BOSTA® 70
FRAME SCAFFOLD

User guide

HÜNNEBECK
BY BRAND SAFWAY

Content

1 Product features

The frame scaffold BOSTA 70 of Hünnebeck meets the requirements for working and safety scaffolds according to DIN 4420, DIN EN 12810, as well as DIN EN 12811. The standard model of BOSTA 70 has got a national technical approval according to DiBt admission rules with the number Z-8.1-54.2.

BOSTA can be used as:

- working scaffold of load class 3 according to DIN EN 12811 4420 (200 kg/m^2)
- protective scaffold (fall height <2.00 m)
- protective roof scaffold <1.50 m

The max. assembly height of the standard model is 24 m plus the extension of the spindles. For higher scaffolds or scaffolds that do not meet the requirements of the standard model a separate structural analysis is required. Using the BOSTA 70 system components the following scaffold types can also be assembled:

- mobile scaffolds
- bracket scaffolds
- supporting structures for roofs of winter constructions and inclement weather shelters.

With 6 different bay lengths between 1.25 m up to 4.00 m, the BOSTA 70 scaffold system is very flexible.

The system width of the scaffold 0.74 m. Using brackets, the scaffold width can be increased to meet the different requirements of the individual application.

All steel components are hot-dip galvanized and the timber parts are weatherproofed. This ensures a long life time combined with high safety standards.

Many components can also be used with BOSTA 100 or the MODEX scaffolds.

Requirements

This user guide and the national technical approval must be kept available when BOSTA 70 scaffolds are used. Only qualified persons that are familiar with the user guide and the national technical approval of BOSTA 70 are allowed to assemble, modify, disassembly and use the scaffold.

The manufacturing and identification of all components is regulated in the national technical approval Z-8.1-54-2.

Only use undamaged and original scaffold components made by Hünnebeck. Therefore all components must be visually checked for their origin and damages prior to installation. If it is necessary to exchange components only use original parts.

Repairs may only be carried out by HÜNNEBECK.

The user is not allowed to modify the scaffold components.

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.

All technical details described in the user guide that may be helpful to the builder or user of the scaffold to comply with the requirements of the industrial health & safety standards act are not mandatory. Based on the requirements of the industrial health & safety standards act, the builder or user of the scaffold is responsible for assessing all hazards and must meet all obligatory preventative measurements at his own discretion. For this the characteristics of each single case must be considered.

The erection, modification, and dismantling of BOSTA 70 scaffolds must only be performed by properly trained personnel with professional knowledge according to the local regulations (for Germany BGI 663. Handlungsanleitung für den Umgang mit Arbeits- und Schutzgerüsten). An appropriately qualified supervisor, who has to be determined by the contractor, must guide the erection of the scaffold. The erection of the scaffold must also be observed by a supervisor with sufficient knowledge and experience, who is responsible for safety issues during the erection. This includes object-related instructions, which refer to the specific hazardous situations. When using personal protective equipment, the supervisor is responsible for the determination of the correct attachment points and to ensure that the employees uses the safety equipment properly to prevent falling from heights. See also chapter *Assembly procedure with personal protective equipment against fall from heights* on page 46.

Within the scope of the following user guide and based on our own risk analysis, we are providing options to act in certain installation and usage situations according to the industrial health & safety standards for the builder and user.

Up to a height of 2.00 m, the scaffold may be used as fall protection or as a protective roof scaffold. All planks in these user guide can be used with protective and protective roof scaffolds.

The standard requirements for the use of the scaffold is that the present user guide must be followed.

This user guide describes the erection of the standard design. If the scaffold system is used in setups which deviate from the standard design, these deviations must be assessed and approved according to the construction regulations and the National Technical Approval License Z-8.1-150.

An approval is not required if the setup of the scaffold complies with this user guide for the standard design.

The structural stability of the scaffold must always be guaranteed.

Only erect, modify and disassemble the BOSTA 70 scaffold as described in this user guide and only use the components listed in chapter *Components* on page 8.

Other setups are possible, but do require a separate approval which can be obtained from the manufacturer.

Preparation Work

Prior to putting into operation, after long periods of work breaks, after modifications, and after unexpected impacts the contractor has to check the scaffold (see also chapter *Calculation of material* on page 117). The completeness, the condition of the components, the structural safety, as well as the working and operational safety of the scaffold must be checked.

Using the scaffold before the final approval is not allowed.

Using damaged scaffold components is not allowed. Only the manufacturer may perform any necessary repairs.

The scaffold may only be erected on a leveled surface and load carrying ground. If necessary prepare the surface on which the scaffold is erected. All base jacks must be placed on load-distributing planks.

A safe transfer of the loads into the building must be approved. Furthermore, the arrangement and number of vertical bracings must be correct. If the distance between the scaffold and the building exceeds 30 cm, an additional back railing, knee-level rail, and, if necessary, a toe board must be added to the side of the scaffold that is facing the building.

Scaffold access stairways must be built to be safe and firmly tied.

When the scaffold is erected at building corners the planks must be laid around the corner in full width. To prevent uplift by wind at buildings with a roof pitch of ≤20° as well as scaffolds at inner building corners, secure the highest levels of the scaffold tension proofed, down to the second uppermost tying level with frame pins Ø8 mm. As a rule follow all valid safety standards and regulations. Furthermore follow all regulations about the industrial health & safety standards act must be adhered to.

The contractor has to ensure that the user guide provided by the manufacturer is available on site at all time. Before the assembly and use the site personnel has to be familiar with the user guide and the user guide must be readable and complete.

The same is valid for the installation instructions that has to be created by the contractor (see DIN EN 12811-1: 2004-03, para. 8).

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

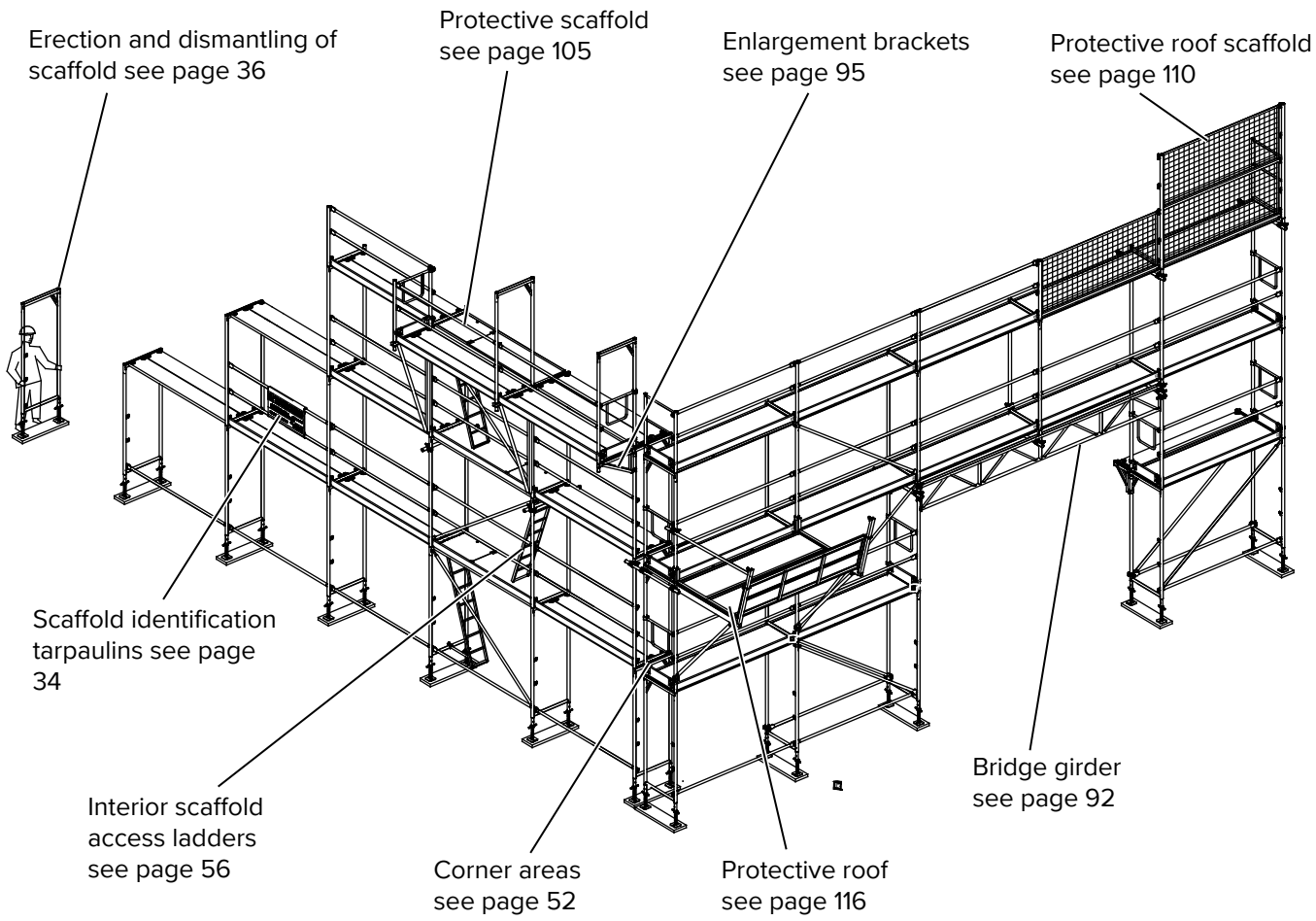
VISUAL CHECK refers to a visual check and is not related to personal injury.

Overview setup variants standard model

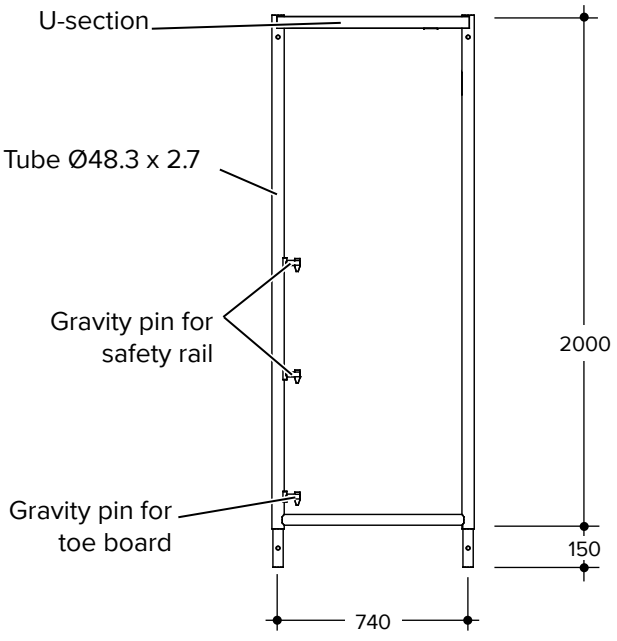
Cladding	Facade	AS*	Load	Bay length	First tie level	Decks	Use as protective scaffold and roof protection	Page
without	open + closed	①	LC3	L ≤ 3.00 m	at 4.00 m	all decks	permitted	77
without	open + closed	②	LC3	L ≤ 3.00 m	at 4.00 m	all decks	permitted	79
without	closed	③	LC3	L ≤ 3.00 m	at 4.00 m	HBP	not permitted	
Nets	open + closed	④	LC3	L ≤ 3.00 m	at 4.00 m or 2.00 m	all decks	permitted	81
Tarpaulin	open + closed	⑤	LC3	L ≤ 3.00 m	at 4.00 m or 2.00 m	all decks	permitted	85
Tarpaulin	open + closed	⑥	LC3	L ≤ 3.00 m	at 2.00 m	all decks	permitted	87
Tarpaulin	open + closed	⑦	LC3	L ≤ 3.00 m	at 2.00 m	all decks	permitted	88

*AS = Tie pattern starting on page 72

2 Overview



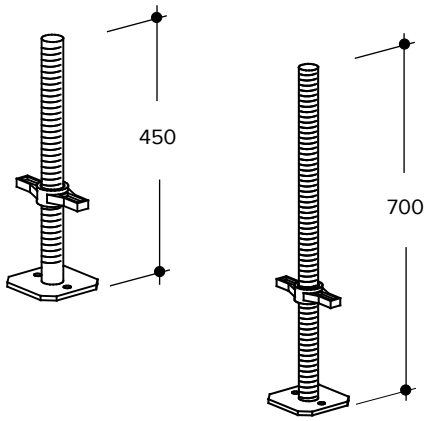
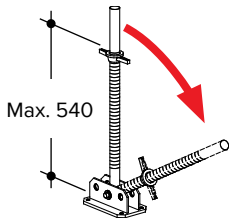
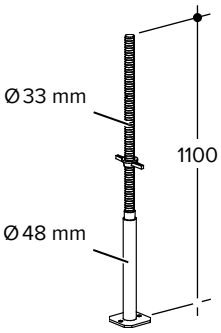
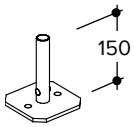
Vertical frame 200/70 light



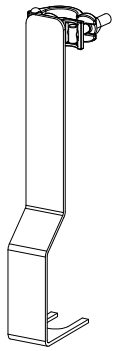
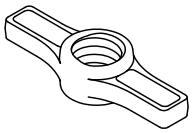
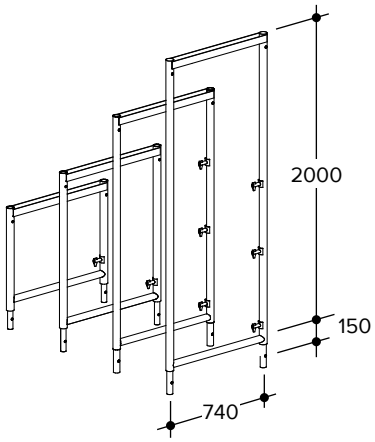
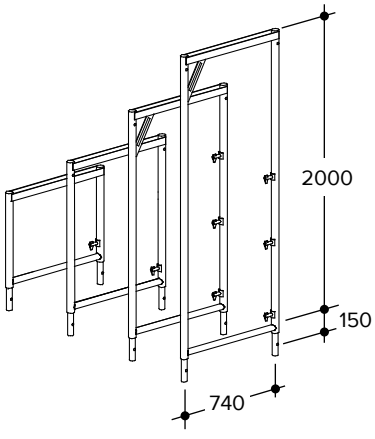
Unless stated otherwise, all dimensions are in mm.

3 Components

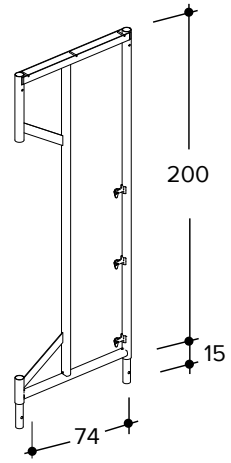
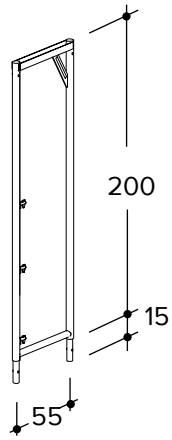
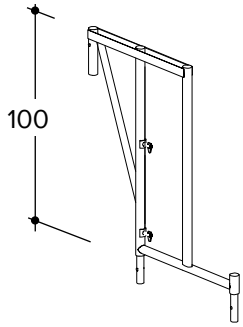
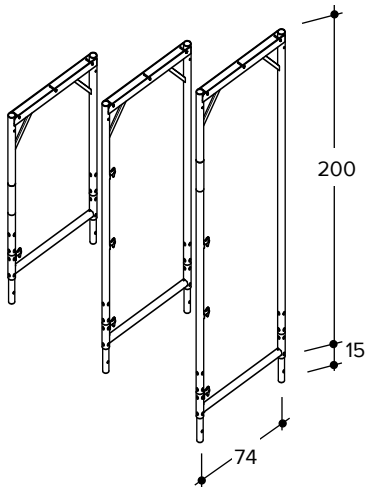
3.1 Basic components

	Component	Part code	Weight [kg]
	**Base Jack 45/3.8** Adjustment range 6.5 cm – 26.5 cm	**551234**	**3.10**
	Base Jack 70/3.8 Adjustment range 6.5 cm – 50.0 cm	**540575**	**4.00**
	Base Jack 50/3.3 Adjustment range 6.5 cm – 26.5 cm	**144131**	**3.00**
	Base Jack 70/3.3 Adjustment range 6.5 cm – 50.0 cm To compensate for unevenness of the ground (Refer to page 36).	**54630**	**3.60**
	**Swivel Base Jack 70** Used on slopes (Refer to page 36).	**571822**	**5.90**
	**Base Jack 110** To compensate for ground unevenness up to 0.90 m (Refer to page 36).	**571248**	**4.60**
	**Rigid Base Plate** Like a Base Jack, serves to conduct vertical loads into the ground (Refer to page 36).	**428533**	**1.20**

Unless stated otherwise, all dimensions are in mm.

	Component	Part code	Weight [kg]
	**Base Jack Securing Device** To attach base jacks to the vertical frame.	**651762**	**2.20**
	**Wing Nut 30/150** Secures the Base Jack to Enlargement Brackets.	**426545**	**0.40**
	**Vertical Frame 200/70, light** **Vertical Frame 150/70, light** **Vertical Frame 100/70, light** **Vertical Frame 66/70, light** For storey heights of 2.00 m (Refer to page 38) and compensation heights of 1.50 m, 1.00 m and 0.66 m (Refer to page 37).	**652044** **652070** **652067** **652064**	**18.20** **16.10** **12.50** **10.50**
	**Vertical Frame 200/70** **Vertical Frame 150/70** **Vertical Frame 100/70** **Vertical Frame 66/70** For storey heights of 2.00 m (Refer to page 38) and compensation heights of 1.50 m, 1.00 m and 0.66 m (Refer to page 37). (no longer produced)	**119000** **552320** **119010** **132982**	**22.10** **18.32** **13.73** **11.18**

Components

	Component	Part code	Weight [kg]
	**Eave Frame 200/70** Used for façade offsets	**562110**	**22.70**
	**BOSTA Vertical Frame 200/50** Vertical frame only 55 cm wide; suitable for a 32 cm plank and an 18 cm plank.	**S1014**	**20.50**
	**BOSTA 70 Offset Frame**	**S125**	**20.40**
	**Alu Vertical Frame 200/70** **Alu Vertical Frame 150/70** **Alu Vertical Frame 100/70** For storey heights of: 2.00 m, 1.50 m and 1.0 m.	**410644** **652915** **411936**	**11.10** **9.80** **8.30**

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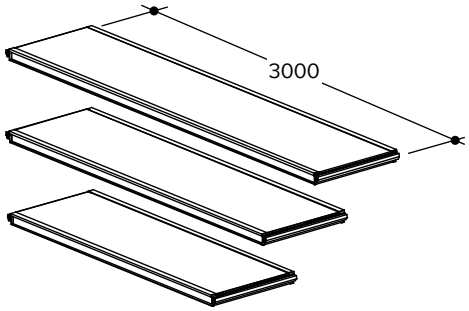
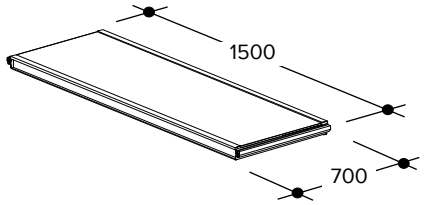
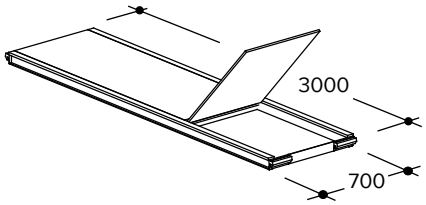
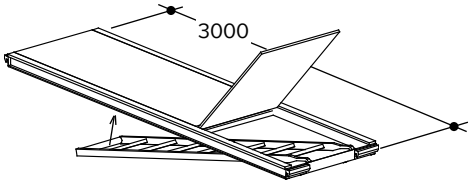
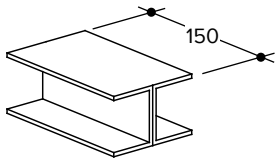
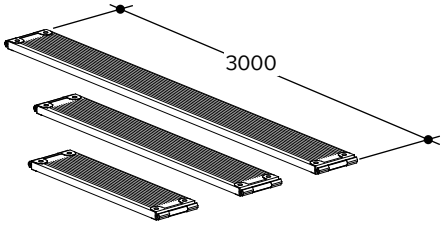
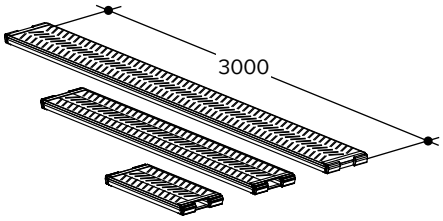
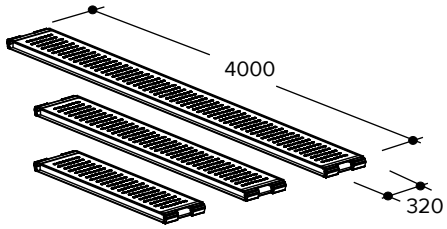
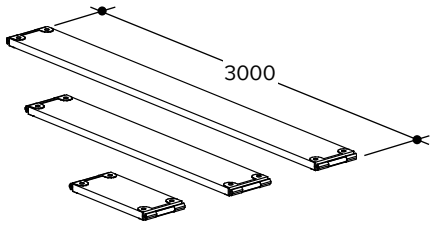
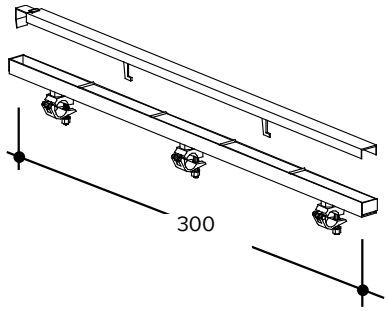
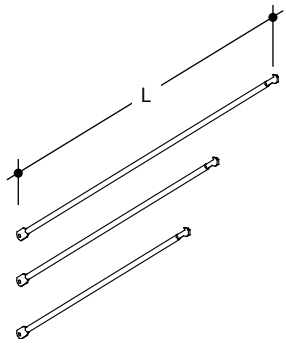
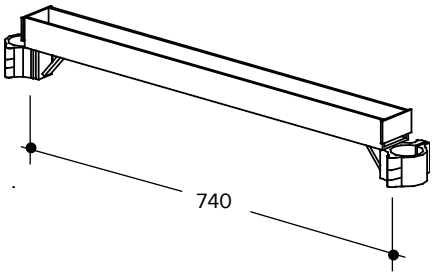
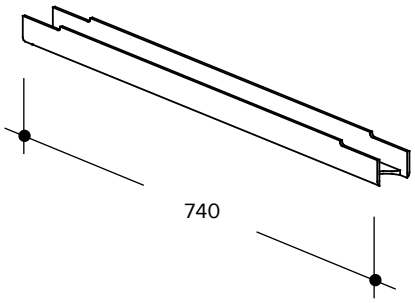
	Component	Part code	Weight [kg]
	**Alu Frame Deck 300/70 (2.0 kN/m² LC 3)** **Alu Frame Deck 250/70 (2.0 kN/m² LC 3)** **Alu Frame Deck 200/70 (2.0 kN/m² LC 3)** Aluminium-plywood design. Extremely lightweight frame deck with exchangeable planks (Refer to page 39).	**437476** **437487** **437498**	**20.20** **17.30** **13.90**
	**Alu Frame Deck 150/70**	**S1580**	**10.90**
	**Alu Passage Plank 300/70 (2.0 kN/m², LC 3)** **Alu Passage Plank 250/70 (2.0 kN/m², LC 3)** Aluminium-plywood design for the installation of an interior passage plank. Use ladder 200 A (Refer to page 39).	**437502** **437513**	**22.30** **19.40**
	**Alu Passage Plank 300/70 (LC 3) with Ladder** **Alu Passage Plank 250/70 (LC 3) with Ladder** Same design as above, but with integrated folding ladder (Refer to page 39).	**492910** **465031**	**26.39** **23.33**
	**Plank Connector** Only for Alu Plank 400/32. One Plank Connector between two planks. Prevents the individual planks from sagging. Spaced ≥ 50 cm from support.	**529390**	**1.20**
	**Alu Plank 400/32 (2.0 kN/m² LC 3)** **Alu Plank 300/32 (4.5 kN/m² LC 5)** **Alu Plank 250/32 (6.0 kN/m² LC 6)** **Alu Plank 200/32 (6.0 kN/m² LC 6)** **Alu Plank 150/32 (6.0 kN/m² LC 6)** **Alu Plank 125/32 (6.0 kN/m² LC 6)** Two Alu Planks form a working platform for a scaffold bay. Symmetrical design (either side can be used). Non-slip surface (Refer to page 39). (no longer produced)	**529805** **479860** **479871** **479882** **479893** **479908**	**21.50** **16.90** **14.50** **12.00** **9.60** **8.40**

Unless stated otherwise, all dimensions are in mm.

