

Facade formwork

User guide



Contents

1	Product features	3
1.1	General	3
1.2	Safety instructions	3
2	Overview	6
3	Components	7
4	Assembly	11
4.1	Detail 1.....	14
4.2	Detail 2.....	15
4.3	Detail 3	16
4.4	Detail 4.....	18
4.5	Detail 5.....	19
5	Operation	20
6	Column formwork	22
7	Technical Data	30
8	Chronology	34

1 Product features

The Facade Formwork is used for the building of facades made of a combination of prefabricated elements and in situ concrete columns. By constructing the building facade independent and ahead of the slabs, the slab can be constructed faster and safer.

1.1 General

This user guide provides important information regarding the assembly and use of the Facade-formwork tables of HÜNNEBECK as well as safety instructions that are important for a safe application on site. This user guide is created to support effective working processes on site with the Facade-formwork. Therefore read this user guide before assembly and use of Facade-formwork carefully, keep it always at hand and archive it for reference. HÜNNEBECK products are exclusively designed for commercial use by technically suitable users.

This user guide is intended for commercial users with appropriate technical training. The contents and processes described are in accordance with the legal and occupational safety regulations of Germany and Austria. HÜNNEBECK assumes no liability for deviations from the contents and processes described or for use outside this area of application.

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. His 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 forms part of the basis for the compilation of a set of installation instructions.
- User guide
Formwork is work equipment which is intended for commercial use only. The intended use must take place exclusively through properly trained personnel and appropriately qualified supervising 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) or a set of installation instructions which 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 has to ensure that the user guide provided by the manufacturer or formwork supplier is available at the place of use. Site personnel are to be informed of this before assembly and use takes place, and that it is available at all times.

- **Representations**
The representations shown in the user guide are, in part, situations of assembly and not always complete in terms of safety considerations. The safety installations which have possibly not been shown in these representations must nevertheless be available.
- **Storage and Transportation**
The special requirements of the respective formwork constructions regarding transportation procedures as well as storage must be complied with. By way of example, name the appropriate lifting gear to be used.
- **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 can result in the compilation of a separate set of assembly instructions required for the installation of the equipment.
- **Safety Symbols**
Individual safety symbols are to 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 notice.

For the safety-related application and use of the products, all current country-specific laws, standards as well as other safety regulations are to be complied with without exception. They form a part of the obligations of employers and employees regarding industrial 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.

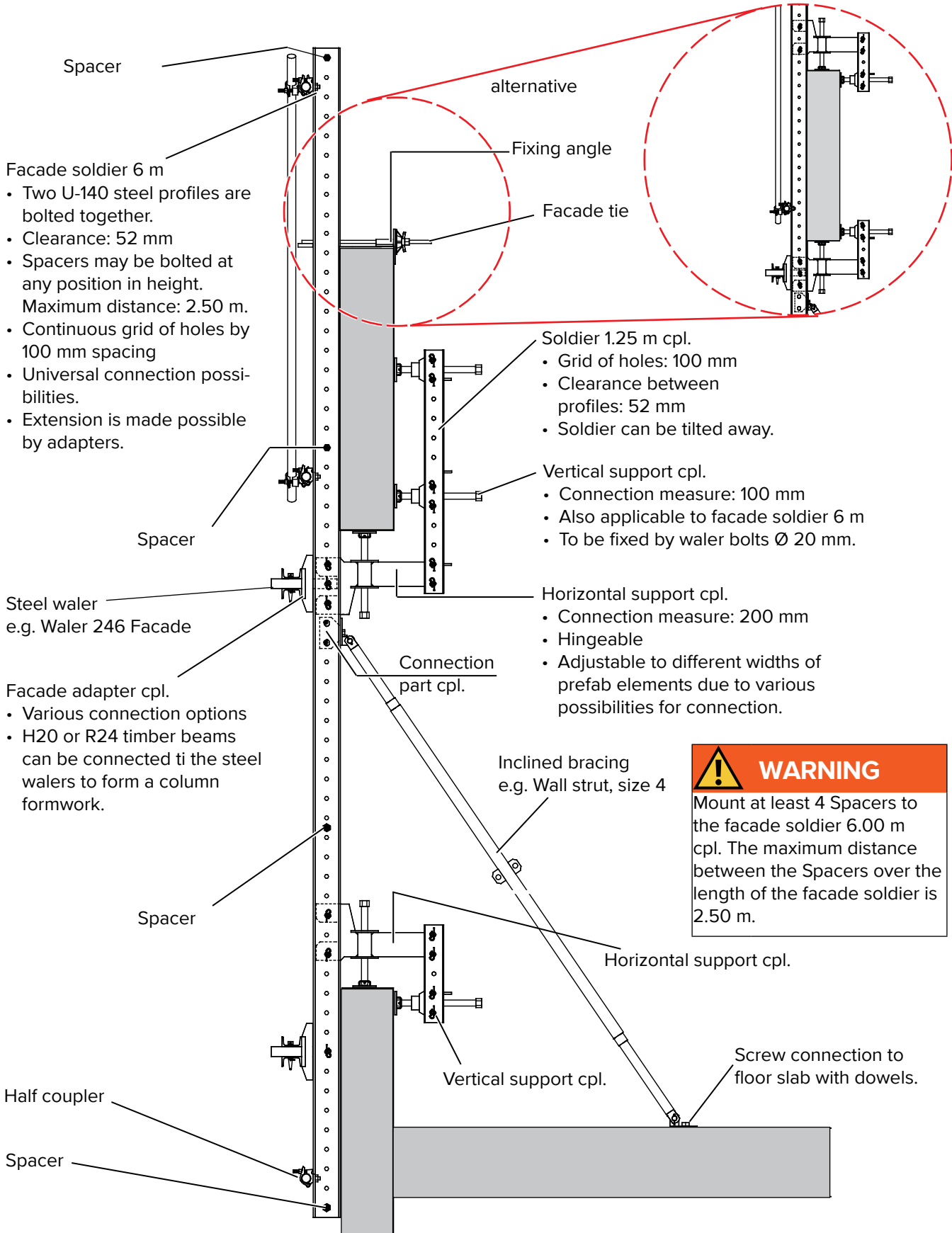
This also includes the basic assembly, dismantling and the transport of the formwork and falsework constructions or their components. The complete construction is to be checked during and after assembly.

Copyright:

Güteschutzverband Betonschalungen e.V.
PO BOX 10 44 61, 40852 Ratingen, Germany

2 Overview

The facade formwork consists of only a few additional parts which can be combined with other HÜNNEBECK components. All steel parts of the facade formwork are galvanized and are provided with the required connection material.



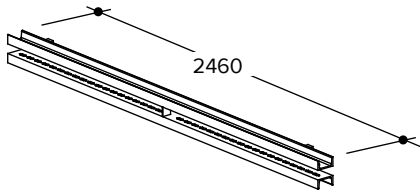
3 Components

	Component	Product code	Weight [kg]	
	Facade Soldier 6 m cpl. Soldier 1.25 m cpl. incl. 2 x Waler bolt Ø 20 (Product code 420000) incl. 2 x Spring cotter 4 (Product code 600288)	600762 600790	197.80 28.80	
	Soldier 1.0 m cpl. incl. 2 x Waler bolt Ø 20 (Product code 420000) incl. 2 x Spring cotter 4 (Product code 600288)	600789	23.00	
	Soldier 0.75 m cpl. incl. 2 x Waler bolt Ø 20 (Product code 420000) incl. 2 x Spring cotter 4 (Product code 600288)	600788	17.75	
	Soldier 0.50 m cpl. incl. 2 x Waler bolt Ø 20 (Product code 420000) incl. 2 x Spring cotter 4 (Product code 600288)	600787	12.30	
	Steel waler 96 Steel waler 121 Steel waler 146 Steel waler 171 Steel waler 196 Steel waler 221 Steel waler 246 Steel waler 271 Steel waler 296 Special lenght on request	503871 503882 503893 503908 503919 503920 503930 503941 503952	22.46 27.85 33.43 38.86 44.29 49.72 55.20 60.73 66.16	

NOTE

Note
 For more information on the use of the steel walers see the user guides of the H20 or GF 24 formwork.

Component	Product code	Weight [kg]
Steel waler 246 Facade	600792	55.10

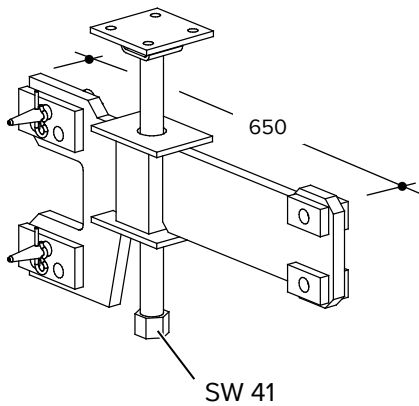


NOTE

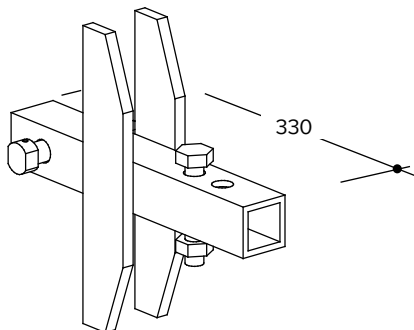
Note

The steel walers of the large-panel formwork can not be used in the facade formwork!

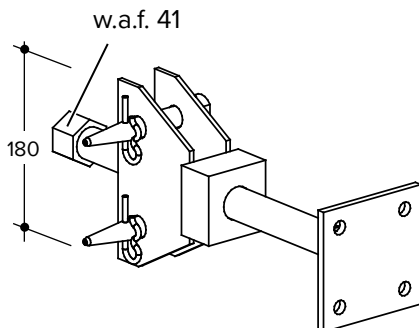
Horizontal Support cpl.	600759	27.80
-------------------------	--------	-------

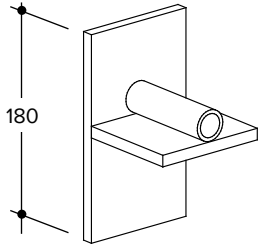


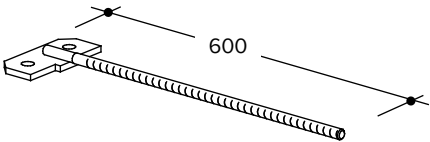
Facade Adapter cpl.	600794	6.40
---------------------	--------	------



Vertical Support cpl.	600760	7.30
-----------------------	--------	------



	Component	Product code	Weight [kg]
	Fixing Angle	600822	2.80

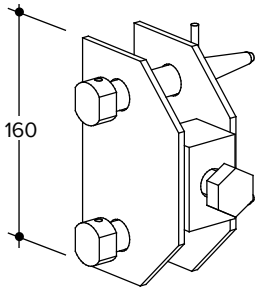
	Facade Tie	600823	1.60
---	-------------------	---------------	-------------



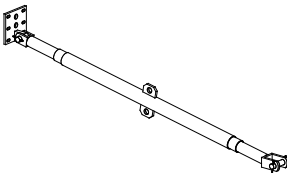
WARNING

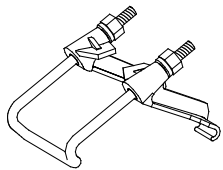
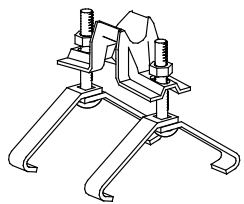
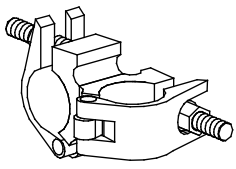
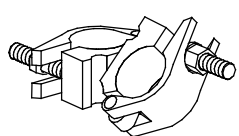
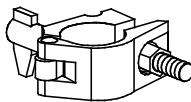
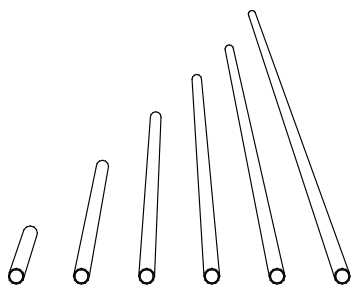
Warning!

