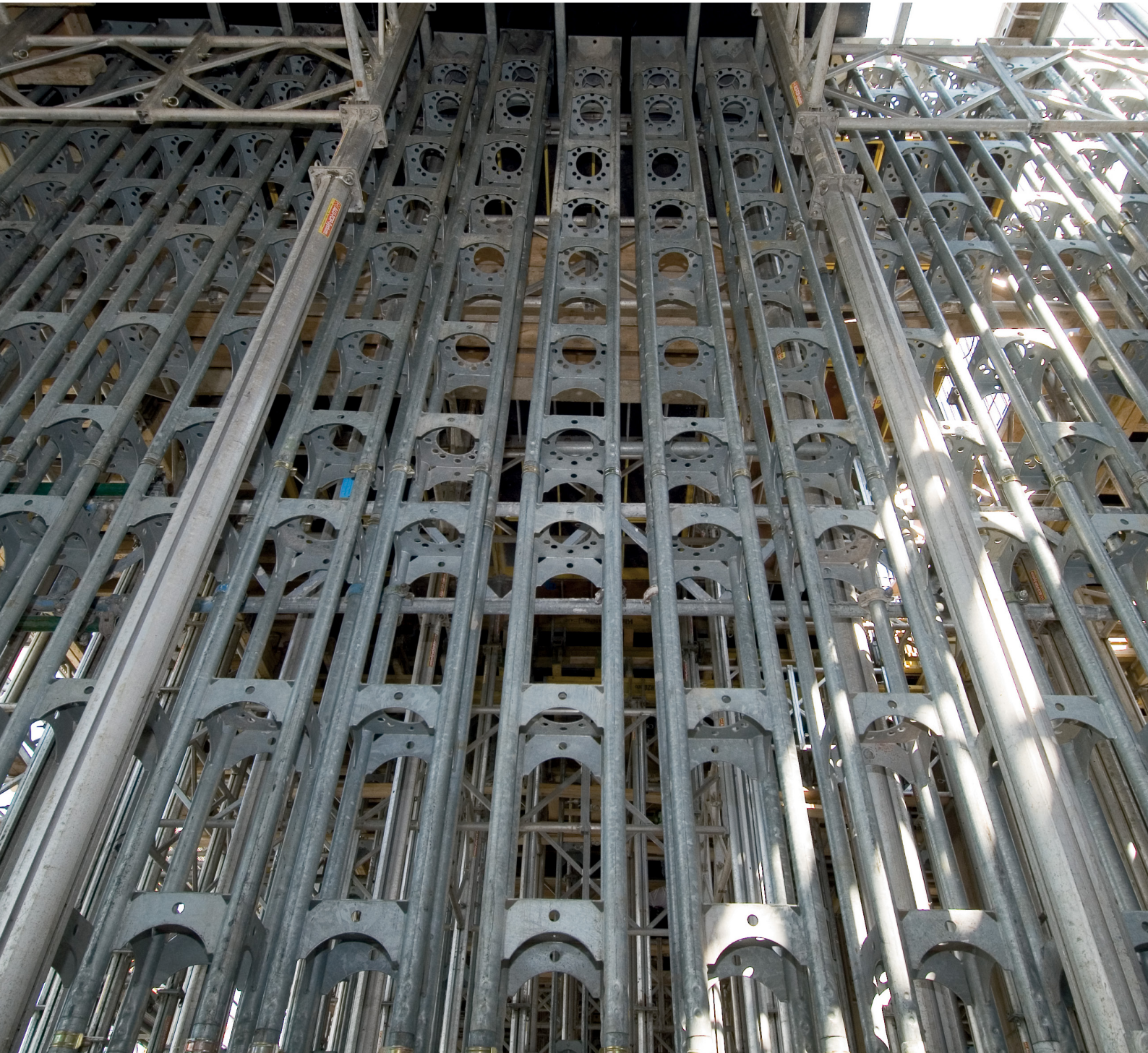


LOAD-BEARING FRAME PROP

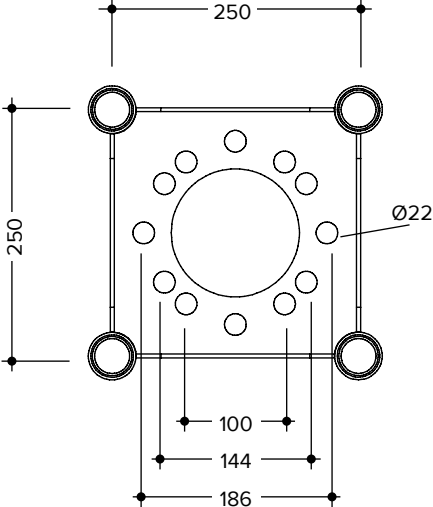
User guide



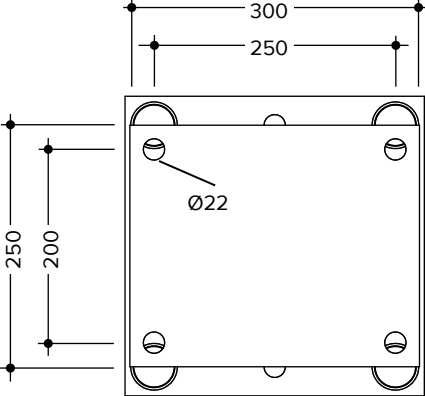
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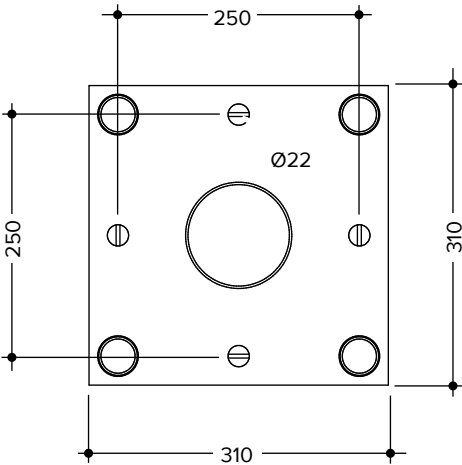
Cross-section frame section



Base plate of prop jack 2



Head plate of head section 50/75



1 Product features

The HÜNNEBECK frame prop is a versatile multi-functional prop for all applications where particularly high loads need to be supported safely and economically. The system dimensions of the frame prop are 25 x 25 cm. The maximum load bearing capacity is 210 kN depending on the height of the prop and on horizontal loads. It is possible to build frame props starting at 1.00 m. For heights up to 14 m with wind and 16 m without wind an official type approval is available. Applications higher than 14 m or 16 m have to be verified by individual design calculations. All components are robust and galvanized for a long product life.