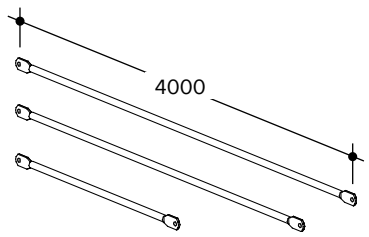
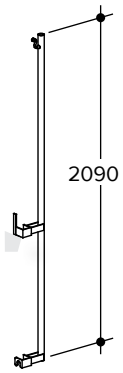
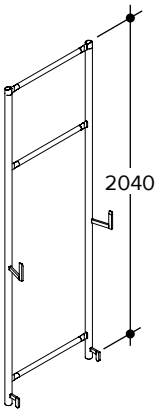
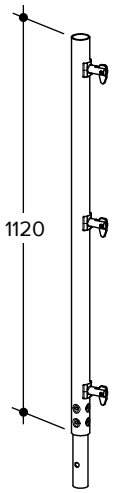
Components

	Component	Part code	Weight [kg]
	**Hollow Box Plank 300/32 (2.0 kN/m², LC 3)**	**531323**	**17.77**
	Hollow Box Plank 250/32 (3.0 kN/m², LC 4)	**531334**	**15.27**
	Hollow Box Plank 200/32 (4.5 kN/m², LC 5)	**531345**	**12.77**
	Hollow Box Plank 150/32 (6.0 kN/m², LC 6)	**531356**	**10.27**
	Hollow Box Plank 125/32 (6.0 kN/m², LC 6)	**531367**	**8.82**
	Hollow Box Plank 74/32 (6.0 kN/m², LC 6)	**531687**	**6.27**
	Steel sheet design with aluminium zinc coating, extremely lightweight and sturdy; corrugated non-slip surface. Two planks required per scaffold bay. (Refer to page 39)		
	**Steel Plank 400/32 (2.0 kN/m² LC 3)**	**530307**	**30.20**
	Steel Plank 300/32 (3.0 kN/m² LC 4)	**427984**	**23.50**
	Steel Plank 250/32 (4.5 kN/m² LC 5)	**427973**	**19.90**
	Steel Plank 200/32 (6.0 kN/m² LC 6)	**430279**	**16.30**
	Steel Plank 150/32 (6.0 kN/m² LC 6)	**485858**	**12.20**
	Steel Plank 125/32 (6.0 kN/m² LC 6)	**430280**	**10.40**
	Steel Plank 113/32 (6.0 kN/m² LC 6)	**485869**	**9.60**
	Steel Plank 82/32 (6.0 kN/m² LC 6)	**485870**	**7.30**
	Two hot-dip galvanised steel planks form the deck of a scaffold bay. Extremely sturdy with non-slip surface. Two planks per scaffold bay (Refer to page 39).		
	**Timber Plank 300/32 MS10 (2.0 kN/m², LC 3)**	**566428**	**24.92**
	Timber Plank 250/32 (3.0 kN/m² LC 4)	**533399**	**21.20**
	Timber Plank 200/32 (4.5 kN/m² LC 5)	**533403**	**17.40**
	Timber Plank 150/32 (6.0 kN/m² LC 6)	**458473**	**13.60**
	Timber Plank 125/32 (6.0 kN/m² LC 6)	**427539**	**11.70**
	Timber Plank 74/32 (6.0 kN/m² LC 6)	**462612**	**7.80**
	Two Timber Planks form a working platform for a scaffold bay. Symmetrical design (either side can be used) (Refer to page 39). (no longer produced)		

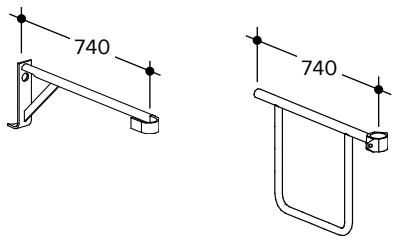
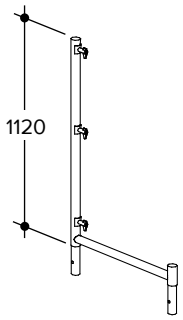
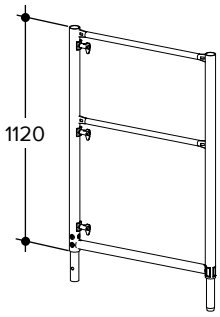
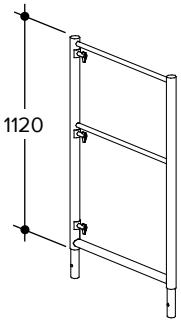
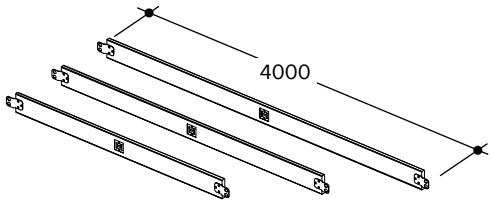
Unless stated otherwise, all dimensions are in mm.

	Component		Part code	Weight [kg]
	**Deck Bearing Add-on Profile 300**		**574219**	**17.00**
	Lifting Retainer 300		**574220**	**8.20**
	Deck Bearing Add-on Profile 200		**574193**	**11.90**
	Lifting Retainer 200		**574208**	**5.60**
	Deck Bearing Add-on Profile 160		**572080**	**9.60**
	Lifting Retainer 160		**573660**	**4.60**
	Deck Bearing Add-on Profile 130		**572069**	**8.30**
	Lifting Retainer 130		**572070**	**3.70**
	Deck Bearing Add-on Profile 100		**572047**	**6.00**
	Lifting Retainer 100		**572058**	**2.80**
	for scaffold bay	length x height		
	Diagonal 204	**4.00 m x 2.00 m**	**547176**	**10.00**
	Diagonal 203	**3.00 m x 2.00 m**	**110167**	**7.90**
	Diagonal 200	**2.50 m x 2.00 m**	**110020**	**6.90**
	Diagonal 150	**2.50 m x 1.50 m**	**119606**	**6.40**
	Diagonal 100	**2.50 m x 1.00 m**	**2054**	**4.60**
	Diagonal 220	**2.00 m x 2.00 m**	**410758**	**6.30**
	Diagonal 215	**1.50 m x 2.00 m**	**410736**	**5.50**
	For bracing the scaffold in longitudinal direction. Attach the top end to the U-profile and slide the bottom over the clevis pin (Refer to page 39).			
	**Adjustable Transom 70**		**423622**	**4.30**
	**Bearing Profile 74**		**553623**	**3.00**
	Supports planks installed at the lowest level of the scaffold. These planks are used only as a surface on which to place ballast.			

Components

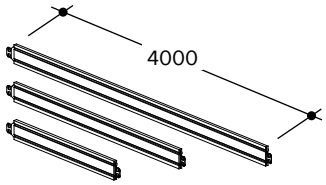
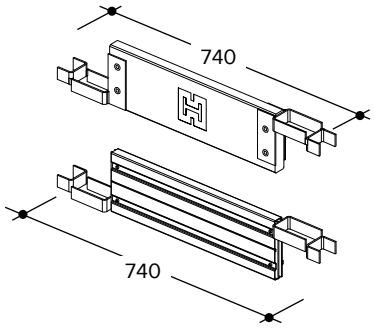
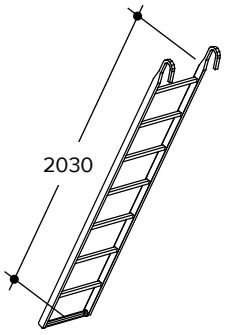
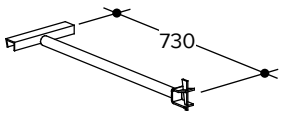
	Component	Part code	Weight [kg]
	**Guard Rail 400**	**525715**	**13.30**
	Guard Rail 300	**138957**	**5.20**
	Guard Rail 250	**2113**	**4.20**
	Guard Rail 200	**154080**	**3.40**
	Guard Rail 150	**407683**	**2.70**
	Guard Rail 125	**2102**	**2.10**
	Slide both ends over the clevis pins (Refer to page 38).		
	**Railing Post AGR BOSTA**	**651772**	**6.60**
	Used to erect a temporary railing to secure the sides of the scaffold at the next-higher level (Refer to page 42).		
	**Railing AGR 70 Trans**	**651926**	**12.48**
	Used to erect a temporary railing to secure the end face of the scaffold at the next highest scaffold level (Refer to page 42).		
	**Single Post 70**	**133120**	**4.80**
	For use with Enlargement Bracket 35 or 70. Used to support the side protection. Secured with Ø 8 mm Frame Pin.		

Unless stated otherwise, all dimensions are in mm.

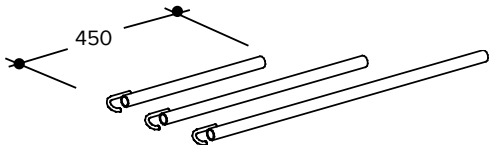
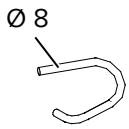
	Component	Part code	Weight [kg]
	**Guard Rail 70 Trans**	**24733**	**1.75**
	Double Railing 70 Trans For securing the scaffold levels at the end faces (Refer to page 49). (no longer produced)	**534419**	**3.40**
	**Railing Post 70** Used to support the side protection at the top level of the scaffold. Fastened with Ø 8 mm Frame Pin. (Refer to page 49)	**452980**	**7.71**
	**Twin-Railing Post 70 Trans light** Secures the top scaffold level at the end faces instead of the Railing Post 70. Fastened with Ø 8 mm Frame Pin.	**652880**	**13.00**
	**Twin-Railing Post 70 Trans** Placed at the end of the upper scaffold level at the end faces. Secure the Twin-Railing Post with an Ø 8 mm Frame Pin to prevent it from lifting off. (no longer produced)	**452970**	**14.21**
	**Toe Board 400/15**	**651979**	**10.87**
	Toe Board 300/15	**651978**	**7.15**
	Toe Board 250/15	**651977**	**6.03**
	Toe Board 200/15	**651976**	**4.91**
	Toe Board 150/15	**651975**	**3.79**
	Toe Board 125/15	**651974**	**3.23**
	Toe Board 74/15	**651970**	**2.09**
	Component of the three-part side protection. Secures the scaffold bay at plank level, 15 cm high and 3.0 cm thick (3.5 cm with 4.00 m length) (Refer to page 49).		

Unless stated otherwise, all dimensions are in mm.

Components

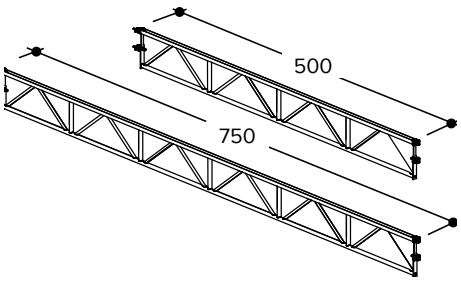
	Component	Part code	Weight [kg]
	**Steel Toe Board 300/15**	**531437**	**9.00**
	Steel Toe Board 250/15	**531448**	**6.70**
	Steel Toe Board 200/15	**531459**	**5.50**
	Steel Toe Board 150/15	**531460**	**4.30**
	Steel Toe Board 125/15	**531470**	**3.70**
	Steel Toe Board 113/15	**652017**	**3.60**
	Steel Toe Board 101/15	**652016**	**3.30**
	Steel Toe Board 82/15	**652015**	**2.80**
	Steel Toe Board 74/15	**652014**	**2.60**
	Toe board in sheet steel hollow box design with aluminium zinc coating (Refer to page 49). 15 cm high and 2.8 cm thick.		
	**Toe Board 70/15 Trans**	**651991**	**2.40**
	Steel Toe Board 70/15 Trans	**652002**	**2.40**
	To complete the side protection along the end faces of the scaffold. 15 cm high (Refer to page 49).		
	**Ladder 200 A**	**136318**	**9.80**
	For interior ascent at storey height of 2.0 m (Refer to page 56).		
	**Ladder Lock**	**422753**	**2.30**
	The Ladder 200 A at the lowest scaffold level is fastened to the lower transom of the vertical frame with the aid of the Ladder Lock (Refer to page 56).		

Unless stated otherwise, all dimensions are in mm.

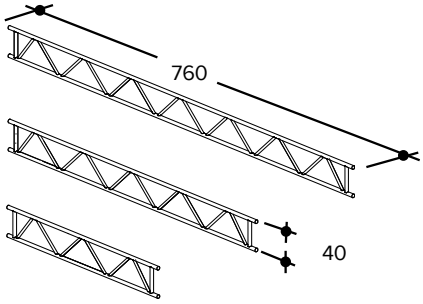
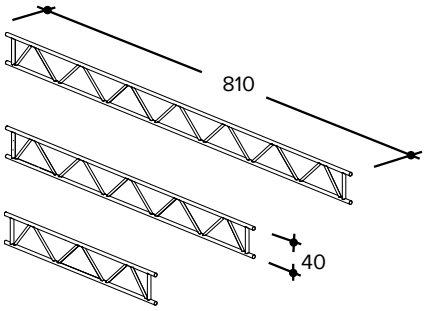
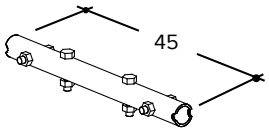
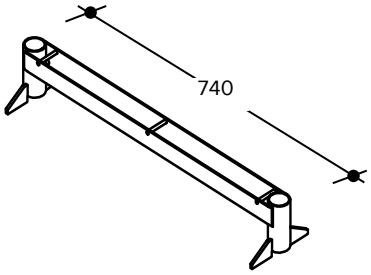
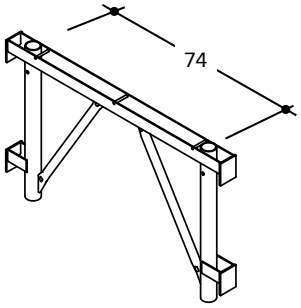
	Component	Part code	Weight [kg]
	**Scaffold Retainer 350** l = 300 cm	**467063**	**11.70**
	Scaffold Retainer 250 l = 250 cm	**467041**	**8.50**
	Scaffold Retainer 223 l = 223 cm	**467085**	**7.50**
	Scaffold Retainer 180 l = 180 cm	**116820**	**6.10**
	Scaffold Retainer 140 l = 140 cm	**116793**	**4.90**
	Scaffold Retainer 110 l = 110 cm	**116808**	**3.60**
	Scaffold Retainer 75 l = 75 cm	**78940**	**2.50**
	Scaffold Retainer 45 l = 45 cm Steel tube Ø 48.3 mm with hooks Ø 20 cm. For tying the scaffolds (Refer to page 72).	**78939**	**1.65**
	**Ø 8 mm Frame Pin** Secures the Railing Post (Refer to page 49).	**61312**	**0.06**

3.2 Auxiliary components

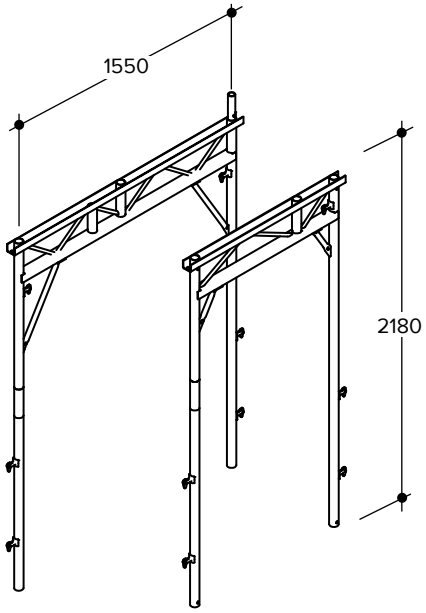
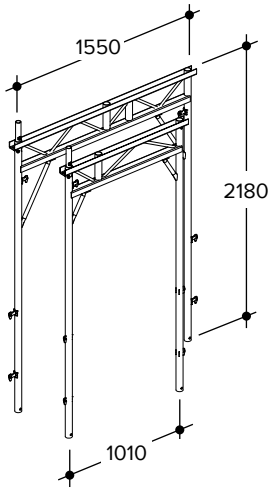
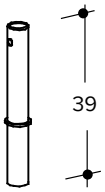
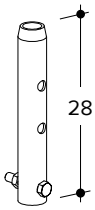
The auxiliary components expand the potential range of applications and increase the degree of utilisation of the scaffold.

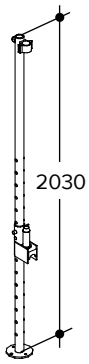
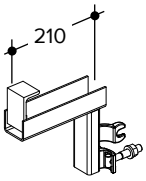
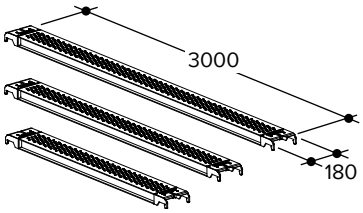
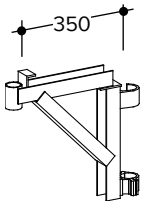
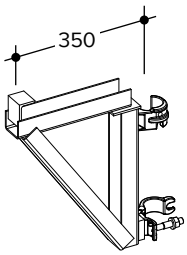
	Component	Part code	Weight [kg]
	**Bridge Girder 500**	**135780**	**50.60**
	Bridge Girder 750 Lower chord tubing Ø 48.3 mm, upper chord U-profile. To bridge spans up to 5.00 m or 7.50 m. Bolt to vertical frame with weld-on half-coupler. Use only in conjunction with Transom 70 (part code 416446) (Refer to page 92).	**135770**	**77.25**

Components

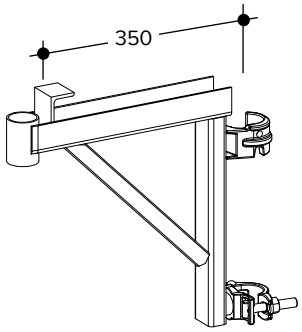
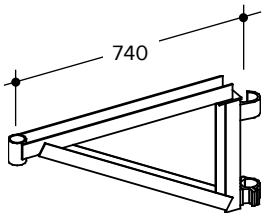
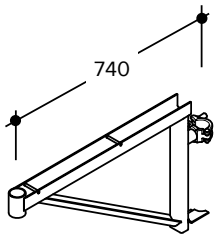
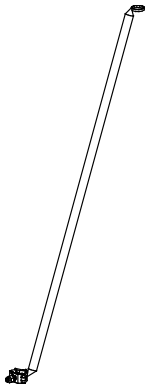
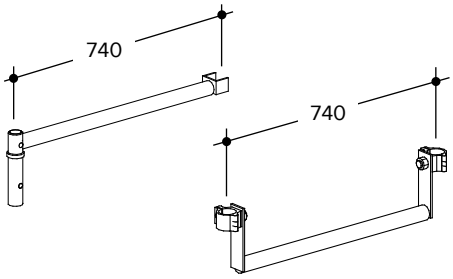
	Component	Part code	Weight [kg]
	**Steel Lattice Girder 760**	**575555**	**68.90**
	Steel Lattice Girder 610	**575544**	**55.80**
	Steel Lattice Girder 510	**575533**	**47.00**
	Steel Lattice Girder 410	**575522**	**38.20**
	Steel Lattice Girder 310	**575511**	**29.50**
	**Alu Lattice Girder 810**	**444251**	**29.90**
	Alu Lattice Girder 610	**444240**	**22.80**
	Alu Lattice Girder 510	**444230**	**19.20**
	Alu Lattice Girder 410	**444229**	**15.60**
	Alu Lattice Girder 310	**444218**	**12.10**
	**Connection Tube cpl.**	**575500**	**1.90**
	**Transom 70** Holds vertical frames between two bridge girders. Use only in conjunction with a bridge girder (Refer to page 92).	**416446**	**4.00**
	**Bridging Frame** Placed between commercially available lattice girders to serve as the base for the Vertical Frame 200/70.	**581597**	**10.10**

Unless stated otherwise, all dimensions are in mm.

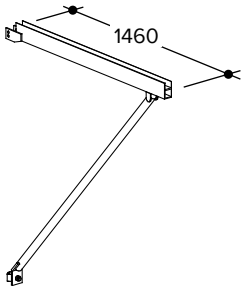
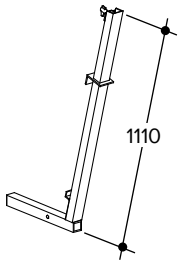
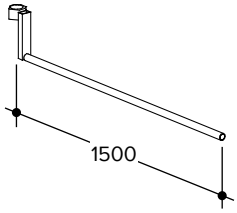
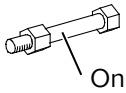
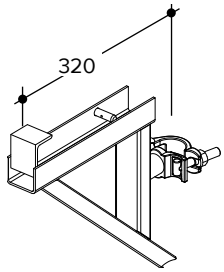
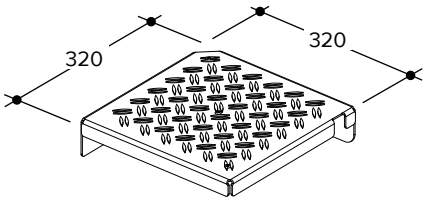
	Component	Part code	Weight [kg]
	**Passage Frame 100 light** Used to construct pedestrian passages (Refer to page 91). Distance between vertical posts 1.01 m. Weight reduced by 1.9 kg compared to the previous model, part code 459077.	**652885**	**26.90**
	Passage Frame 150 light Distance between vertical posts 1.55 m. Weight reduced by 1.6 kg compared to the previous model, part code 409340.	**652890**	**34.40**
	**Passage Frame 100**	**459077**	**28.81**
	Passage Frame 150 Used to construct pedestrian passages (Refer to page 91). (no longer available)	**409340**	**36.04**
	**Tubular Joint 150 cpl. (incl. screw)** When the Vertical Frame 200/100 is used with a Passage Frame 150, order one Tubular Joint for each Vertical Frame.	**417977**	**1.10**
	**Tubular Joint 100 (incl. screw)** When the Vertical Frame 200/100 is used with a Passage Frame 100, order one Tubular Joint for each Vertical Frame.	**462921**	**0.80**

	Component	Part code	Weight [kg]
	**Adjustment Stand 70** To compensate substantial ground unevenness. Heigh adjustable from 29 cm to 129 cm (Refer to page 37).	**39835**	**12.77**
	**Enlargement Bracket 18** To extend the deck by 18 cm. Cover with an 18 cm wide steel plank (Refer to page 95).	**652142**	**2.50**
	**Steel Plank S 400/18** **Steel Plank S 300/18** **Steel Plank S 250/18** **Steel Plank S 200/18** **Steel Plank S 150/18** **Steel Plank S 125/18** **Steel Plank S 113/18** **Steel Plank S 82/18** For the Enlargement Bracket 18, part code 652142. Hot-dip galvanised sheet steel design.	**651595** **550744** **550733** **550722** **550711** **651594** **651593** **651592**	**21.78** **15.30** **14.30** **10.43** **8.03** **7.30** **6.60** **5.04**
	**Enlargement Bracket 35** To extend the deck by 35 cm. Cover with a 35 cm wide plank (Refer to page 95).	**402599**	**6.15**
	**Enlargement Bracket 35 without Starting Piece** Like part 402599, but without Starting Piece.	**652089**	**5.80**

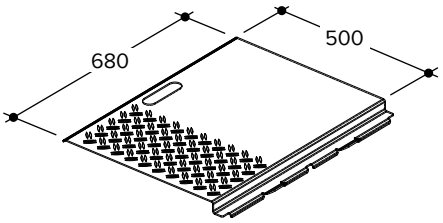
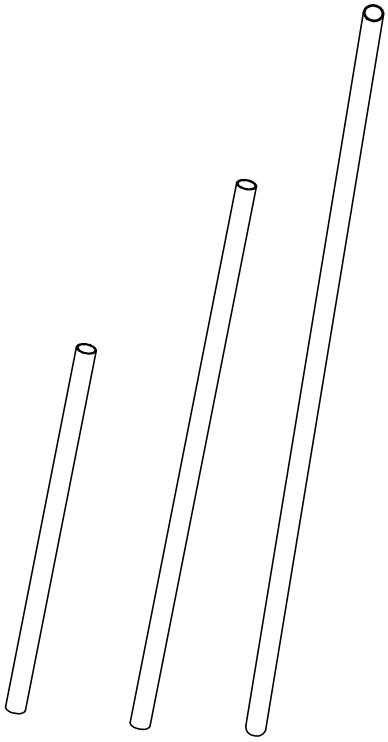
Unless stated otherwise, all dimensions are in mm.