Do not weld or heat tie rods because of unheralded failure

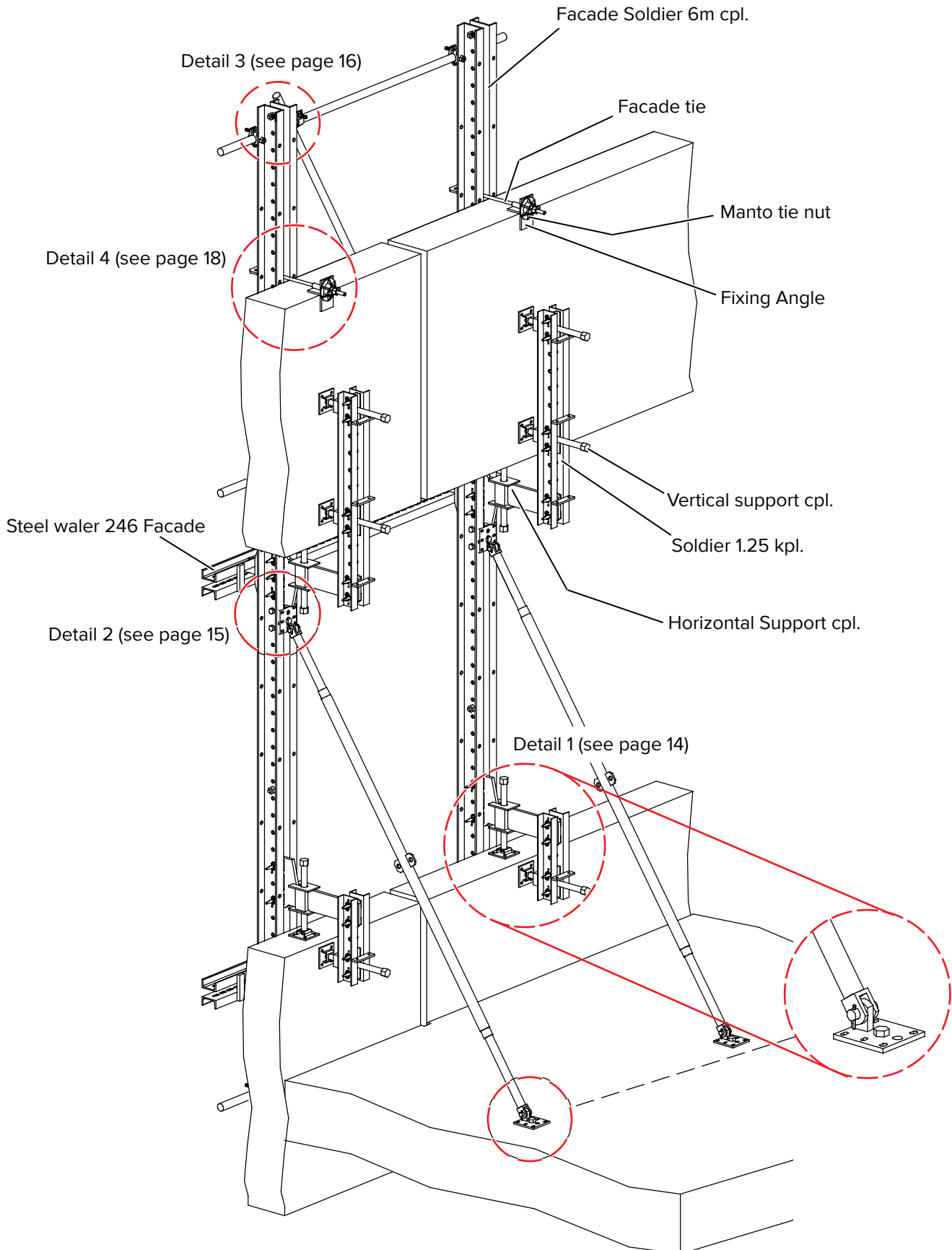
	Connection Part cpl.	600810	2.60
--	-----------------------------	---------------	-------------

	Wall Strut, size 1 (170-240 cm)	506500	19.50
	Wall Strut, size 2 (220-290 cm)	506420	21.00
	Wall Strut, size 3 (270-340 cm)	506430	22.00
	Wall Strut, size 4 (320-390 cm)	506463	24.00
	Wall Strut, size 5 (420-490 cm)	506485	27.00
	Wall Strut, size 6 (530-590 cm)	506555	40.00

	Sprag Brace, size 1 (120-190 cm) for Wall Struts, sizes 1 + 2	506511	16.00
	Sprag Brace, size 2 (190-240 cm) for Wall Struts, sizes 3 + 4	506533	18.00

	Component	Product code	Weight [kg]
	H20 Timber Beam Clamp	568048	0.82
	Waler Clamp R24	504410	0.59
	Rigid coupler 48/48 SW 22	2514	1.18
	Rigid coupler 48/48 SW 19 Permissible load: 9 kN. Torque: 50 Nm.	801135	1.20
	Swivel coupler 48/48 SW 22	2525	1.37
	Swivel coupler 48/48 SW 19 Permissible load: 5 kN. Torque: 50 Nm.	801146	1.40
	Half coupler 48/FB w.a.f. 22 To attach guard rails and vertical diagonals.	116370	0.84
	mm x cm		
	Scaffold tube 48.3 x 100	169012	3.81
	Scaffold tube 48.3 x 150	169023	5.72
	Scaffold tube 48.3 x 200	169034	7.62
	Scaffold tube 48.3 x 250	169045	9.53
	Scaffold tube 48.3 x 300	169056	11.43
	Scaffold tube 48.3 x 350	169067	13.34
	Scaffold tube 48.3 x 400	169078	15.24
	Scaffold tube 48.3 x 450	169089	17.15
	Scaffold tube 48.3 x 500	169090	19.05
Scaffold tube 48.3 x 550	169104	20.96	
Scaffold tube 48.3 x 600	169115	22.86	

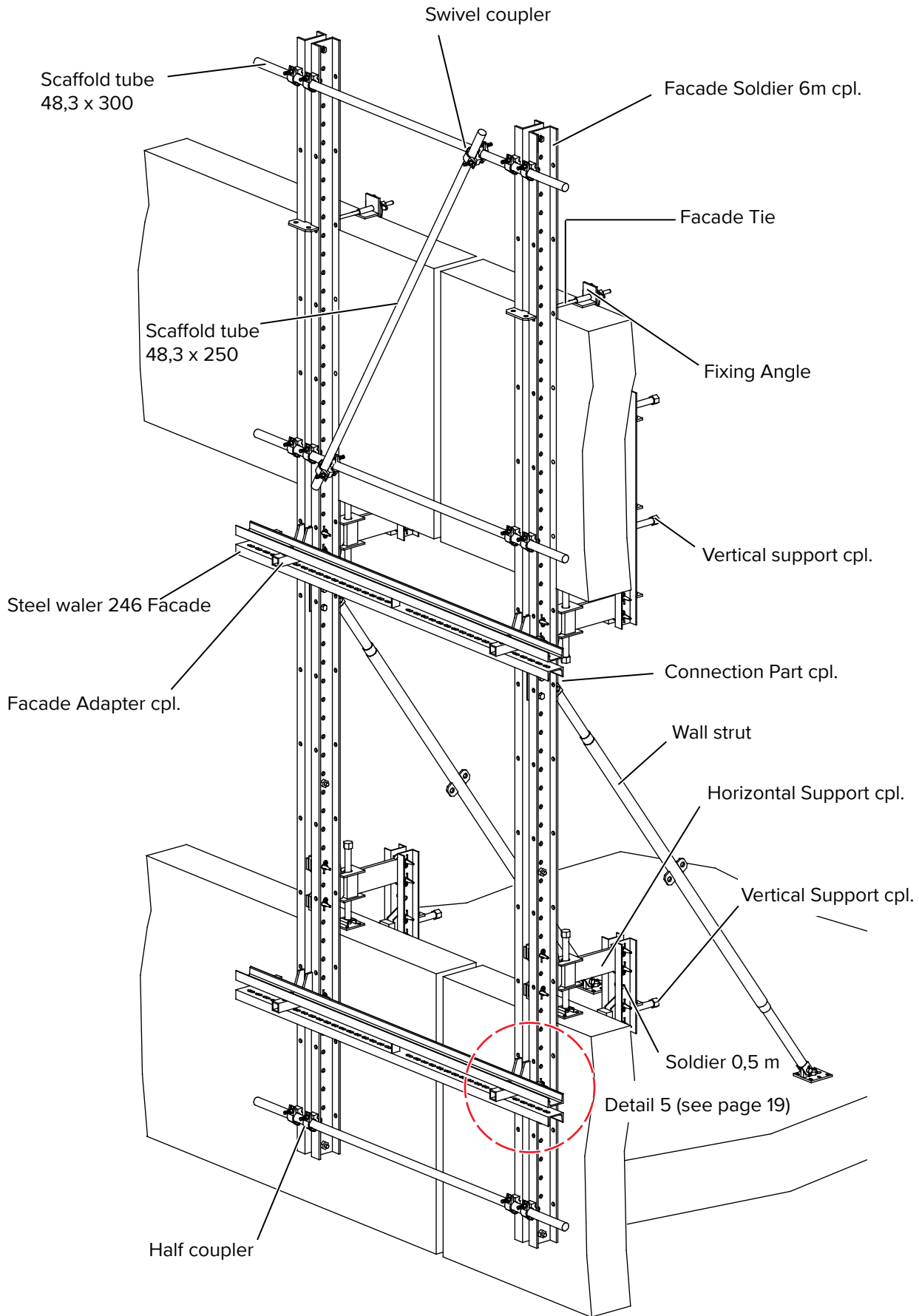
4 Assembly



WARNING

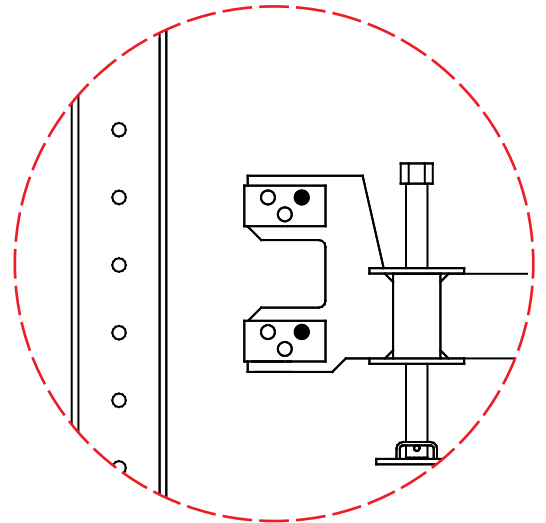
Warning!

Dowelling must be placed in the 1st hole of the wall strut as illustrated!

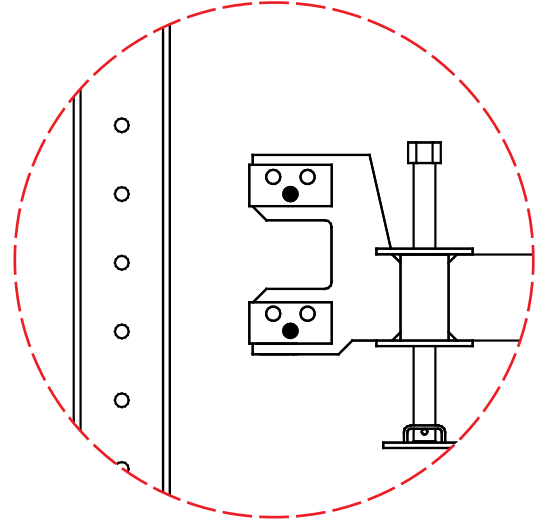


Assembly of a Facade Formwork according to the width of the pre-cast concrete parapet elements.