The basic components of the frame prop are three types of frame sections with different heights, a prop jack and two frame sections that can be used as head section.

All connections are secured with L bolts.

The prop jack can be installed at the top as well as at the bottom of the frame prop.

The required height of the frame prop is achieved by combining the various frame sections and the spindles of the prop jack.

The frame can be arranged in a 25 cm grid. The adjustable range of each prop jack is 30 cm. That allows a stepless height adjustment. If prop jacks are installed at both ends of the frame prop, a combined spindle range of 60 cm can be achieved.

The base of the prop jack is hinged and can compensate inclinations of up to 10° on concrete or timber surfaces. For steel surfaces the inclinations have to be limited to 7° or the base of the prop jack has to be bolted to the steel to prevent slipping.

The frame sections are equipped with web plates and bulkhead plates with groups of holes that allow the flexible attachment of multiple types of accessories such as half couplers, walkway brackets, props etc.

The addition of single props to prop rows or to shoring towers can be made user friendly with the system components of the HÜNNEBECK INFRA-KIT. This allows efficient project planning, work preparation and workmanship.

All components are also available for rent from HÜNNEBECK'S European rental park.

For these systems check each application responsibly, for the permitted loads shown further below.

1.1 General information

This user guide provides important information about the installation and application of the HÜNNEBECK load bearing frame prop as well as precautions which are necessary for safe assembly and reliable use. This user guide is intended to allow effective work with the load bearing frame prop. Please read the user guide carefully prior to assembly and use of the load bearing frame prop and keep it at hand as a reference book.

HÜNNEBECK products are exclusively intended for commercial use by technically qualified users.

1.2 Safety instructions


Important information regarding the intended use and safe application of formwork and falsework


The contractor is responsible for drawing up a comprehensive risk assessment and a set of installation instructions. The latter is not usually identical to the user guide.


- **Risk assessment**
The contractor is responsible for the compilation documentation, implementation and revision of a risk assessment for each construction site. Employees are obliged to implement the measures resulting from this in accordance with all legal requirements.
- **Installation instructions**
The contractor is responsible for compiling a written set of installation instructions. The user guide is part of the basis for the compilation of a set of installation instructions.
- **User guide**
Formwork and falsework are technical work equipment that is intended for commercial use only. The product must be used as intended exclusively by properly trained personnel and appropriately qualified supervisory personnel. The user guide is an integral component of the formwork construction. It comprises at least safety guidelines, details on the standard configuration and intended use as well as the system description.
The functional instructions (standard configuration) contained in the user guide are to be complied with as stated. Enhancements, deviations or changes represent a potential risk and therefore require separate verification (with the help of a risk assessment and a structural analysis) or a set of installation instructions that comply with the relevant laws, standards and safety regulations. The same applies in those cases where formwork and/or falsework components are provided by the contractor.
- **Availability of the user guide**
The contractor must ensure that the user guide provided by the manufacturer is available on site at all time. Before assembly and use, the site personnel must be familiar with the user guide and the user guide must be readable and complete. Replacements can be obtained from HÜNNEBECK.
- **Illustrations**
The illustrations shown in the user guide are, in part, situations of assembly and not always complete in terms of safety considerations. Nevertheless, the safety installations that may not be shown in these illustrations must be available.
- **Storage and transportation**
The special requirements of the respective formwork constructions regarding transportation procedures as well as storage must be complied with. For example, the appropriate lifting gear should be indicated.
- **Material check**
Formwork and falsework material deliveries are to be checked on arrival at the construction site/place of destination as well as before each use to ensure that they are in perfect condition and function correctly. Changes to the formwork materials are not permitted.
- **Spare parts and repairs**
Only original components may be used as spare parts. Repairs are to be carried out by the manufacturer or authorized repair facilities only.
- **Use of other products**
Combining formwork components from different manufacturers carries certain risks. They are to be individually verified and may result in the compilation of a separate set of assembly instructions required for the installation of the equipment.

- Safety warnings, notes and visual check
The individual safety messages or notes and the visual check must be complied with.


Examples:

 DANGER	DANGER! DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
--	---

 WARNING	WARNING! WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
---	--

 CAUTION	CAUTION! CAUTION used with the safety alert symbol indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
---	---

NOTE	NOTE NOTE refers to practices not related to personal injury.
-------------	---

 VISUAL CHECK	VISUAL CHECK refers to a visual check and is not related to personal injury.
--	--

