Grip column formwork

Technical information

Service in Formwork + Shoring

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GSV (Güteschutzverband Betonschalungen e.V., www.gsv-betonschalungen.de) Guideline:
Instructions for the proper, safe use of formwork and shoring.
As of 28th August 2009

The contractor has to compile a risk assessment and installation instructions. The latter is generally not identical to an assembly instruction.

- **Risk assessment**

The contractor is responsible for compiling, documenting, implementing, and revising a risk assessment for each building site. His employees are obligated to implement the resulting measures in conformity with the law.

- **Installation instruction**

The contractor is responsible for compiling written installation instructions. The assembly instruction forms one of the bases for compiling installation instructions.

- **Assembly instruction**

Formwork is a technical working appliance intended for commercial use only. Proper application has to be done exclusively by professionally qualified personnel and appropriately qualified supervisory personnel. The assembly instruction is an integral part of formwork construction. They contain at least safety instructions, information about standard design and intended use, as well as the system description.
The functional instructions (standard design) in the assembly instruction are to be obeyed exactly. Extensions, deviations, or changes represent a potential risk and therefore require separate verification (with the aid of a risk assessment) or installation instructions in compliance with applicable laws, standards, and safety regulations. The same applies to on-site provided formwork/shoring parts.

- **The availability of an assembly instruction**

The contractor has to ensure that the assembly instruction provided by the manufacturer or formwork supplier is present at the installation location, known to the employees before assembly and use, and always accessible.

- **Illustration**

The illustrations shown in the assembly instruction are partly assembly situations and are thus not always complete in a safety-related sense. Safety equipment possibly not shown in these illustrations must nevertheless be present.

- **Storage and transport**

The respective formwork constructions' special requirements relating to transport procedures and storage are to be followed. The use of proper lifting accessories is cited as an example.

- **Material inspection**

Formwork and shoring material is to be checked for sound condition and function before entrance to the building site or at the destination point as well as before each use. Changes to the formwork material are impermissible.

- **Replacement parts and repairs**

Only original parts may be used as replacement parts. Only the manufacturer or authorized organisations may conduct repairs.

- **Use of other products**

Mixtures of formwork components from different manufacturers contain possible dangers. They should be checked separately and can lead to the need to compile in-house installation instructions.

- **Safety symbols**

Individual safety symbols must be obeyed.
Examples


Safety notice: Non-compliance can lead to property damage or damage to health (including danger to life).


Visual test: The action undertaken is to be done via a visual inspection.

Note: Supplementary information for the activities' safe, proper, and professional conduct.

- **Miscellaneous**

Changes during the course of technical development are expressly reserved. The most current versions of country-specific laws, standards, and other safety regulations are to be used for the safety-related application and use of the products. They form part of the employers' and employees' duties with respect to work safety. Among other things, the contractor's duty to ensure the stability of formwork and shoring structures, as well as that of the construction during all states of construction derives from this. This includes basic assembly, and the disassembly and transport of the formwork and shoring constructions and their parts. The overall construction is to be checked during and after assembly.

Content

Key :

Symbols and signal words used

Caution! This warning symbol identifies hazards in the document that can cause property or personal damage. Strictly obey the action instructions associated with this symbol.

Attention! This signal word warns of hazards that can alone cause property damage. Strictly obey the action instructions associated with this symbol.

Tip Useful recommendations that simplify the device's operation follow this signal word.


Guard rail
Crane eye
Working platform
Grip-wing,
covered with a 21 mm thick,
plastic-coated birch plywood
Tensioning device
Ladder
Connection for props
Ladder fastening
Adjustable prop
Foot plate

Fig. 1

- The adjustable column formwork Grip from PASCHAL is a steel-frame formwork, the wings of which are constructed according to the so-called windmill wing principle (Fig. 2).
- With four wings each, square and rectangular column cross-sections can be formed in the adjustment range of 20 cm to 60 cm in 5 cm steps. The individual wings are constructed with articulations so that they can be stored and transported in a space-saving manner.
- Heights of 340 cm, 300 cm, 150 cm, and 90 cm are available.
- DIN 18218 permits a maximum fresh concrete pressure of 80 kN/m².
- A 21 mm thick, plastic coated, plywood is built into the wings as formwork facing, which is screwed on from the frame side. Concrete surfaces with stricter requirements can be produced this way.
- Fastening options for accessory parts such as adjustable props, working platforms, or ladders are present in the individual wings, as are eyes for crane transport.

Loosening the tensioners on one side is sufficient to open the entire column formwork.
After that the whole formwork folds open and can be moved with just one crane lift (Fig. 2).
Closing the formwork for the use occurs by folding the column wings together and re-tensioning.

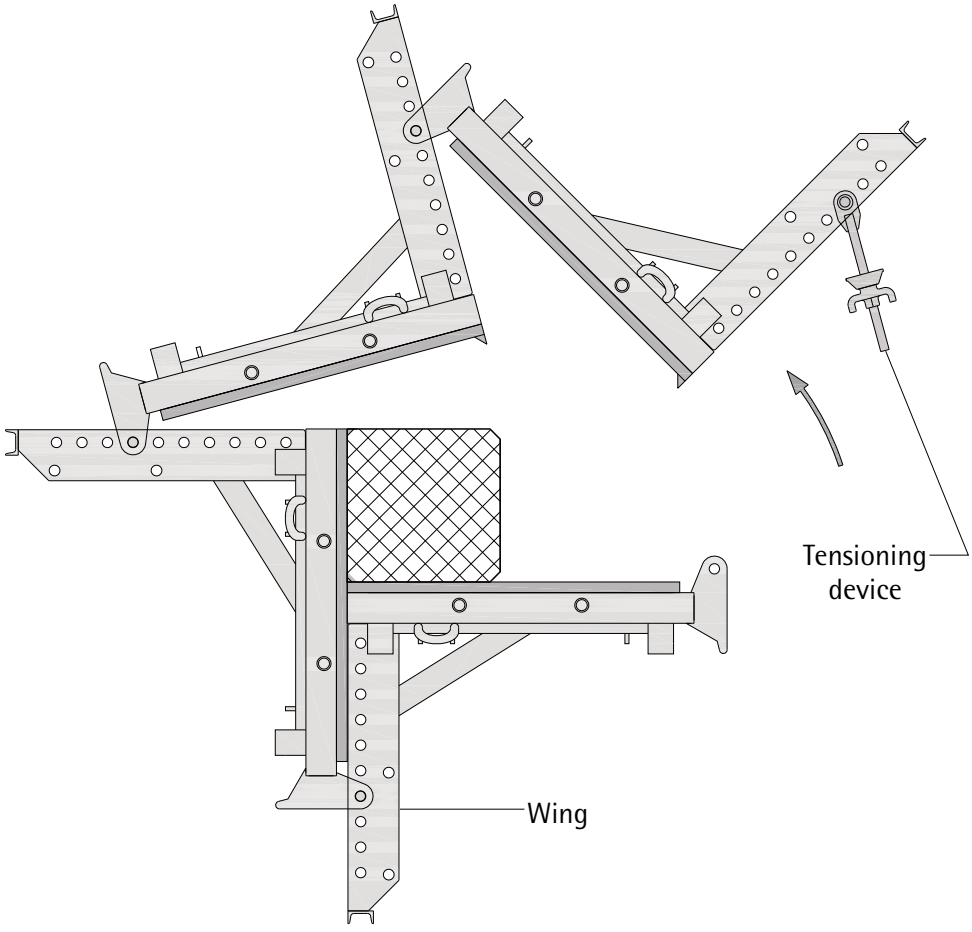
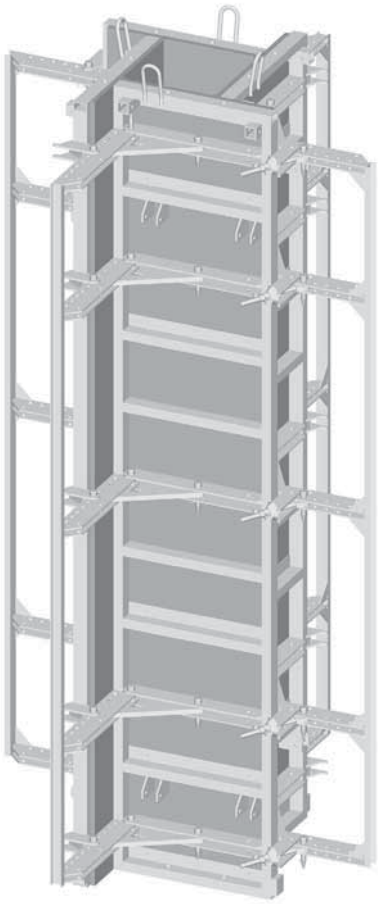
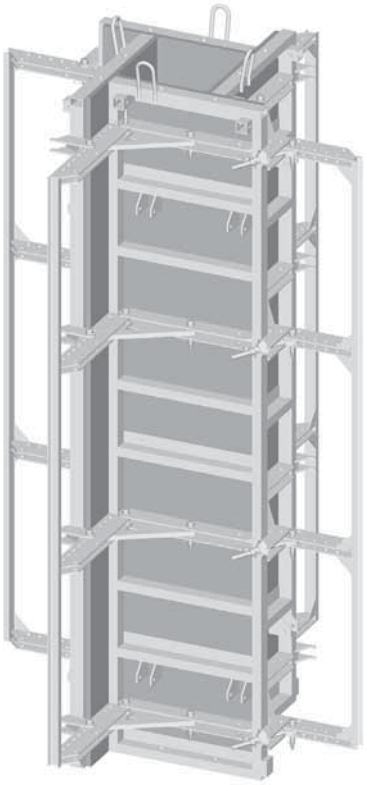