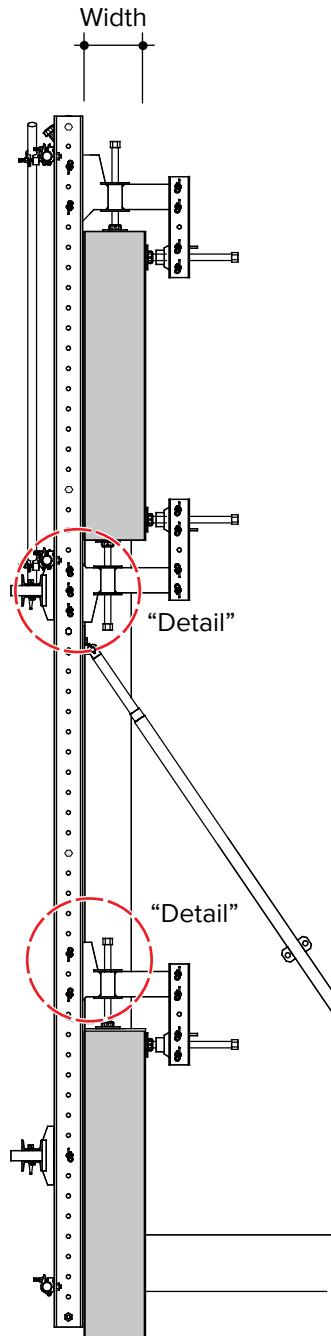
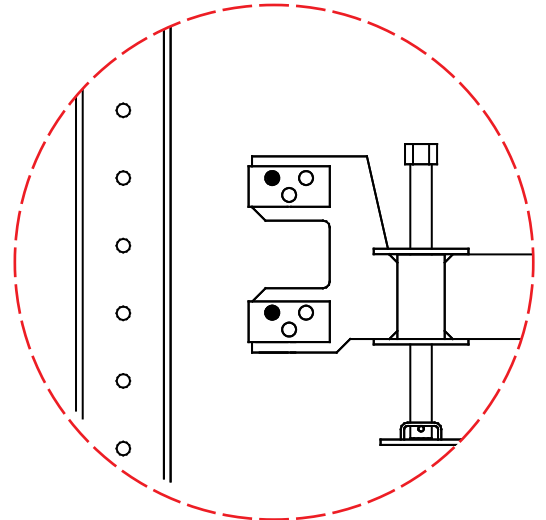
Facade width: 10–22.5 cm



Facade width: 22.5–27.5 cm



Facade width: 27.5–30 cm



4.1 Detail 1

Connection of

- Facade soldier
- Horizontal support
- Soldier
- Vertical support

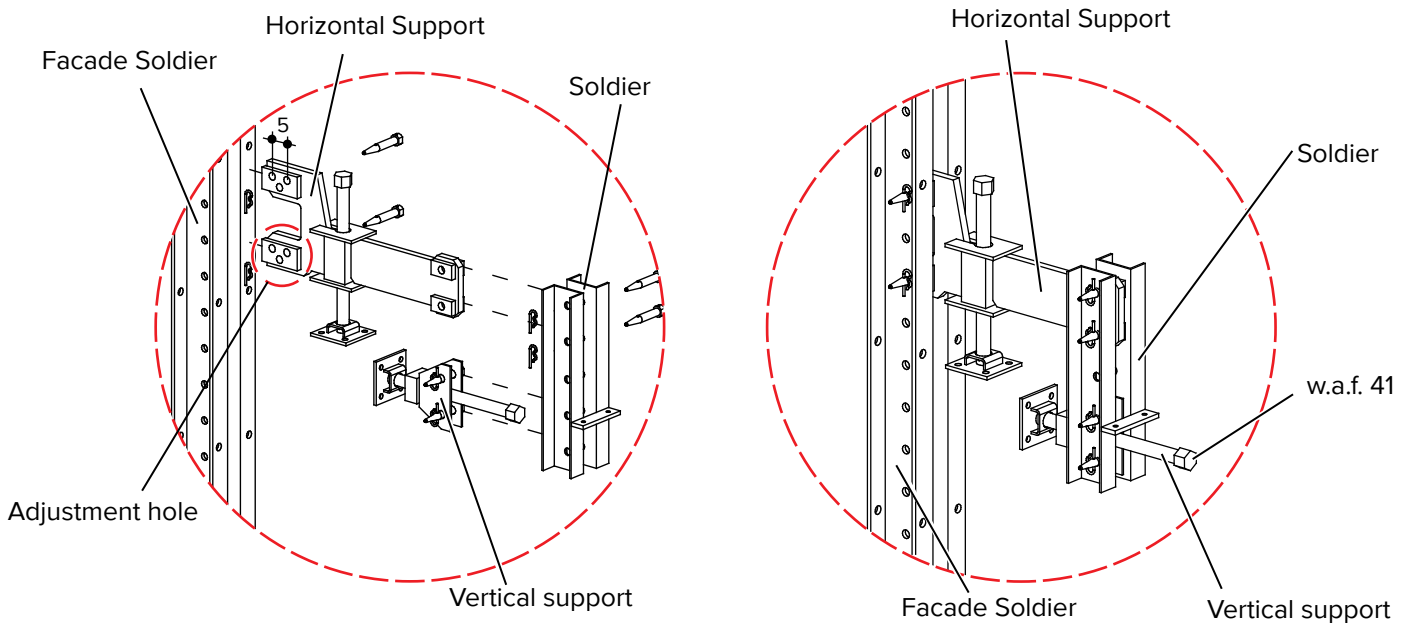
The horizontal and vertical supports and the soldier are pinned together with the corresponding pins and spring cotters.

The distance between the holes is always 10 cm (fixed grid).

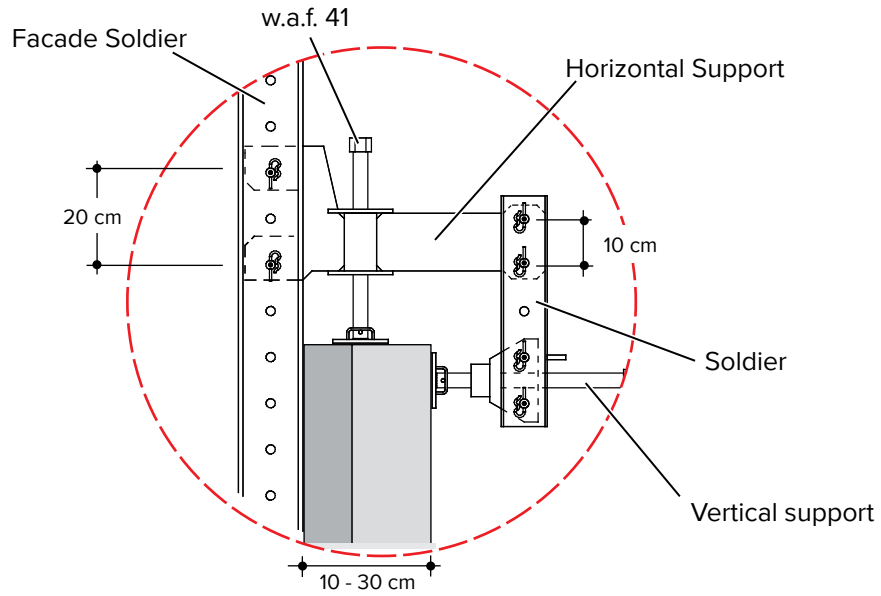
The connection claw of the horizontal support is provided with three holes each at the upper and lower part for pinning. These holes are used for rough adjustment of the distance between 20 and 30 cm.

The spindles of the horizontal and vertical supports allow the prefab elements to be aligned and fixed.

The hexagon heads of the spindles can be operated with a wrench size 41.



Prefabricated elements with wall thicknesses between 10 and 30 cm can be fixed as shown.

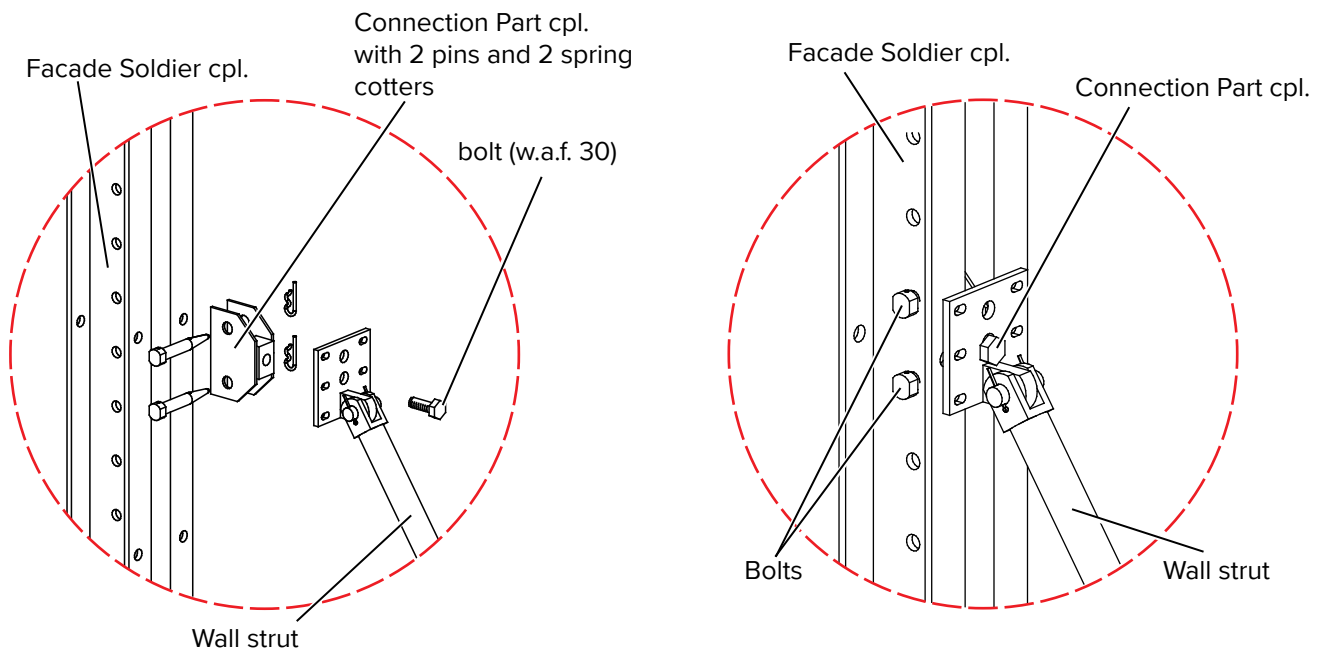


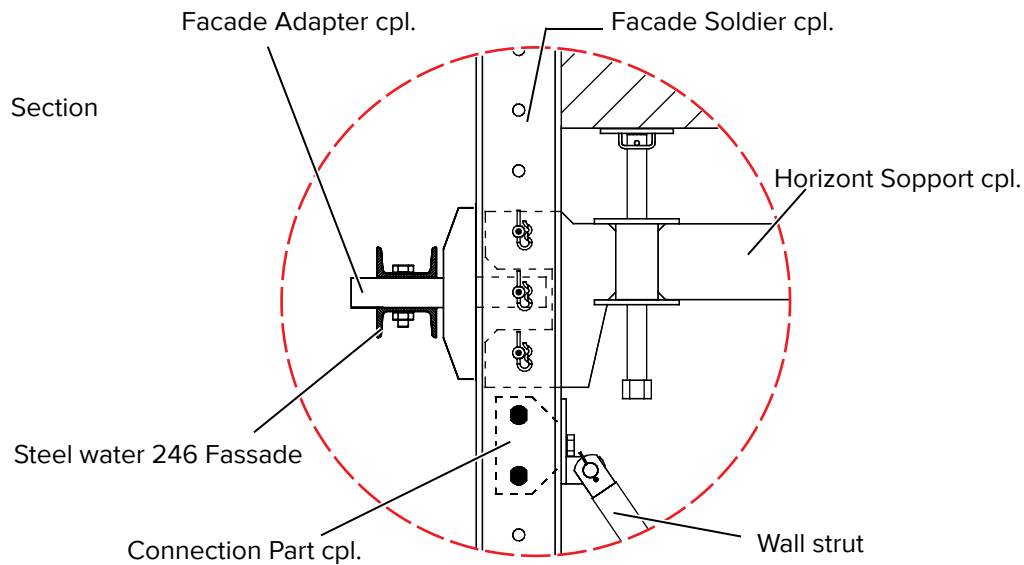
4.2 Detail 2

Connection of

- Facade soldier
- Connection part cpl.
- Wall strut

The connection part cpl. has to be bolted to the facade soldier and fixed with the included pins and spring cotters. The wall strut is attached to the connection part cpl. using the included bolt.





WARNING

Warning!

In order to achieve an optimum and safe bracing, the connection part for the wall strut has to be installed directly below the claw of the horizontal support (see section).

4.3 Detail 3

Shifting of the facade units must be carried out with a two rope crane cable with sufficient load bearing capacity, supplied by site. Attach the crane cables to the upper spacers of the Facade soldier 6.0 m cpl.!