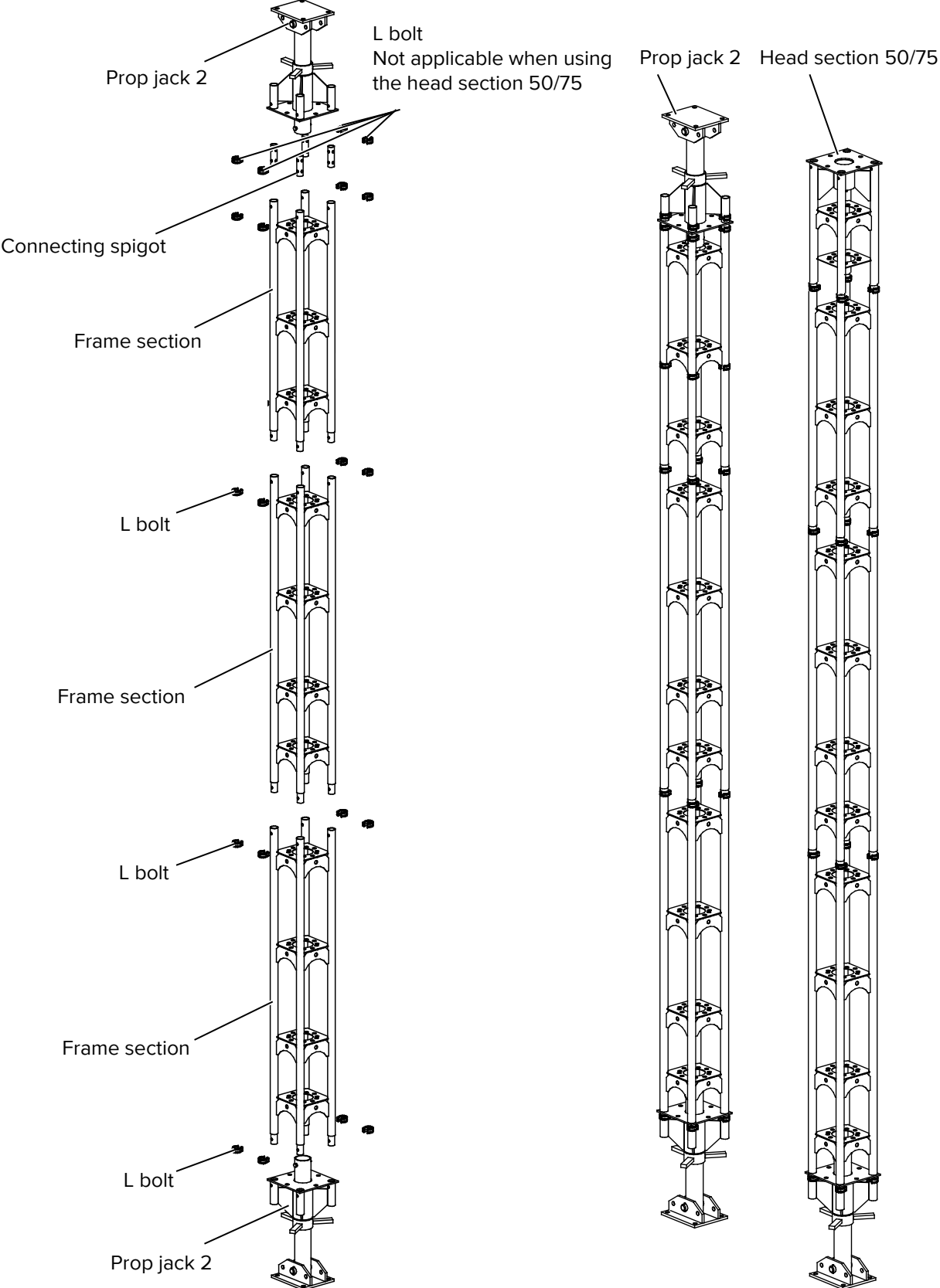
- Miscellaneous
Technical improvements and modifications are subject to change without note. For the safety-related application and use of the products all current country-specific laws, standards and other safety regulations are to be complied with without exception. They form a part of the obligations of employers and employees regarding industrial work safety. This results in, among other things, the responsibility of the contractor to ensure the stability of the formwork and falsework constructions as well as the structure during all stages of construction. This also includes the basic assembly, disassembly and the transport of the formwork and falsework constructions or their components. The complete construction is to be checked during and after assembly.

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GERMANY

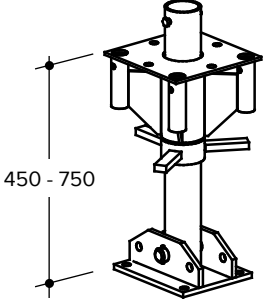
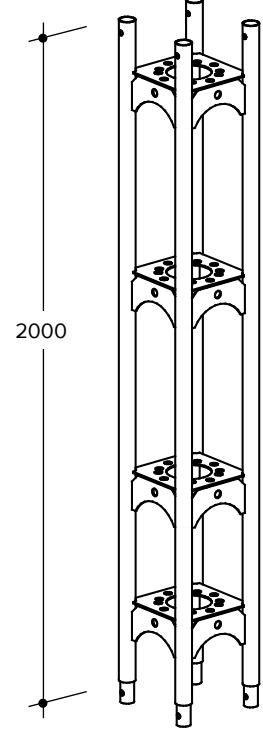
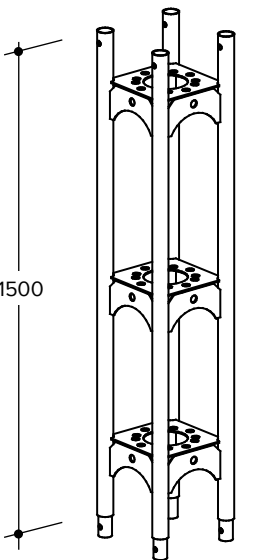
2 Overview

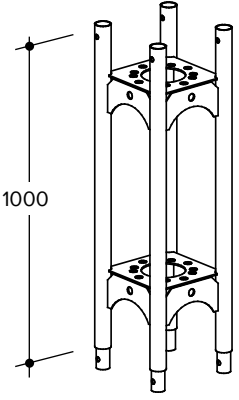
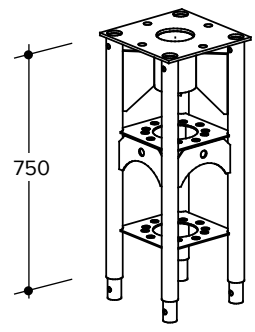
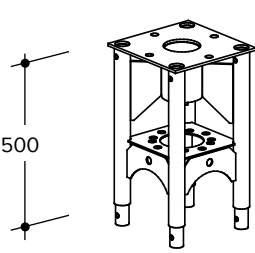
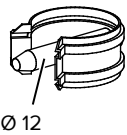
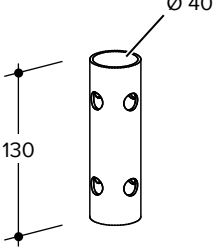
The load bearing frame prop can be equipped with a second prop jack or with a rigid head section 50/75.



3 Components

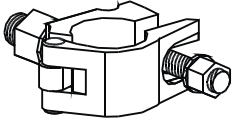
3.1 Basic parts

	Component	Product code	Weight [kg]
	<p>Prop jack 2</p> <p>Spindle with a system height starting from 0.45 m up to 0.75 m. It can be installed at the base as well as at the top of the frame prop (see page 11).</p>	<p>600354</p>	<p>49.99</p>
	<p>Frame section 200</p> <p>Component with a system height of 2.00 m (see page 11).</p>	<p>600348</p>	<p>40.32</p>
	<p>Frame section 150</p> <p>Component with a system height of 1.50 m (see page 11).</p>	<p>600349</p>	<p>30.60</p>

	Component	Product code	Weight [kg]
	<p>Frame section 100 Component with a system height of 1.00 m (see page 11).</p>	<p>600350</p>	<p>20.87</p>
	<p>Head section 75 Component with a system height of 0.75 m (see page 12).</p>	<p>600351</p>	<p>27.83</p>
	<p>Head section 50 Component with a system height of 0.50 m (see page 12).</p>	<p>600352</p>	<p>23.26</p>
	<p>L bolt Secures the joint between the prop sections (four parts required per joint, see page 12).</p>	<p>600356</p>	<p>0.11</p>
	<p>Connecting spigot This item is used to install the prop jack 2 to the top of the frame prop (four connecting spigots and eight L bolts are required per jack, see page 12).</p>	<p>600358</p>	<p>0.26</p>