Fig. 2

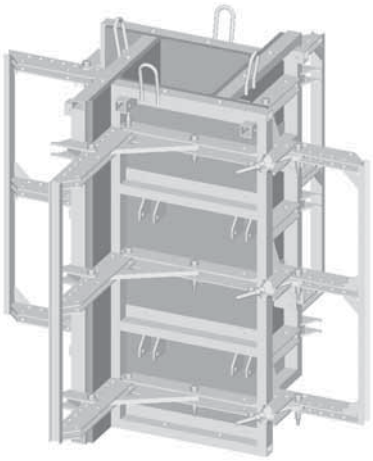
Heights of the Grip column formwork



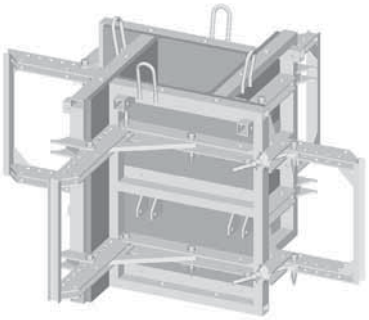
340 cm Grip column formwork
Art. no.: 170.006.1000
Weight: 750.0 kg



300 cm Grip column formwork
Art. no.: 170.006.1001
Weight: 645.0 kg



150 cm Grip column formwork
Art. no.: 170.006.1002
Weight: 400.0 kg



90 cm Grip column formwork
Art. no.: 170.006.1003
Weight: 265.0 kg

Storage, Transport

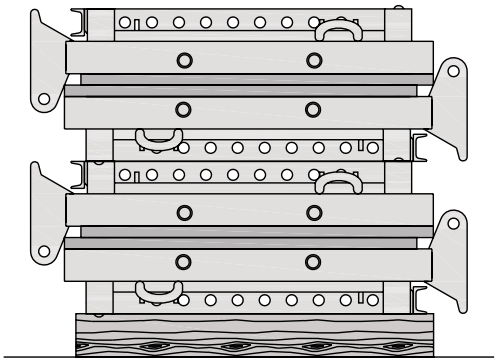


Fig. 3

Storage or transport of the wings is done in the folded state.
For this, position two elements each that the plywood lie over one another. Arrange four wings (1 column) to a stack (Fig. 3) and secure against slippage.
Square timbers are provided as protection under the individual stacks.

Transport with crane :

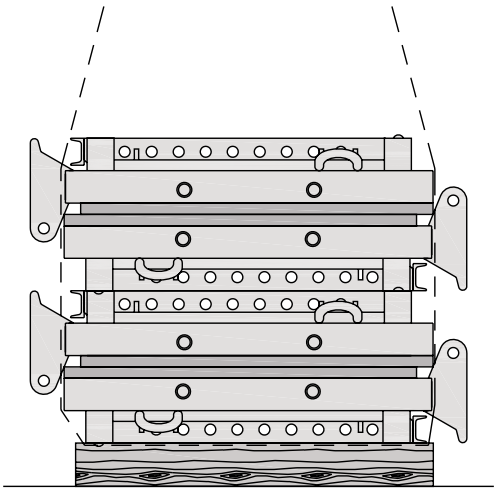


Fig. 4

Transport with forklift :

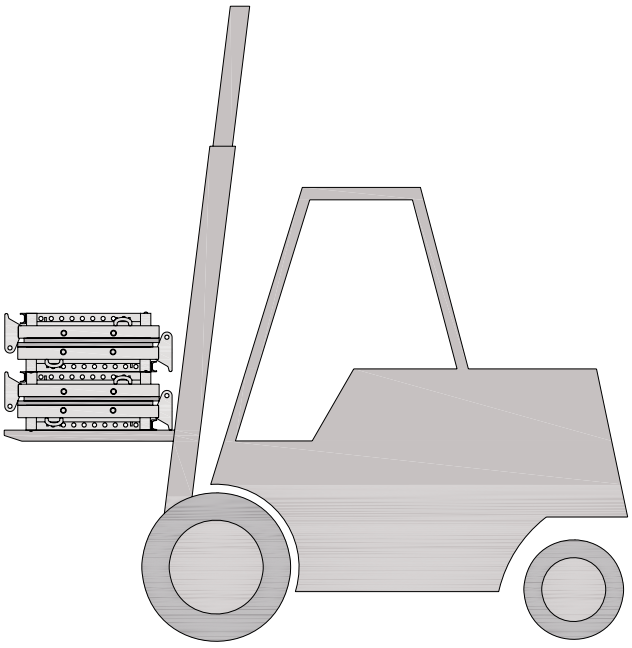


Fig. 5

Note:
The instructions on pages 10 ff. apply for the transport, or for movement or temporary storage of complete formwork components on building sites.

Grip bolt D.20x135
Art. no.: 170.006.0210
Weight: 0.36 kg

Retaining pin D.4
Art. no.: 911.024.0004
Weight: 0.03 kg

Folding out occurs in the following order to ready the Grip column formwork's individual wings for use:

1. Pull the Grip bolt (safety bolt) and retaining pin on the lying element (Fig. 6).
2. Fold the perforated strip upward by 90° (Fig. 6).
3. Fold integrated diagonals downward into the frame (Fig. 7).
4. Peg the diagonals into the frame with Grip bolt and retaining pin (Fig. 7).

Tip:
Folding out the wings occurs right on the stack without moving the frames.