	Component	Part code	Weight [kg]
	**Enlargement Bracket 35 light** To extend the deck by 35 cm. Cover with an 32 cm wide plank: Weighs 1.5 kg less than Enlargement Bracket 35 (Refer to page 95).	**652883**	**4.70**
	**Enlargement Bracket 70** To extend the deck by 70 cm. Cover with two 32 cm wide planks (Refer to page 95).	**424226**	**8.75**
	**Enlargement Bracket 70 light** To extend the deck by 74 cm. Cover with two 32 cm wide planks. Weighs 2.4 kg less than Enlargement Bracket 70 (Refer to page page 95).	**652906**	**6.40**
	**Diagonal EB 70 cpl.** To stabilise Enlargement Bracket 70 (Refer to page 108).	**554959**	**8.20**
	**Bracket 70 Plank Retainer** **Plank Retainer 74 cpl.** To prevent the planks from lifting off of the Enlargement Bracket 70 or vertical frame (Refer to page 95).	**442837** **417348**	**2.40** **4.30**

Components

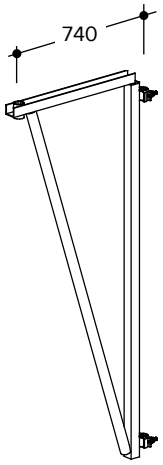
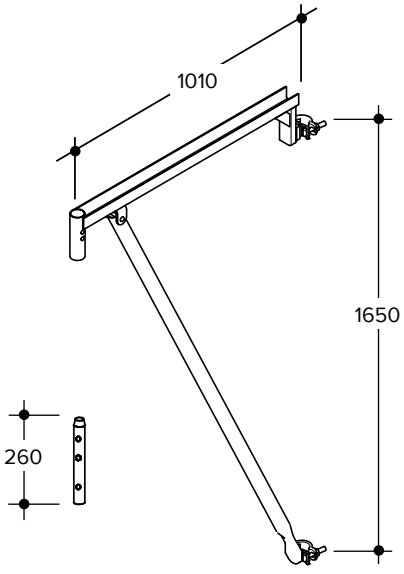
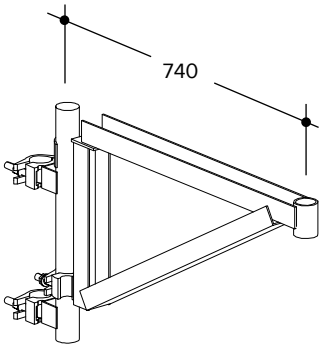
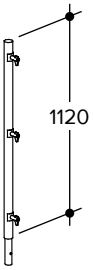
	Component	Part code	Weight [kg]
	**Deck Bracket 1.8 m** Collapsible; for a protective roof that projects 1.80 m. Used in conjunction with Bracket Post, Gap Plate, Plank Retainer, Frame Pin and screw (Refer to page 116).	**427907**	**23.40**
	**Bracket Post** To create protective roofs in conjunction with the Deck Bracket. Secure with the Ø 12 mm Frame Pin. Use an alu frame deck for the protective roof (Refer to page 116).	**429468**	**8.40**
	**Plank Retainer** To prevent the frame decks from lifting off. Slide the end of the tube onto the bracket post pin and attach the half coupler to the vertical frame (Refer to page 116).	**427664**	**5.00**
	**Screw M8x80 (with Nut) 5.6** To secure the Deck Bracket to the vertical frame (Refer to page 116).	**411638**	**0.04**
	**Corner Bracket 32** Used at the corners of interior extensions to create a continuous plank surface (Refer to page 52).	**652768**	**3.33**
	**Corner Plate 32** Used at the corners of interior extensions to create a continuous plank surface.	**652760**	**5.50**

Unless stated otherwise, all dimensions are in mm.

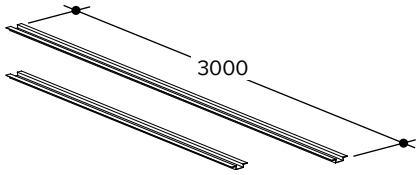
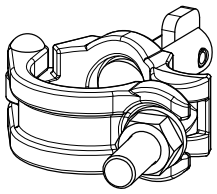
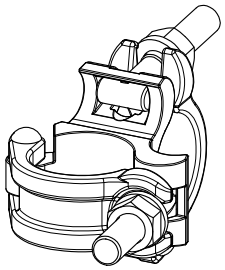
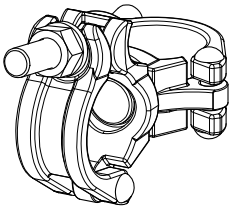
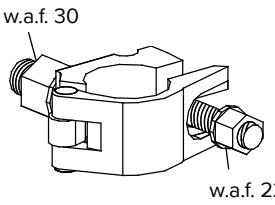
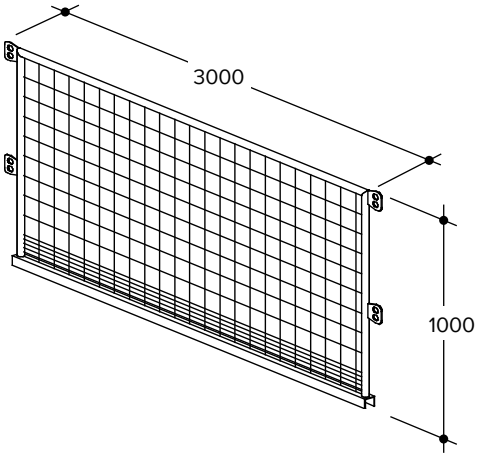
	Component	Part code	Weight [kg]
	**Passage Plate 68/30** To bridge the gap between two scaffolds at corners (Refer to page 55).	**652758**	**4.10**
	**Scaffold Tube 48.3 x 50** l = 50 cm	**169001**	**1.90**
	Scaffold Tube 48.3 x 100 l = 100 cm	**169012**	**3.80**
	Scaffold Tube 48.3 x 150 l = 150 cm	**169023**	**5.70**
	Scaffold Tube 48.3 x 200 l = 200 cm	**169034**	**7.60**
	Scaffold Tube 48.3 x 250 l = 250 cm	**169045**	**9.50**
	Scaffold Tube 48.3 x 300 l = 300 cm	**169056**	**11.40**
	Scaffold Tube 48.3 x 350 l = 350 cm	**169067**	**13.30**
	Scaffold Tube 48.3 x 400 l = 400 cm	**169078**	**15.24**
	Scaffold Tube 48.3 x 450 l = 450 cm	**169089**	**17.20**
	Scaffold Tube 48.3 x 500 l = 500 cm	**169090**	**19.10**
	Scaffold Tube 48.3 x 550 l = 550 cm	**169104**	**21.00**
	Scaffold Tube 48.3 x 600 l = 600 cm Scaffolds elements Ø 48.3 mm steel tube	**169115**	**22.90**
	**Alu Tube 48/600**	**465443**	**8.90**

Unless stated otherwise, all dimensions are in mm.

Components

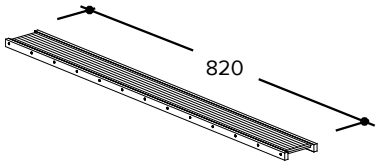
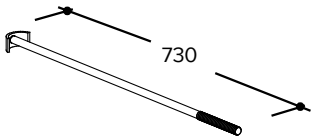
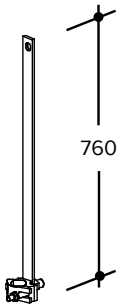
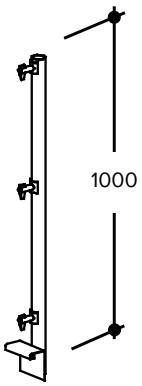
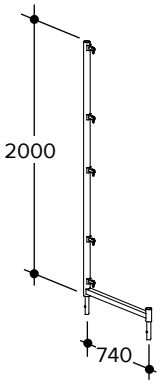
	Component	Part code	Weight [kg]
	**Enlargement Bracket 70/200** To extend the deck by 70 cm or to create a parallel offset. Cover with two 32 cm wide planks (Refer to page 96).	**458635**	**20.97**
	**Enlargement Bracket 100 light** **Tubular Joint 100 cpl.** To extend the deck by 101 cm, with a safe working load pursuant to LC 4. Secured at the top and bottom with half couplers. The Tubular Joint is used to connect the Railing Post and Lifting Retainer. Secure with Ø 12 mm Frame Pin. Cover with three 32 cm wide planks.	**652869** **462921**	**13.70** **0.80**
	**BOSTA 70 Offset Bracket**	**S1013**	**12.10**
	**Single Post 70** Can be used with Enlargement Bracket 35 or 70 and to attach the side protection (Refer to page 107). Secure with the Ø 8 mm Frame Pin to prevent lift-off.	**133120**	**4.79**

Unless stated otherwise, all dimensions are in mm.

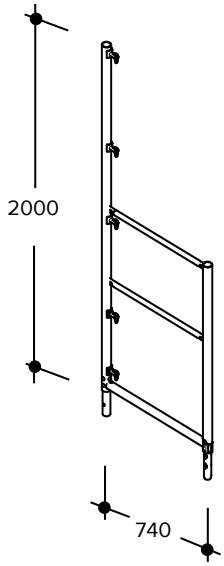
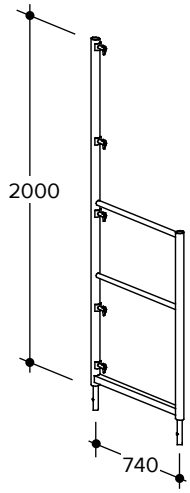
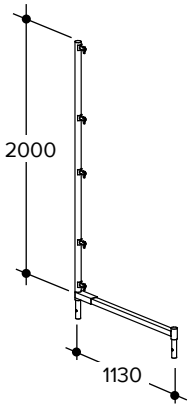
	Component	Part code	Weight [kg]
	**Gap Plate 300** **Gap Plate 250** To close the gap between the scaffold plank and the protective roof (Refer to page 107). To close the gap between the scaffold plank and bracket plank, if necessary.	**138990** **138980**	**6.90** **5.80**
	**Half Coupler 48/G w.a.f. 22** To attach guard rails and vertical diagonals to an additional clevis pin. Torque 50 Nm.	**116370**	**0.80**
	**Rigid Coupler 48/48 w.a.f. 22** To connect Ø 48.3 mm scaffold tubes at a right angle. Torque 50 Nm.	**2514**	**1.20**
	**Swivel Coupler 48/48 w.a.f. 22** To connect Ø 48.3 mm scaffold tubes at any angle. Torque 50 Nm.	**2525**	**1.40**
	**Half Coupler 48/M 20x30** **w.a.f. 22 / w.a.f 30** **Half Coupler 48/M 20x70** **w.a.f. 22 / w.a.f 30** With an additional thread M 20 × 30 mm or M 20 × 70 mm. Torque 50 Nm.	**2488** **39846**	**0.90** **1.00**
	**Safety Grate 300** **Safety Grate 250** **Safety Grate 200** **Safety Grate 150** **Safety Grate 125** A roofer's protective wall that complies with all relevant regulations can be constructed using two stacked Safety Grates, along with the Roofer's Safety Post 70 (Refer to page 111). (no longer produced)	**543329** **543330** **543340** **543351** **543362**	**21.80** **19.00** **15.90** **12.90** **11.50**

Unless stated otherwise, all dimensions are in mm.

Components

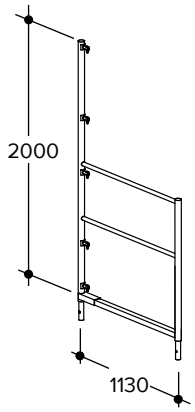
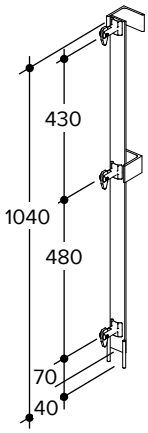
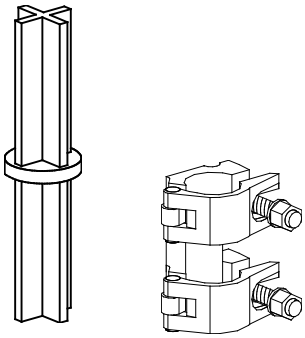
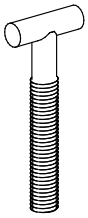
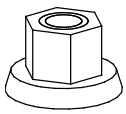
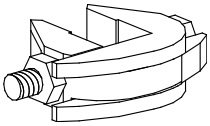
	Component	Part code	Weight [kg]
	**Alu Working Plank 8.20**	**541124**	**60.00**
	Alu Working Plank 6.20	**541113**	**35.00**
	**Walkway Post Fastener**	**549999**	**1.30**
	**Wing Nut**	**509618**	**0.30**
	**Plank Retainer Universal**	**545052**	**2.80**
	**Walkway Post 100**	**548950**	**5.70**
	**Roofer's Safety Post 70** To construct a roofer's protective wall, 2 m high. Can accommodate two stacked safety grates (Refer to page 111). Secure with the Ø 8 mm Frame Pin to prevent lift-off.	**543204**	**12.50**

Unless stated otherwise, all dimensions are in mm.

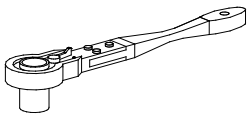
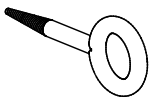
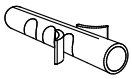
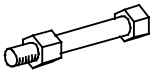
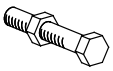
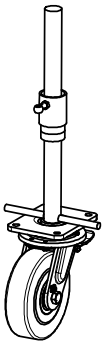
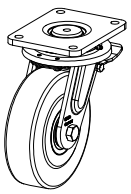
	Component	Part code	Weight [kg]
	**Roofer's Safety Post 70 Trans, light** Completes the roof protection along the end faces (Refer to page 111). Secure with the Ø 8 mm Frame Pin to prevent lift-off. Weight reduced by 2.9 kg compared to the previous model, part code 544860.	**652875**	**16.50**
	**Roofer's Safety Post 70 Trans** Completes the roof protection along the end faces (Refer to page 111). Secure the Roofer's Safety Post with an Ø 8 mm Frame Pin to prevent it from lifting off.	**544860**	**19.45**
	**Roofer's Safety Post 113** To construct a roofer's protective wall, 2 m high. Can accommodate two stacked safety grates. For the Vertical Frame 200/70 light as well as the Vertical Frame 200/70 in conjunction with the Enlargement Bracket 35. Secure with two Ø 8 mm Frame Pins to prevent lift-off.	**586935**	**16.82**

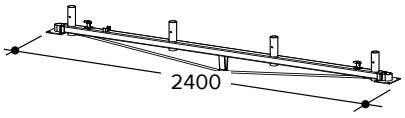
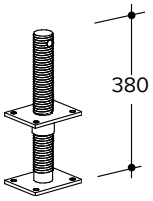
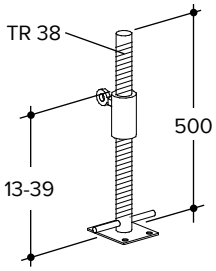
Unless stated otherwise, all dimensions are in mm.

Components

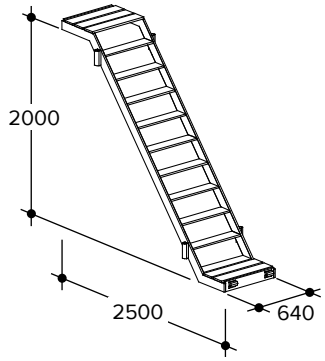
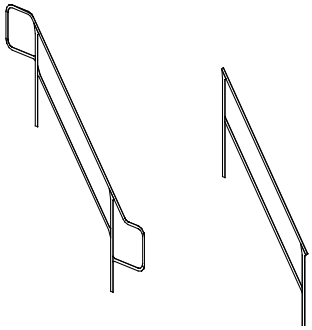
	Component	Part code	Weight [kg]
	**Roofer's Safety Post 113 Trans** To construct a roofer's protective wall, 2 m high. Completes the roof protection along the end faces. Secure with two Ø 8 mm Frame Pins to prevent lift-off.	**586990**	**23.73**
	**BOSTA 70 ISP Rail** To construct side protection on the interior side (façade side) of a working or protective scaffold.	**652280**	**3.40**
	**Tension Coupler 48/48, consisting of:** **Tube Connector for Tension Coupler** **Outer Part of Tension Coupler w.a.f. 22** To connect scaffold tubes. Torque 50 Nm.	 **801168** **20003**	 **1.10** **1.40**
	**Hammer-head Screw M14x77Z 5.6** **Hammer-head Screw M14x87Z 5.6**	**76984** **154230**	**0.10** **0.10**
	**Collar Nut M14 w.a.f. 22** **Collar Nut M14 w.a.f. 19**	**154263** **801330**	**0.10** **0.10**
	**Flange Clamp w.a.f. 24**	**3953**	**1.20**

Unless stated otherwise, all dimensions are in mm.

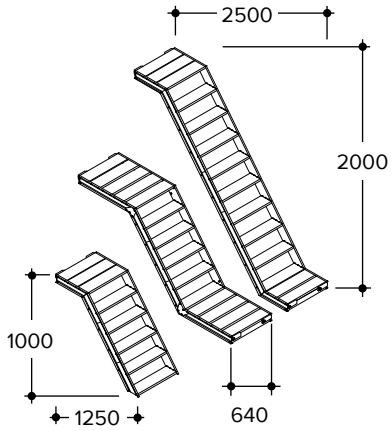
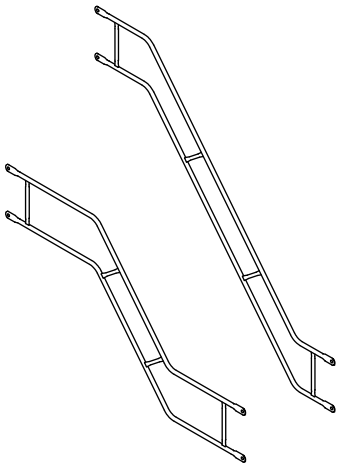
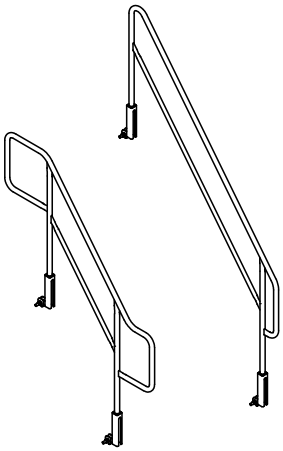
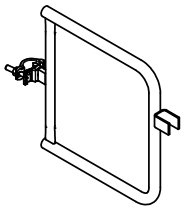
	Component	Part code	Weight [kg]
	**Universal Scaffolding Ratchet w.a.f. 19/22** **Ratchet w.a.f. 19/22** **Scaffolding Ratchet w.a.f. 22** **Scaffolding Ratchet w.a.f. 19**	**651791** **884265** **587300** **587311**	**0.50** **0.90** **0.80** **0.80**
	**25no. Scaffold Eye Bolts GS 12 x 120** **25no. Scaffold Eye Bolts GS 12 x 160**	**497864** **497875**	**4.60** **5.00**
	**25no. Plugs S14 ROE -100** To tie the scaffold to walls when insulating the façade.	**497842**	**0.20**
	**Screw M16x60 (with Nut) 8.8** **Screw M10x25 (with Nut) 4.6** **Screw M10x30 (with Nut) 4.6** **Screw M8x80 (with Nut) 5.6**	**651808** **5724** **553347** **411638**	**0.10** **0.10** **0.10** **0.10**
	**Screw M12x65 (with Nut) 4.6** **Screw M12x75 (with Nut) 4.6**	**143560** **554710**	**0.10** **0.10**
	**Spring Pin 9** Secures railing posts and vertical frames.	**440919**	**0.10**
	**Base Jack Swivel Castor** For mobile scaffolds. Screwed to Rigid Base Plate 428533.	**480862**	**7.60**
	**Swivel Castor 200/10** For mobile scaffolds. Screwed to Rigid Base Plate 428533.	**481780**	**4.80**

	Component	Part code	Weight [kg]
	**Castor Wheel Bar 70**	**57107**	**25.80**
	Castor Wheel Bar 70/100	**415740**	**27.00**
	Wheel Bar Extension 70/100	**422411**	**9.00**
	**Jack for Castor** Secured with four Screws M10x30 (with Nut) (part code: 553347). Hole size 110 x 80 mm	**25186**	**5.00**
	**Adjustable Base Plate** Secured with four Screws M10x30 (with Nut) (part code: 553347). Hole size 110 x 80 mm	**481790**	**4.50**

3.3 Alu scaffold staircases

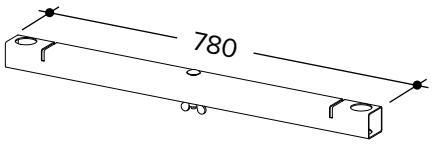
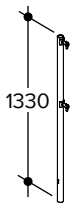
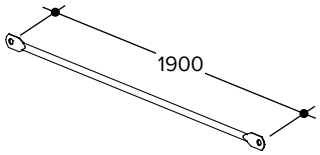
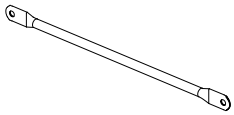
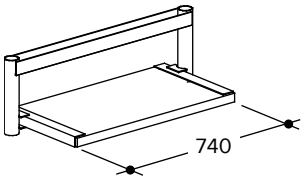
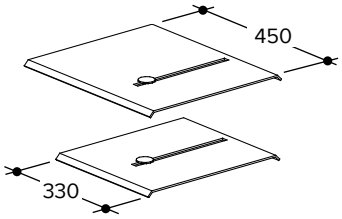
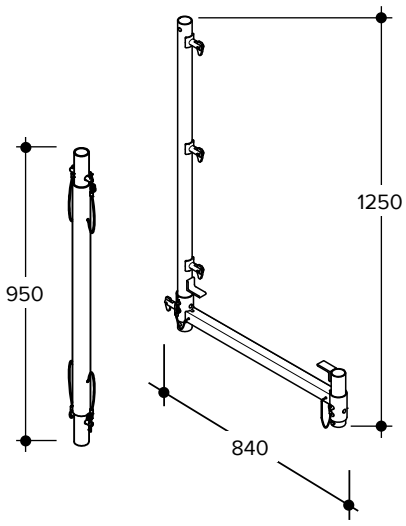
	Component	Part code	Weight [kg]
	**Alu Staircase 250** Flight with landings for external staircase access. Fits Vertical Frame 200/70 (Refer to page 59). Bay length: 2.50 m Storey height: 2.00 m Stair width: 0.64 m Step height: 0.20 m Max. erection height: 62.00 m Permitted load: 1.00 kN/m²	**464633**	**23.40**
	**Outer Handrail**	**464655**	**16.90**
	Inner Handrail	**464644**	**11.90**
	Secures the scaffold staircase. (Refer to page 59).		