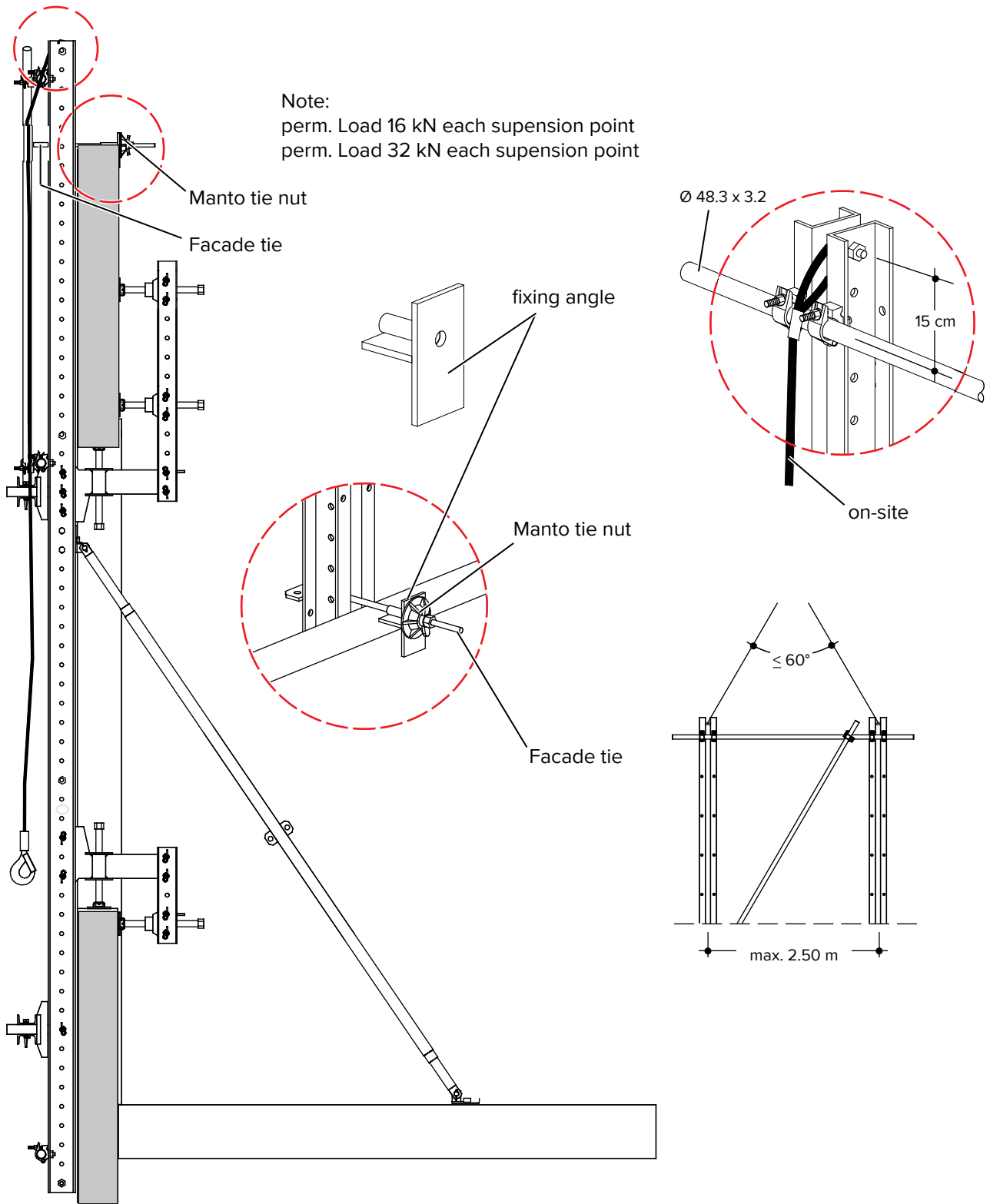
WARNING

Warning!

The spreading angle of the crane ropes has to be limited to 60°. As illustrated a scaffold tube must be installed 15 cm below the suspension point to absorb the resulting forces during lifting. The scaffold tube must be fastened with two Half couplers to the Facade Soldier 6.0 m cpl. Only use sufficient load carrying equipment.

Weight of illustrated Facade components

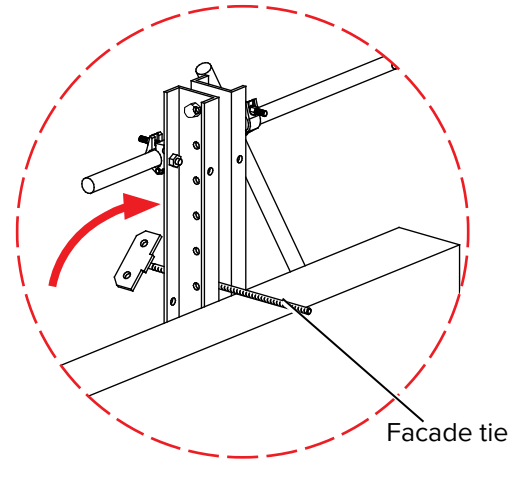
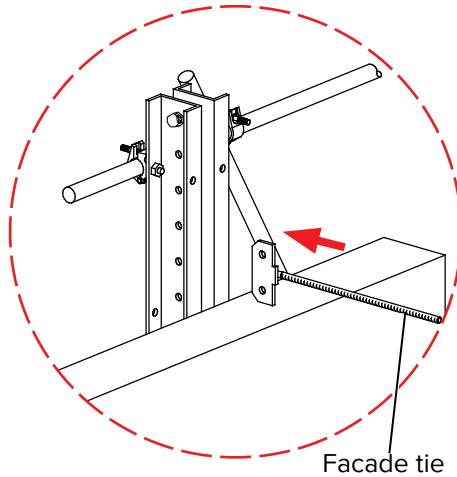
2 x Facade soldier 6.0m cpl.	Product code 600762	395.6 kg
2 x Soldier 0.5 m	Product code 600787	24.6 kg
2 x Soldier 1.25 m	Product code 600790	57.6 kg
2 x Waler 246 facade	Product code 600792	110.2 kg
4 x Horizontal support cpl.	Product code 600759	111.2 kg
6 x Vertical support cpl.	Product code 600760	43.8 kg
2 x Connection part cpl.	Product code 600810	5.2 kg
2 x Wall strut, size 5	Product code 506485	54.0 kg
4 x Facade adapter cpl.	Product code 600794	25.6 kg
2 x Facade tie	Product code 600823	3.2 kg
2 x Fixing angle	Product code 600822	5.6 kg
12 x Half coupler 48 (w. a. f. 22)	Product code 002488	10.8 kg
2 x Swivel coupler 48/48S	Product code 002525	2.8 kg
1 x Scaffold tube 3.0 m	Product code 169056	11.4 kg
3 x Scaffold tube 2.5 m	Product code 169045	28.5 kg
total weight:		890.1 kg



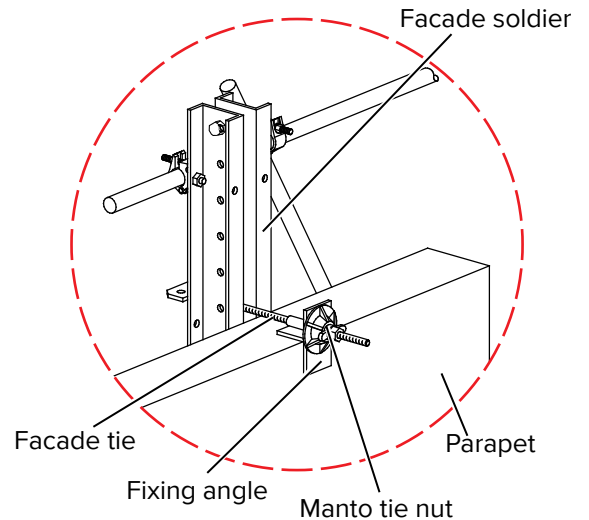
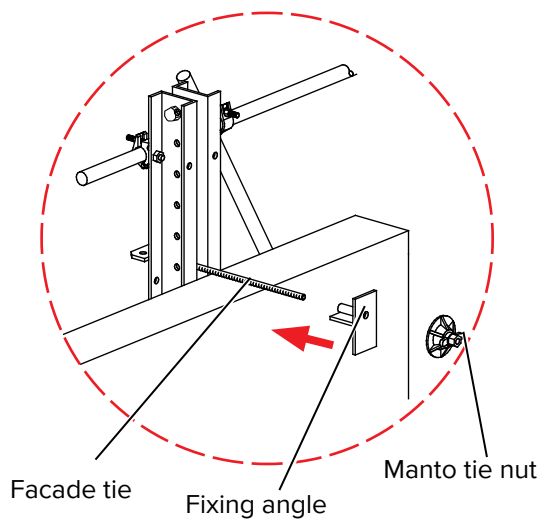
4.4 Detail 4

Facade tie

The end plate of the facade tie is passed through the gap between the channels of the facade soldier. After that the facade tie must be turned by 90°.



As soon as the facade tie is positioned at the facade soldier, install the fixing angle with the Manto tie nut. The facade tie, fixing angle and the Manto tie nut tightly connect the parapet precast element to the facade soldier.

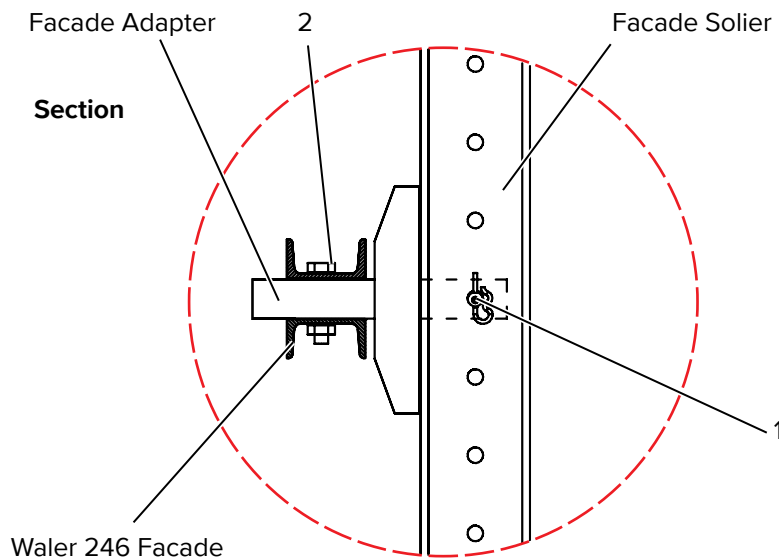
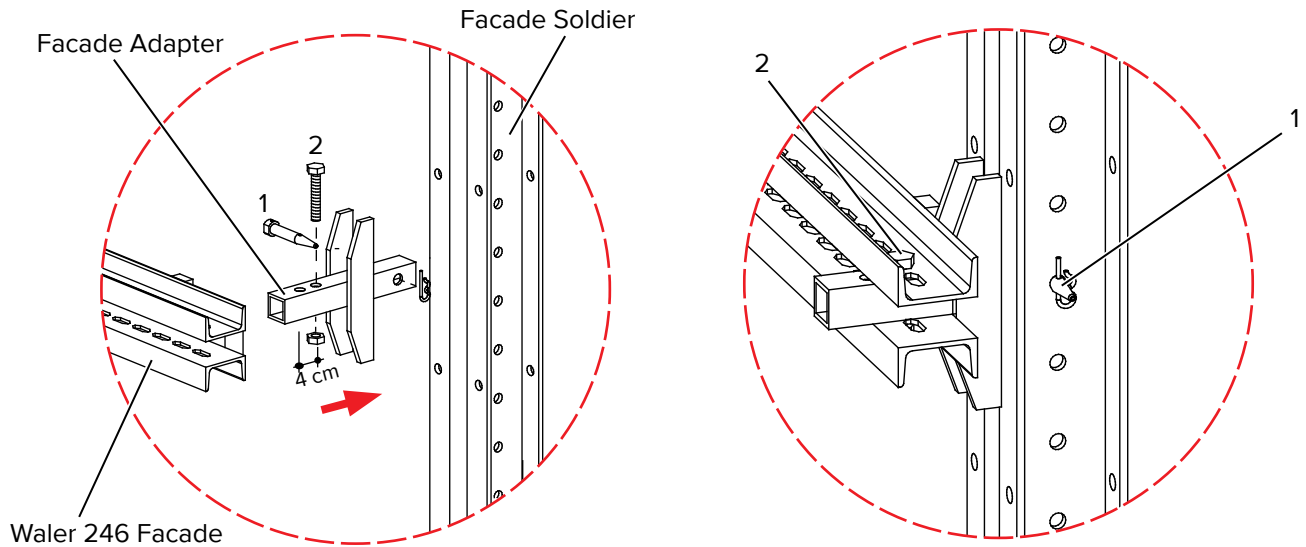


4.5 Detail 5

Connection of

- Waler 246 facade
- Facade adapter
- Facade soldier

The facade adapter is inserted in the facade soldier and connected with the pin (1) and secured with the included spring cotter. Now place the Waler 246 Facade on the Facade Adapter and fasten it with the matching bolt (2), washer and nut.