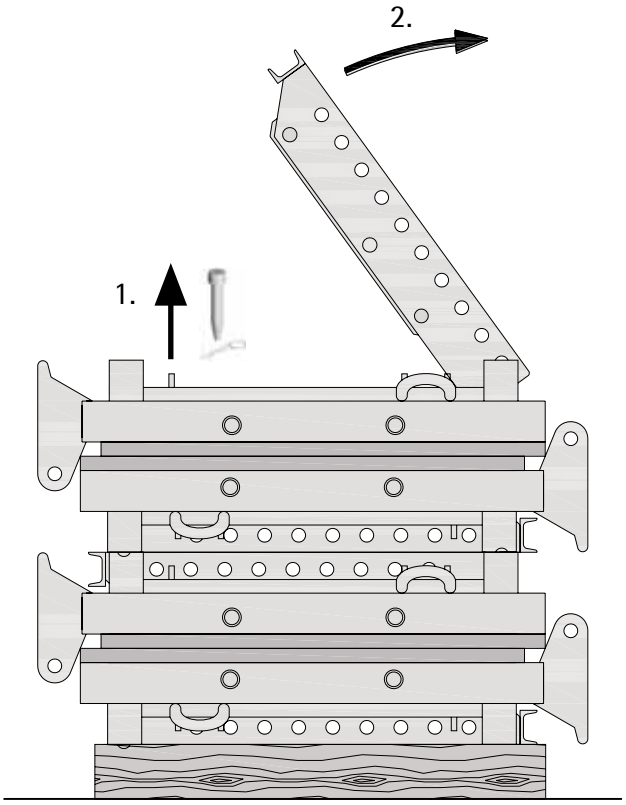


Fig. 6

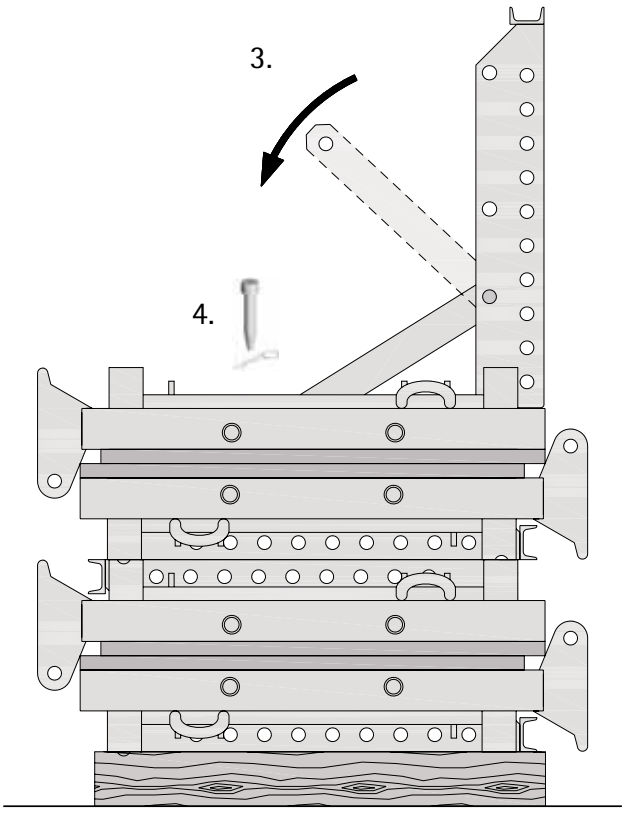


Fig. 7

Edge design

170.006.0206	Grip chamfer angle 340cm
170.006.0207	Grip chamfer angle 300cm
170.006.0208	Grip chamfer angle 150cm
170.006.0209	Grip chamfer angle 90cm

Tab. 1

The edges of the column to be concreted can be made broken or sharp-edged. For this reason, the front side of the formwork facing should be properly prepared:

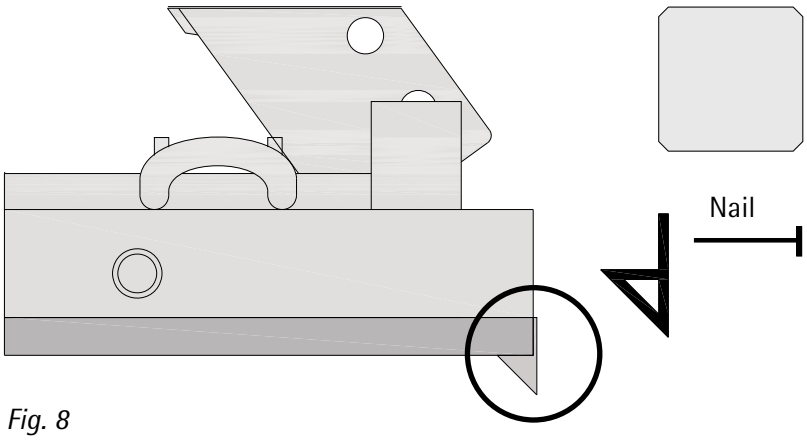


Fig. 8

a. Installation of a sealing tape or plastic strip 2 mm thick for sharp edges

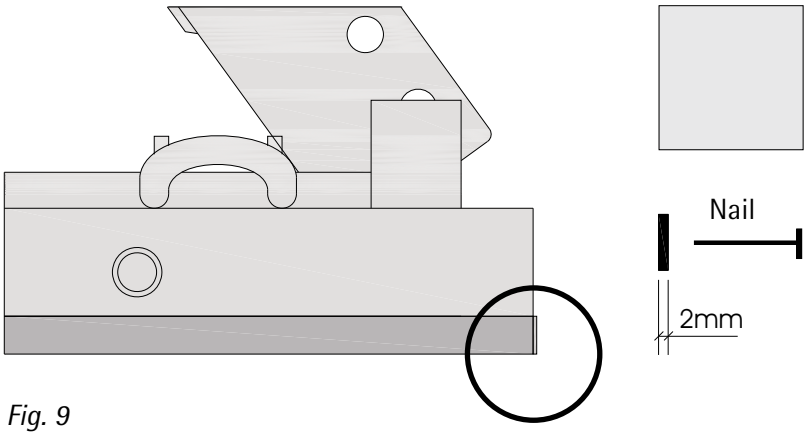


Fig. 9

b. Installation of a chamfer angle strip for bevelled edges

Tip:
Edge preparation occurs directly on the stack without moving the frames.

With greater formwork heights, the wings of the Grip column formwork are assembled in the lying or standing position.

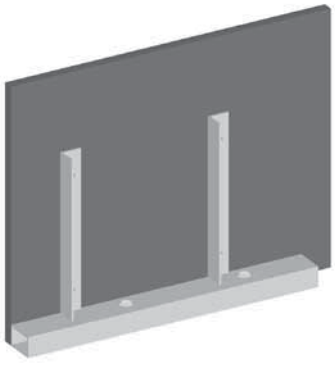
Likewise, an extension angle can be screwed on, which is covered with plywood, for example, to shutter horizontally to outgoing armouring (Fig. 12).

Attention!
When assembling in the lying state, the required formwork floor should be designed so that damage (scratching) on the formwork facing and chamfer angle strip is prevented. Evenness should also be heeded to preclude offsets in the formwork facing's joints.

1. Remove **stacking screws** from the upper parts of the frame (Fig. 10).
2. Connect wings (or wings with extension angles) together and tie the upper and lower parts together with **two stacking screws per frame** (Figs. 11 and 12).
Transport occurs acc. Fig. 14 on page 11.

Grip extension angle without plywood cpl. (four units)
Art. no. : 170.006.0232
Weight : 16.40 kg

Grip extension angle with plywood cpl. (four units)
Art. no. : 170.006.0230
Weight : 37.20 kg



Stacking screw M18x110 with nut
Art. No. : 170.006.0204
Weight : 0.35 kg

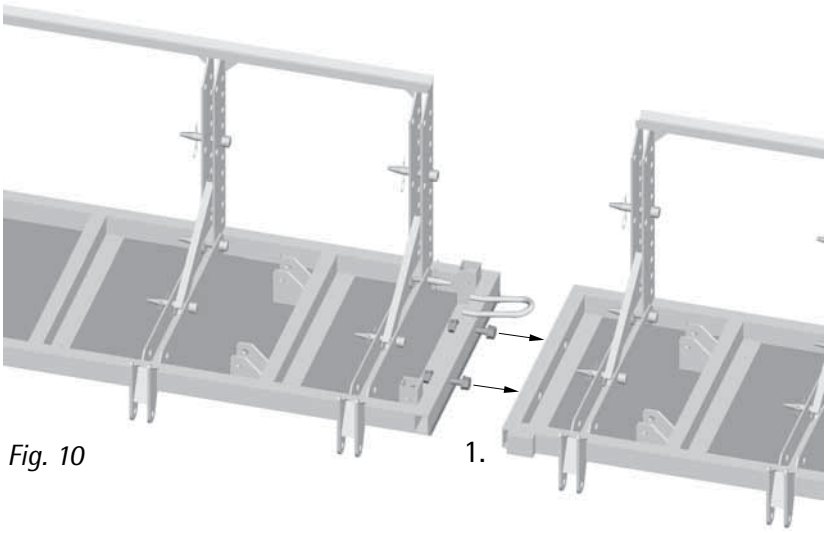


Fig. 10 1.

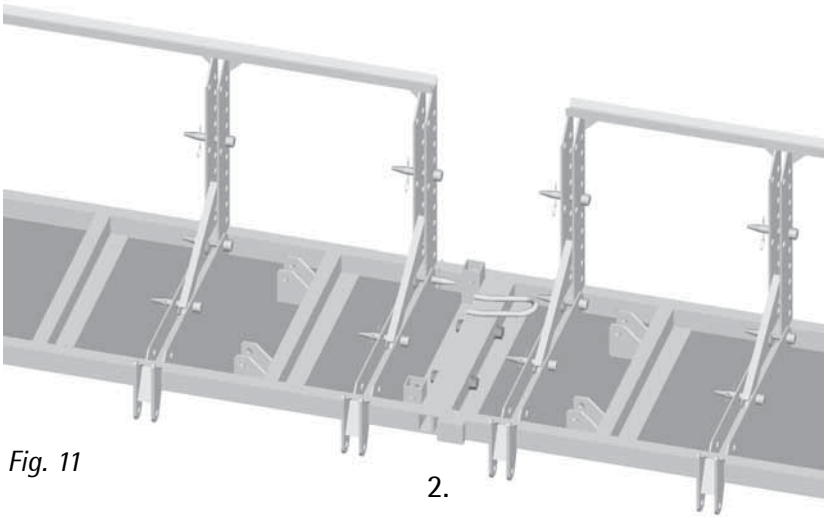


Fig. 11 2.