Unless stated otherwise, all dimensions are in mm.

	Component	Part code	Weight [kg]
	**Alu Staircase G2 250/200** **Alu Staircase G2 250/100** **Alu Staircase G2 125/100** Reinforced flight with landings for external staircase access as scaffold staircase. Screwed together.	**652780** **652785** **652895**	**25.50** **24.90** **13.90**
	**Alu Staircase G2 Outer Handrail 250/200** **Alu Staircase G2 Outer Handrail 250/100** Secures the exterior of Alu Staircases 250/200, 250/100 and 125/100. Weight of outer handrail 250/200 reduced by 4.3 kg compared to previous model.	**652860** **652930**	**12.60** **11.10**
	**Alu Staircase G2 Inner Handrail 250/200** **Alu Staircase G2 Inner Handrail 250/100** Secures the interior of Alu Staircases 250/200, 250/100 and 125/100. Weight of inner handrail 250/200 reduced by 0.8 kg compared to previous model.	**652865** **652935**	**11.10** **11.10**
	**Alu Staircase G2 Guard Rail** To close spaces between the inner handrail and vertical frame resulting from the structure or the scaffold or to close off access ways.	**653000**	**3.80**

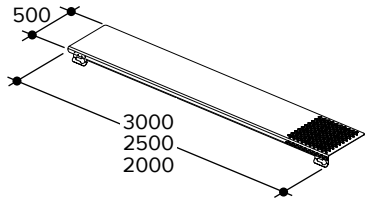
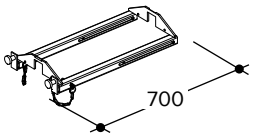
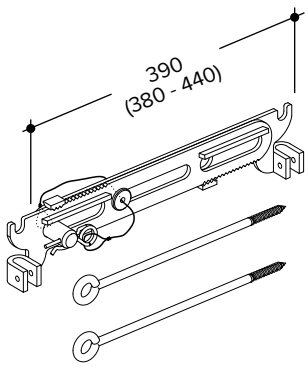
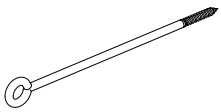
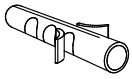
Unless stated otherwise, all dimensions are in mm.

Components

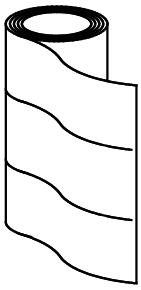
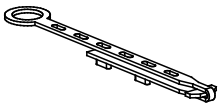
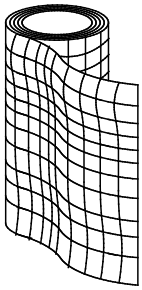
	Component	Part code	Weight [kg]
	**Alu-Staircase G2 Jack Connector 125/100** Used to install base jacks at the Alu-Staircase G2. Fasten with screws to the lowest stair of the Alu-Staircase G2 125/100.	**653130**	**2.28**
	**Handrail Post** Post to which Guard Rail 190 is attached (Refer to page 59).	**547669**	**3.60**
	**Guard Rail 190** Secures the stairway exit on the uppermost scaffold level (Refer to page 59).	**547658**	**3.30**
	**Guard Rail 74** 74 cm guard rail.	**S44**	**6.60**
	**Stairway Access** Lowest step and also fastening point for first staircase. Placed on base jacks (Refer to page 59).	**553656**	**10.20**
	**Gap Plate Top** **Gap Plate Bottom** To bridge the gaps between the upper and lower staircase landings, and the scaffold planks (Refer to page 59).	**467670** **467626**	**2.10** **1.60**
	**BOSTA 70 Recess Bracket** **BOSTA 70 Recess Bracket Extension** Used to construct three-part side protection at interior corners and to install the guard rails at a stairway exit. In conjunction with the Recess Bracket Extension and a Enlargement Bracket as a way to connect brackets in recesses.	**652830** **652835**	**8.40** **3.50**

Unless stated otherwise, all dimensions are in mm.

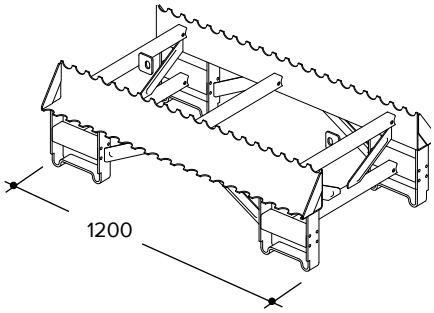
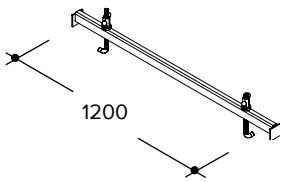
3.4 Façade insulation accessories

	Component	Part code	Weight [kg]
	**BOSTA 70 Façade Insulation Plank 300** **BOSTA 70 Façade Insulation Plank 250** **BOSTA 70 Façade Insulation Plank 200** Used for installation of façade insulation systems to close the temporary gap between the façade and the scaffold plank (Refer to page 97 ff.).	**652235** **652236** **652237**	**17.04** **14.21** **11.38**
	**BOSTA 70 Façade Insulation Telescopic Bracket** Inserted into the BOSTA Vertical Frames during erection of the scaffold and later supports the BOSTA 70 Insulation Planks (Refer to page 97 ff.).	**652230**	**10.69**
	**Façade Insulation Bridge cpl.** Set with Façade Insulation Bridge and two Eye Bolts to tie scaffolds to façades, particularly in the case of façade insulation. The 28 cm lever guarantees a sufficient load bearing capacity of the bridge parallel to the façade (Refer to page 97 ff.).	**652293**	**2.50**
	**Façade Insulation Eye Bolt 12 x 360 10.9** **Façade Insulation Eye Bolt 12 x 280 10.9** **Façade Insulation Eye Bolt 12 x 230 10.9** To tie the scaffold to walls when insulating the façade (Refer to page 97 ff.).	**652260** **652840** **652291**	**0.40** **0.30** **0.30**
	**25no. Plugs S14 ROE -100** To tie the scaffold to walls when insulating the façade (Refer to page 97 ff.).	**497842**	**0.18**

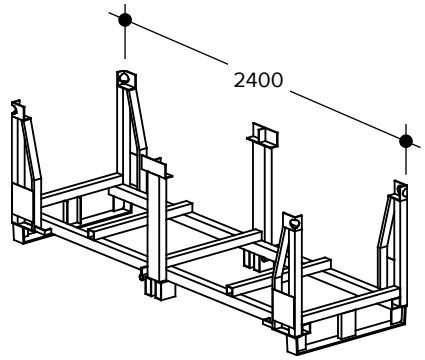
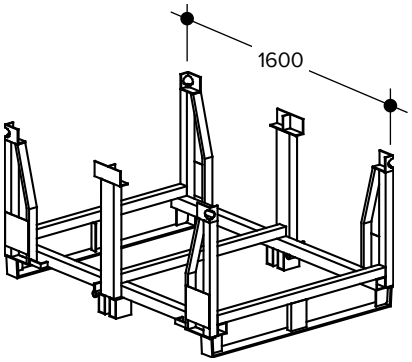
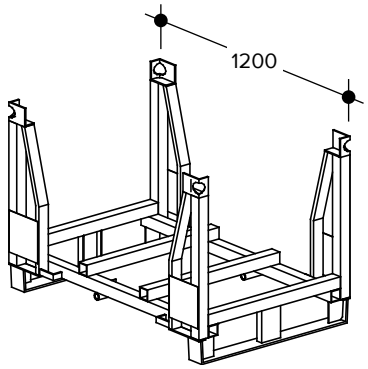
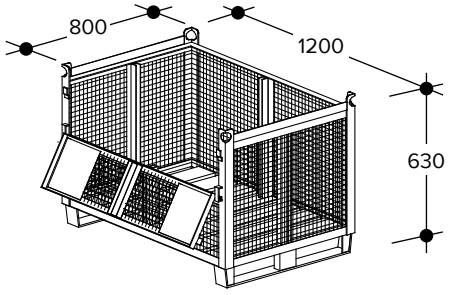
3.5 Scaffold tarp and accessories

	Component	Part code	Weight [kg]
	**DELTA Scaffold Tarp 2.70 x 20 m**	**543292**	**15.12**
	DELTA Scaffold Tarp 3.25 x 20 m	**543307**	**18.20**
	**DELTA Toggle Binder, 50 pieces**	**533609**	**0.60**
	DELTA Toggle Binder, 1 piece	**533035**	**0.12**
	**Scaffold Netting 2.5 x 20 m**	**563343**	**3.00**
	Scaffold Netting 3.0 x 20 m	**563354**	**3.60**

3.6 Transport racks and accessories

	Component	Part code	Weight [kg]
	**Vertical Frame Storage Pallet** For storage and transport of BOSTA 70 Vertical Frames. The pallet can accommodate up to 20no. vertical frames. Do not stack more than two pallets. Order the Lift-off Retainer for Vertical Frame separately.	**651402**	**43.90**
	**Lift-off Retainer for Vertical Frame** Secures the BOSTA Vertical Frame during transport on a Storage Pallet.	**651401**	**6.10**

Unless stated otherwise, all dimensions are in mm.

	Component	Part code	Weight [kg]
	**Euro Stacking Frame 240 / 80**	**566509**	**92.50**
	**Euro Stacking Frame 160 / 120**	**566494**	**84.00**
	**Euro Stacking Frame 120 / 80**	**553689**	**54.50**
	**Euro Lattice Box**	**548480**	**71.60**

Unless stated otherwise, all dimensions are in mm.

4 Assembly

The scaffold erection must follow the step-by-step instructions described below. Dismantling follows the same steps in reverse order.

VISUAL CHECK

Prior to each use check and make sure that all components are without damage. Cracks are not allowed in the components and they must not be bended or deformed.

NOTE

Note

Only use couplers with a valid building approval or couplers according to DIN EN 74-1.

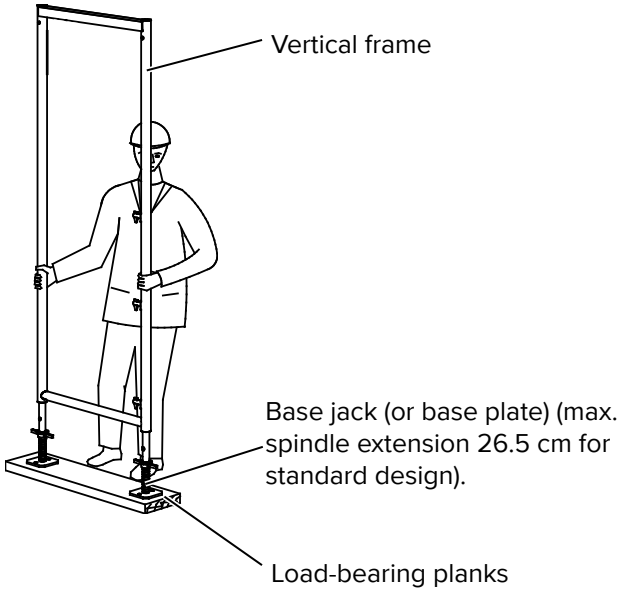
NOTE

Note

All the enacted laws and local regulations for work safety as well as the requirements of the industrial health & safety standards must always befollowed!

4.1 Load-distributing substructure and base jacks

The scaffold may only be erected on load-bearing ground. Otherwise, a load-distributing substructure must be provided (e.g. timber planks). Erection should start at the highest elevation of the erection site. Base jacks or base plates must be placed under each post of a vertical frame



NOTE

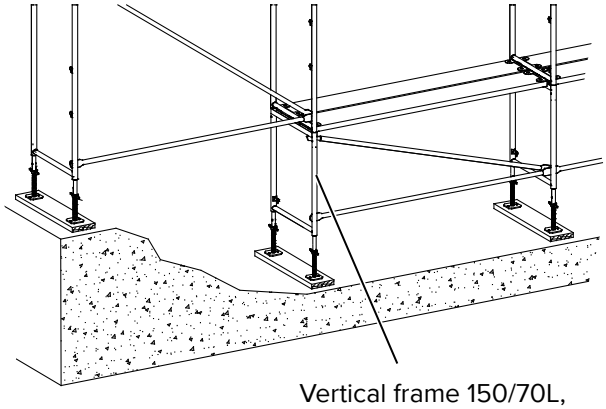
Note

A vertical post with the 3 gravity pins has always to be placed at the outside of the scaffold.

Unless stated otherwise, all dimensions are in mm.

4.2 Adjustment frame

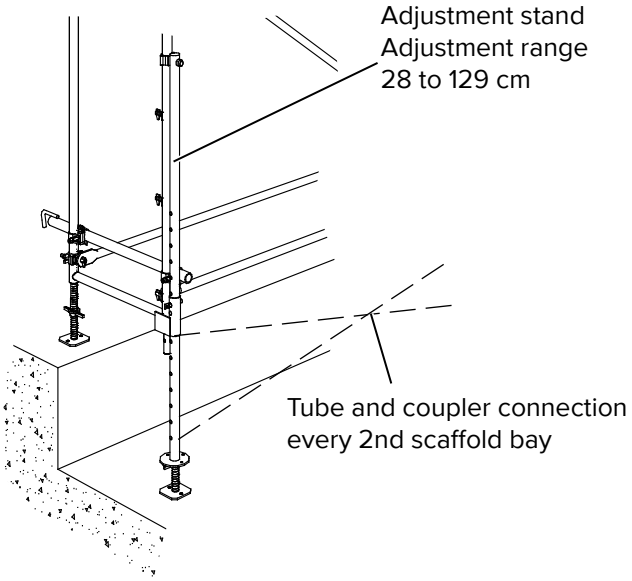
Vertical adjustment frames, type 66, 100 or 150, may be used in case of sloping erection sites and varying elevations. Adjustment frames may also be used for reaching higher scaffold levels.



Vertical frame 150/70L,
vertical frame 100/70L or
vertical frame 66/70L

4.3 Adjustment stands

Adjustment stands are used to bridge varying elevations and unevenness of the ground. They are connected to the post of the vertical frame, using rigid couplers. Use the hole pattern in the attachment rail to roughly level the structure with the erection site. Use the base jacks to do the final adjustments. See page 92 for further instructions.



Adjustment stand
Adjustment range
28 to 129 cm

Tube and coupler connection
every 2nd scaffold bay

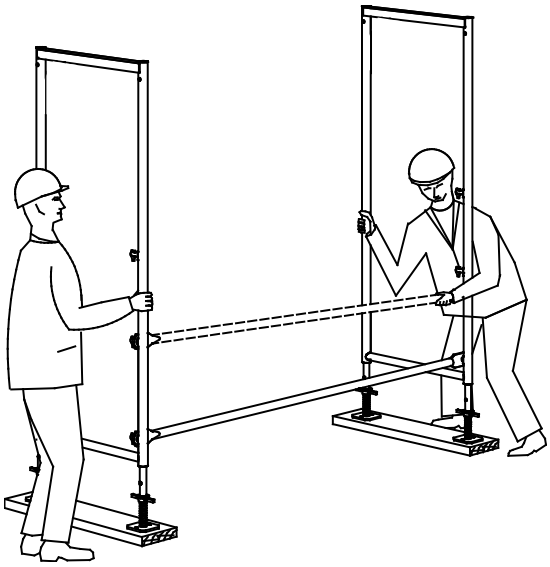
4.4 Vertical frames and passage frames

Vertical and passage frames must be assembled vertically, using base jacks or base plates, with the appropriate distance from the wall of the building. The vertical frames are connected to each other by using guard rails, which are attached to the lower gravity pins. For the use of passage frames see page 91.

WARNING

Warning!

To secure components with gravity pins, the pins must always be in a vertical position! With side protection components, the scaffold bay must also be equipped with planks!

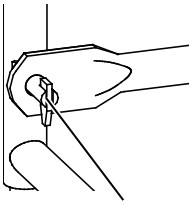


NOTE

Note

This guard rail is only used as an assembly aid for the 1st scaffold bay. It can be removed after installation of the diagonals and the planks (as described in chapter “Diagonals and planks”).

Connection guard rail



Gravity pin

Unless stated otherwise, all dimensions are in mm.

4.5 Diagonals and planks

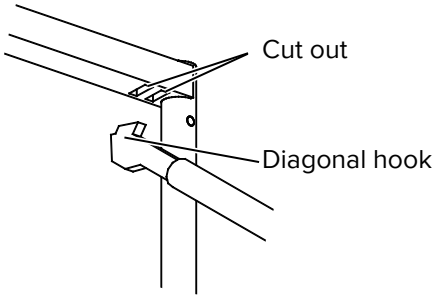
Attach diagonals as longitudinal stiffeners to the outside face of the scaffold. Insert the diagonal hook in one of the cut-outs of the U-section above and attach the lower part to the gravity pin of the other vertical frame. Diagonals and planks must be installed continuously with the assembly of the scaffold.

WARNING

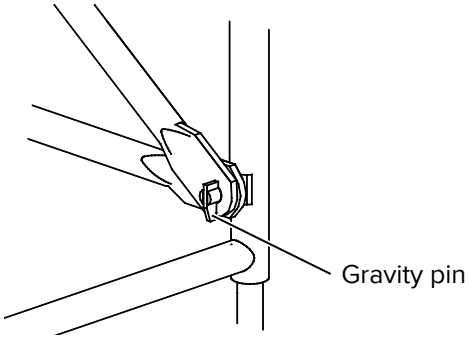
Warning!

Cover decks, timber and steel planks, and aluminum decks are placed with their support profiles on top of the U-section of the vertical frame, ensuring the legs of the U-profile fit firmly into the beads of the plank support.

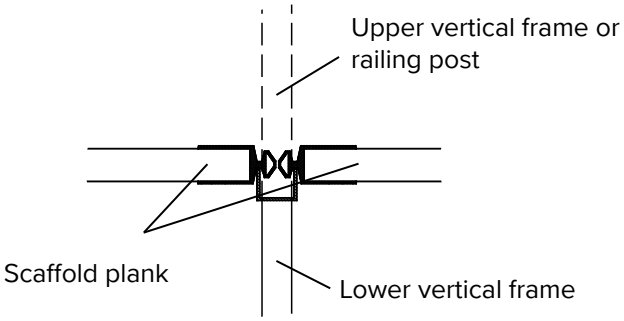
Attachment of diagonal at top



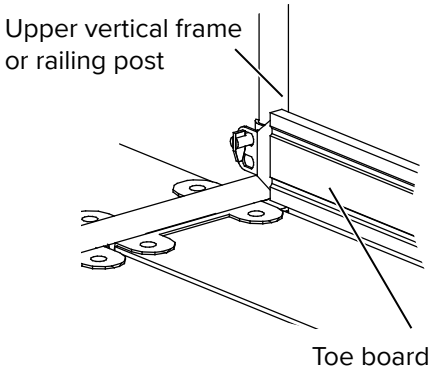
Attachment of diagonal at bottom



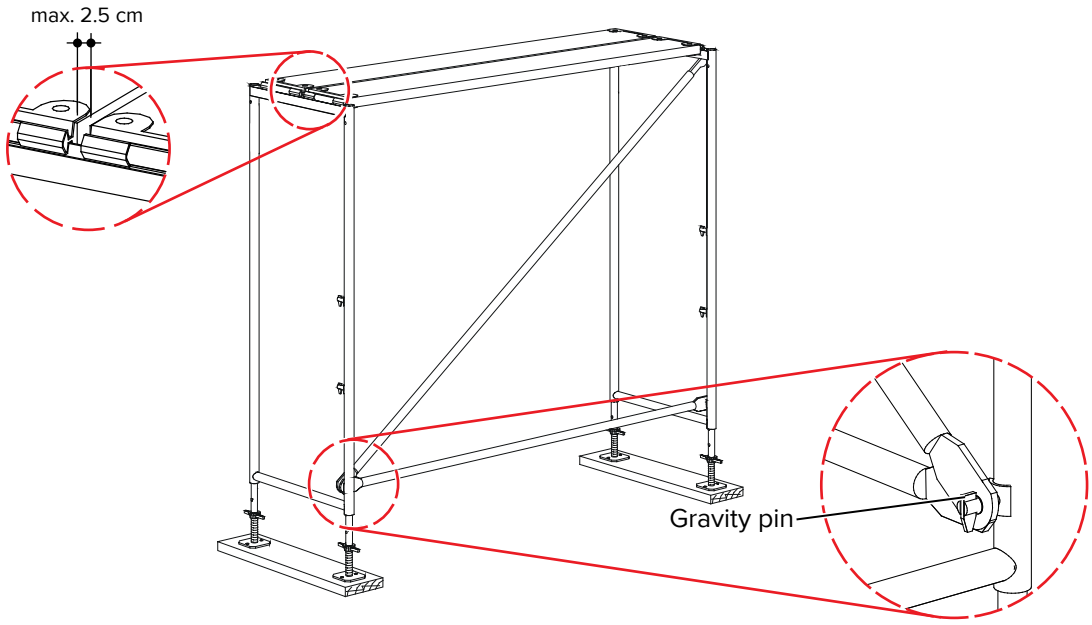
Attachment of scaffold plank



Attachment of toe board



When using BOSTA vertical frames without displacement lock, the permitted gap between the 32 cm wide planks is max. 2.5 cm. Now the assembled scaffold bay must be adjusted vertically and horizontally with the base jacks. Check the distance to the wall of the building.



WARNING

Warning!

The planks are used as stiffening components and must be mounted to the entire width of the scaffold!

VISUAL CHECK

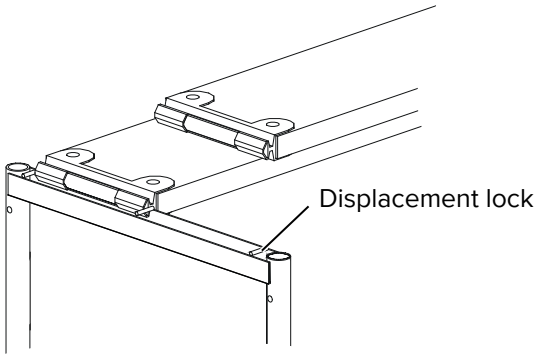
Make sure that the gravity pin is in “locked” position!

NOTE

Note

Three displacement locks in the BOSTA vertical frame (built in 4/96 or after) center the 32 cm wide scaffold planks.

Placement of scaffold planks



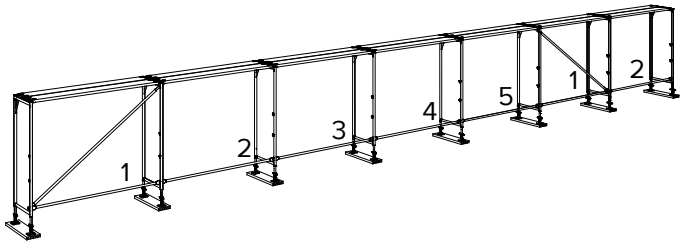
VISUAL CHECK

Check correct position of supporting profiles!

Unless stated otherwise, all dimensions are in mm.

4.6 Adjustment frames

The assembly of the following scaffold bays is carried out as described above. Every 5th scaffold bay must be braced with a diagonal. Additional diagonals may be necessary depending on the type of assembly.