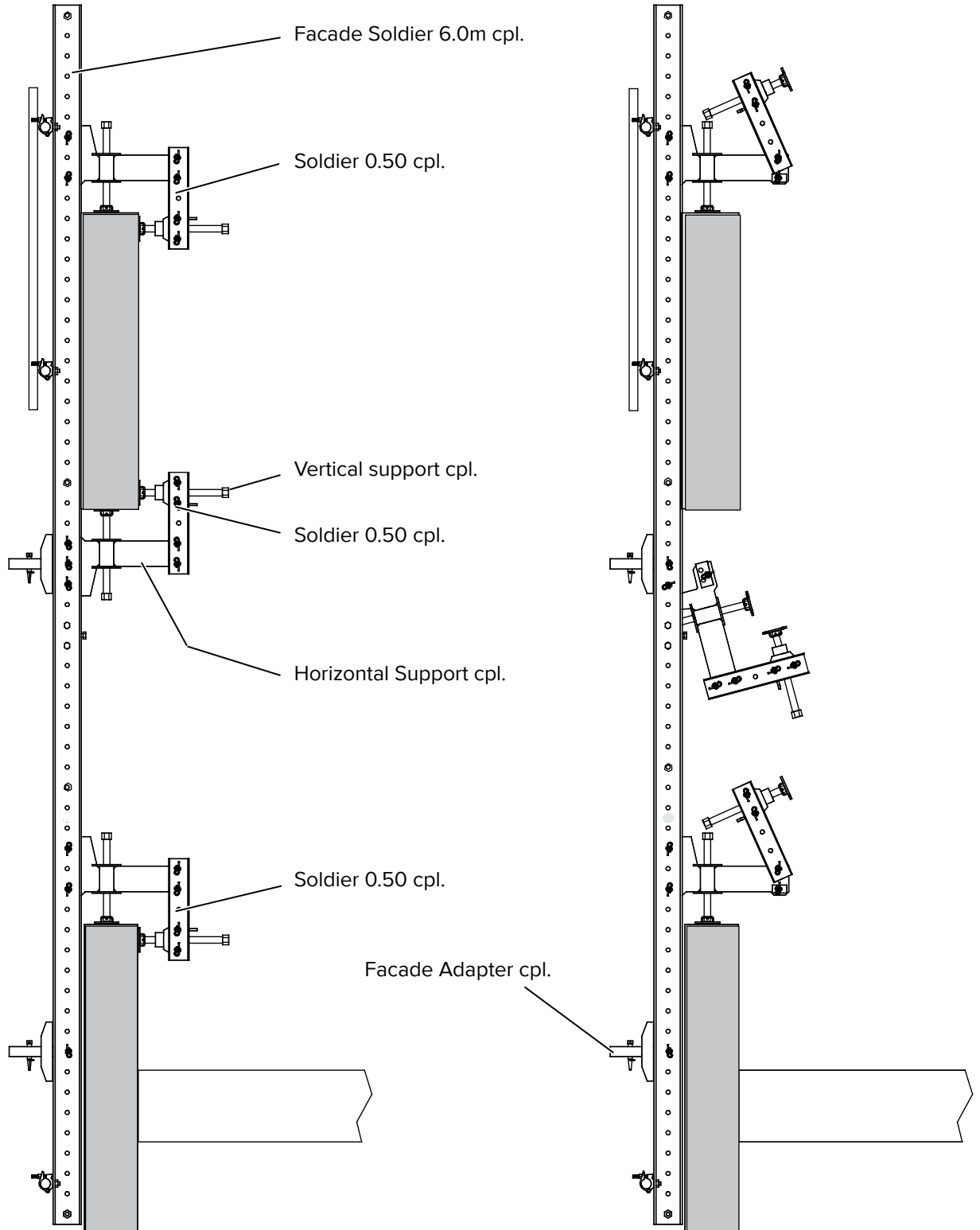
The facade adapter provides two continuous holes for fixing the waler 246. The distance between the holes is 4 cm.

Both holes allow to position the waler in combination with H20-Beams or R24-Girders when integrating column formwork or in situ columns into the facade formwork.

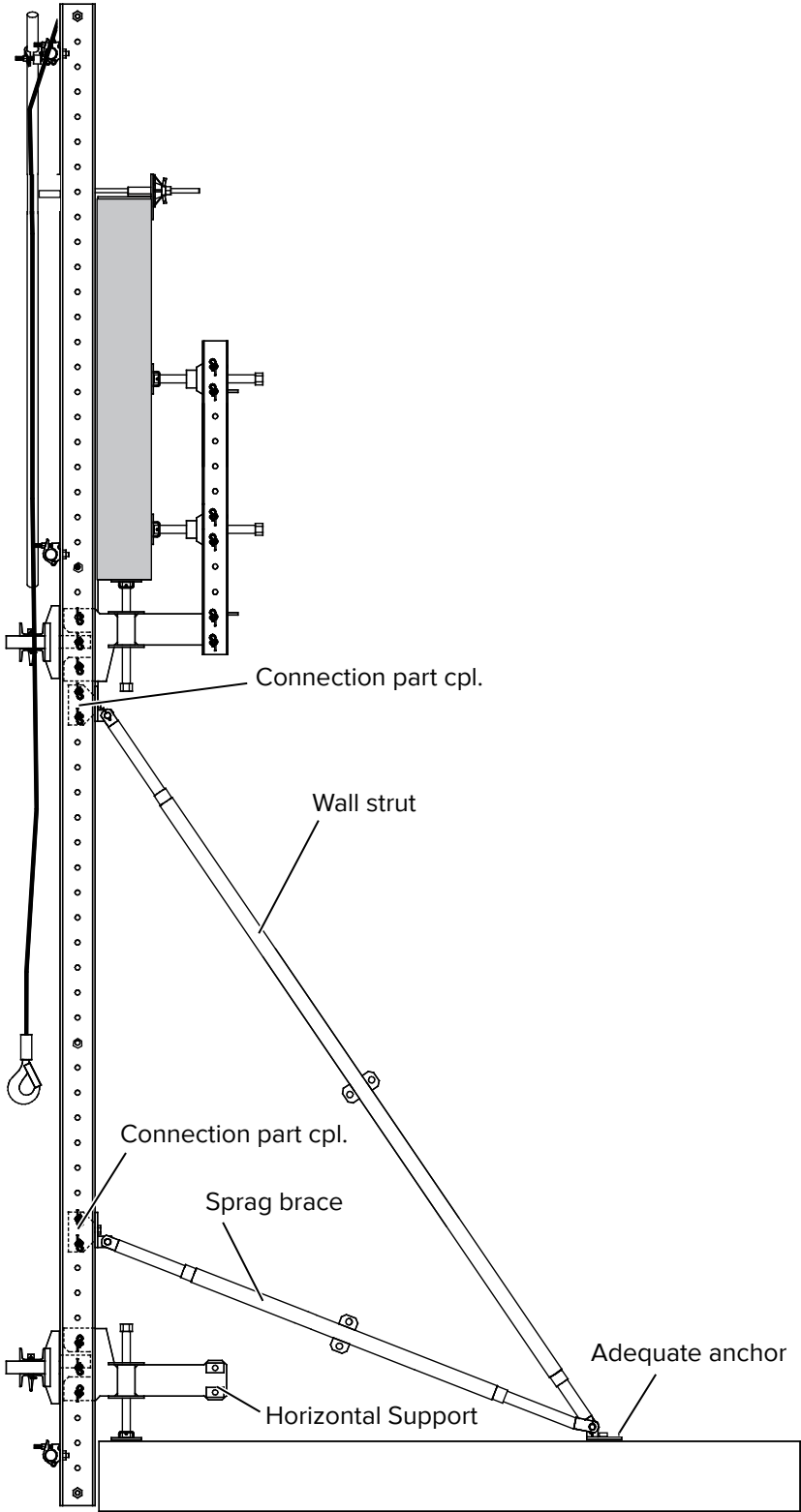
The R24 girders or H20 timber beams are connected to the waler by waler clamps R24 (Part code 504410) resp. H20 timber beam clamps (Part code 568048).

5 Operation

The support brackets for prefab elements can be swiveled (simply pull out one of the two relevant bolts to tilt the support).



The facade formwork unit has to be used as shown if there is no parapet (= prefab element) at the bottom slab which can be used to secure the lower part.



6 Column formwork

Basic design of a column formwork for cast-in-place concrete columns.

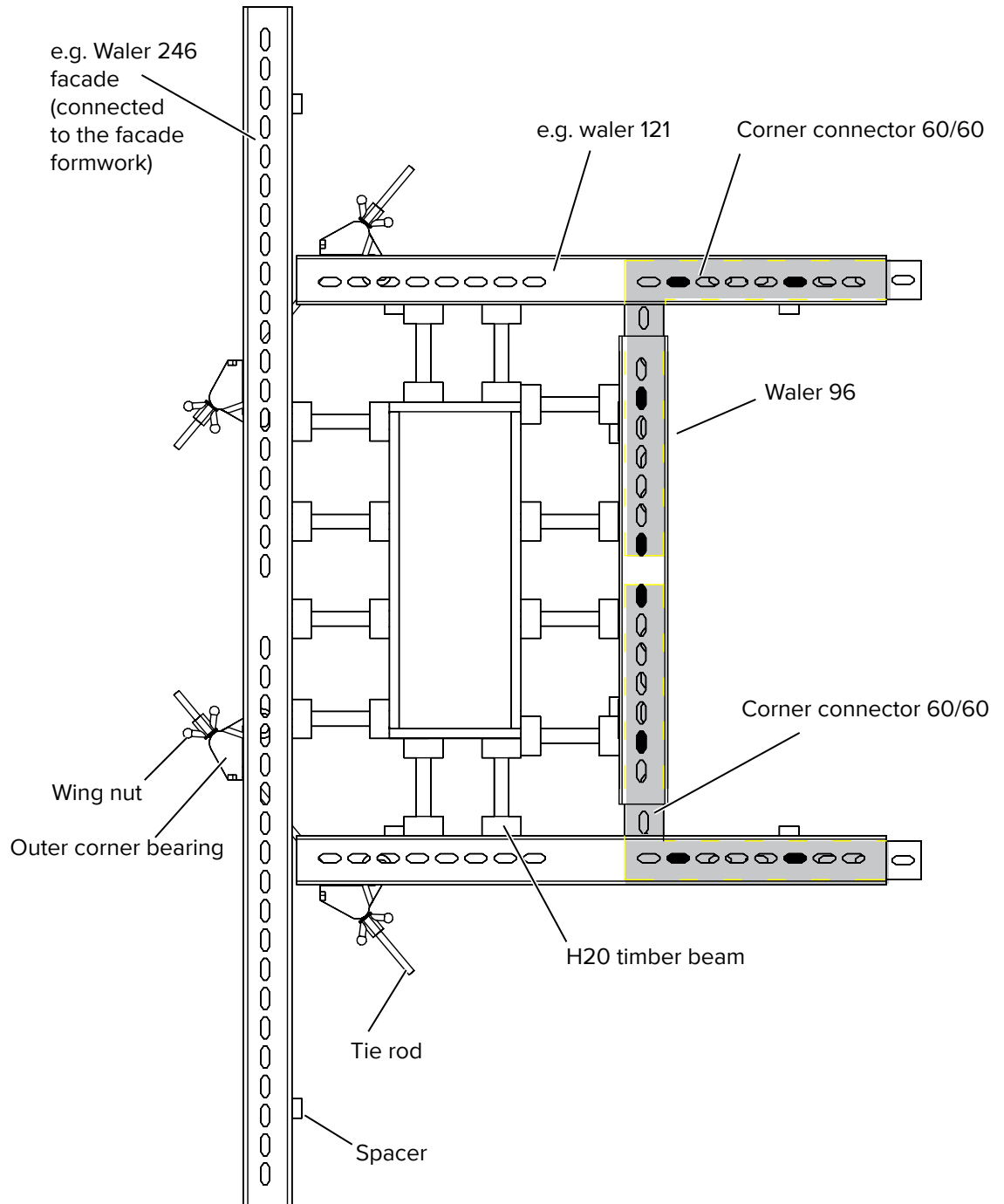
Example of an integrated column formwork



VISUAL CHECK

Check all wedges for tight fit!