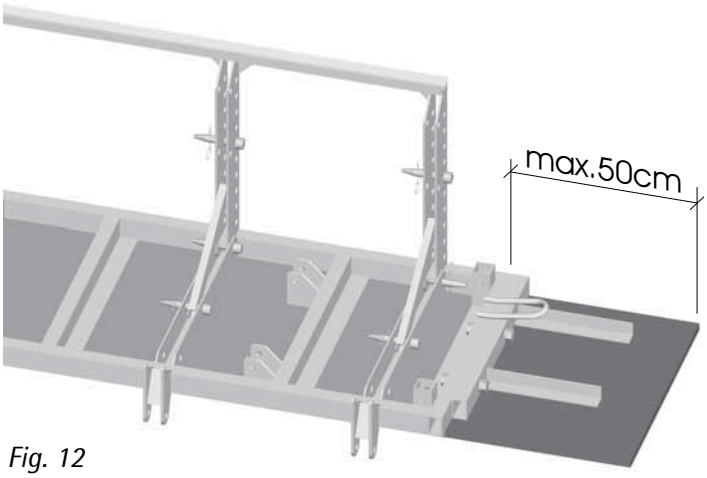


Fig. 12

Lying pre-assembly

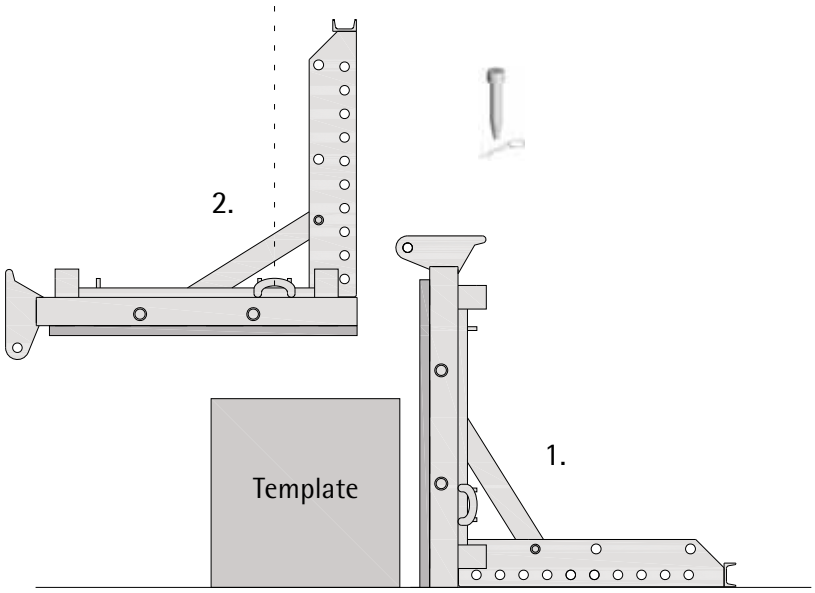


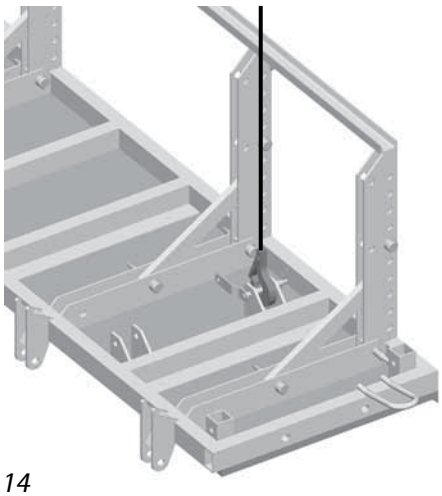
Fig. 13

1. Lay the first wing with the perforated strip downward on the floor.

2. Prepare the second wing and move acc. to Fig. 14. The crane hitch is accomplished via the security bolt 130 cpl. in the slinging plates for the adjustable props (two hitches).

3. Connect both wings with Grip bolts and retaining pins through the perforated strips and fastening plates (Fig. 16).

Note:
4. The Grip bolts required for this connection are located in the wings' perforated strips (Fig. 15).



Security bolt 130 cpl.
Art. no.: 189.001.0069
Weight: 0.30 kg

Fig. 14

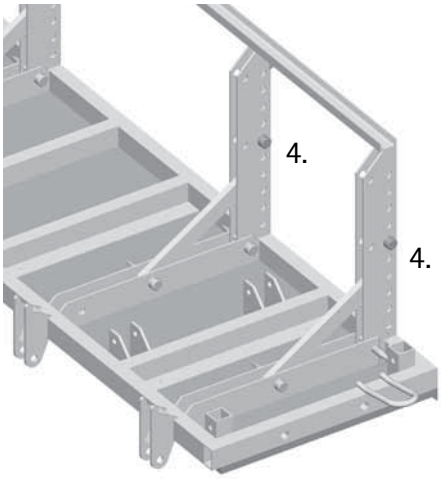


Fig. 15

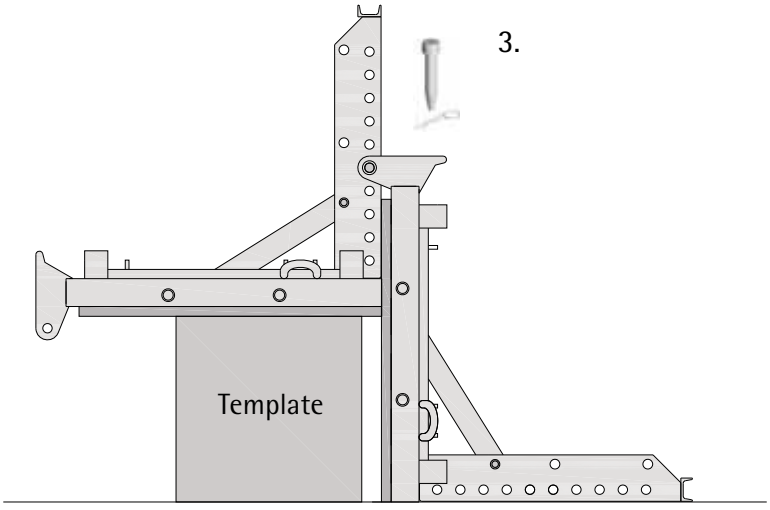


Fig. 16

Fasten adjustable props and supports between the slinging plates in the frame with security bolts 130 and retaining pins D.4 (Fig. 17).

Note:
The size of the adjustable props for different formwork heights is shown in Table 2 (p. 13).
Two adjustable props can be installed on a wing to prevent the column from twisting during alignment.

Push working platform (I) into the two pieces of tube on the upper part of the frame and secure it with two form-clips (Fig. 18).

Push both parts of the guard rail (II + III) into the working platform's tube pieces and secure with three form-clips each (Fig. 19).

Note:
Intermediate platforms can also be set up with the working platform for great formwork heights. Then the 120x30.5cm guard rail will be used for part II; part III remains.