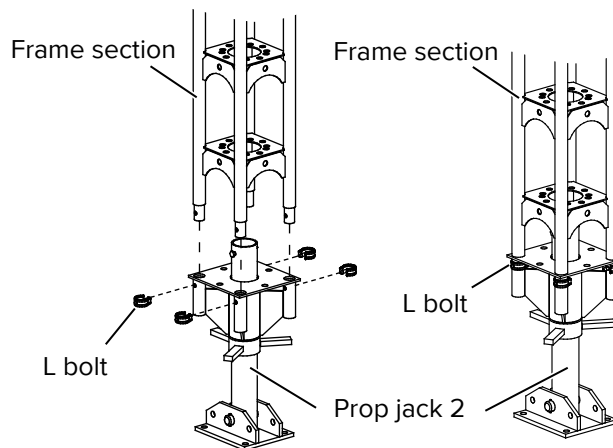
3.2 Walkway bracket and struts

	Component	Product code	Weight [kg]
	MANTO walkway bracket 90	448205	12.59
	PROTECTO railing post	601225	3.65
<p>This item is used to attach a 90 cm wide working platform or a walkway to a row of frame props. The MANTO walkway bracket is connected to the holes of the web plates of the frame sections at the desired height and secured with spring cotters. The timber decking is secured by nails to the integrated wooden nailing strip.</p>			
<p>The PROTECTO railing post is inserted into the walkway bracket (see page 17).</p>			
<p>This solution meets the requirements of load class 2 according to DIN EN 12811 with max. spacing between the walkway brackets of 2.40 m. When using plank railings the distance between the PROTECTO posts is limited to 2.00 m.</p>			
	Wall struts with 2 hinge plates, lacquered		
	Wall strut, size 6 (530 - 590 cm)	506555	40.00
	Wall strut, size 5 (420 - 490 cm)	506485	27.00
	Wall strut, size 4 (320 - 390 cm)	506463	24.00
	Wall strut, size 3 (270 - 340 cm)	506430	22.00
	Wall strut, size 2 (220 - 290 cm)	506420	21.00
	Wall strut, size 1 (170 - 240 cm)	506500	19.50
<p>This item is used to align and brace the load bearing frame props during installation. A hexagon bolt M20 x 40 with nut (product. code 548229) is used for the connection to the frame prop (see page 12).</p>			
	Sprag brace, size 2, lacquered	506533	18.00
	<p>170 - 240 cm for wall struts, size 3 + 4 with hinged plate and hinged bolt.</p>	<p>Connected to the frame prop with hexagon bolts M20 x 40 with nuts.</p>	
<p>Sprag brace, size 1, lacquered</p> <p>120 - 190 cm for wall struts, size 1 + 2 with a hinged plate and a hinged bolt.</p>			

	Component	Product code	Weight [kg]
	Half coupler 48/M20 x 30 SW22	2488	0.90

4 Assembly

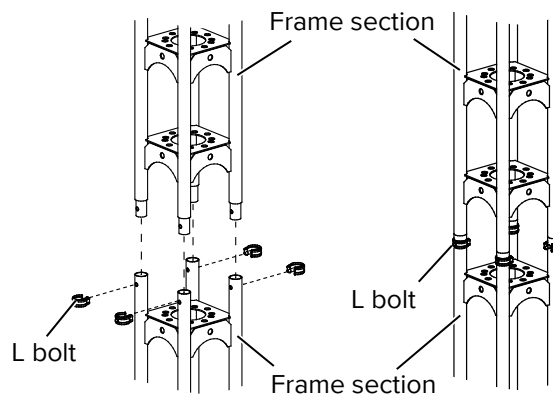
The frame section is inserted into the tubes of the prop jack 2 and then secured with four L bolts.



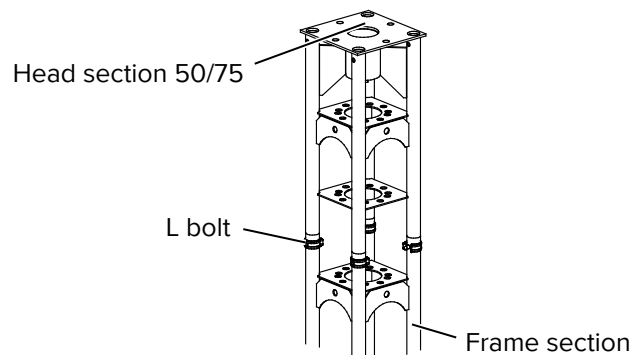
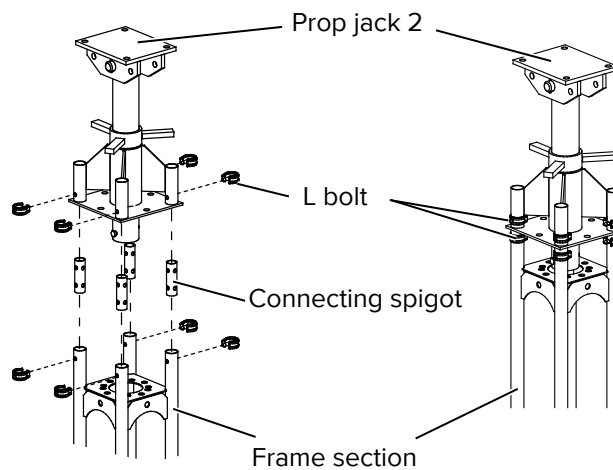
VISUAL CHECK

Visually check the connection between the frame section and the prop jack 2.

To achieve the desired height of the prop the required number of frame sections has to be connected and secured with L bolts.



When reaching the desired height of the frame prop, finally a prop jack 2 or a head section 50/75 can be used as the top of the prop. Therefore four connecting spigots must be inserted. Secure the joint with eight L bolts.



NOTE

NOTE

Permitted load eccentricity with spindles and head section 50/75: ≤ 5.00 mm.

Connection points

The stiffening bulkhead plates of the frame prop offer many solutions for the connection of scaffold tubes for bracing, working platforms and struts.

Half couplers, walkway brackets and wall struts can be attached.

The half coupler is fixed to a web plate by using the holes in the plate.

The walkway bracket is positioned on the horizontal web plate and then secured with the attached spring pins.

An area load of 1.50 kN/m^2 as per load class 2 can be assumed with a spacing between the brackets of max. 2.40 m. When using plank railings the distance between the PROTECTO posts is limited to 2.00 m.

The wall strut has to be fixed to the bulkhead plate by using a hexagon bolt M20 x 40 with nut (product code 548229).



WARNING

WARNING!

