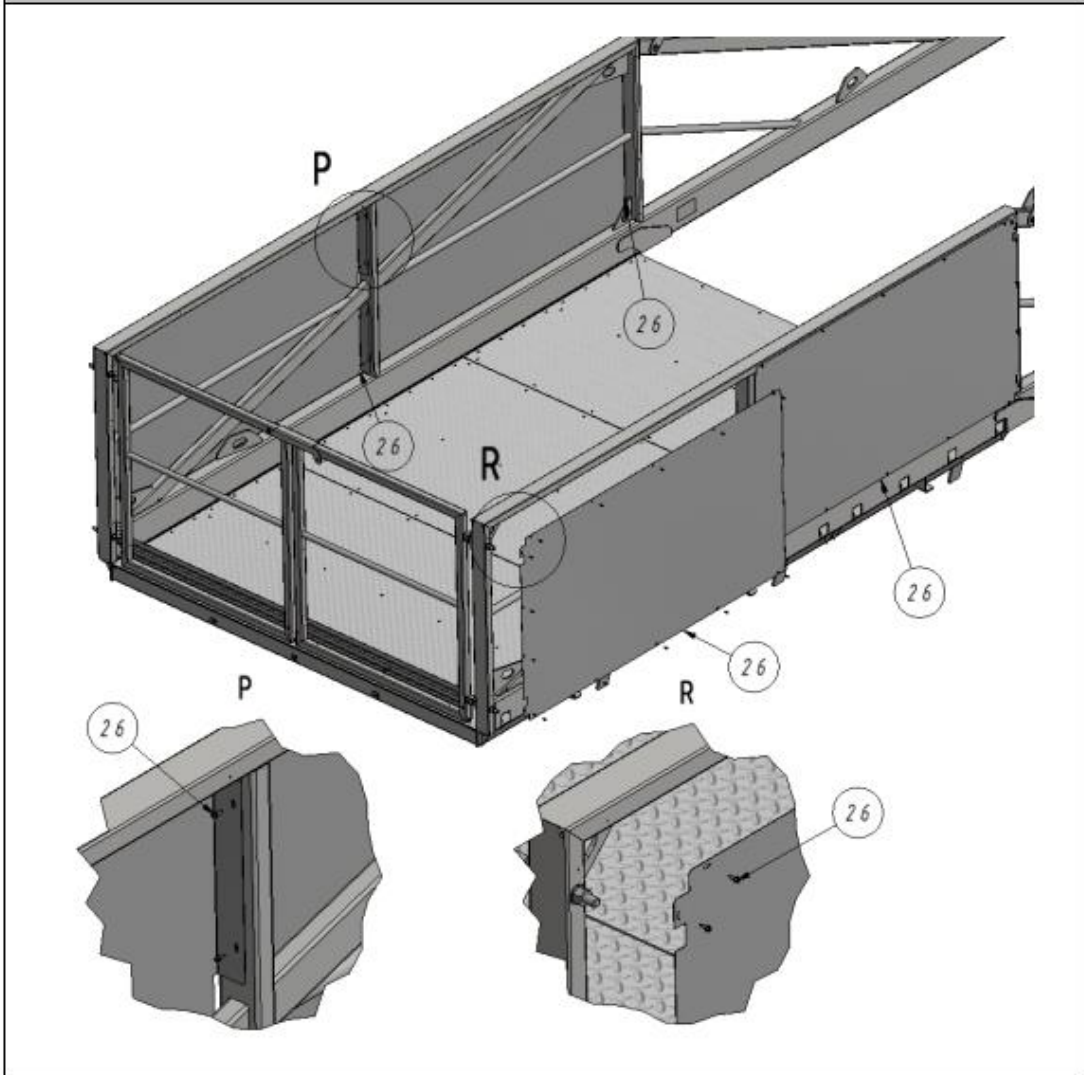
3.8 Ceiling mounting with anchors

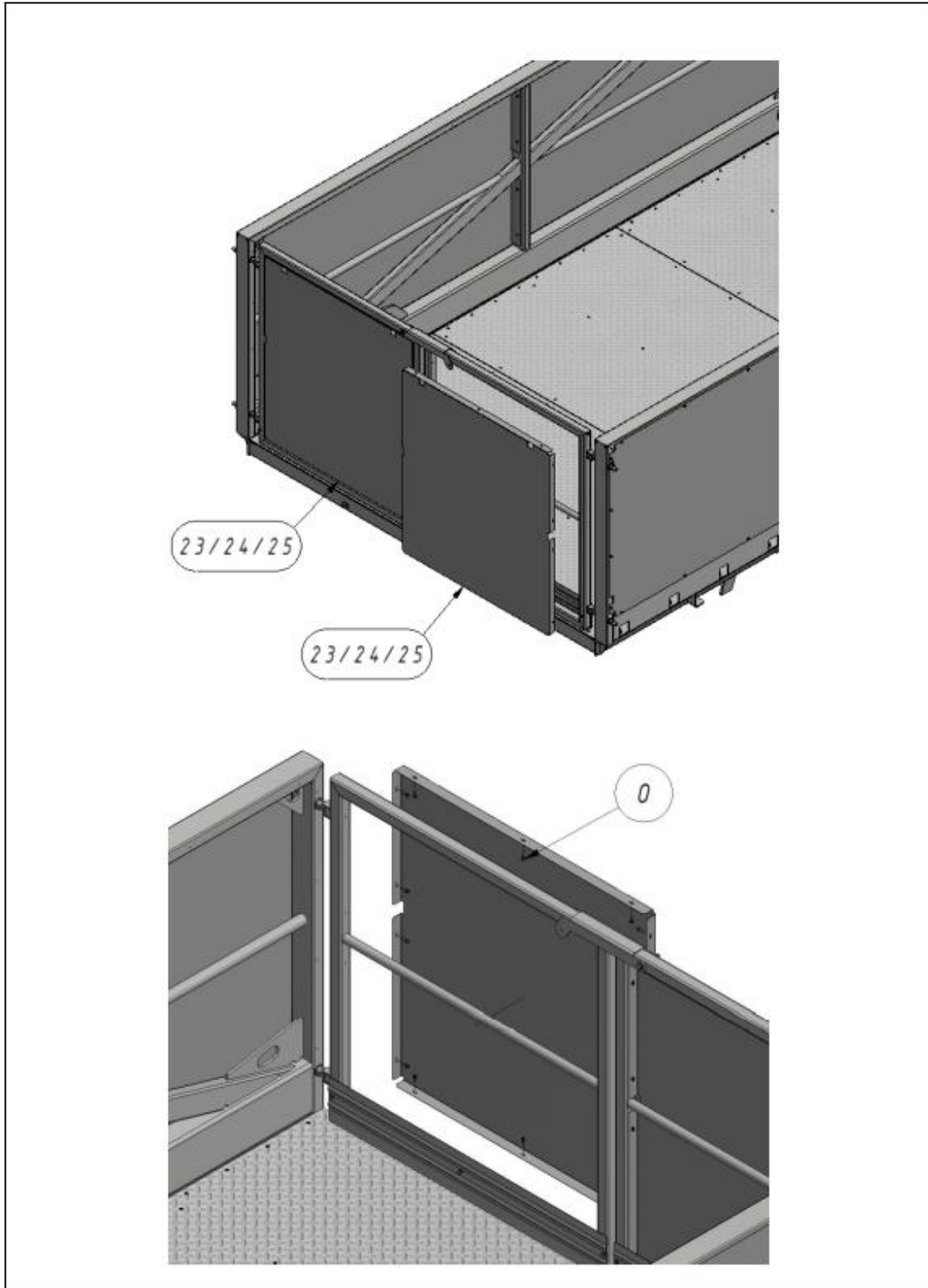


3.9 Assembly of panels on gates



3.10 Assembly of full panels





4. Notes

After assembly check:

- If the ceiling (surface) on which the ramp will be assembled is even
- If all bolted connections are tightened with the correct torque for the bolt cross section
- If there are no loose parts
- If the post nuts are properly secured