Security bolt 130 cpl.
Art. no.: 189.001.0069
Weight: 0.30 kg

Form-clip
Art. no.: 930.007.0031
Weight: 0.16 kg

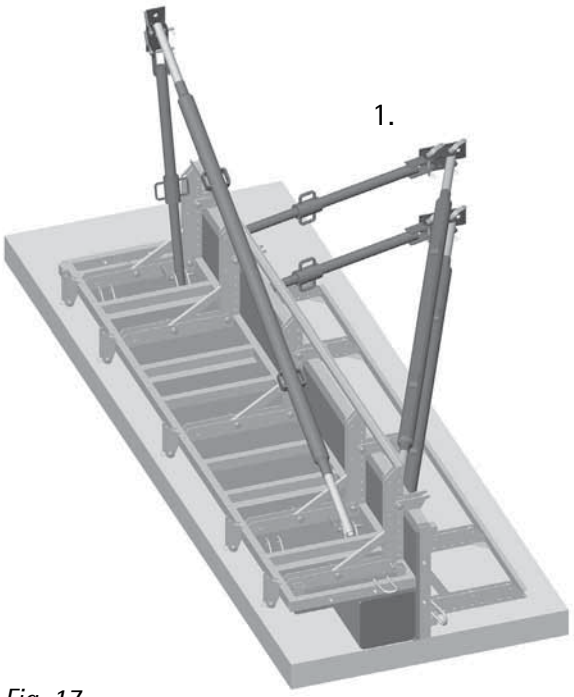


Fig. 17

Fig. 18

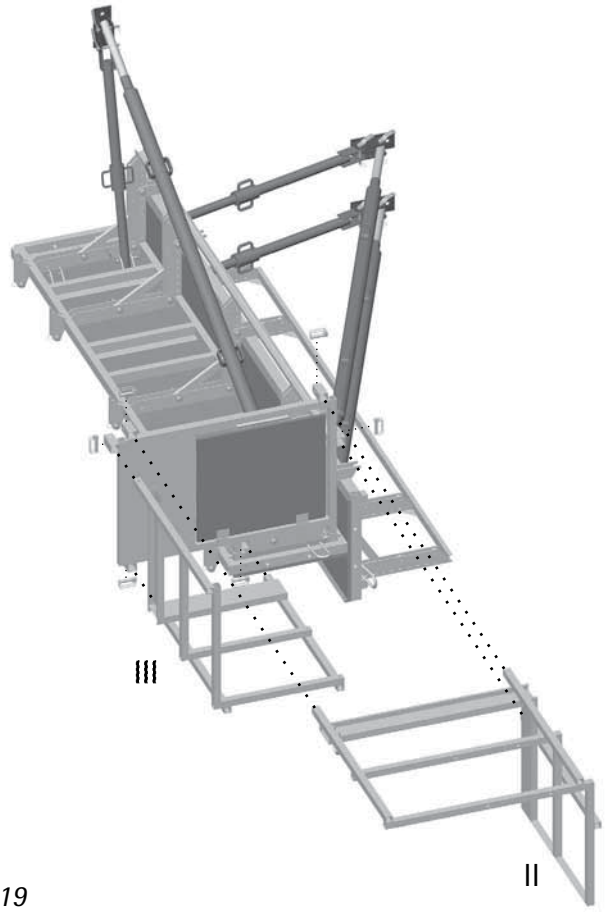


Fig. 19

Assembling ladder, material requirements

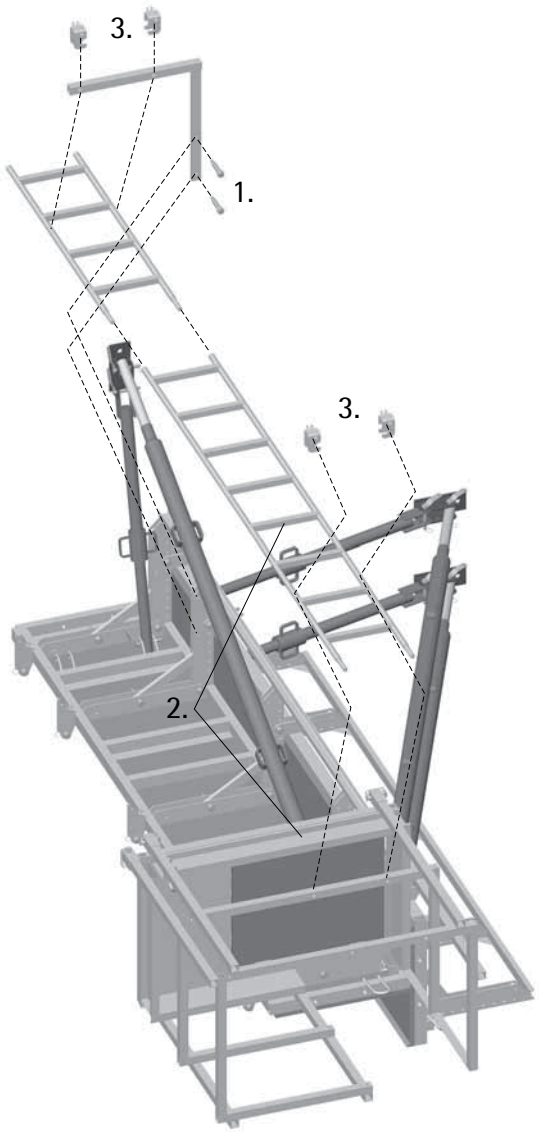


Fig. 20

1. Fix the Grip ladder fastening below to the perforated strip with two Grip bolts.
2. While hatch is open attach the ladder with one rung on the back edge of the working platform (Fig. 21).
3. Secure ladder to the guard rail and to the ladder fastening below each with a pair of ladder fastenings (Fig. 20).

Tip:

4. With greater formwork heights, several ladders can be connected to one another using tube locking pins.

Material requirement for different formwork heights

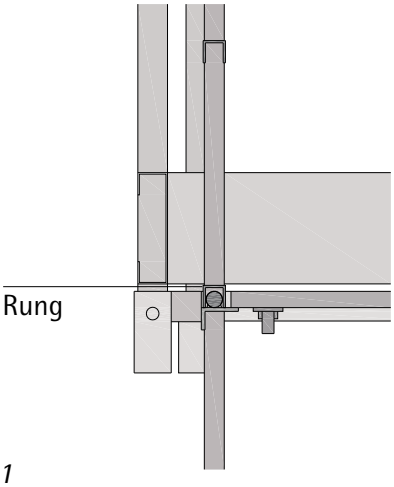


Fig. 21

Art. No.	Item	kg/piece	Require h=3.00m	Require h=3.40m	Require h=3.90m	Require h=4.30m	Require h=4.50m	Require h=4.90m	Require h=5.40m	Require h=6.00m	Require h=6.80m
170.006.1000	Grip column formwork 340cm	750,00		1		1		1			2
170.006.1001	Grip column formwork 300cm	645,00	1		1		1		1	2	
170.006.1002	Grip column formwork 150cm	400,00					1	1	1		
170.006.1003	Grip column formwork 90cm	265,00			1	1			1		
170.006.0226	Grip working platform 125x80cm	46,30	1	1	1	1	1	1	2	2	2
170.006.0222	Grip guard rail 75x79cm	30,00	1	1	1	1	1	1	2	2	2
170.006.0227	Grip guard rail 120x79cm for working platform	36,00	1	1			1	1	1	1	1
170.006.0225	Grip guard rail 120x30.5cm for intermediate platform	27,00			1	1			1	1	1
187.500.0063	Ladder 260cm cpl.	12,00	1	1	1	2	2	2	2	2	3
187.500.0071	Ladder 130cm cpl.	7,00	1	1	1					1	
170.006.0203	Grip ladder fastening below cpl.	6,40	1	1	1	1	1	1	1	1	1
187.500.0074	Ladder fastening guard rail cpl.	2,00	1	1	1	1	1	1	2	2	2
189.005.0006	Adjustable prop RS2 180-290cm	11,00	2 (3)			2 (3)	2 (3)	2 (3)	2 (3)	2 (3)	2 (3)
189.005.0015	Adjustable prop 255-405cm	33,50		2 (3)	2 (3)						
189.005.0016	Adjustable prop 400-620cm	54,50				2 (3)	2 (3)	2 (3)	2 (3)	2 (3)	
189.005.0017	Adjustable prop 620-1000cm	110,00									2 (3)
189.005.0001	Support variable 105-150cm	9,50	2 (3)	2 (3)	2 (3)						
189.005.0023	Foot plate 3-holes	3,60	2 (3)	2 (3)	2 (3)	2 (3)	2 (3)	2 (3)	2 (3)	2 (3)	2 (3)
189.005.0033	End plate for BKS	7,20									
189.001.0069	Security bolt 130	0,30	4 (6)	4 (6)	4 (6)	4 (6)	4 (6)	4 (6)	4 (6)	4 (6)	4 (6)