4.7 Erection of additional scaffold bays

Work on a scaffold must be properly planned and carried out to either completely prevent, or at least minimize the danger of falling. Based on his own risk analysis for each individual case or activity, the contractor must define actions to prevent dangerous situations. Possible actions are the use of “mounting guard rails” (MGR) or the use of appropriate “Persönliche Schutzausrichtungen, PSA” [Personal Fall Protective Equipment] to protect against falling.

The following options or combinations can be used, when erecting the BOSTA 70 scaffold system:

- Install guard rails on the entire upper level of the scaffold;
- MGR in access bay with additional attachment points for personal protective equipment;
- Assembly of the scaffold by skilled and instructed personnel and supported by named attachment points for personal protective equipment.
- Assembly of scaffold by skilled and instructed personnel.

4.7.1 Installation of mounting guard rails [MGR].

WARNING

Warning!

During assembly, reconstruction and disassembly risk of falling may occur!

The MGR consists of posts and standard safety railing. The safety railing remains a part of the completed scaffold. First of all, hook the first post into the vertical frame (fig. 1); then attach the standard guard railing to the post (fig. 2). The second post is hooked to the guard railing (fig. 3), swiveled upward, and hooked to the next vertical frame. Only then is the worker allowed to access the next higher and already secured scaffold level (fig. 4).

Fig. 1

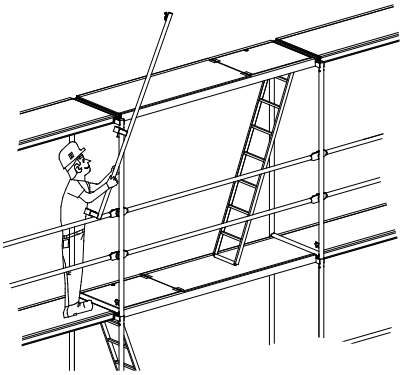


Fig. 2

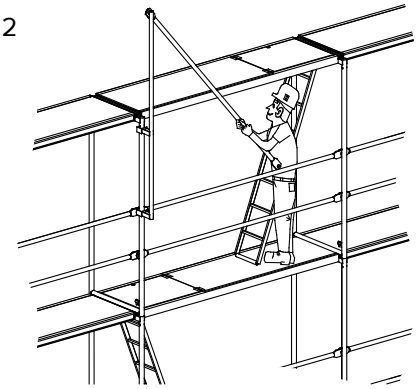


Fig. 3

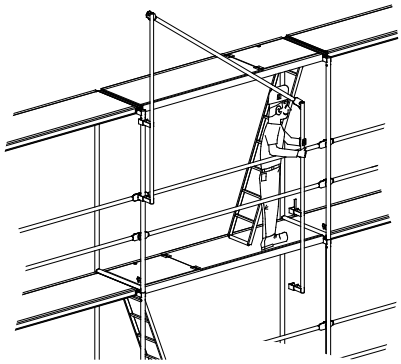
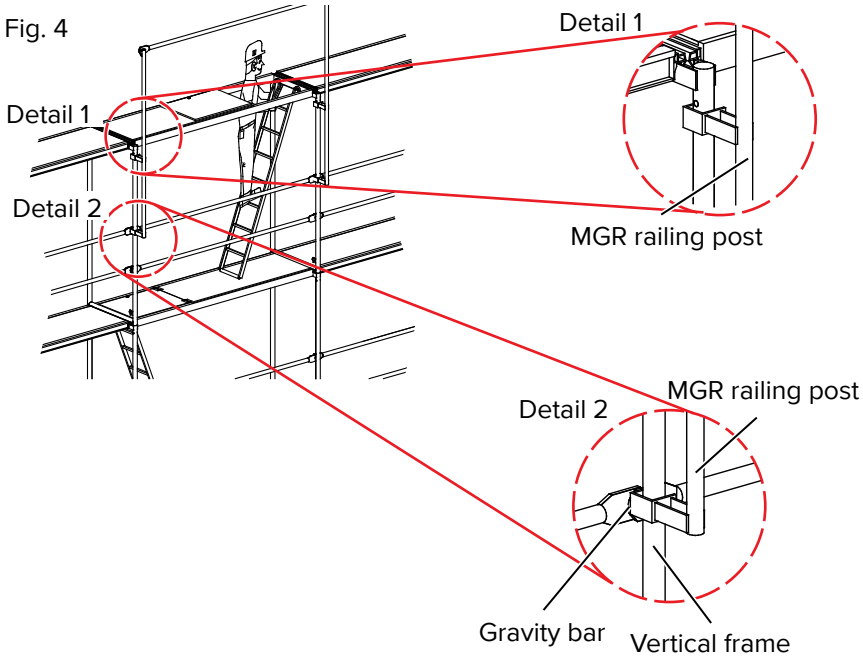


Fig. 4



WARNING

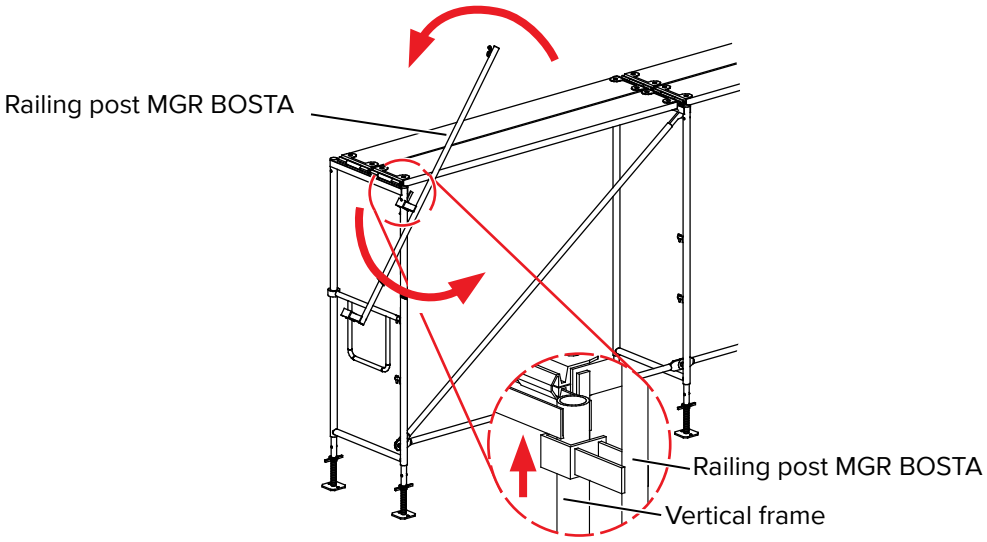
Warning!

In assembled position, the MGR post must firmly fit onto the gravity pin!

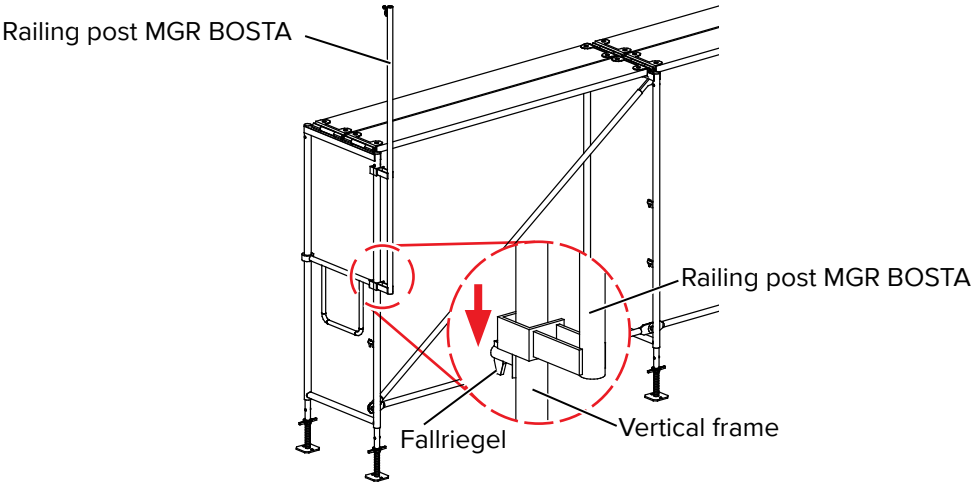
Unless stated otherwise, all dimensions are in mm.

4.7.2 Installation procedure

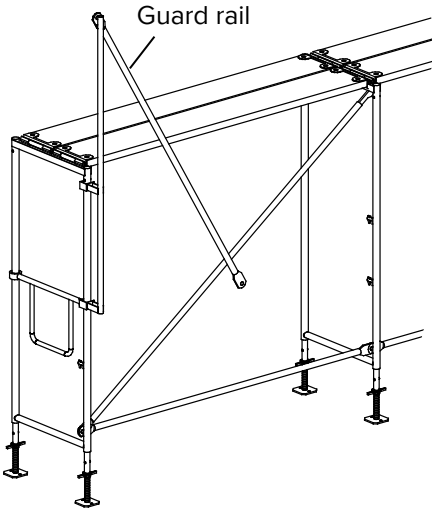
Step 1 Hook the railing post MGR BOSTA to the top of the vertical frame and rotate it counterclockwise.



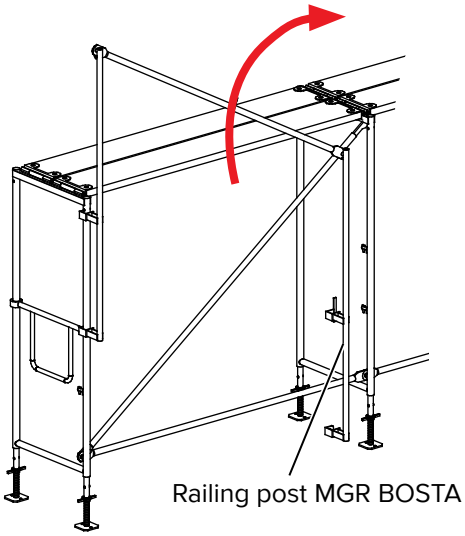
Step 2 The lower attachment point of the railing post MGR BOSTA must be placed onto the gravity pin of the vertical frame.



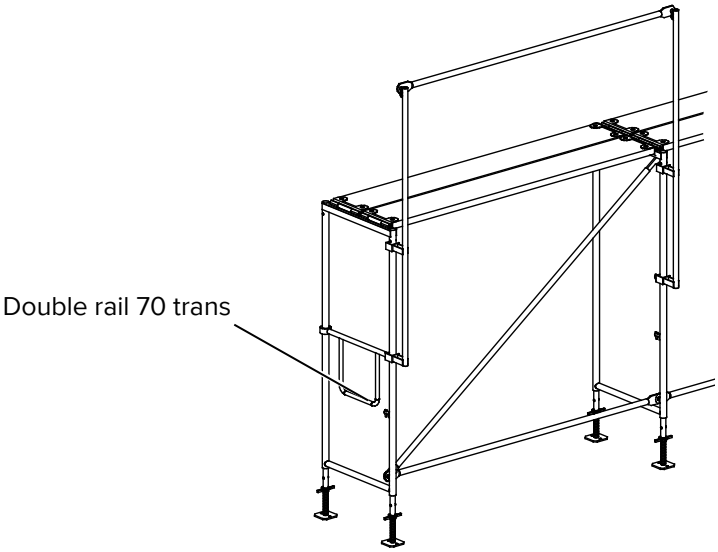
Step 3 Insert the guard rail to the uppermost hook of the MGR-railing post.



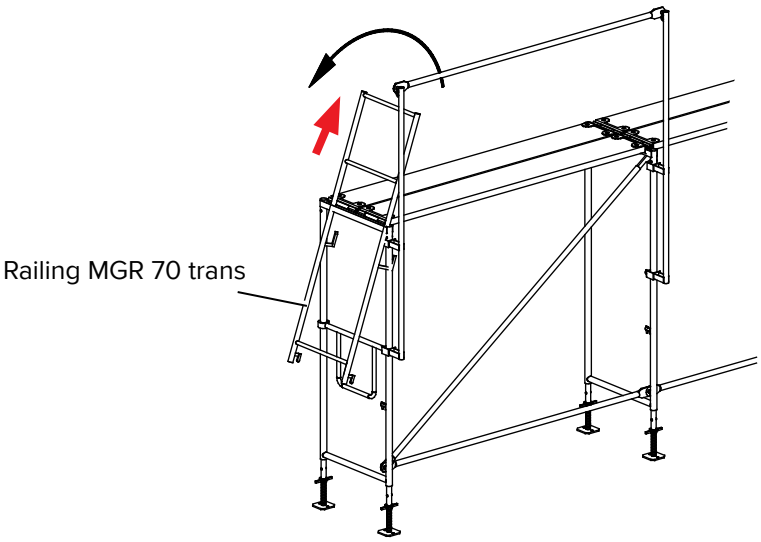
Step 4 The second railing post MGR BOSTA is connected with the guard rail and attached to the vertical frame, as described in step 1.



Step 5 Now, the uppermost level of the 1st scaffold bay is secured.

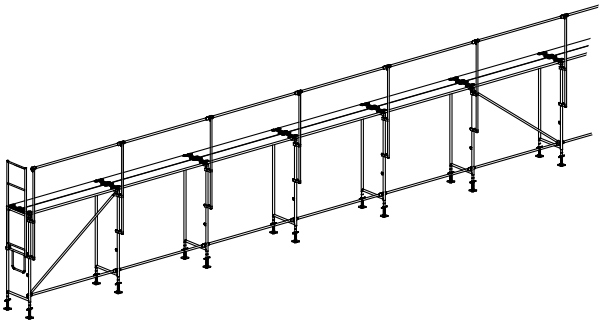


Step 6 Hook the railing MGR 70 trans to the vertical frame and lower it onto the double rail 70 trans to secure it.



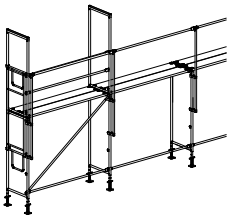
Unless stated otherwise, all dimensions are in mm.

Step 7 All following scaffold bays are secured in the same way as described above.

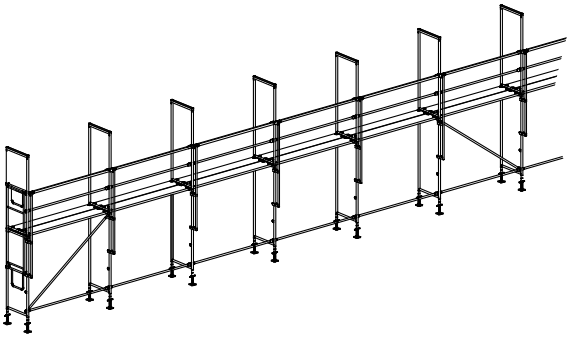


NOTE	**Note** Now access to the secured scaffold level is allowed.

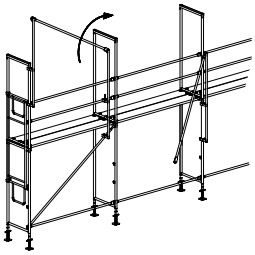
Step 8 Subsequently, the vertical frames are installed on the uppermost scaffold level.



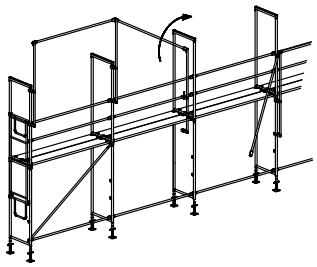
Step 9 The side protection is installed.



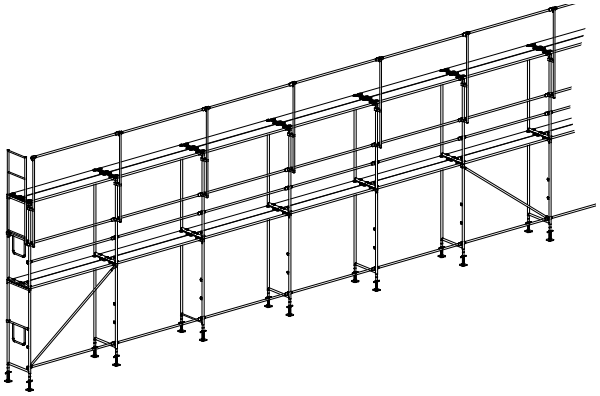
Step 10 Transfer the MGR railing post to the vertical frame of the second scaffold bay.



Step 11 The MGR-railing post is then placed in the next bays of the second scaffold level. Then, the planks are inserted into the vertical frame.



Step 12 Complete the installation of the guard rails on the uppermost level of the scaffold.



4.7.3 Assembly procedure with personal protective equipment against fall from heights

General

The fall protection personal protective equipment (PPE) is only used if a risk assessment indicates that safer, collective actions such as fall prevention and catching devices for the scaffold cannot be applied or are not justifiable.

The following must be observed:

- Precautionary measures within the framework of the risk assessment and organizational and technical arrangements must be taken at the place of use of the selected fall protection PPE to rescue, if necessary, intercepted persons.
- The fall protection PPE is only suitable for the intended use; for example, in detail:
  - An EC type-examination as a system according to the purpose for the selected fall protection PPE must be carried out by an accredited test (CE mark, instruction manual supplied by the manufacturer).
  - With regard to the connection means, only a system with proven load capacity along one edge (for horizontal applications) should be used.
  - Depending on the selected fall protection PPE and the available attachment points, it is vital to ensure the required clear height beneath the standing level of the user (usually 5.75 m).
  - This also applies to the use of fall arrest equipment.
- Only the lifting points shown in this chapter and those verified as suitable points of the scaffold may be used.
- From these, before use, the mounting attachment points must be marked by the responsible supervisor before starting work.
- Only one person may use a tying point.

- The fall protection PPE must be used only while observing the information in the instructions of the manufacturer.
- The responsible supervisor has to ensure that the fall protection PPE is used as intended.
- After an incident where the impact force in catching a person is taken by the scaffolding, this may be entered only after a new release by the responsible supervisor.

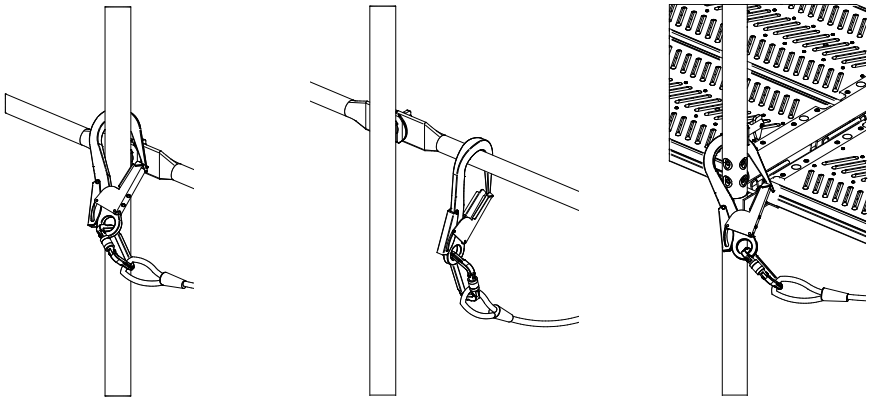
WARNING

Warning!

The use of attachment points for fall protection PPE is possible both on steel vertical frames of the old version with head brace and handle tube Ø49.3 x 3.25 and on steel vertical frame of lightweight design without head brace and handle tube Ø48.3 x 2.70.

The specifics for the use of BOSTA 70 steel scaffolding parts as a tying point are summarized in the following sections.

The pipe hooks must be suitable for the selected attachment types. The slinging as in Image A is for example only permitted where proven shear load pipe hooks exist at the connection.



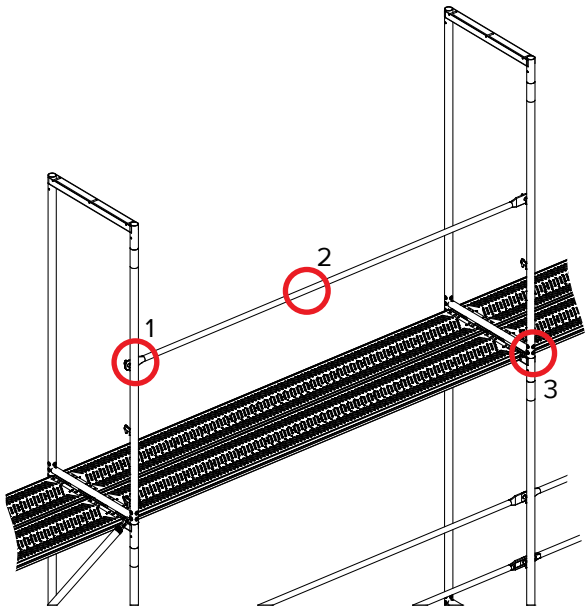
NOTE

Note

- The tying point may always be chosen so that the falling person does not hit a scaffold component or the floor with any part of the body. The maximum length of the connecting means including energy absorber and extension of 0.50 m used for the scaffolders must not exceed 2.50 m.
- When selecting the attachment points on the frame, make sure that the height of the attachment point is at least 1.00 m above the face of the user standing level.
- If an attachment point at the same standing level of the scaffolder is used, the length of the lanyard including energy absorber may not exceed 2.00 m.

4.7.4 Suitable attachment points for fall protection PPE in facade scaffolding

Vertical frame with bracing at top



Considering the user platform and the maximum length of the lanyard is a suitable tying point on each BOSTA 70 steel facade scaffolding one of the following locations:

1. On the edge of a railing bar mounted on the double pin 1.0 m above the scaffolding level;
2. In the middle of a railing bar mounted on the double pin 1.0 m above the scaffolding level;
3. On the vertical post of the standard vertical steel frame above the finished deck level.

4.7.5 Test reports

Test report no 201322840

“Scaffolding system BOSTA with length-orientated scaffold levels as facade scaffold with the opportunity to use proven attachment points for personal protective equipment during assembly of the scaffold”.

Institut für Arbeitsschutz (IFA), Sankt Augustin 2013

DGUV Test
IFA 1405023
Sicherheit geprüft
tested safety

Unless stated otherwise, all dimensions are in mm.

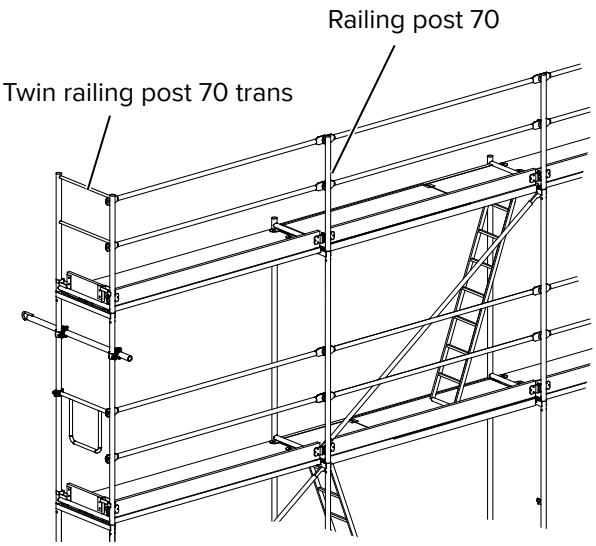
4.8 Tying points

Simultaneously with its erection, the scaffold must be tied to the building. Tie-down instructions must be observed! (see page 72 to page 91)

4.9 Uppermost scaffold level

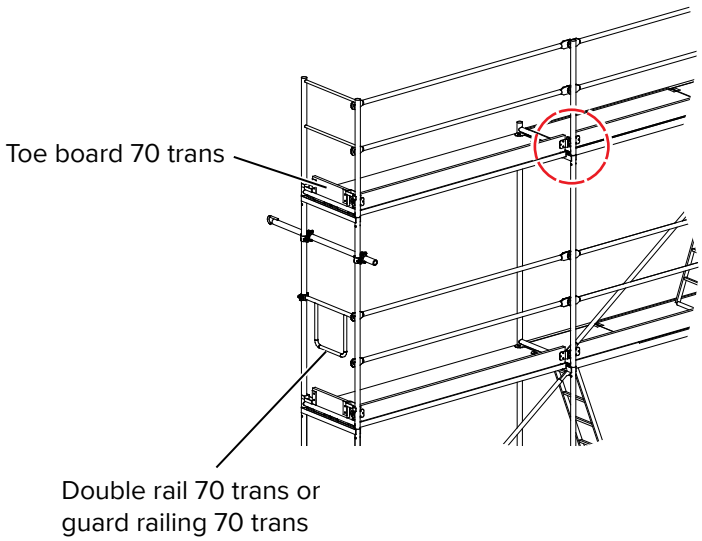
Railing posts along the longitudinal side, and double railing posts at the narrow side of the scaffold, assume the side protection. At the same time, they prevent the planks from lifting off. Use 2 frame pins Ø8 mm each to secure the posts.