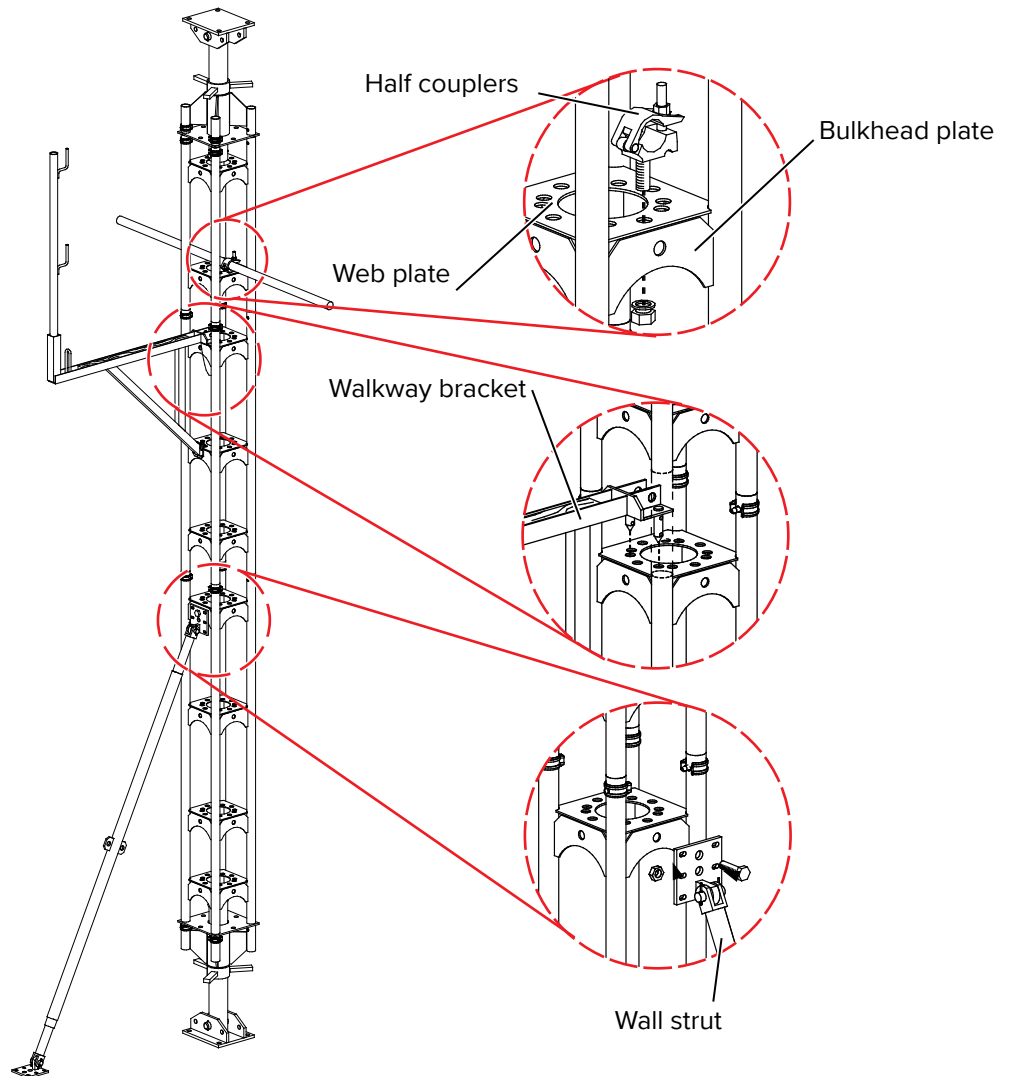
The frame prop has to be adequately secured in both directions against tipping and falling during all assembly, disassembly and construction stages. The wall struts have to be adequately anchored to stable ground.



WARNING

WARNING!

Variations to the user guide must be proved separately.



In the mounting position, the frame props (1) must be braced horizontally in both directions. In cross direction the bracing is done with a wall strut for each prop (2) and in longitudinal direction with at least one wall strut for each prop row (3) and a scaffold tube (4) mounted in longitudinal direction.

Mount wall struts and scaffold tubes on the upper half of the props. The angle of the setup must not exceed 60°.

When mounting walkway brackets (5) to the load bearing frame props, attach wall struts on both sides (6). Limit the distance between the walkway brackets to 2.40 m. Anchor all wall struts (2, 3 and 6) to stable ground. If there is a storm warning or when leaving the building site the second prop row (6) must be mounted also without walkways.

See also the warning in chapter *Load bearing capacity* on page 16.

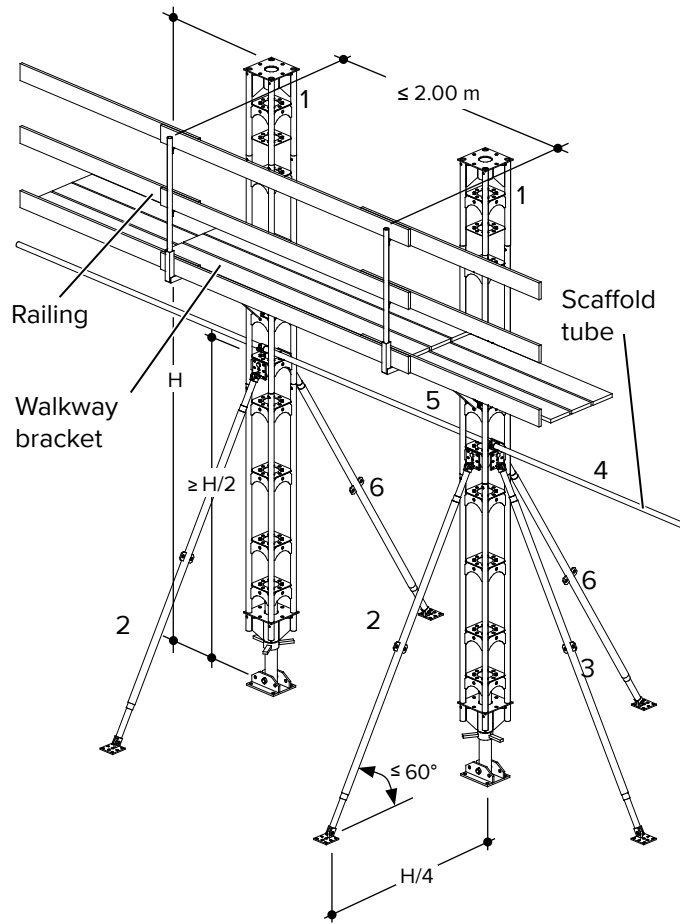
Once the head of the prop is horizontally held in cross direction and longitudinal direction, the wall struts can be removed.



WARNING

WARNING!