Tab. 2 Material requirement for different formwork heights

1. Attach double-stranded crane sling to the crane eyes (Fig. 22).

2. Erect formwork.

3. Transport formwork to the building site.

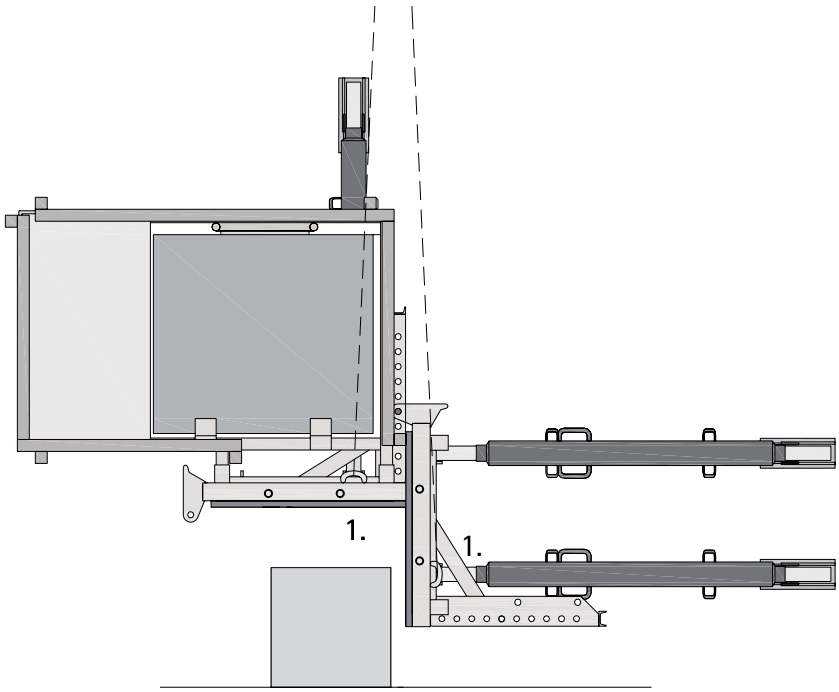


Fig. 22

4. Put formwork down at the building site.

5. Anchor foot plates tension- and pressure-resistantly in the erection area.

Caution!

Anchorages are to be dimensioned so that all loads arising from dead weight, wind, and working operation can be accommodated.

6. Align formwork.

7. Loosen crane sling (Fig. 23).

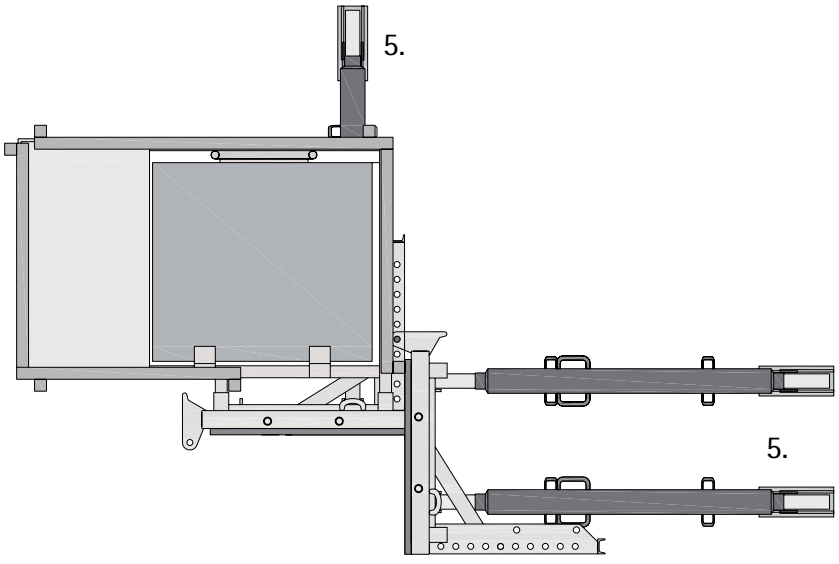


Fig. 23

Closing formwork

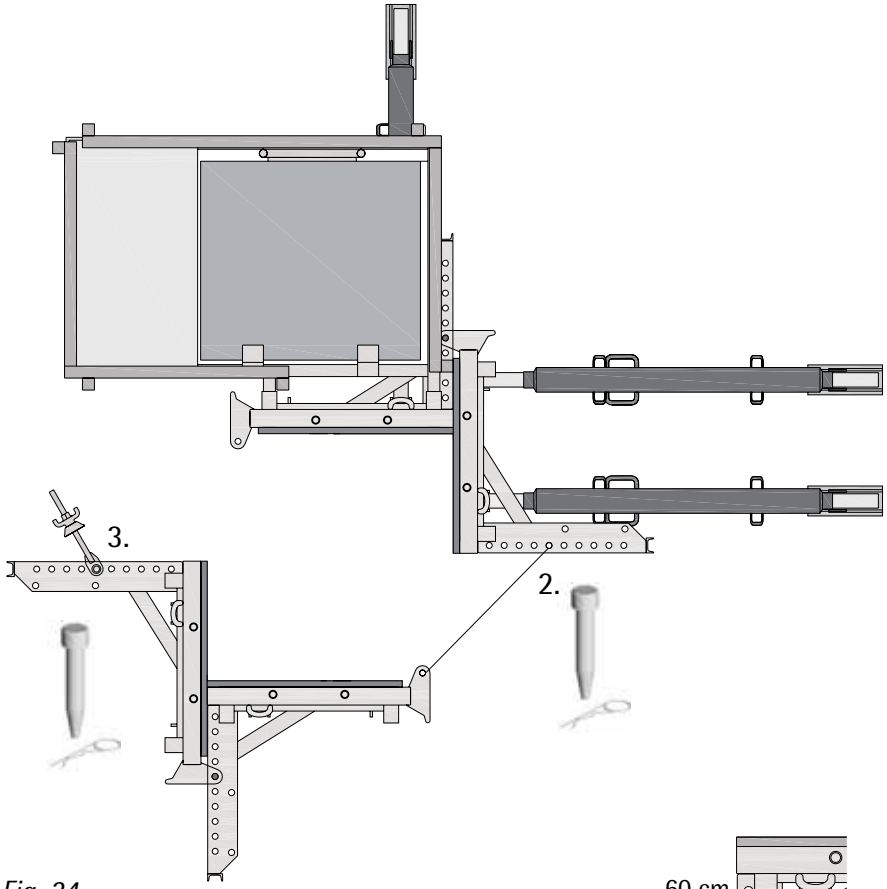


Fig. 24

1. Pre-mount second unit (without adjustable props and working platform, p. 11, Fig. 13).

2. Fasten second unit on the already standing unit with Grip bolts and retaining pins. The connection holes to the respective cross-sections are visible in Fig. 25.

3. Fasten tensioning devices (eye screws + plates with ball-and-socket joint) with Grip bolts and retaining pins (Fig. 24).

Note:
Due to the tensioner's crooked positioning, this connection occurs overlapping outward by one hole (Fig. 26).

4. Swing tensioners in and brace with the Plate with ball-and-socket joint DW15 d.75 (Fig. 26).

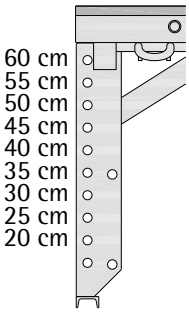


Fig. 25

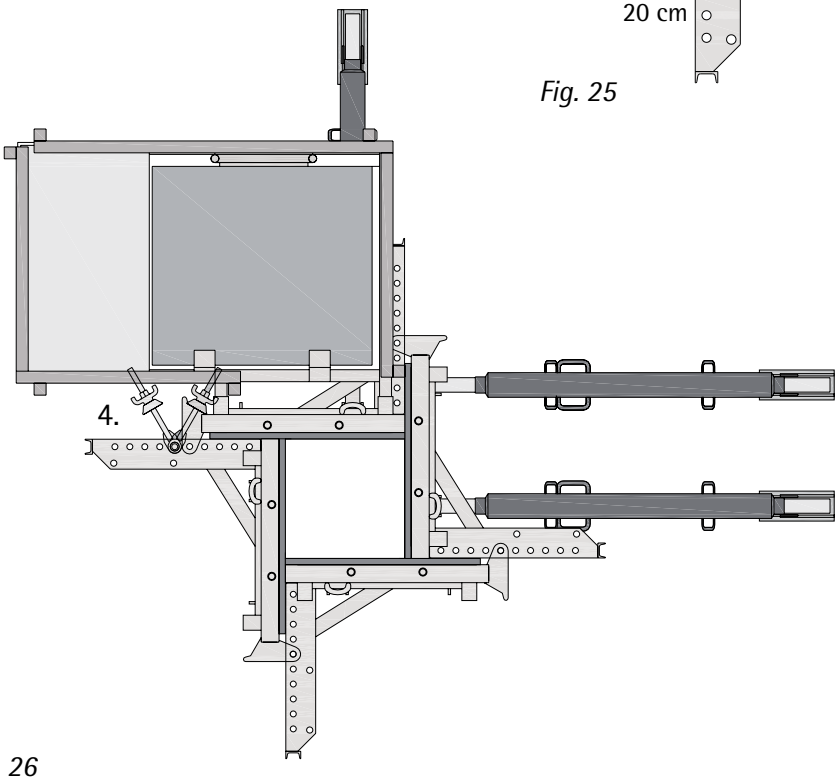
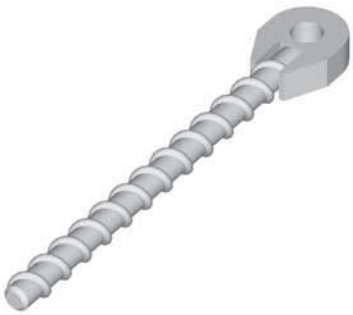


Fig. 26



Eye screw DW15x280
Art. no.: 170.003.0011
Weight: 1.35 kg

Plate with ball-and-socket joint DW15 d.75
Art. no.: 170.003.0012
Weight: 0.64 kg

Tip:
Spray formwork with parting compound on all sides before initial use.
See page 18 for care instructions.