Top view



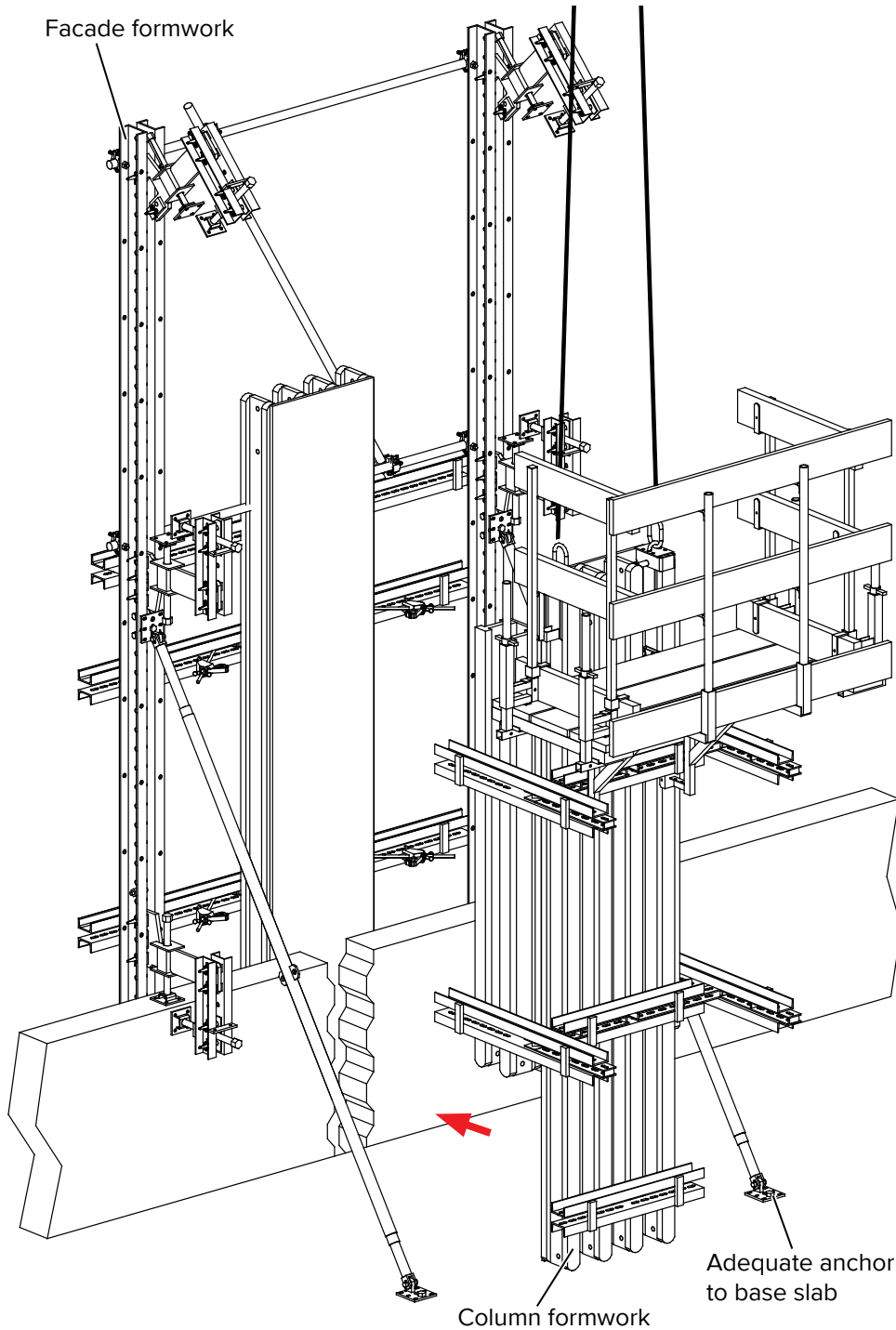
WARNING

Warning!

The spacers of the waler must always face the column!

Step 1 Before casting the insitu concrete column:

- Installation of the facade formwork to the previous building section.
- Column formwork is joined to the facade walers by the outer corner bearings, tie rods & wing nuts.



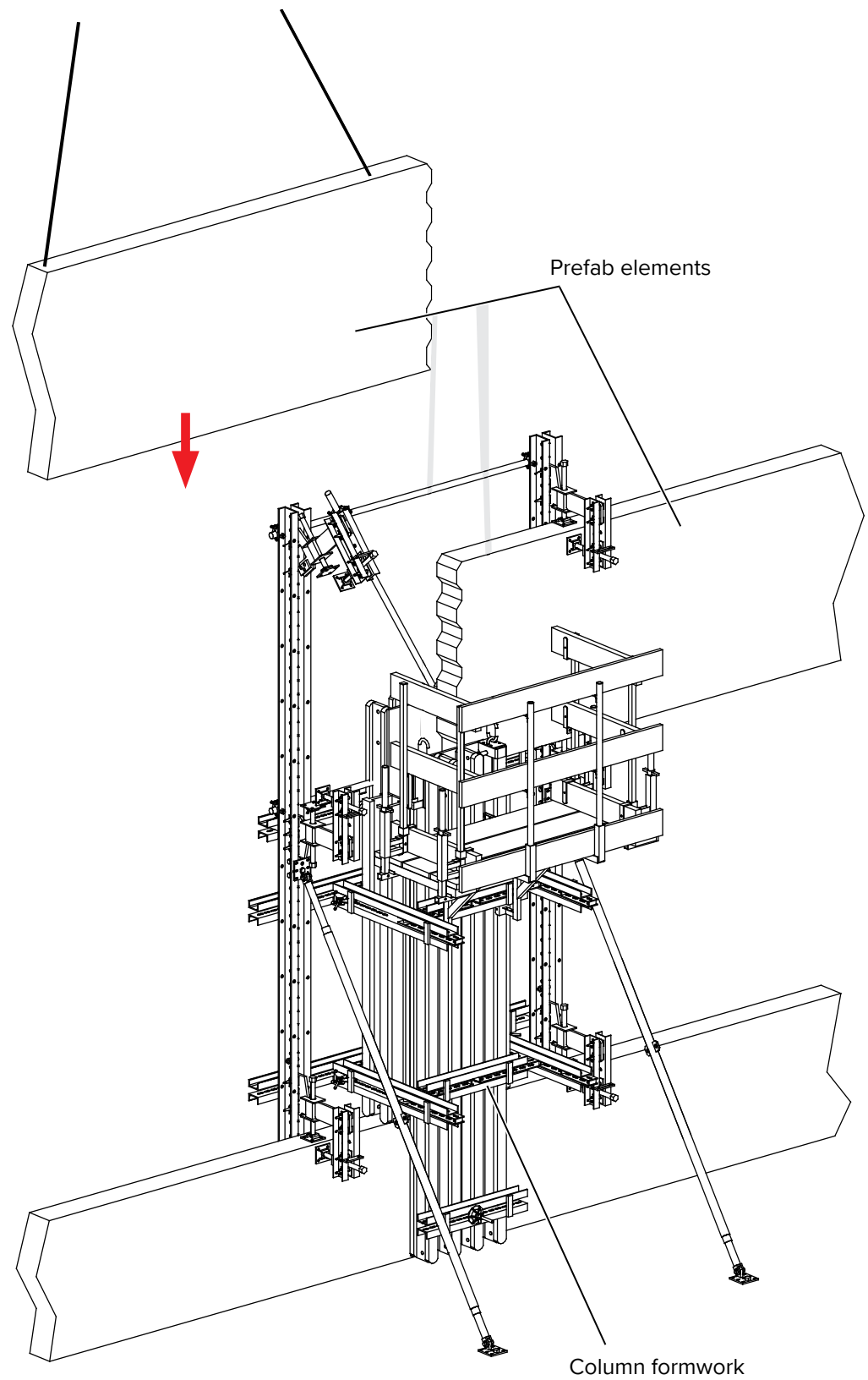
WARNING

Warning!

See the H20 user guide for the correct design of the column formwork.

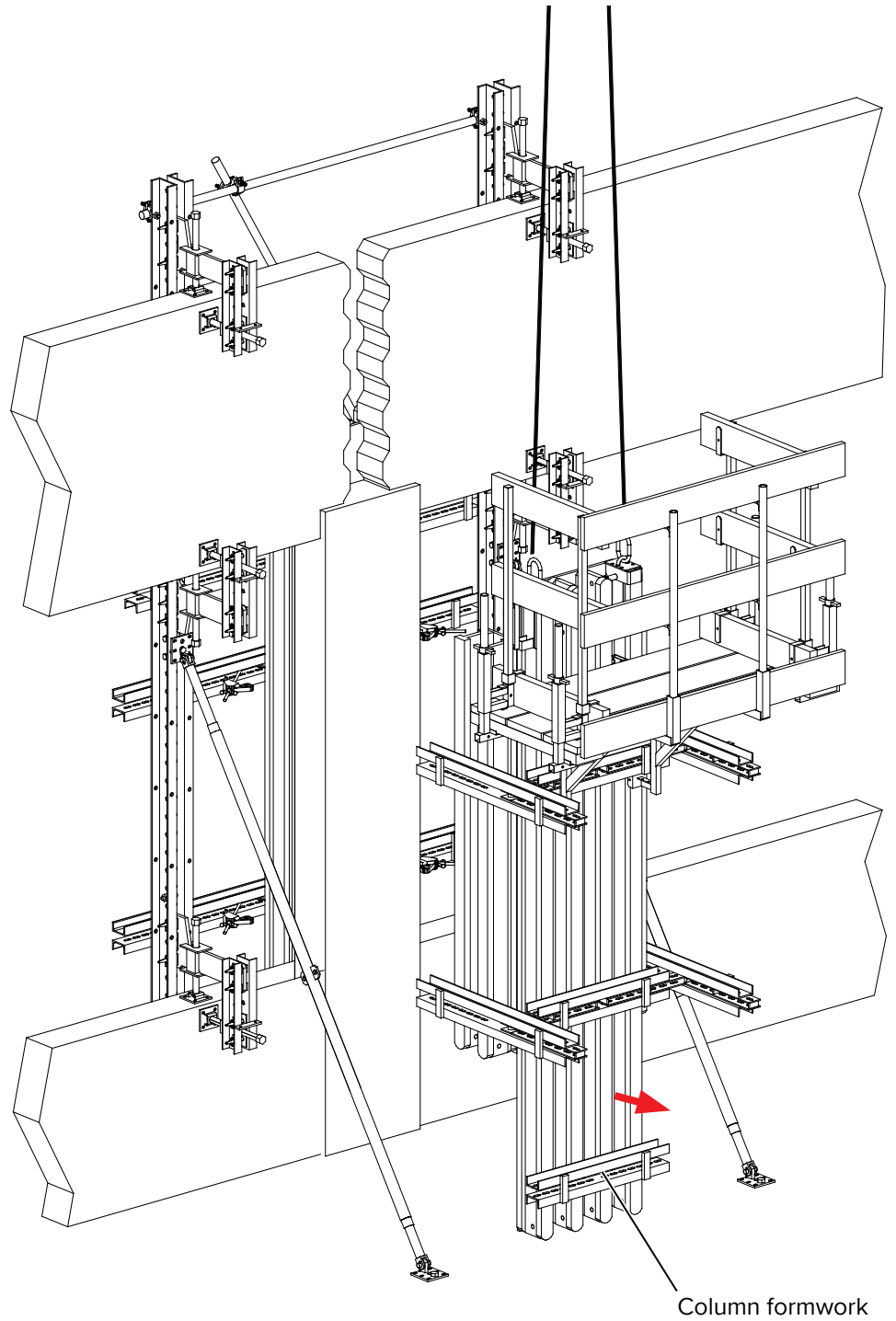
Step 2 Before casting the insitu concrete column:

- Fly-in prefab elements on the support brackets, adjust to correct position and secure to facade soldier.



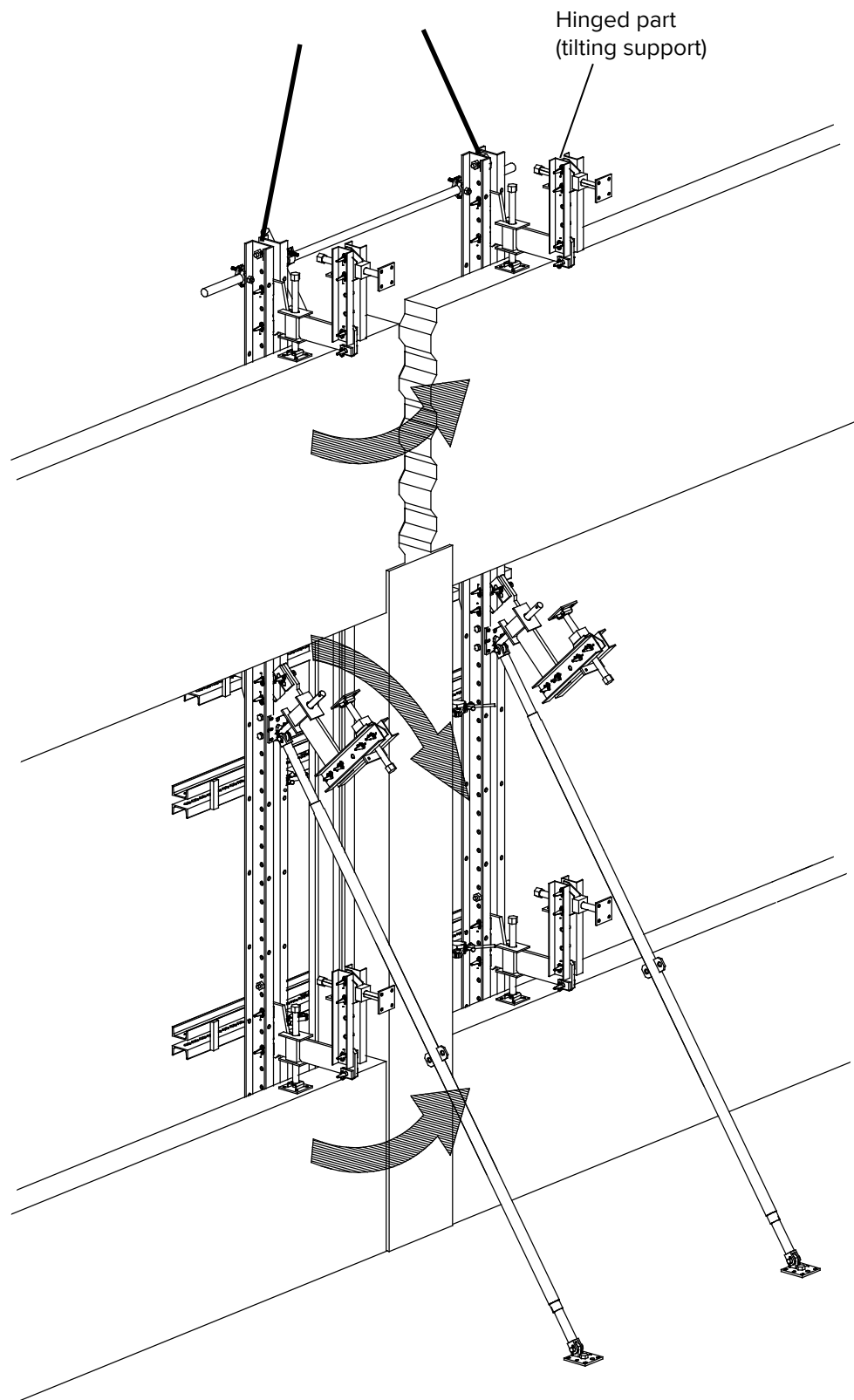
Step 3 After casting the insitu concrete column:

- Dismantle concrete column and store formwork safely on site.