At buildings with a roof inclination of ≤20° or with inner corners, the scaffold levels below down to the next tied level must be secured with frame pins Ø8 mm

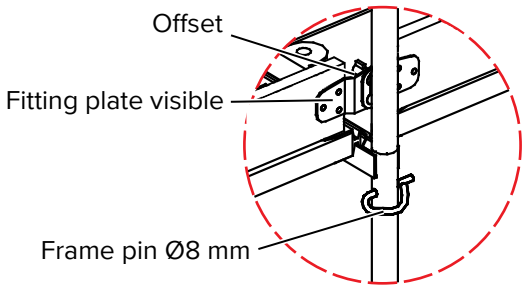


4.10 Completing the side protection

Missing guard rails and toe board, as well as the complete side protection must be installed in all scaffold bays.



VISUAL CHECK	Check the correct position of the gravity pins. Bearing the risk assessment in mind and the valid regulations regarding safety at work, as well as the industrial health & safety standards act, certain parts of the side protection may be omitted.



NOTE

Note

- To assemble the toe boards, always hook in the upper hole of the fitting plate. The fitting plate must be visible from the outside (offset to the outside)!

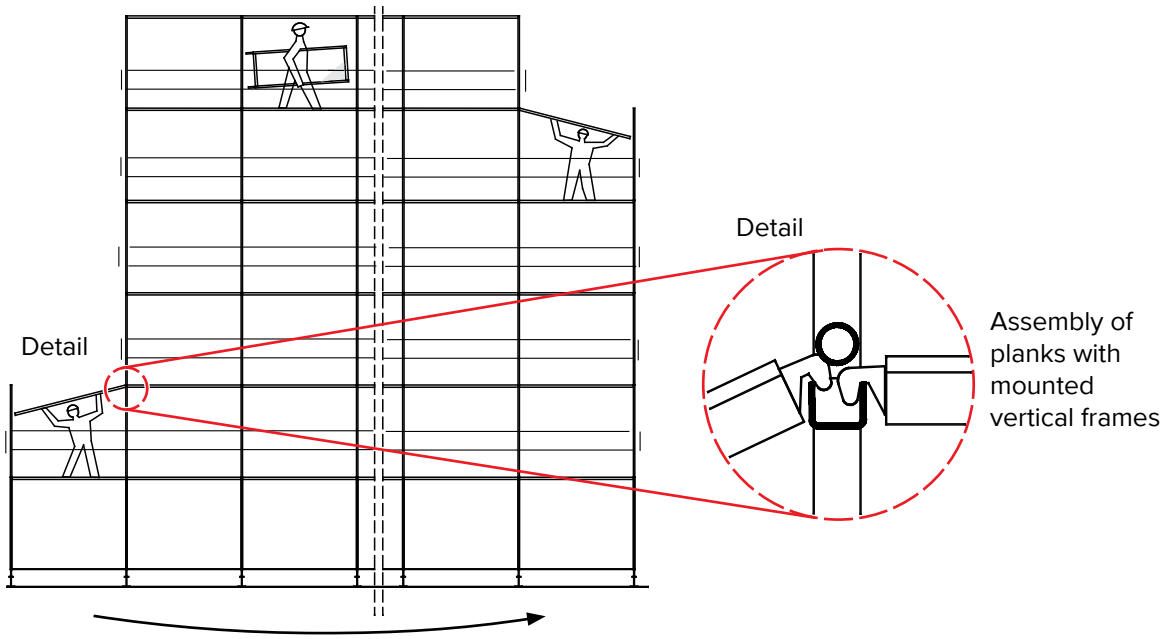
WARNING

Warning!

Danger of falling during installation!
Appropriate safety precautions according to the risk assessment must be taken.

4.11 Erecting and dismantling of scaffold bays (“Wandering”)

The rounded support claws of the planks allow for the vertical dismantling of a bay at one end and erecting a new bay at the opposite end. This way, the scaffold can “wander along” as the work progresses and material and inventory can be saved at the same time.



Unless stated otherwise, all dimensions are in mm.

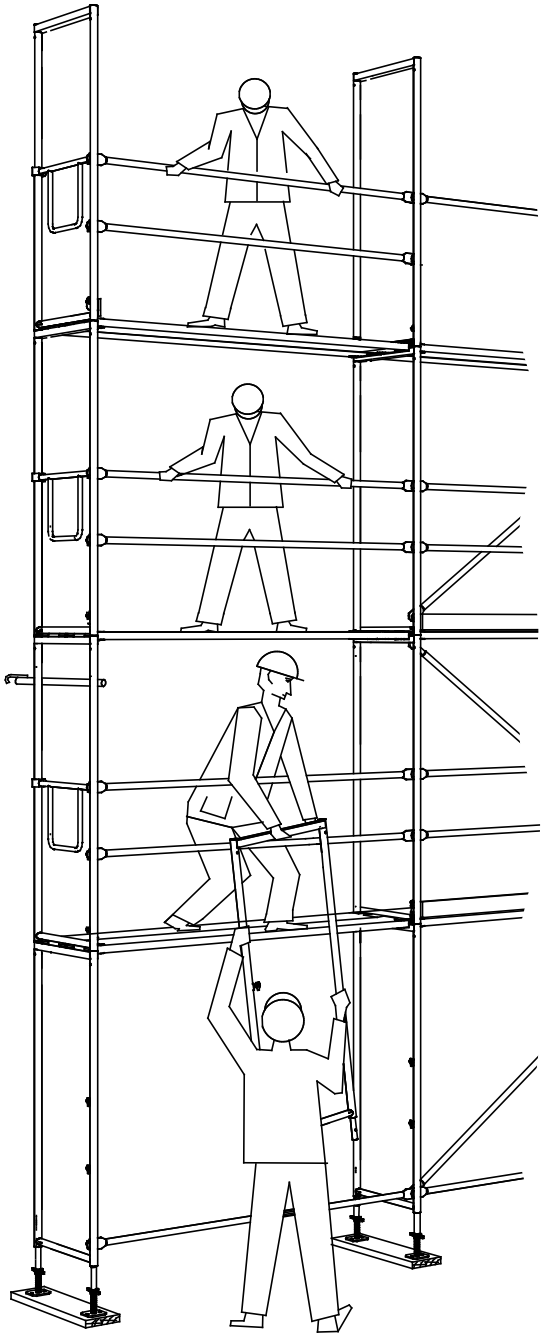
5 Handling of scaffold components

When erecting scaffolds higher than 8.00 m (height of planks above the erection surface), a builder's hoist must be used for the erection and dismantling of the scaffold. Manual pulleys may be considered as builder's hoists as well. Deviating from this rule, a builder's hoist may be omitted if the scaffold height does not exceed 14.00 m and its length does not exceed 10.00 m overall.

If the vertical handling of components inside the scaffold is performed manually, top and knee-level rails must be installed in these bays. The toe board is not required. If scaffold bays are only used for the horizontal transport of components during the erection and disassembly of the scaffold, the knee-level rail and the toe board is not required if the risk assessment does not provide for anything different.

During this manual handling of components, at least one person must be present on each scaffold level. Never throw any scaffold parts from the scaffold!

When storing scaffold parts on the scaffold always ensure a sufficient passage width of 20.0 cm.



WARNING

Warning!

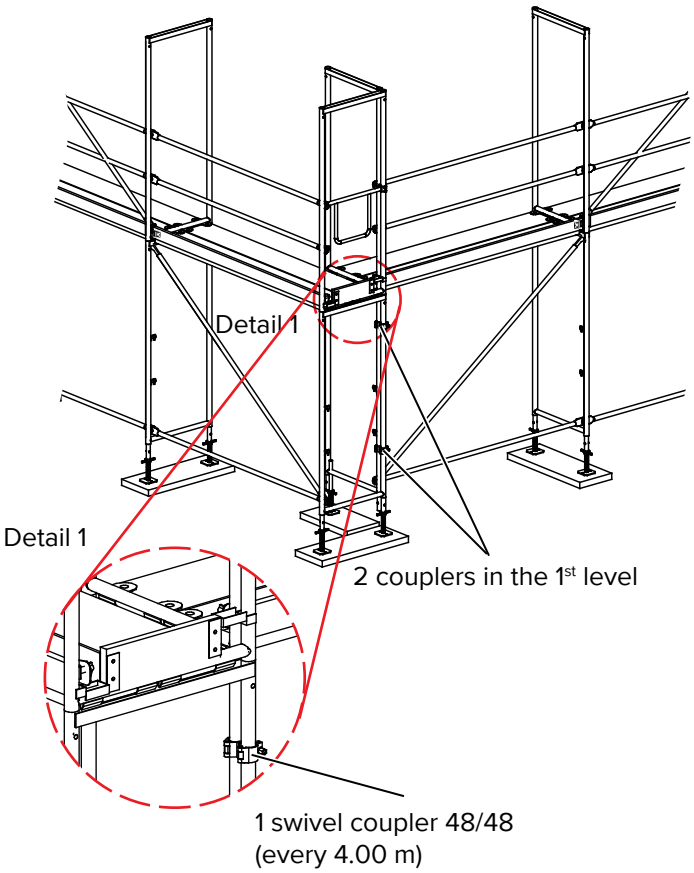
Increased risk due to unintended falling scaffold parts!

6 Corner areas

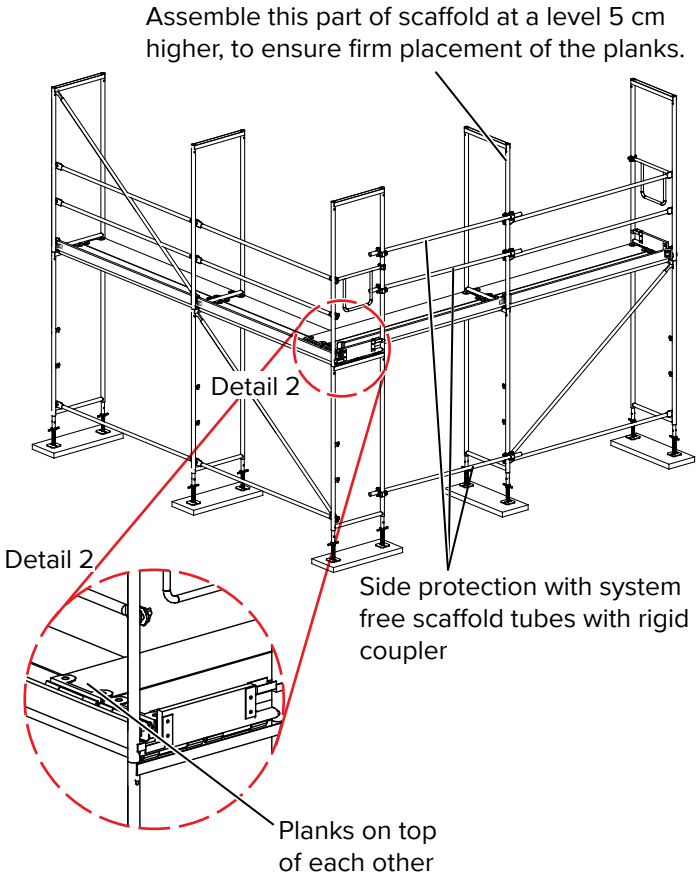
6.1 Layout of corners

Corner areas must be assembled in the full scaffold widths. Two complete scaffold sections are joined at a right angle. The elevation of all joining scaffold levels must be the same. Both abutting scaffolds must be connected in the first level with 2 couplers. Then connect them in every 2nd scaffold level (every 4.0 m).with 1 coupler.

Scaffold connection in corner areas

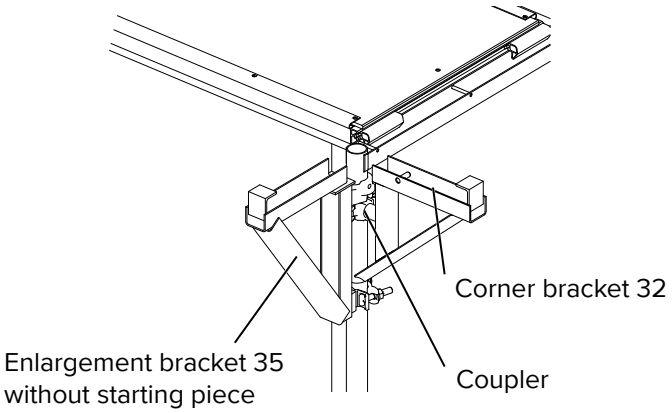


In this corner layout, the scaffold bay is only fitted with planks and side protection components. The planks that are fixed at only one end and loosely placed at the other end must also be secured to prevent lift-off.



6.2 Layout of corners with inside brackets

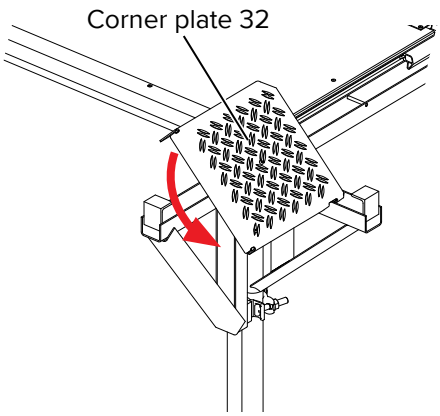
Scaffolds at inner building corners with enlargement brackets 35 without starting piece facing to the facade require for continuous planks a corner bracket 32 with a corner plate 32.



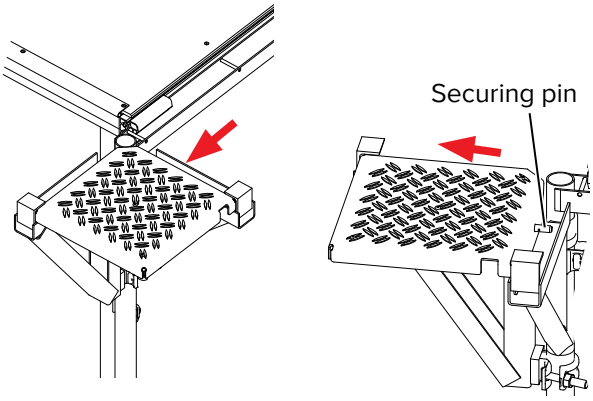
Corner areas

The corner plank 32 is always placed on the right side of the enlargement bracket 35 without starting piece (seen from the scaffold left side) and is fixed with a coupler to the vertical frame in the corner.

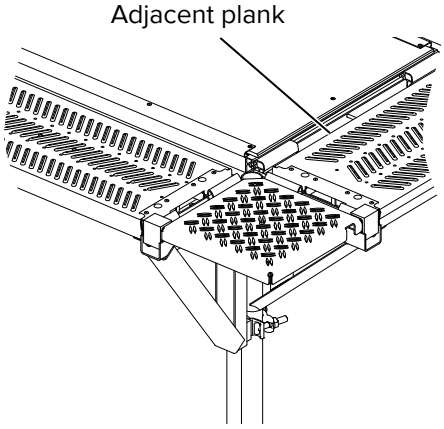
Now the corner plate 32 is placed onto the corner bracket 32.



After placing the corner plate 32, shift the plate sideways. This way, the securing pin grips into the hole of the corner plate 32.



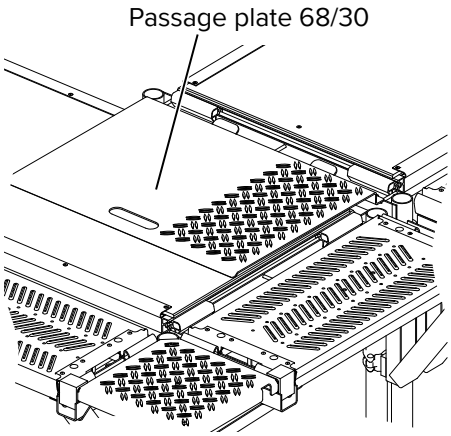
By placing the adjacent plank at the corner bracket 32 the corner plate 32 is secured against shifting.



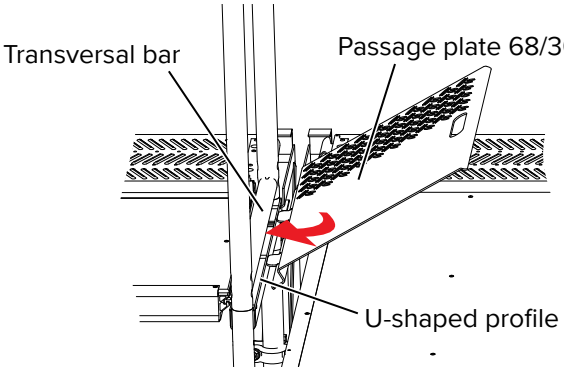
Unless stated otherwise, all dimensions are in mm.

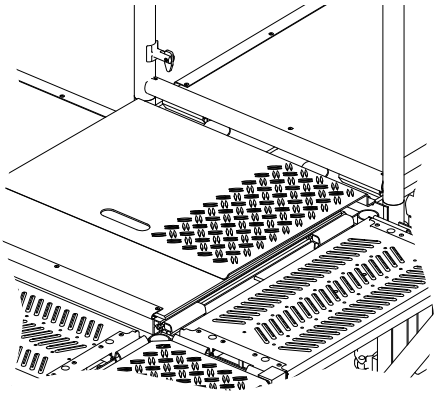
6.3 Passages in corners

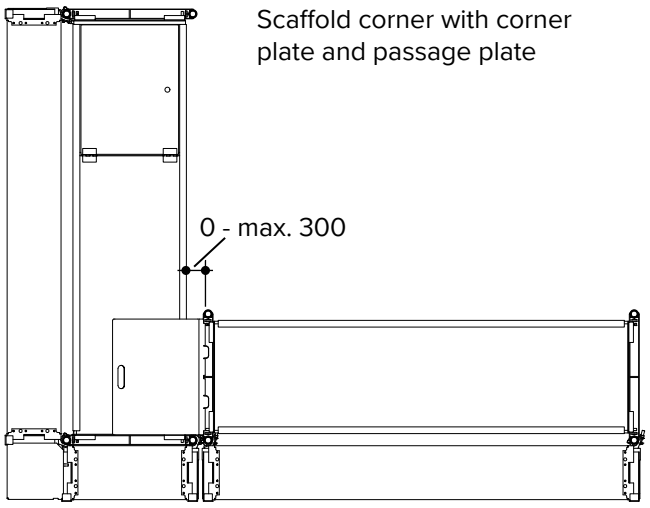
Scaffold corners are made of two scaffolds that are connected at the corner. It is necessary to close the gap between the scaffolds planks. This gap must be bridged with a passage plate.



The passage plate 68/30 is inserted between the transversal bar of the upper vertical frame and the U-shaped profile of the lower vertical frame. Then the passage plate is placed onto the plank.





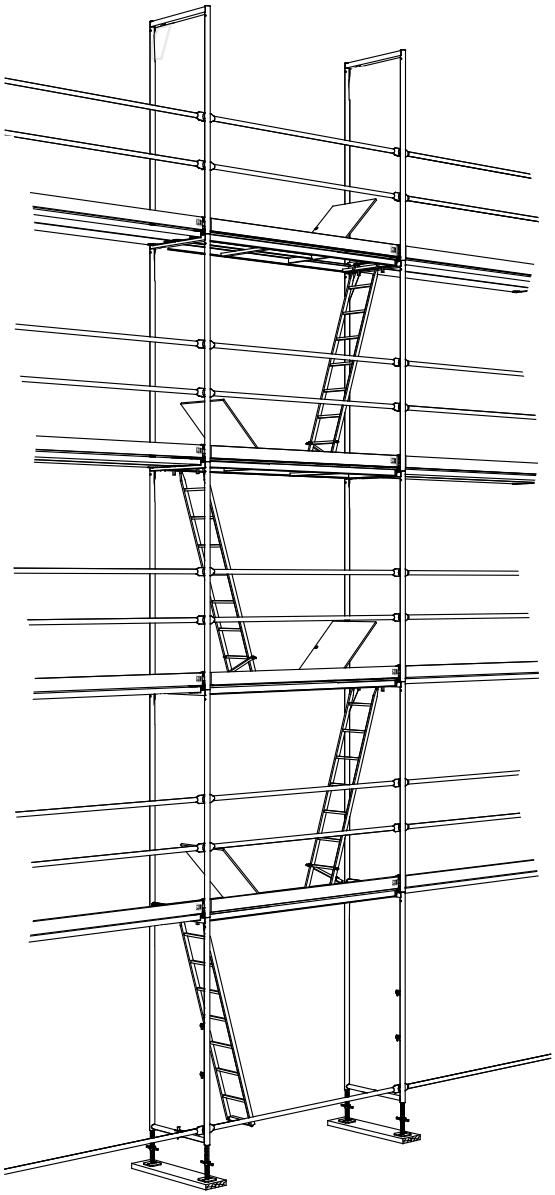


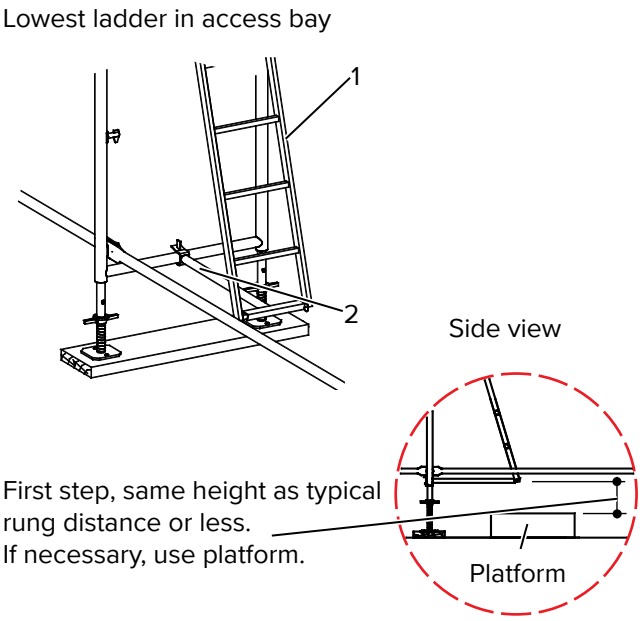
Scaffold corner with corner plate and passage plate

7 Interior scaffold access ladders

Prior to working on the first scaffold level, the scaffold access must be established. A scaffold bay, suitable for the work progress, must be selected. All ladder access decks and ladder 200 A must be installed. Use the ladder lock to fix the lower ladder in a slightly sloping position to the cross beam of the vertical frame.

NOTE	**Note** In special circumstances, the use of a scaffold access stairway instead of access ladders can be necessary.