The working platform together with the guard rail parts provides a secure workplace for concreting and the poured concrete's compaction.
Ascent occurs via the ladder and an access hatch in the platform (Fig. 27).
The working platform's service weight is 200 kg/m² acc. DIN 4420 Part 1.
This corresponds to scaffolding group 3.
Maximum fresh concrete pressure is 80 kN/m².

Attention!
Adjust rate of rise appropriately for concreting heights greater than 3.20 m.

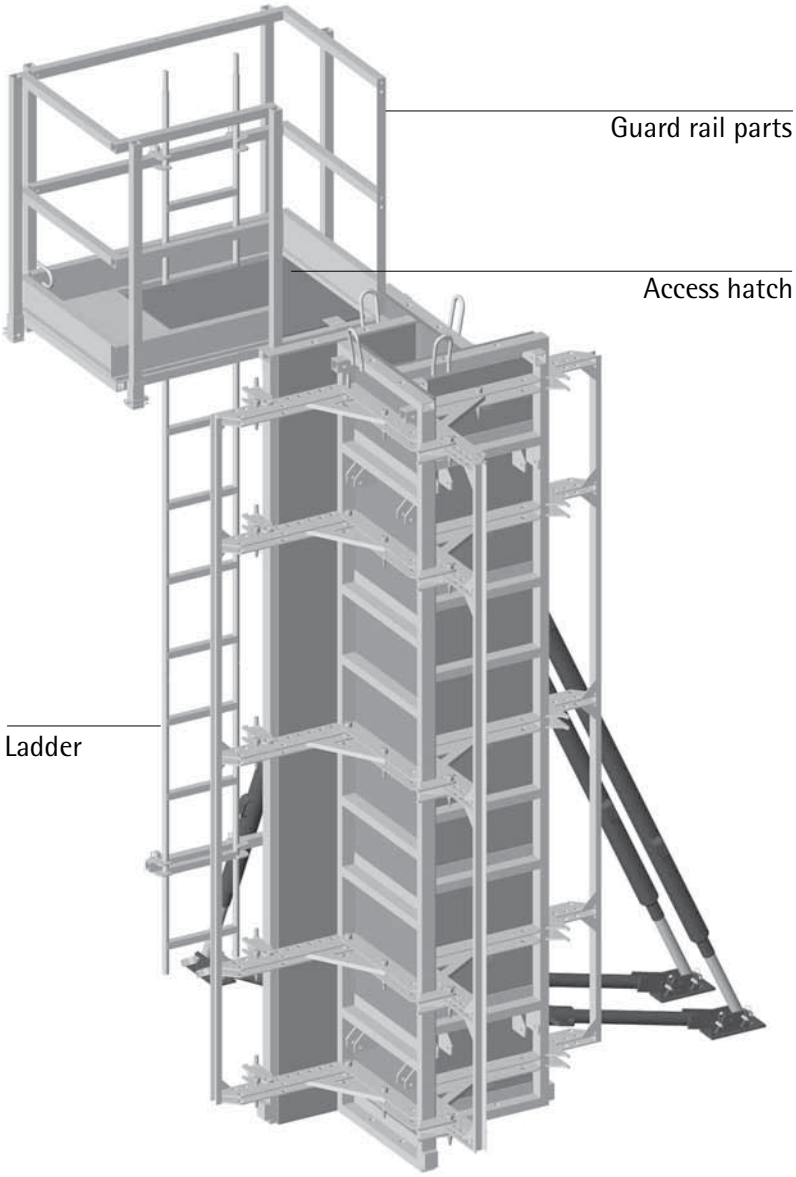


Fig. 27

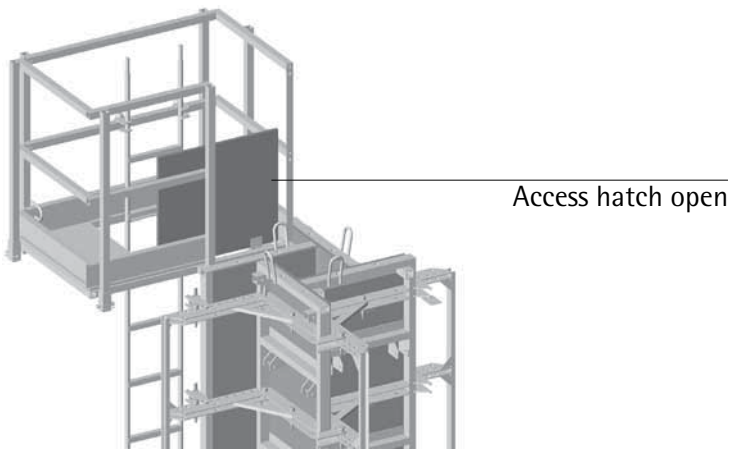


Fig. 28

Dismantling, moving

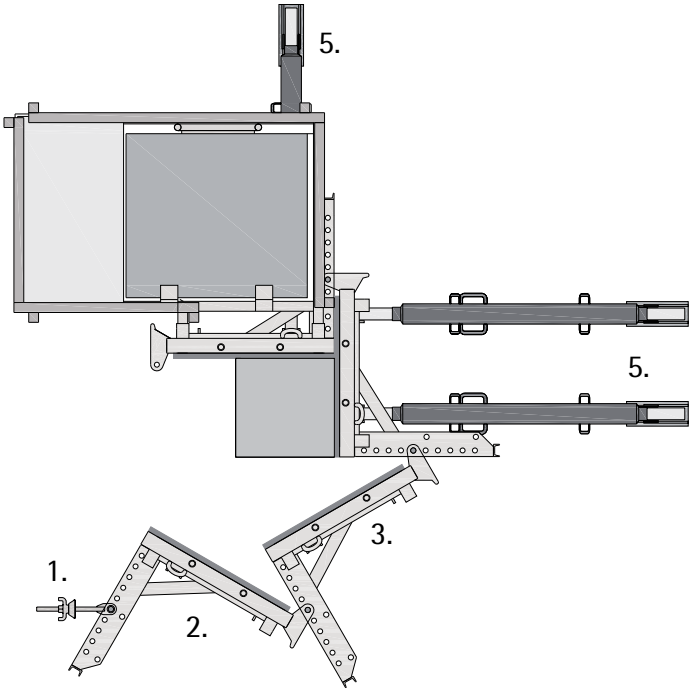


Fig. 29

1. Loosen plates with ball-and-socket joint and swing the tensioning devices outward.

2. Fold out the unit with the tensioning devices (Fig. 29).

3. Loosen second unit from the concrete.

4. Attach the crane sling in the crane eyes and secure the formwork on the crane.

5. Loosen foot plates. The adjustable props stay mounted on the formwork.

6. Loosen the rest of the formwork from the concrete by folding up and move with the crane lift (Fig. 30).

7. Clean formwork between (page 18).

8. Close formwork for the next concreting cycle at the building site (page 15).

Note:
Always fold out in counter-clockwise direction.