The wall struts are used for aligning and bracing during assembly and cannot be assigned to accommodate horizontal loads in free standing applications. Applications not held at their head require properly designed lateral bracing systems.



List of parts				Length overview [mm]							
	Jack min.	Jack max.	Head section 50	Head section 75	Frame section 100	Frame section 150	Frame section 200	Head section 50/75 and jack		With two jacks	
	450	750	500	750	1000	1500	2000	L _{min}	L _{max}	L _{min}	L _{max}
1	1	1	1	0	0	0	0	950	1250		
2	1	1	0	1	0	0	0	1200	1500		
3	1	1	0	0	1	0	0	1450	1750		
4	1	1	1	0	1	0	0	1950	2250		
5	1	1	0	1	1	0	0	2200	2500		
6	1	1	1	0	0	1	0	2450	2750		
7	1	1	0	1	0	1	0	2700	3000		
8	1	1	1	0	0	0	1	2950	3250		
9	1	1	0	1	0	0	1	3200	3500		
10	1	1	1	0	1	1	0	3450	3750		
11	1	1	0	1	1	1	0	3700	4000		
12	1	1	1	0	1	0	1	3950	4250		
13	1	1	0	1	1	0	1	4200	4500		
14	1	1	1	0	0	1	1	4450	4750		
15	1	1	0	1	0	1	1	4700	5000		
16	1	1	1	0	0	0	2	4950	5250		
17	1	1	0	1	0	0	2	5200	5500		
18	1	1	1	0	1	1	1	5450	5750		
19	1	1	0	1	1	1	1	5700	6000		
20	1	1	1	0	1	0	2	5950	6250		
21	1	1	0	1	1	0	2	6200	6500		
22	1	1	1	0	0	1	2	6450	6750		
23	1	1	0	1	0	1	2	6700	7000		
24	1	1	1	0	0	0	3	6950	7250		
25	1	1	0	1	0	0	3	7200	7500		
26	1	1	1	0	1	1	2	7450	7750		
27	1	1	0	1	1	1	2	7700	8000		
28	1	1	1	0	1	0	3	7950	8250		
29	1	1	0	1	1	0	3	8200	8500		
30	1	1	1	0	0	1	3	8450	8750		
31	1	1	0	1	0	1	3	8700	9000		
32	1	1	1	0	0	0	4	8950	9250		
33	1	1	0	1	0	0	4	9200	9500		
34	1	1	1	0	1	1	3	9450	9750		
35	1	1	0	1	1	1	3	9700	10000		
1	1	1	0	0	1	0	0			1900	2500
2	1	1	0	0	0	1	0			2400	3000
3	1	1	0	0	0	0	1			2900	3500
4	1	1	0	0	1	1	0			3400	4000
5	1	1	0	0	1	0	1			3900	4500
6	1	1	0	0	0	1	1			4400	5000
7	1	1	0	0	0	0	2			4900	5500
8	1	1	0	0	1	1	1			5400	6000
9	1	1	0	0	1	0	2			5900	6500
10	1	1	0	0	0	1	2			6400	7000
11	1	1	0	0	2	0	2			6900	7500
12	1	1	0	0	1	1	2			7400	8000
13	1	1	0	0	1	0	3			7900	8500
14	1	1	0	0	0	1	3			8400	9000
15	1	1	0	0	0	0	4			8900	9500
16	1	1	0	0	1	1	3			9400	10000

For the heights of 12 m, 14 m and 16 m compared to the height of 10 m, provide respectively one, two or three "frame sections 200" additionally.

5 Load bearing capacity

5.1 Results

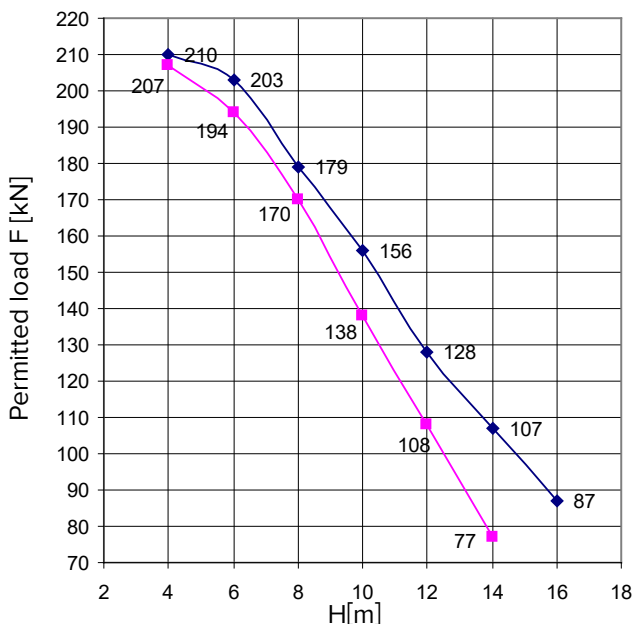
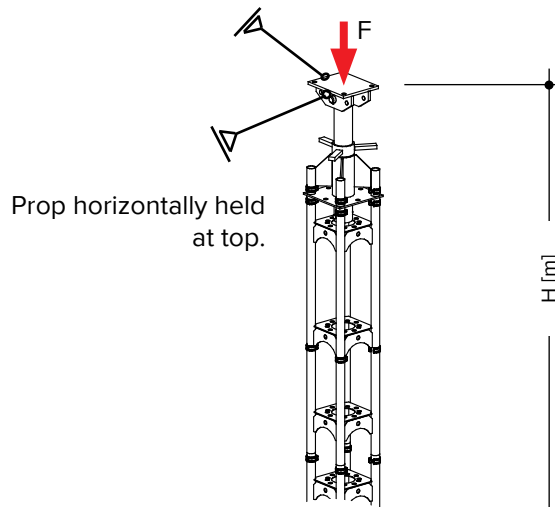
Depending on the length of the prop, the permitted loads for the HÜNNEBECK load bearing frame prop can be taken from the following diagrams. They are in accordance with DIN EN 1993-1-1 as well as DIN EN 12812 design class B1. It is necessary to differentiate between vertical use with and without walkway brackets, as well as horizontal use. Further it is necessary to differentiate between use without wind (e.g. in closed buildings and/or with full wind shading) and with wind. For use with wind, a peak velocity pressure of $q_p = 1.10 \text{ kN/m}^2$ has been calculated. Depending on the wind zone and the area category at the place of use, in accordance with DIN EN 1991-1-4 with NA.A.2 and NA.B.4, the maximum operating heights over ground are to be limited according to the table on the following pages. When using in topographically exposed positions like expansive inland waters, in precipitous valleys and when using over 800 m above sea level separate verification of the wind pressure is necessary.