Step 4 After casting the insitu concrete column:

- Tilt hinged parts as shown and remove the facade formwork unit.



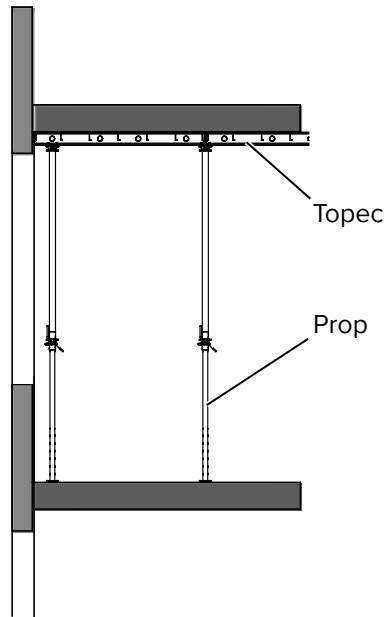
WARNING

Warning!

The advanced parapet may require temporary bracing against horizontal wind loads at this construction stage.

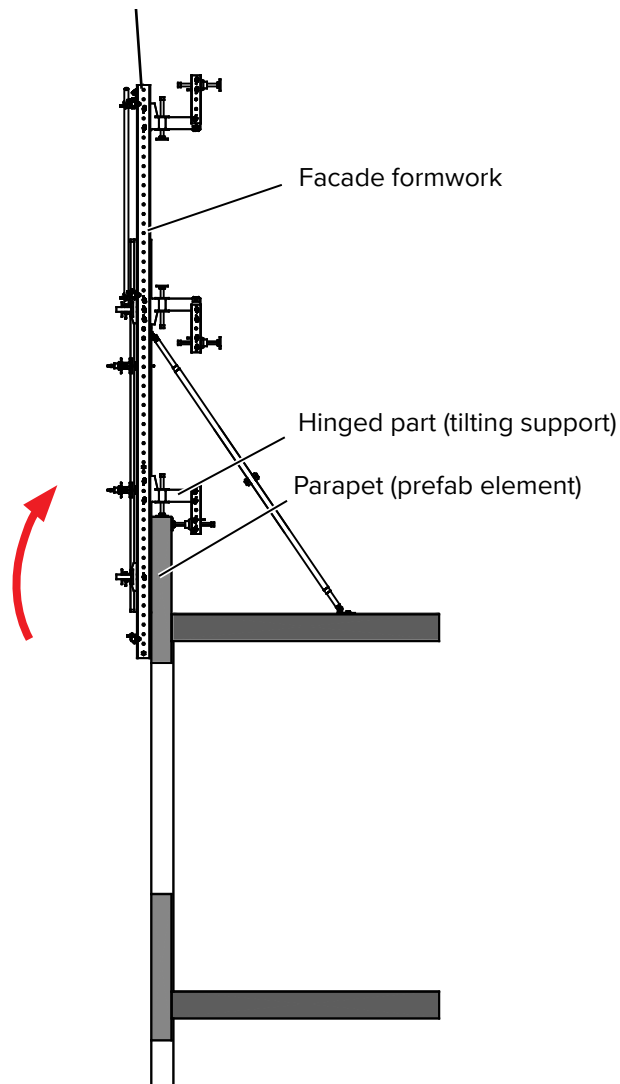
Step 5 Pouring the slab:

- The in-situ slab is typically formed with TOPEC or TOPFLEX timberbeam formwork.



Step 6 Shifting the facade formwork unit:

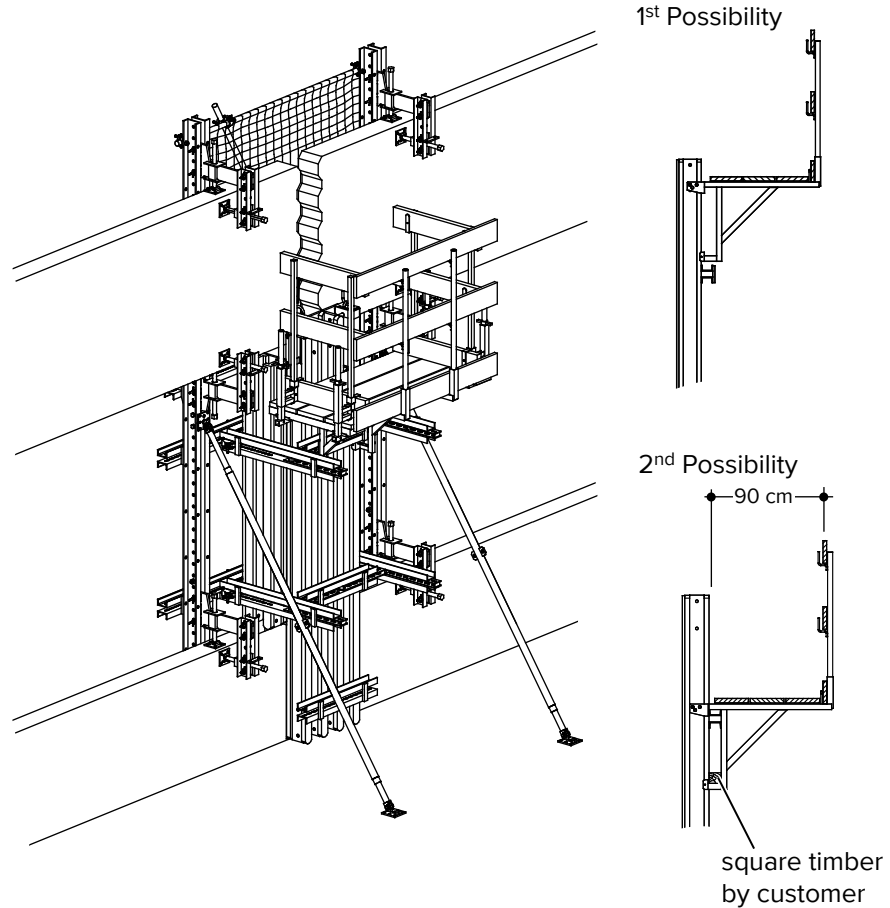
- The facade formwork unit has been shifted to the next place of use and is fixed to the existing parapet by the tilting supports (horizontal/vertical supports).



Walkway bracket:

1st Possibility

The HT Walkway bracket is pinned and secured perpendicular to the web (hole 2.2 cm dia.) of the H20 timber beam using the safety pin.



2nd Possibility

The HT Walkway bracket is placed on the waler in between the H20 beams and secured by the safety pin from behind (parallel to bracket).



WARNING

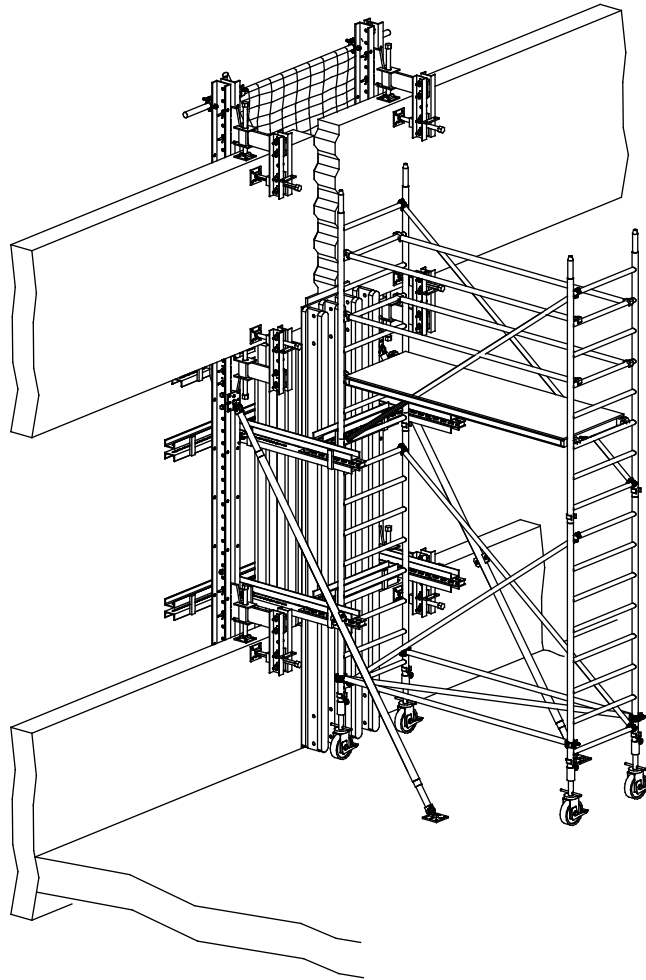
Warning!

When applying the 2nd possibility a squared timber **has to be** arranged at the bottom part of the bracket serving as bearing and spacer for its lower support and to prevent the bracket from tilting.

Secure it by using the hole of the lower profile of the **HT-walkway bracket** .

Alu-Mobil scaffold:

Place the Mobil scaffold as close as possible to the column (see illustration) block the brakes and secure the scaffold before working on the scaffold.



7 Technical Data

The determinations of spacing „e“ of the facade formwork units shown on page 32 are based on the design of the system as depicted here.

Following facts and figures have to be adhered to when planning the use of the facade formwork on construction site:

- b: Width of prefab element < 0.3 m
- h: Height of prefab element < 1.5 m
- H: Floor-to-floor height < 4.5 m
- e: Spacing of the facade formwork units < 7.5 m
- α < 60° (angle smaller than or equal to 60°)

- A: Wall strut fixed to base slab with adequate anchor (dowel with bolt).
- B: Upper support of prefab element must be installed
- x: Distance between the bolted connection part of the strut and the lower horizontal support depending on floor height (see page 32)
- y: Distance (< 0.5 m): From bottom of prefab element to the centre of the bolted connection part of the strut in the soldier

Assumption: Wind-back pressure $q = 1,10 \text{ kN/m}^2$	
Wind- load zone / Area category	Max. heighth of use with 1 year as the maximum periode of use.
WLZ 1 / GK II + III	< 300 m
WLZ 2 / GK II + III	< 287 m
WLZ 3 / GK I + II	< 85 m
WLZ 4 / GK I	< 29 m