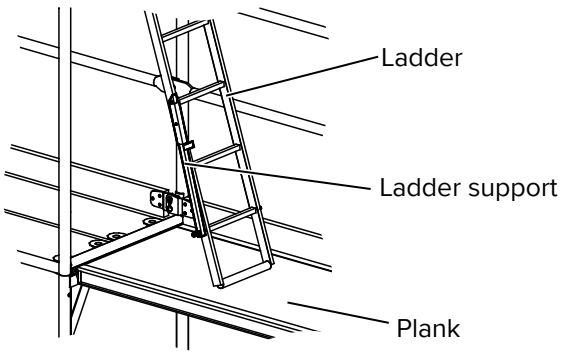




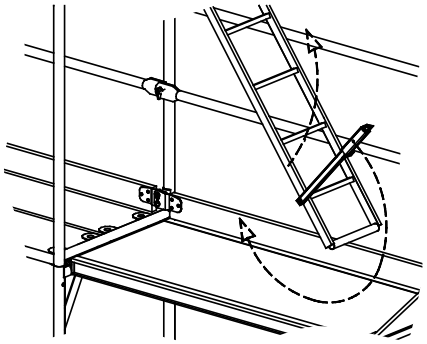
1. Ladder 200 A
2. Ladder lock (only for first ladder)

7.3.1 Ladder support

Due to the deflection of the planks when load is applied, the contact point of the ladder will move. In extreme cases, this may cause a detachment of the plank.



For this reason, make sure that the ladder support is unfolded and braced to the uplift retainer. If older alu passage frames are used (product code 492910 and 465031), the integrated ladders must be upgraded with a ladder support.

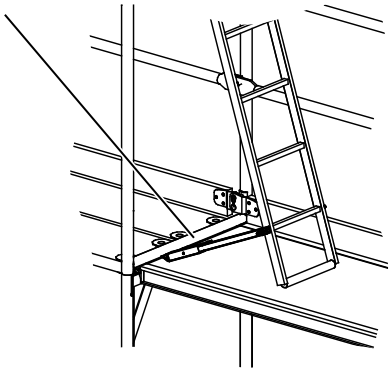


The ladder support is attached to the left-hand side of the ladder.

Drill a Ø12 mm hole at the height of the 1st rung on both sides of the ladder.

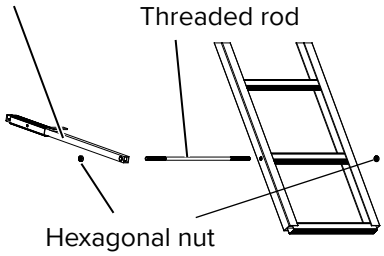
Push the threaded rod through the rung, attach the ladder brace and secure on both sides, using the self-locking hexagonal nuts. Make sure that the ladder support can still be swiveled. For this reason, do not overtighten the hexagonal nuts.

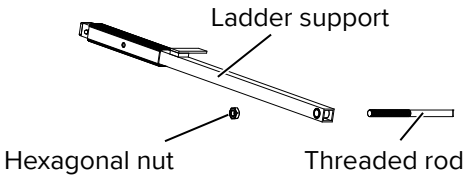
Uplift retainer



The tying of the interior scaffold access complies to the tying of the standard model. The first tying point is at the second scaffold level. Then place a tying point continuously every 4.0 m.

Ladder support





Unless stated otherwise, all dimensions are in mm.

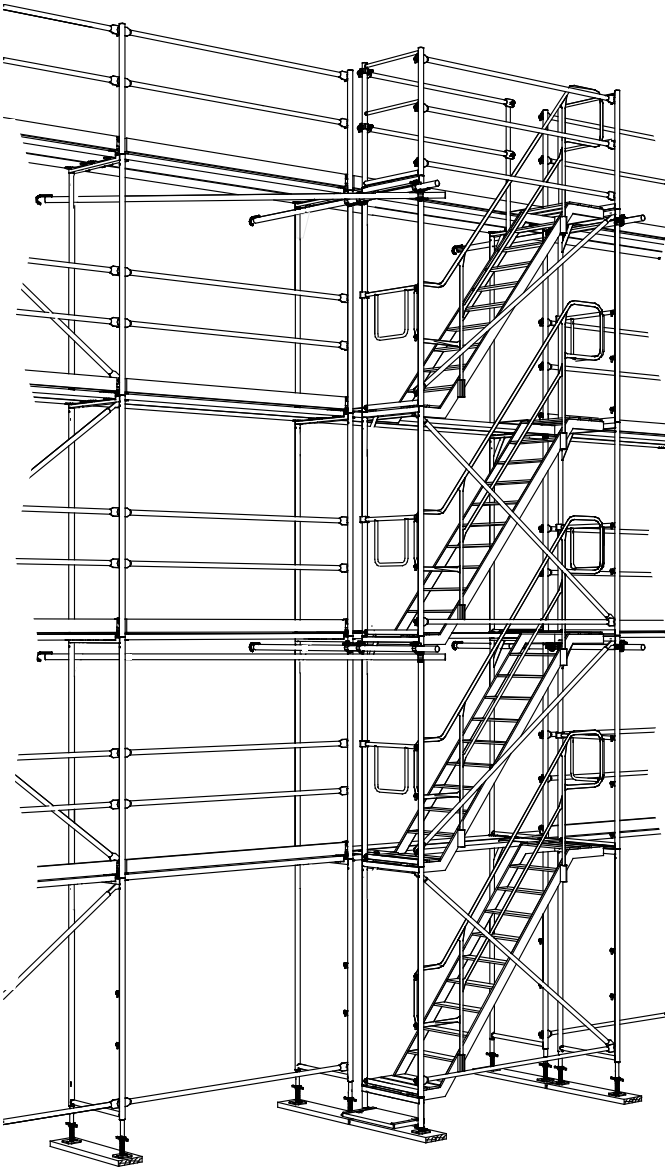
8 One slope scaffold stairway

8.1 Scaffold staircase with Alu Staircase 250

The BOSTA 70 scaffold access stairway is erected in front of the facade scaffold to ensure a quick and safe ascent. The stairway must be connected to the scaffold and tied every 4 m to the vertical frame and the facade. The first tie-level must be max. 4.5 m above ground level. Base jack 50/3.5 or 70/3.3 (spindle extension <26.5 cm) with a min. adjustment of 25 cm should be used. Use the scaffold retainers and couplers to connect the stairway to the scaffold. The applicable regulations for safety at the work-place must always be observed. Furthermore, industrial health and safety standards must be adhered to. The max. construction height for other than the standard design is 24.5 m. The live load capacity is:

nominal

- 1.0 kN/m^2 on max. 5 flights of stairs.
- concentrated load 1.5 kN distributed across an area of 0.2 m x 0.2 m.
- max. 1 person per flight of stairs
- max. 8 persons on the entire scaffold stairway at one time.

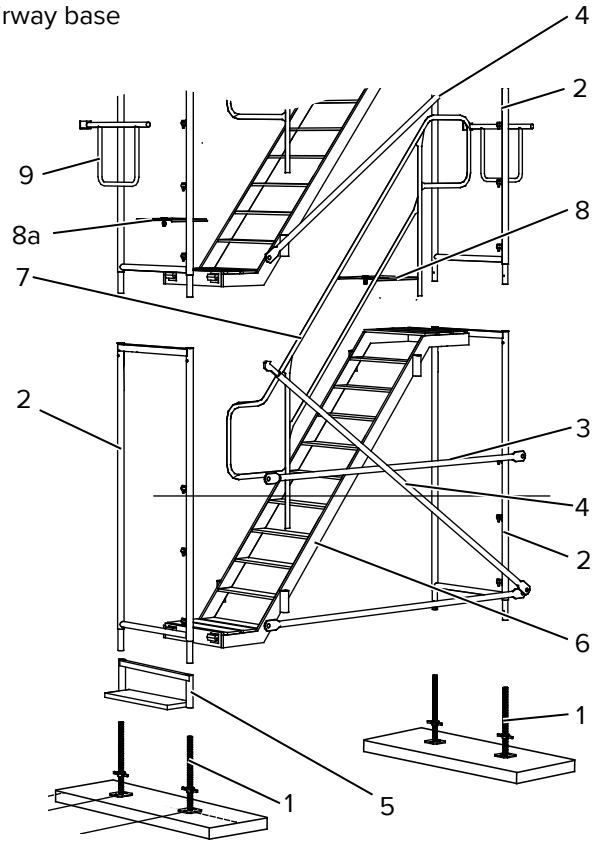


One slope scaffold stairway

8.1.1 Installation sequence of the scaffold access stairway

1. Build the scaffold base by using base jacks (1) to compensate uneven ground. Make rough adjustment of the jacks. Use load-bearing planks.
2. First insert the stairway access (5) at one side and insert the vertical frame 200/70 (2) into the base jacks (1) at the other side.
3. Place the alu stairway 250 (6) onto the U-profile of the stairway access (5) (below) and on the vertical frame 200/70 (2) (above). The stairs are now positioned off center to the vertical frame and the stair access step.
4. Insert the second vertical frame 200/70 (2) into the tube of the stairway access (5).
5. Place the guard rail 250 (3) onto the gravity pins of the vertical frame 200/700 (2) to provide rigidity in longitudinal direction.
6. Use a diagonal 200 (4) to stiffen the scaffold bay. At the top place the hook of the diagonal into the inner cut-out of the U-profile of the vertical frame. At the lower end, place the diagonal onto the gravity pin.
7. Insert the outside handrail (7) into the railing retainers of the stairway (6).
8. At the top of the landing (6) insert the next vertical frame (2) into the lower vertical frame.

Stairway base

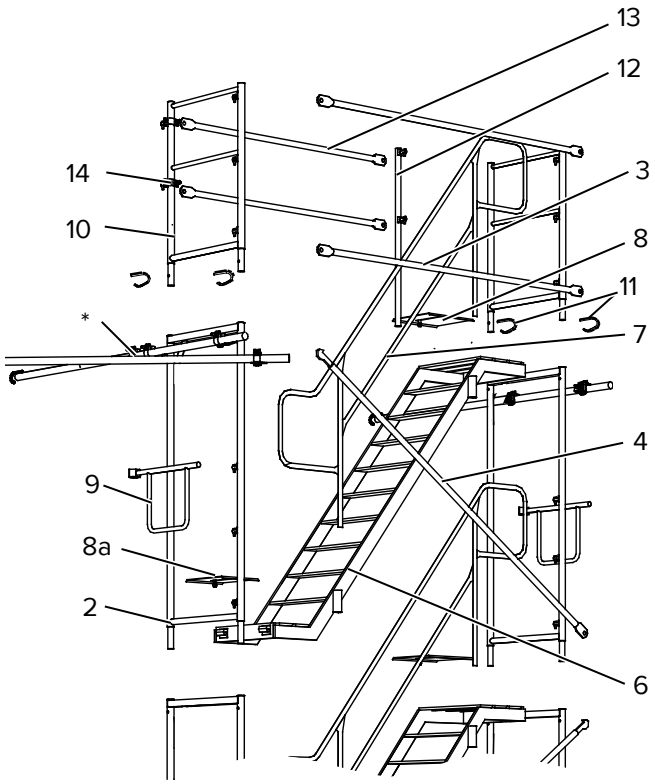


Facade tying points see page 72

1.	Base jack	**8.**	Gap plate, upper
2.	Vertical frame 200/70	**8a.**	Gap plate, lower
3.	Guard rail 250	**9.**	Double rail 70 trans.
4.	Diagonal 200	**10.**	Double post 70 Q
5.	Stairway access	**11.**	Frame pin
6.	Aluminum stairway 250	**12.**	Stairway post
7.	Outside handrail	**13.**	Guard rail 190
		14.	Half coupler 48FB

Unless stated otherwise, all dimensions are in mm.

9. To close the gap between scaffold plank and stairway landing, clamp down the upper gap plate (8) and the lower gap plate (8a).
10. As a side protection now install the double rail 70 trans (9) to the gravity pins of the vertical frame (2) and fix it with the integrated coupler.
11. Now attach the next aluminum ladder 250 (6) followed by the next vertical frame 200/70 (2), the diagonal 200 (4) (like a tower) the outside handrail (7), gap plates (8) and (8a) and the double transverse guard rail 70 (9). Repeat this sequence for the following assembly steps.
12. Insert the double railing posts 70 Q (10) into the uppermost vertical frame (2) and secure them with frame pins Ø8 mm (11).
13. For longitudinal bracing, place guard rail 250 (3) onto the upper and lower gravity pins of the transverse guard rail 70 (9).
14. Attach two half couplers 48FB facing the scaffold (14) to the twin railing post 70 trans (10) and insert the stairway post (12) into the upper bushing (6) of the alu stairway 250.
15. To secure the upper scaffold level, place two guard rails 190 (13) onto the gravity pin of the stairway post (12) and the two half couplers (14).

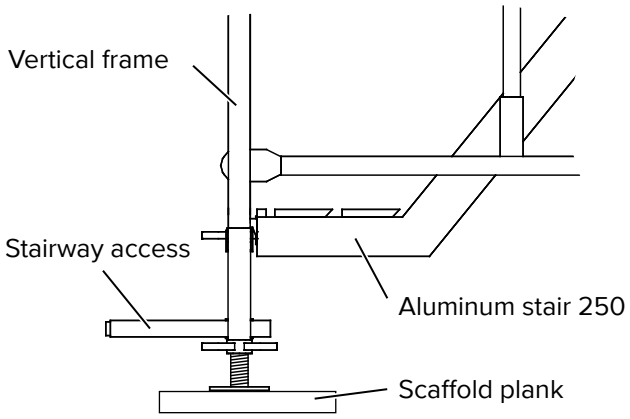


* Facade tying points see page 72

1.	Base jack	**8.**	Gap plate, upper
2.	Vertical frame 200/70	8a.	Gap plate, lower
3.	Guard rail 250	**9.**	Double rail 70 trans.
4.	Diagonal 200	**10.**	Double post 70 Q
5.	Stairway access	**11.**	Frame pin
6.	Aluminum stairway 250	**12.**	Stairway post
7.	Outside handrail	**13.**	Guard rail 190
		14.	Half coupler 48FB

One slope scaffold stairway

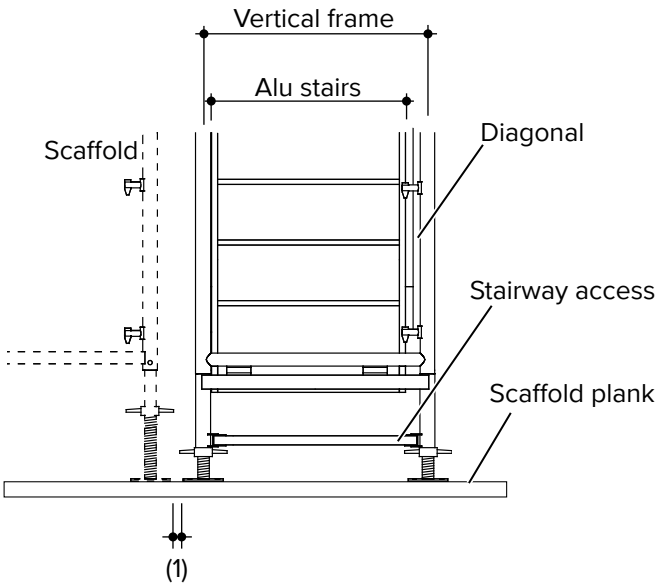
The scaffold stairway may only be installed on a surface capable of supporting the load. A load-distributing base structure (e.g. timber planks) must be used if the ground is too soft



NOTE

Note

Place base plates of base jacks as close to each other as possible (1).

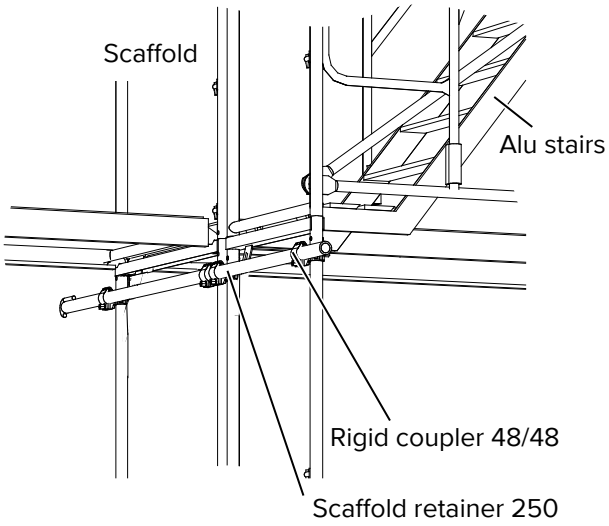


WARNING

Warning!

Danger of falling during installation!
Appropriate safety precautions according to the risk assessment must be taken!

Unless stated otherwise, all dimensions are in mm.



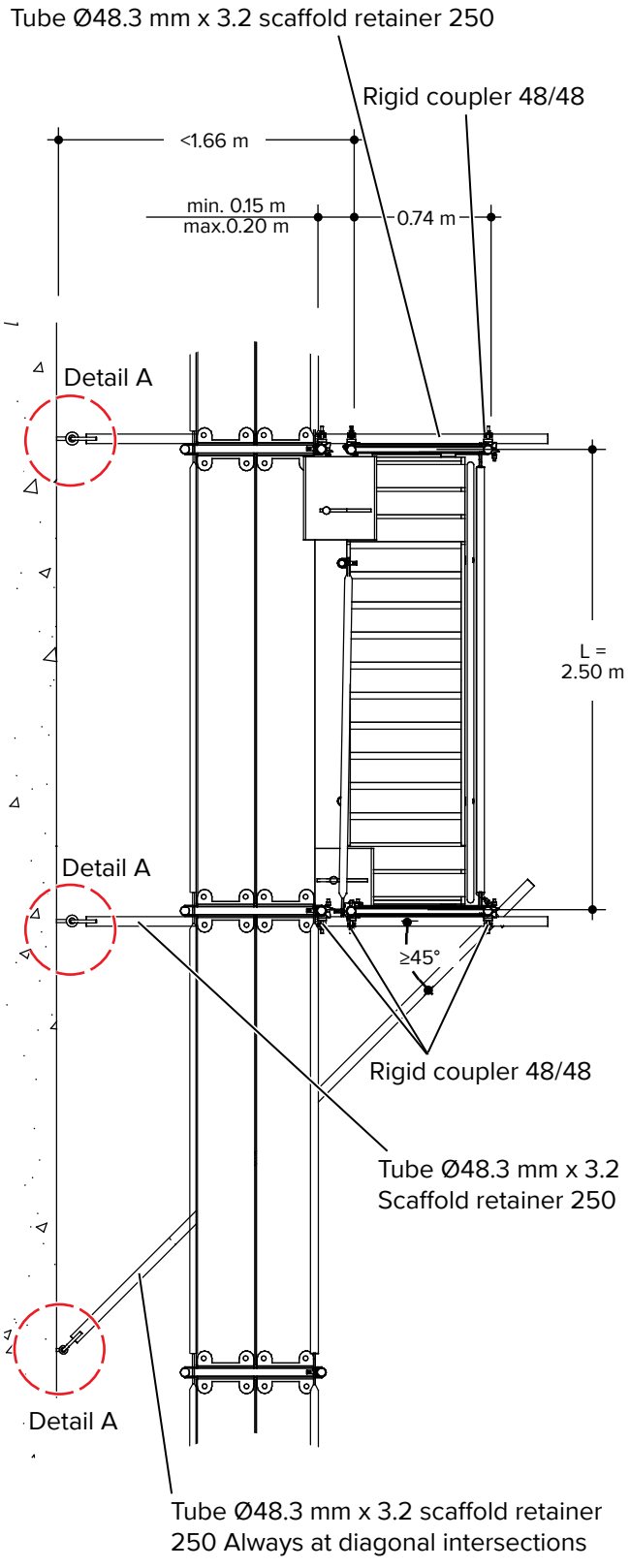
Use the scaffold retainers and couplers to connect the stairway to the scaffold.

NOTE	**Note** For tie-in forces also see chapter *Tying* on page 72.

8.1.2 Tying of scaffold stairway

Vertical tie distance

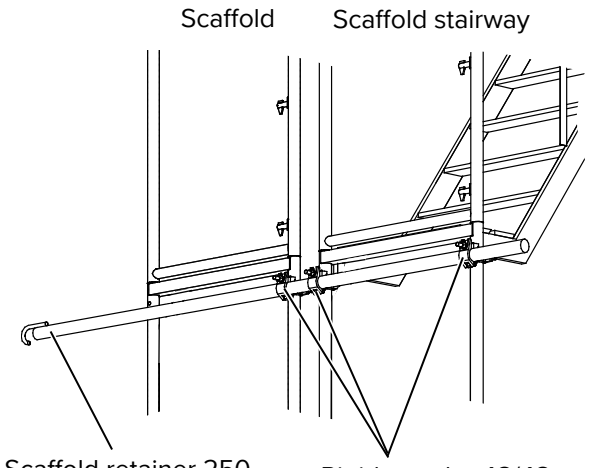
The stairway must be tied to the building's facade at a height of max. 4.5 m above the ground. The following tying points must be placed at a max. distance of 4.0 m. Always place ties in the highest stairway level and to the one below.

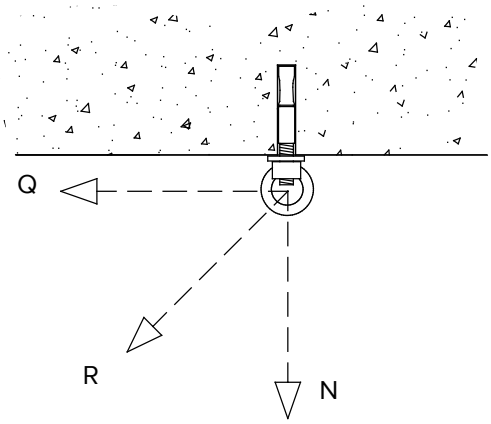


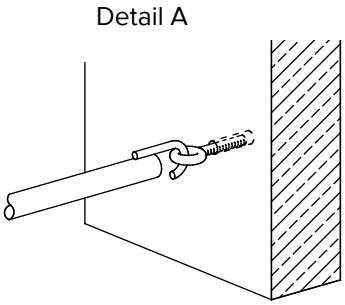
Use facade ties to attach the scaffold stairway to the scaffold.

Unless stated otherwise, all dimensions are in mm.

For tie forces, see table below.







8.1.3 Tie forces

Tying distance	N [kN]	Q [kN]	R [kN]
4.0 m	3.5	3.5	4.9

NOTE

Note

For tie-in forces also see chapter “9 Tying”.

8.2 Scaffold staircase with Alu Staircase G2 250/200

8.2.1 Erecting first scaffold level

Installing lower components

Step 1 If necessary, place sturdy bases (4) for the base jacks on the ground next to the vertical frame, spaced the same as the vertical frames.

Step 2 Place two base jacks (5) on each base or on the ground.

Step 3 Attach the stairway access to the base jacks on the side from which the staircase is to be ascended.