5.2 Vertical use without walkway bracket

NOTE

NOTE

Props jacks cannot cater for tension loads. For load bearing frame props which are mounted with frame sections, the tension load $Z = 89 \text{ kN}$ is permitted if they are anchored adequately.



Maximum height of use over ground [m] when using with wind		
Wind zone	Area category	Max. height of use over ground
WZ 1	GK II + III	≤ 300 m
WZ 2	GK II + III	≤ 287 m
WZ 2	GK I	≤ 226 m
WZ 3	GK I + II	≤ 85 m
WZ 4	GK I	≤ 29 m

Maximum length of application:
12 months according to DIN EN 1991-1-4:2010-12 Tab NA.B.5

◆ Without wind
 ■ With peak velocity pressure $q_p = 1.10 \text{ kN/m}^2$

5.3 Vertical use with walkway bracket



WARNING

WARNING!

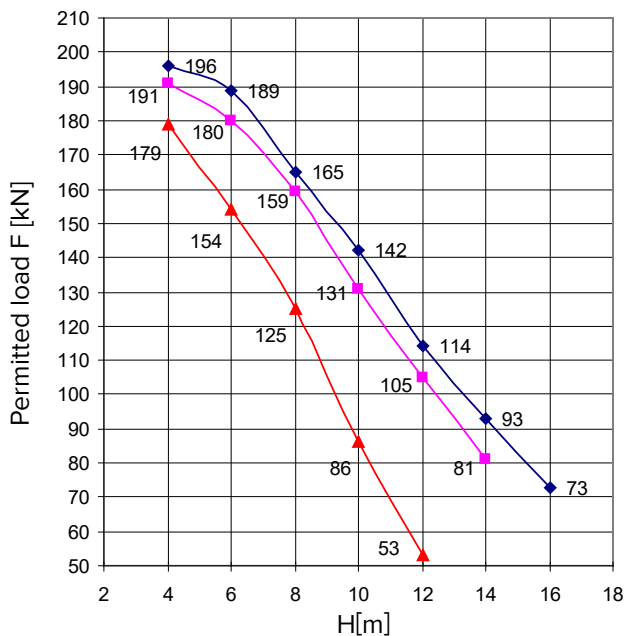
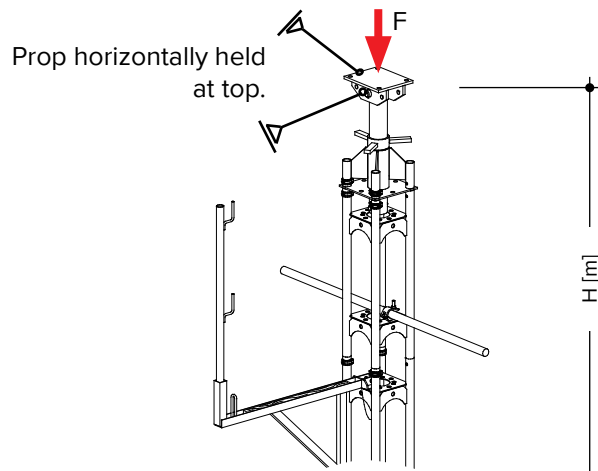
When using the curve “working wind 0.20 kN/m²” the walkway brackets must be removed completely during a storm warning!

When using the curve “working with peak velocity pressure $q = 1.1 \text{ kN/m}^2$ ” it is necessary to remove all working loads from the walkway brackets.

NOTE

NOTE

Props jacks cannot cater for tension loads. For load bearing frame props which are mounted with frame sections, the tension load $Z = 89 \text{ kN}$ is permitted if they are anchored adequately.



- ◆ Without wind
- Working wind 0.20 kN/m²
- ▲ With peak velocity pressure $q_p = 1.10 \text{ kN/m}^2$

Maximum height of use over ground [m] when using with wind		
Wind zone	Area category	Max. height of use over ground
WZ 1	GK II + III	≤ 300 m
WZ 2	GK II + III	≤ 287 m
WZ 2	GK I	≤ 226 m
WZ 3	GK I + II	≤ 85 m
WZ 4	GK I	≤ 29 m

Maximum length of application:
12 months according to DIN EN 1991-1-4:2010-12 Tab NA.B.5

Load bearing capacity

5.4 Horizontal use

During horizontal application, the frame prop must be held fixed in its position in vertical and horizontal direction.



WARNING

WARNING!

The deflection of the frame prop during horizontal use caused by self weight has to be measured on site and limited to $H/500$ by appropriate supports.



WARNING

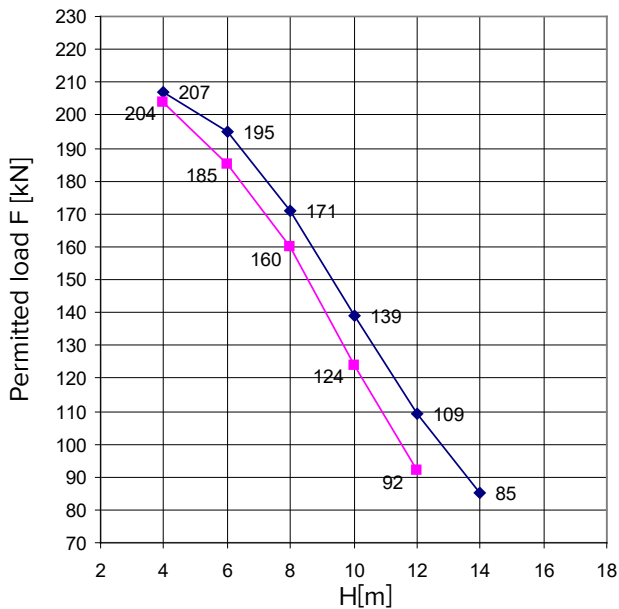
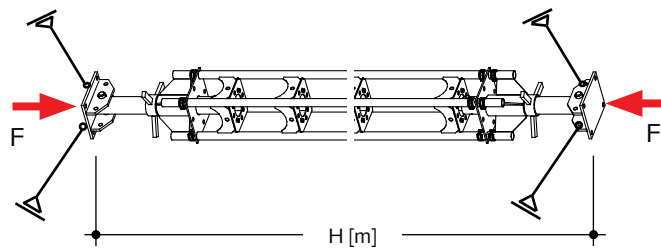
WARNING!

Horizontally installed frame props must not be used as beams e.g. for working platforms.

NOTE

NOTE

Props jacks cannot cater for tension loads. For load bearing frame props which are mounted with frame sections, the tension load $Z = 89$ kN is permitted if they are anchored adequately.