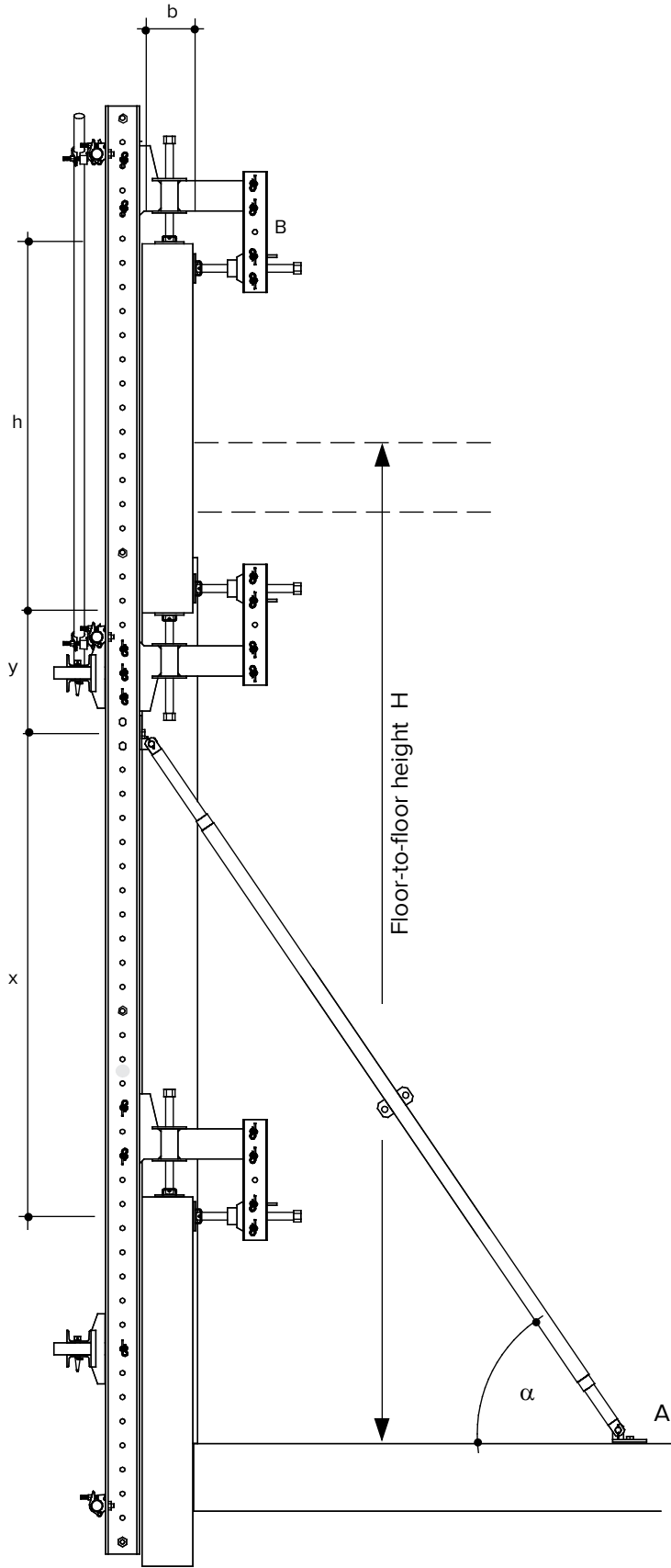
WARNING

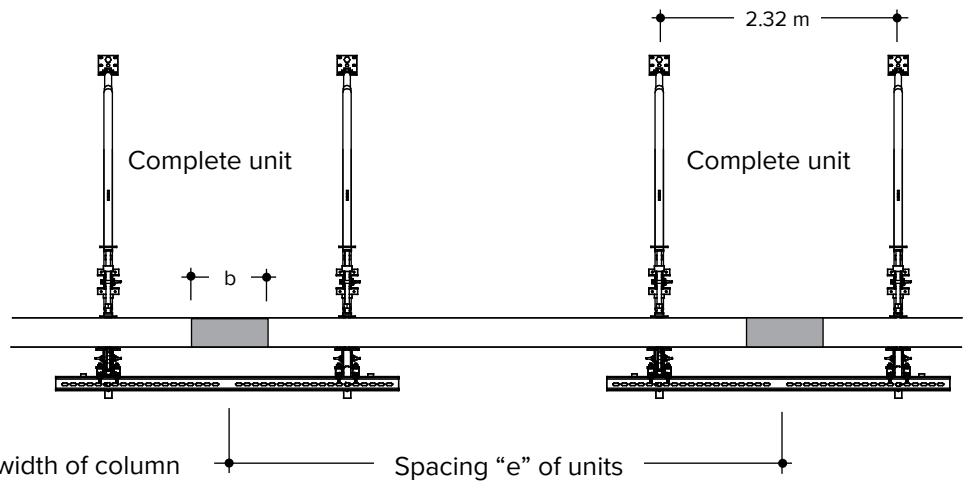
Warning!

When exceeding the maximum height and/or the maximum period of use a separat structural calculation is required!

Permissible load of strut: N perm. [kN]; Wall strut sizes 2 – 5 Angle of inclination $30^\circ \leq \alpha \leq 60^\circ$

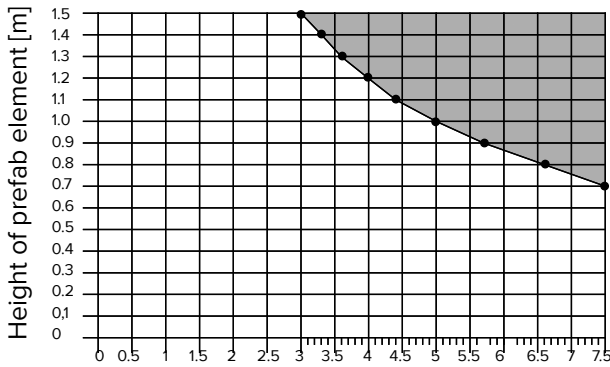
Size	Lenght [cm]	N perm. [kN]
2	220	15.2
	255	15.2
	290	15.2
3	270	15,2
	305	15.2
	340	15.2
4	320	15.2
	355	15.2
	390	13,7
5	420	12.5
	455	10.6
	490	9.0





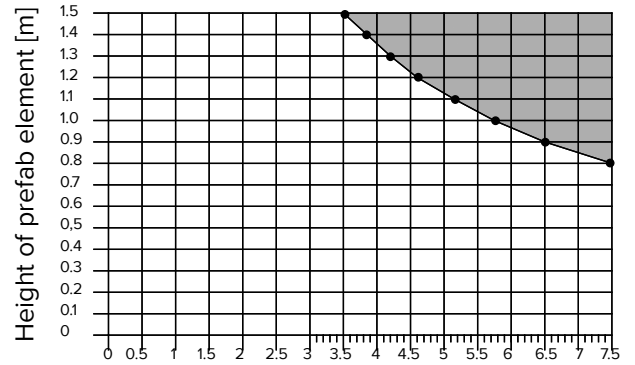
Diagrams are valid for spindle extensions < 175 mm and Wind- back pressure $q = 1.10 \text{ kN/m}^2$

Spacing e (floor-to-floor height 3 m)



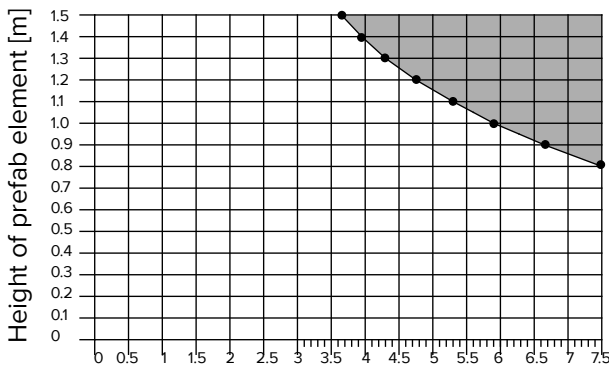
Bracing with wall strut SIZE 2
(Product code 506420)
 $x \geq 1.10 \text{ m}$; $b \leq 0.50 \text{ m}$

Spacing e (floor-to-floor height 3.5 m)



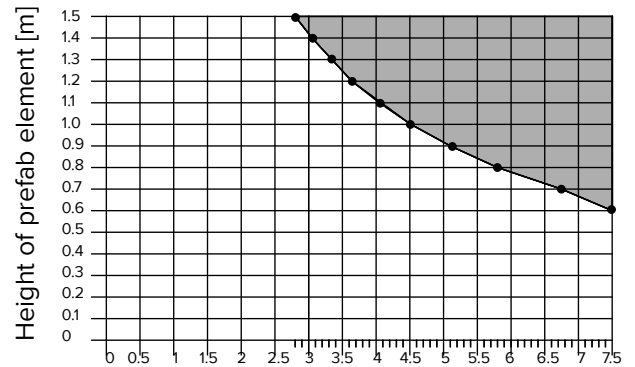
Bracing with wall strut SIZE 3
(Product code 506430)
 $x \geq 1.60 \text{ m}$; $b \leq 0.50 \text{ m}$

Spacing e (floor-to-floor height 4 m)



Bracing with wall strut SIZE 4
(Product code 506463)
 $x \geq 2.10 \text{ m}$; $b \leq 0.50 \text{ m}$

Spacing e (floor-to-floor height 4.5 m)

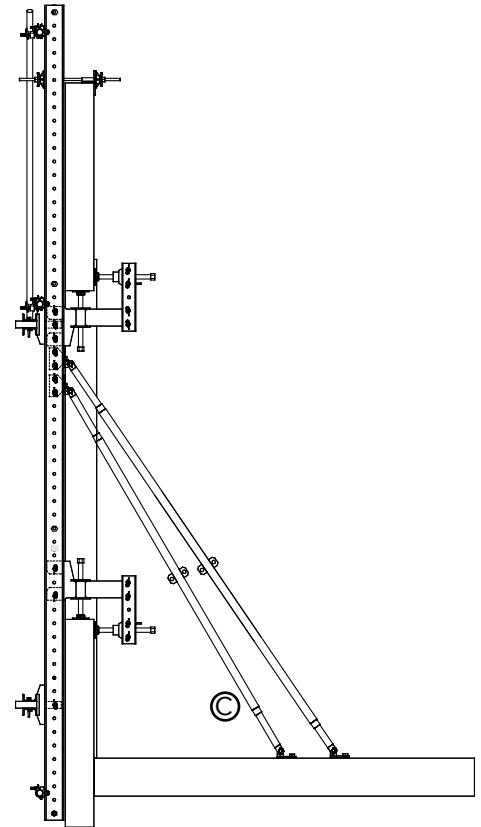
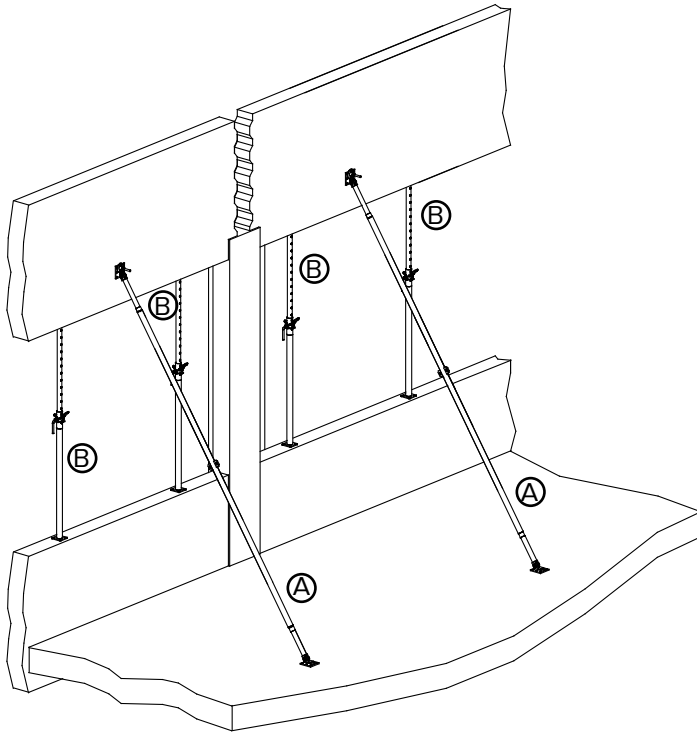


Bracing with wall strut SIZE 5
(Product code 506485)
 $x \geq 2.60 \text{ m}$; $b \leq 0.50 \text{ m}$

In areas marked in dark grey are additional support required!

Additional support:

An additional support is needed for applications based on the dark grey area marked in the diagrams. The prefab elements are supported additionally by further wall struts (A) and HÜNNEBECK steel props (B). Alternatively, prefab elements can be supported by further raking wall struts (C) connected to the facade soldier as shown right. This method replaces bracing struts (A).



WARNING

Warning!

A separate design proof (= calculation) has to be prepared in special loading cases!

8 Chronology

Changes compared to issue 2010-03		
Changes	Page	Date
Layout updated	div	2018-12

**Hünnebeck
Deutschland GmbH**
Rehhecke 80
D-40885 Ratingen
+49 2102 9371
info_de@huennebeck.com
www.huennebeck.com

The copyright in these instructions for assembly and use belongs to BrandSafway. All the trademarks named in these instructions for assembly and use are the property of BrandSafway, unless marked as third-party rights or identifiable as such in another way. Hünnebeck, SGB and Aluma Systems are trademarks of BrandSafway. Furthermore, all rights are reserved, particularly with regard to patent grant or utility model registration. The unauthorized use of these instructions for assembly and use, of the trademarks contained therein and other intellectual property rights is expressly prohibited and represents an infringement of copyright, trademark rights and other industrial property rights.

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

Last updated: December 2018
Keep for later use!