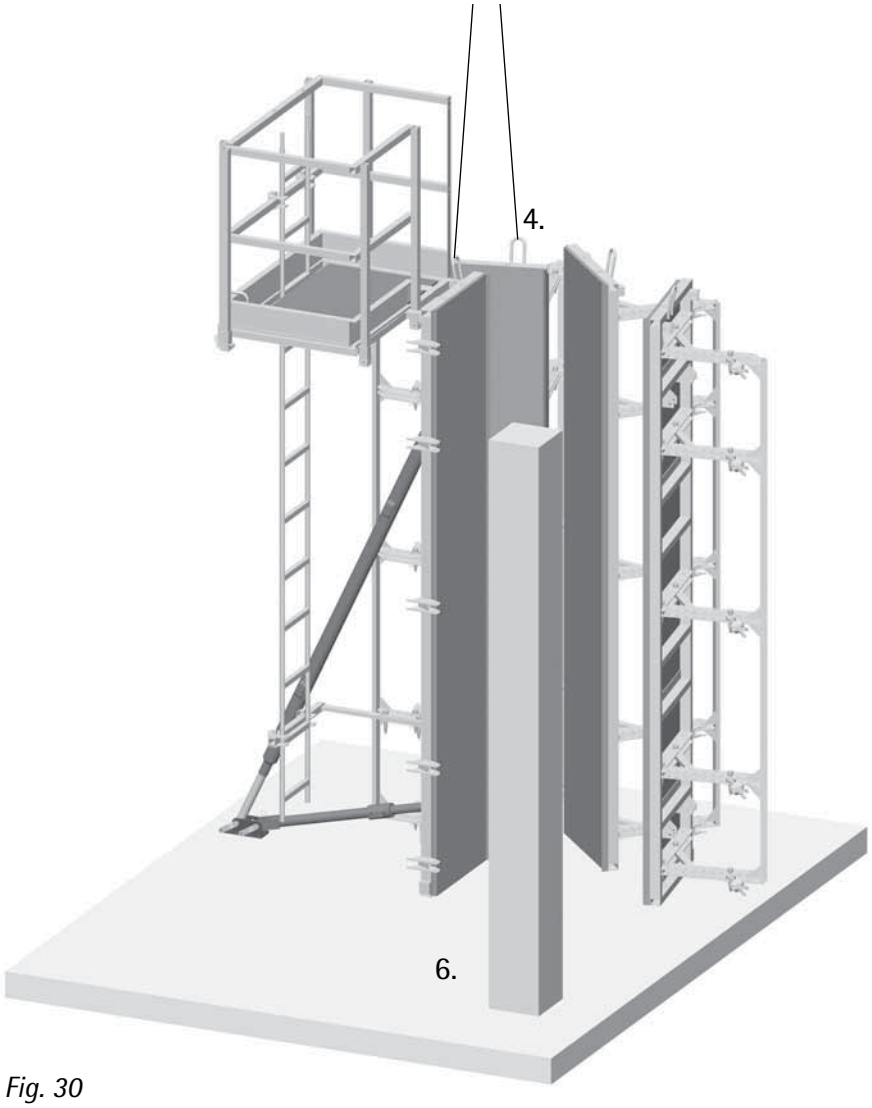


Fig. 30

Tip:
Heeding the following user instructions reduces overall cleaning effort enormously and increases the formwork's operating life.

- Spray formwork with parting compound on all sides before initial use.
- After each concreting, clean rough concrete residues from the back of the form with the water jet.
- Clean provisionally and remove concrete residues after each stripping of the formwork facing. Subsequently spray lightly with parting compound.
- Also treat the back side (frame side) of the formwork with release agent at regular intervals.

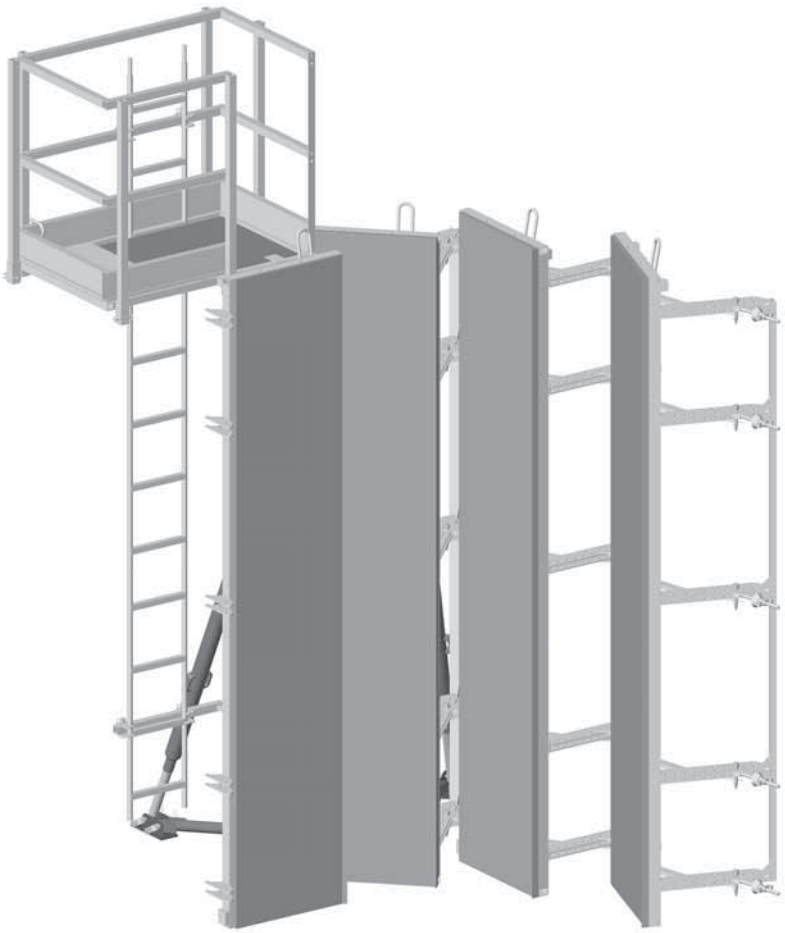
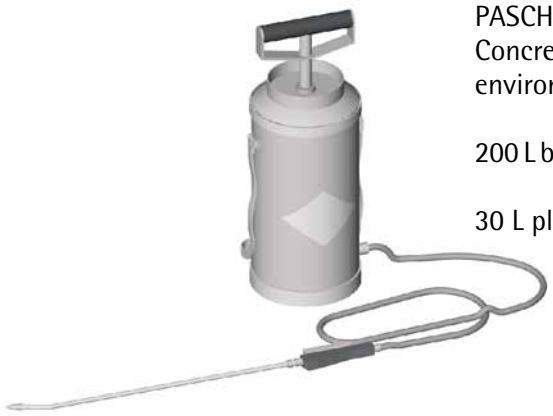


Fig. 31

Attention:
Cleaning may be conducted only with tools, such as brooms and special scrapers, that don't damage the formwork facing or other system parts. The use of sand-blasting equipment, angle grinders, wire brushes, and other highly stressful or pointed tools leads to damage.



PASCHAL P2000
Concrete parting compound environmentally friendly

200 L barrel with tap

30 L plastic can

Fig. 32

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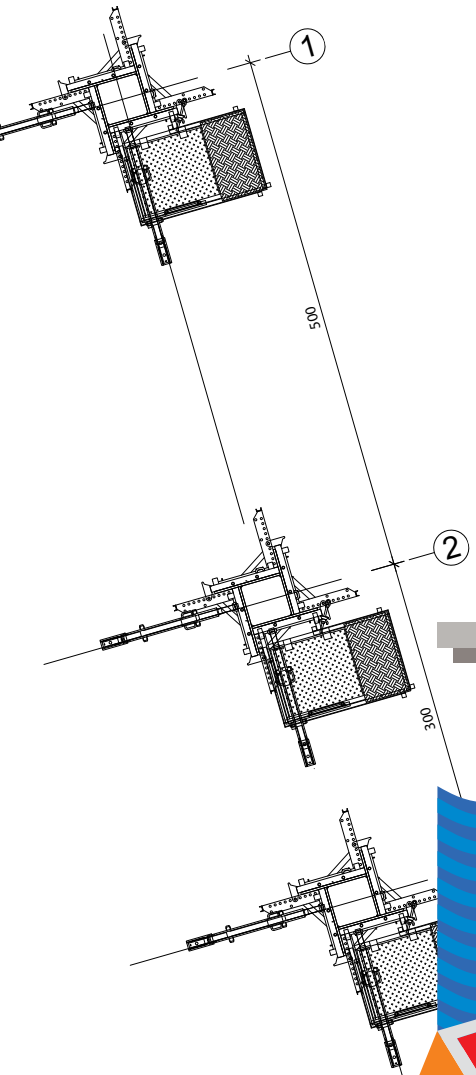

PASCHAL

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