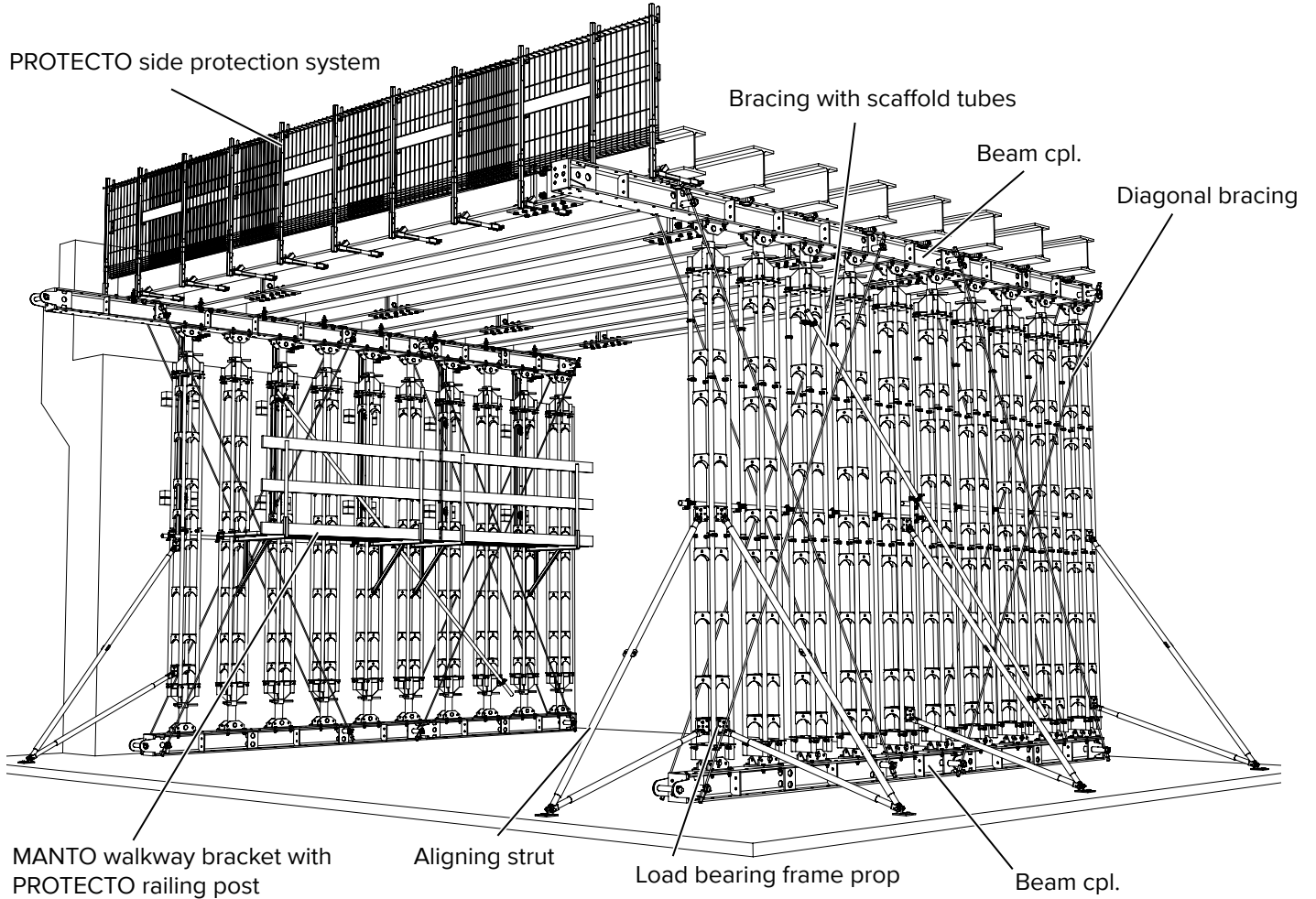
- ◆ Without wind
- ◆ With peak velocity pressure $q_p = 1.10$ kN/m²

Maximum height of use over ground [m] when using with wind		
Wind zone	Area category	Max. height of use over ground
WZ 1	GK II + III	≤ 300 m
WZ 2	GK II + III	≤ 287 m
WZ 2	GK I	≤ 226 m
WZ 3	GK I + II	≤ 85 m
WZ 4	GK I	≤ 29 m

Maximum length of application:
12 months according to DIN EN 1991-1-4:2010-12 Tab NA.B.5

6 Information on INFRA-KIT

For detailed information on INFRA-KIT, see instructions for assembly and use of the INFRA-KIT.



7 Notes on structural analysis

Unless explicitly stated otherwise, all load specifications in this document are safe working loads. This means that characteristic loads can be used for calculations. The following safety factors are included in the safe working load (where applicable):

Load:

$$\gamma_f = 1.5$$

According to DIN EN 1991-1-1

Resistances:

Steel:

$$\gamma_m = 1.1$$

Imperfections, load assumptions and additional rules:

According to DIN EN 1993 / DIN EN 12810 / DIN EN 12811 / DIN EN 12812 / DIN EN 1991

Aluminum:

$$\gamma_m = 1.1$$

Imperfections, load assumptions and additional rules:

According to DIN EN 1999 / DIN EN 12810 / DIN EN 12811 / DIN EN 12812 / DIN EN 1991

Timber:

$$\gamma_m = 1.3$$

$$K_{mod} = 0.9$$

Imperfections, load assumptions and additional rules:

According to DIN EN 1995 / DIN EN 12810 / DIN EN 12811 / DIN EN 12812 / DIN EN 1991

Concrete:

$$\gamma_m = 1.5$$

Imperfections, load assumptions and additional rules:

According to DIN EN 1992 / DIN EN 12810 / DIN EN 12811 / DIN EN 12812 / DIN EN 1991

Concrete steel:

$$\gamma_m = 1.15$$

Imperfections, load assumptions and additional rules:

According to DIN EN 1992 / DIN EN 12810 / DIN EN 12811 / DIN EN 12812 / DIN EN 1991

These values only include those loads that derive from the respective part itself (unless stated otherwise).

An increase of the loads due to effects in the full system (e.g. Theory II, substitute horizontal loads, scaffolding class, etc.) must be considered.

8 Chronology

Changes compared to issue 2010-03		
Changes	Page	Date
Layout updated	var.	2019-01
Distance of PROTECTO posts updated	var.	2019-01

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The illustrations in this brochure depict actual site conditions which may not always conform with applicable safety rules and regulations.

Last updated: January 2019
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