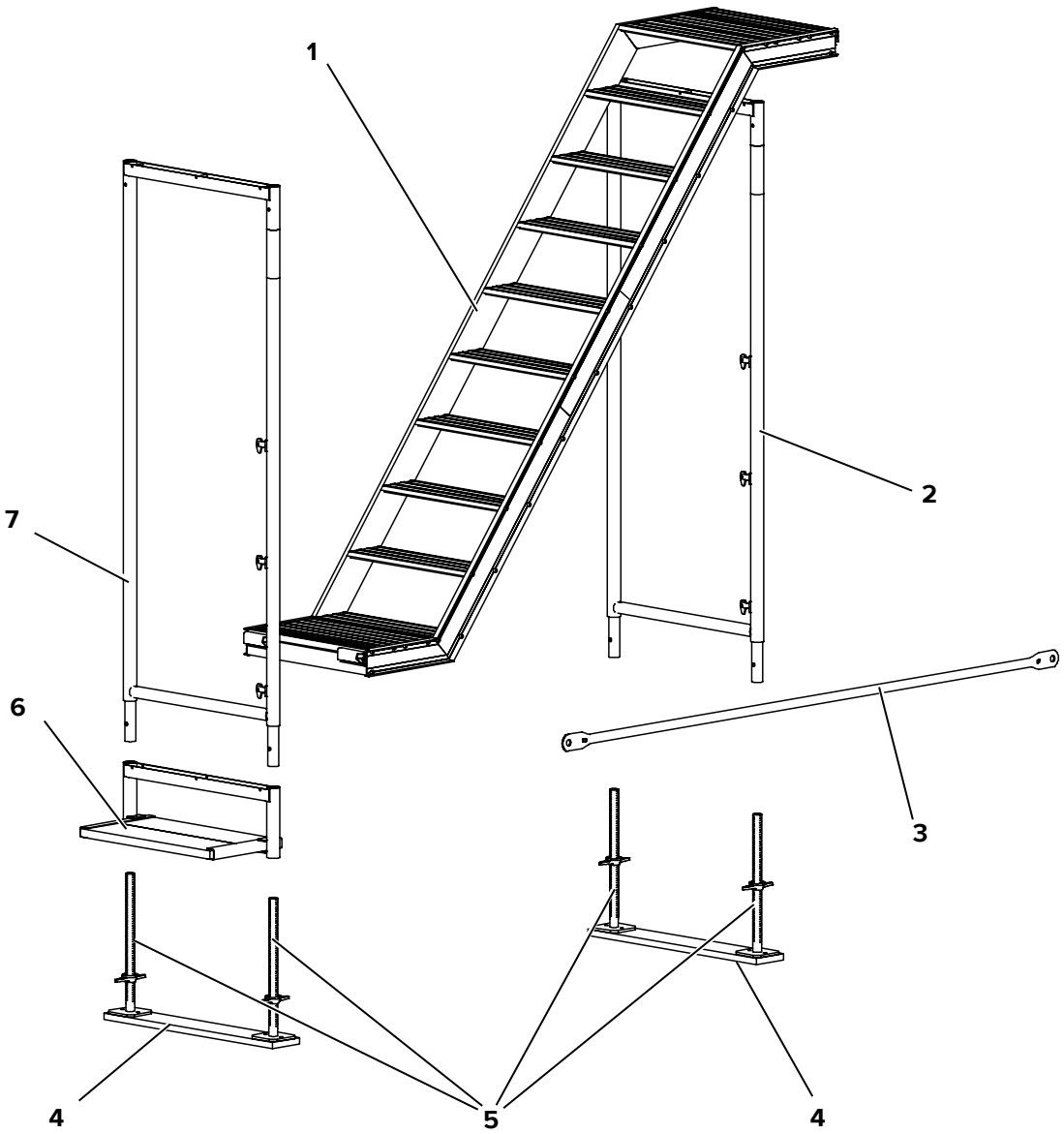
Step 4 Place the Vertical Frame 200/70 (2) on the other base jacks and have someone brace them.

Step 5 Insert the lower supporting latches on the Alu Staircase G2 250/200 (1) in the U-profile on the stairway access (6).

Step 6 Attach the upper supporting latches on the staircase to the vertical frame (2).

Step 7 Place the Vertical Frame 200/70 (7) on the stairway access.

Step 8 Attach the guard rail (3) to the lower clevis pin on the outside of the two Vertical Frames 200/70.



The vertical frames no longer need to be braced.

Unless stated otherwise, all dimensions are in mm.

Step 9 Use the base jacks to level the staircase such that the guard rail and stairway access are horizontal.

WARNING

Risk of serious and fatal injury due to falling from the staircase!

Until the Outer Handrail is attached, there is a risk of falling from the staircase.

- Do not ascend the staircase until the Outer Handrail is in place.
- Until then, use other means of ascending the scaffold to reach the next-higher level.

Step 10 Ascend to the first level of the scaffold and continue work from there.

Installing upper components

The tasks described in the next section have to be performed from the scaffold.

Step 1 Place two Vertical Frames 200/70 (1, 2) on the previous vertical frames by the stairway access and the upper end of the staircase (5).

Step 2 Attach the Vertical Frames 200/70 to the lower vertical frames with Ø 8 mm Frame Pins or screws M8.

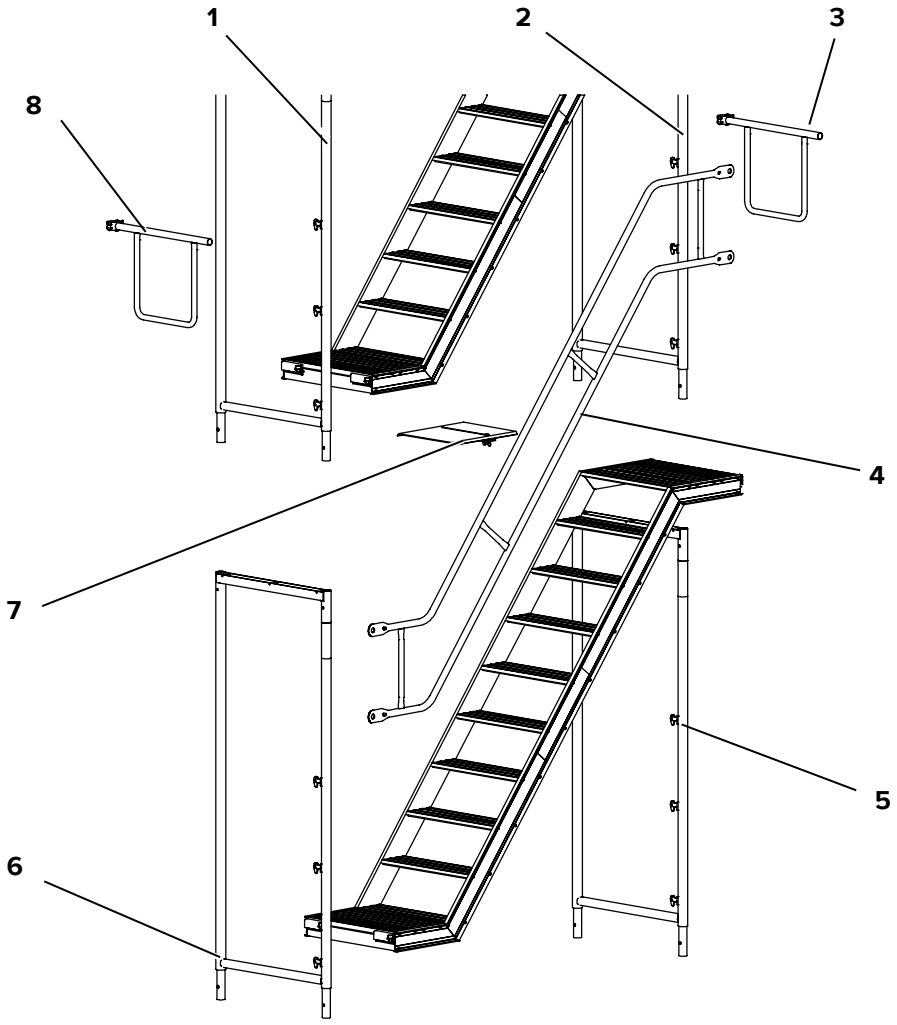
Step 3 Fasten the Alu Staircase G2 Outer Handrail 250/200 (4) to the middle and upper clevis pins on the Vertical Frame 200/70 at the stairway access (6) and the upper Vertical Frame 200/70 (2).

Step 4 Attach the Double Rail 70 Trans (3) to the upper clevis pin on the upper Vertical Frame 200/70 (2).

Step 5 Connect the coupler on the Double Rail 70 Trans to the inner post of the Vertical Frame 200/70 (2).

Step 6 Connect the Double Rail 70 Trans (8) to the lower Vertical Frame 200/70 (1) in the same way.

Step 7 Install the Gap Plate (7) between the top step of the staircase and the plank.



8.2.2 Erecting additional levels

Subsequent levels are erected in the same way, the only difference being how the upper-most level is erected (Refer to page 70). Follow these steps for each level:

Step 1 Place two Vertical Frames 200/70 on the previous two Vertical Frames 200/70 of the staircase.

Step 2 Attach both Vertical Frames 200/70 to the lower Vertical Frames 200/70 with Ø 8 mm Frame Pins or screws M8.

Step 3 Attach the lower supporting latches on the staircase to the lower Vertical Frame 200/70.

Step 4 Attach the upper supporting latches on the staircase to the upper Vertical Frame 200/70.

WARNING

Risk of serious and fatal injury due to falling from the staircase!

Until the Outer Handrail is attached, there is a risk of falling from the staircase.

- Do not ascend the staircase until the Outer Handrail is in place.
- Until then, use other means of ascending the scaffold to reach the next-higher level.

Step 5 Ascend to the next-higher level and continue erection.

Step 6 Fasten the Alu Staircase G2 Outer Handrail 250/200 to the middle and upper clevis pins on the two Vertical Frames 200/70.

Step 7 Attach Double Rails 70 Trans to the two Vertical Frames 200/70 as described in the previous section.

Step 8 Install Gap Plates to the top and bottom, between the respective landings and the plank.

Step 9 Repeat steps 1 to 8 for additional levels.

Step 10 Tie the scaffold staircase to the scaffold and the façade every 4 m as described in the following section.

8.2.3 Tying staircase

DANGER

Risk of fatal injury due to scaffold or staircase tipping over!

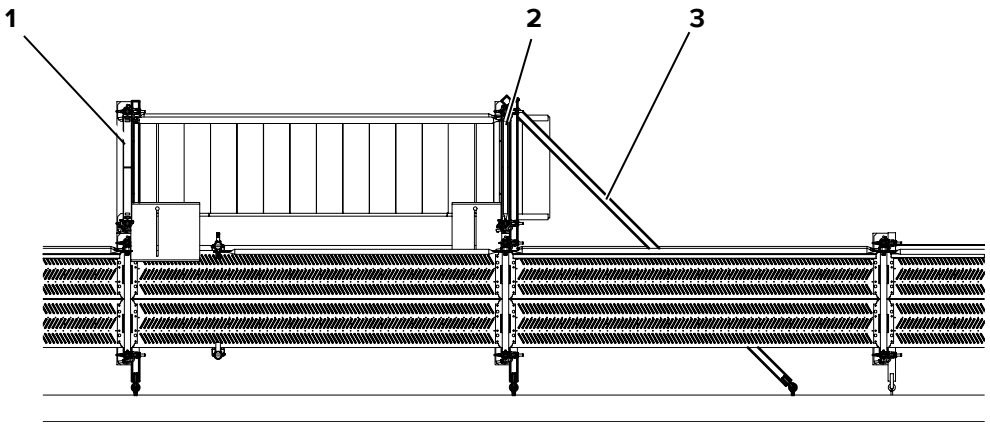
The staircase or scaffold can tip over if not tied properly. Risk of fatal injury.

- Tie the staircase at every other level of the scaffold.
- Follow the instructions on tying contained in the user guide for the scaffold.

The staircase has to be tied every 4 m in height (every other scaffold level) and at the upper-most level. The lowest tie point may not be higher that 4.5 m off the ground.

A staircase tie for a single level consists of these components:

- Two scaffold retainers (1, 2) attached to all vertical posts of the staircase and the scaffold, to tie the staircase and scaffold to the façade at a right angle
- One scaffold retainer connected to the exterior vertical post to tie the staircase to the façade at an angle of at least 45° (3).
- Four rigid couplers per scaffold retainer (1, 2) to secure the scaffold retainer to the vertical posts of the scaffold and staircase
- One rigid coupler to attach the diagonal scaffold retainer (3) to the vertical post of the staircase
- A suitable tie for each scaffold retainer to secure to the façade (Refer to page 72)



Tying staircase and scaffold

Use suitable scaffold retainers to tie both ends of the staircase to the façade, securing at a right angle and as high as possible.

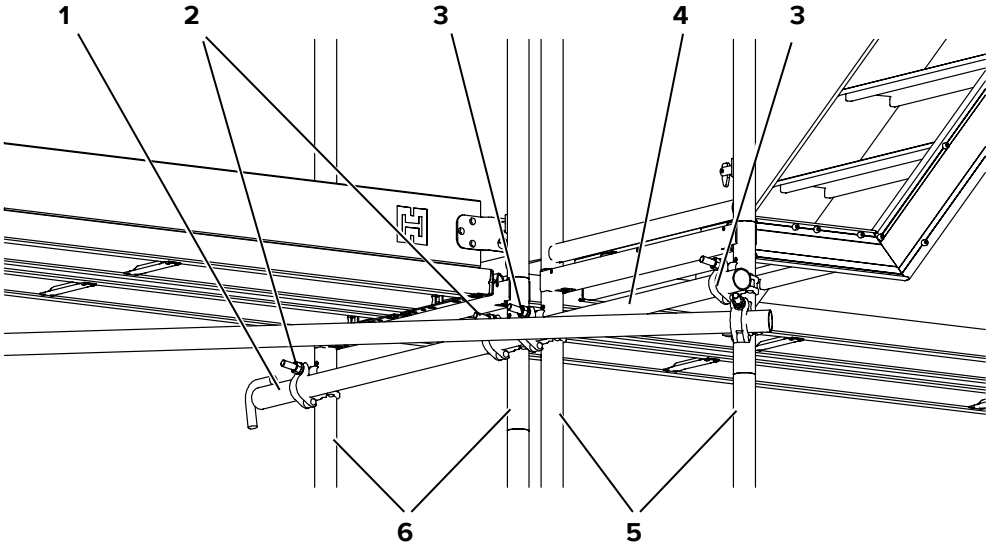
Step 1 Attach a rigid coupler (2) to each of the two vertical posts of the scaffold's Vertical Frame 200/70 (6).

Step 2 Attach a rigid coupler (3) to each of the two vertical posts of the staircase's Vertical Frame 200/70 (5).

Step 3 Tie a scaffold retainer (4) of the proper length to the façade using a suitable fastener (1).

Step 4 Attach the scaffold retainer to the Vertical Frame 200/70 with the four rigid couplers (2, 3).

Step 5 Repeat steps 1 to 4 to tie the other side of the staircase.

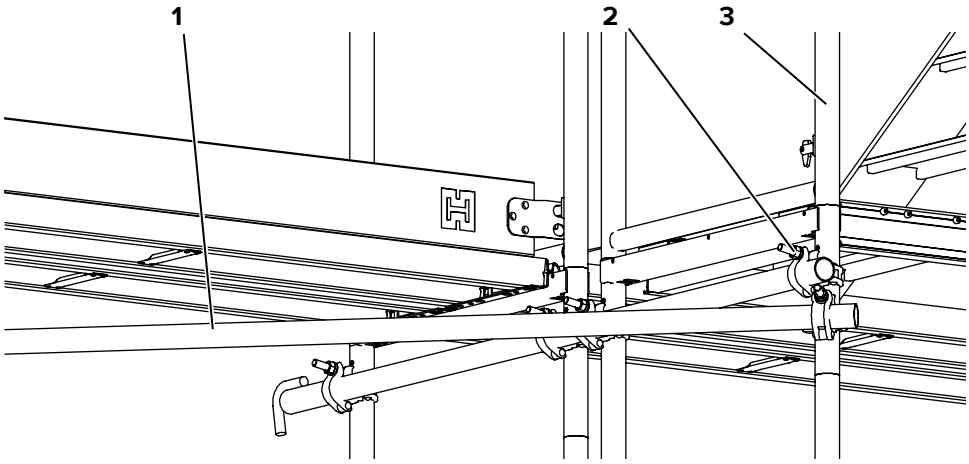


Tying staircase diagonally

The side of the staircase also has to be tied diagonally to the façade at an angle of at least 45°.

Step 1 Attach a rigid coupler (2) to the exterior post of the desired Vertical Frame 200/70 (3) of the stairs.

Step 2 Tie a scaffold retainer (1) of the proper length to the façade using a suitable fastener.



8.2.4 Assembling upper-most level

Step 1 Place a Vertical Frame 200/70 (6) on the previous Vertical Frame 200/70 where the staircase ends.

Step 2 Attach the Vertical Frame 200/70 to the lower vertical frame with Ø 8 mm Frame Pins or Screws M8.

Step 3 Connect a Twin-railing Post 70 Trans light (1) to the previous Vertical Frame 200/70 where the staircase begins.

Step 4 Connect the Twin-railing Post 70 Trans light to the lower vertical frame with Ø 8 mm Frame Pins or Screws M8.

Step 5 Connect the Double Rail 70 Trans (8) to the Vertical Frame 200/70 (6).

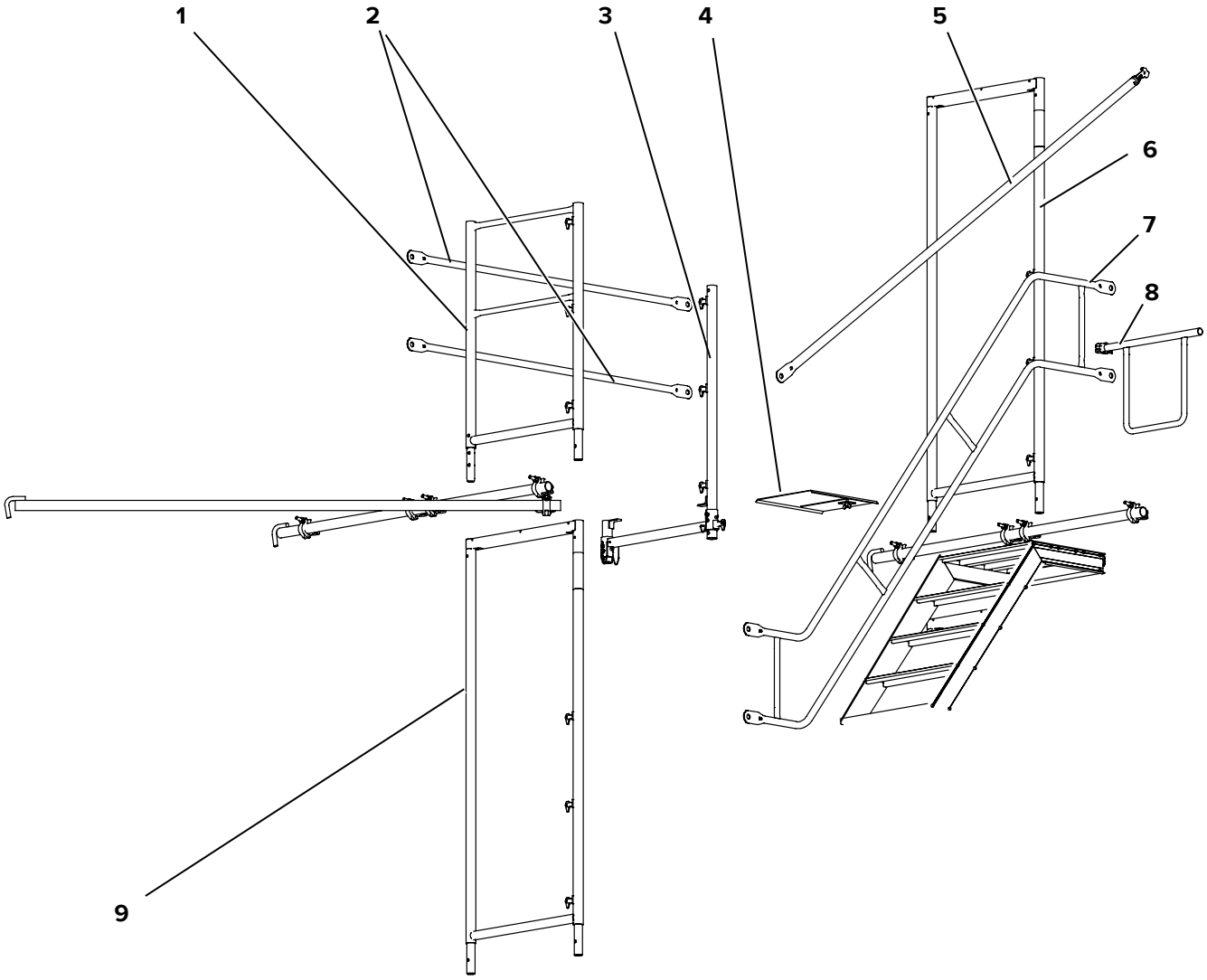
Step 6 Insert a diagonal (5) of the required length between the Twin-railing Post Trans light (1) and the Vertical Frame 200/70.

Step 7 Install a Recess Bracket (3) in the plank on the upper-most level of the scaffold.

Step 8 Attach two Guard Rails 190 (2) to the upper and middle clevis pins on the Recess Bracket and the Twin-railing Post 70 Trans light to serve as handrail and knee rail.

Step 9 Install a suitable Gap Plate (4) between the landing and the upper-most level of the scaffold.

Step 10 Secure the staircase to the scaffold and tie it to the façade as described beginning on page 72.



9 Tying

9.1 General

The following pages contain the information for the anchoring loads and anchoring grid for the different assembly alternatives. All anchoring must be installed along with the scaffolding as the assembly advances. As equipment for a secure attachment, eyelet bolts with an eye diameter of 23 mm must be used.

Appropriate dowels must be selected as part of the anchoring system. Eyelet screws with wood-thread that are normally used with plastic dowels and eyelet screws with a metric thread are to be used with metallic expansion dowels or to secure the scaffolding to a tying system. The eyelet screws must comply with a minimum load class of 4.6 and a diameter of 12 mm. As corrosion prevention measure, the screws must be galvanized and the eyes must be welded. The screws must have marking on the shaft, the last one about 2.0 cm from the eye. Independent from the length of use, all eyelet screws must be screwed in to the last marking as only this can ensure that the screw carries the loads parallel to the facade. During the dismantling of the scaffolding, all anchors must be removed and the open holes covered with plaster or concealed with a plastic cover. A plastic cover prevents water from entering through the opening into the facade and permits reusing the hole in the future. The anchoring loads are stated in the charts on the following pages.

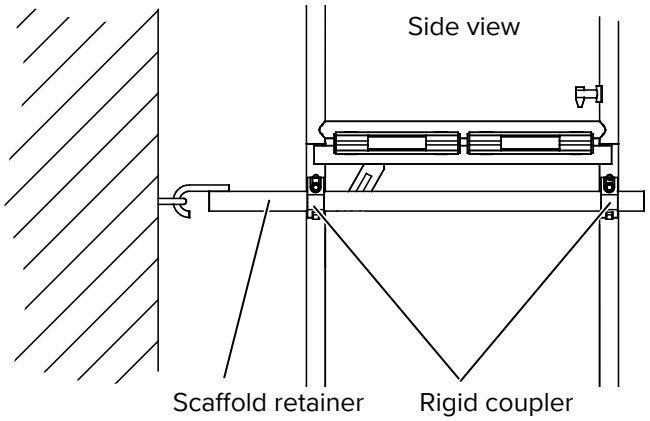
9.2 Scaffold retainer

The information for the anchoring loads and anchoring grid for the different assembly alternatives can be found on page 77.

Tying solution A1

Securing the scaffold retainer to the inner and outer vertical frame elements with rigid couplers.

Tying solution A1: Long scaffold retainer

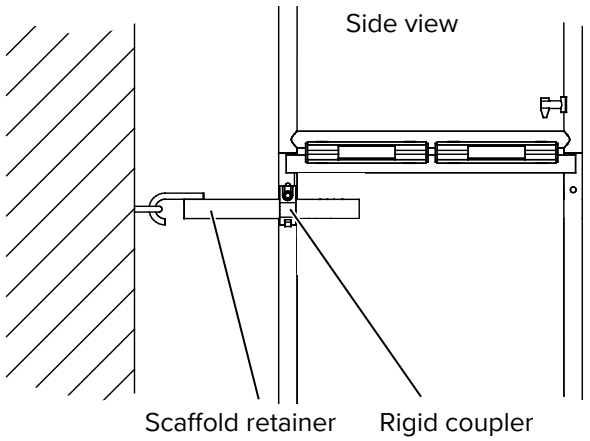


Tying solution A2

Securing the scaffold retainer only to the inner vertical element. In this case, every third anchor must be built as a V shape (as trestle or frame support).

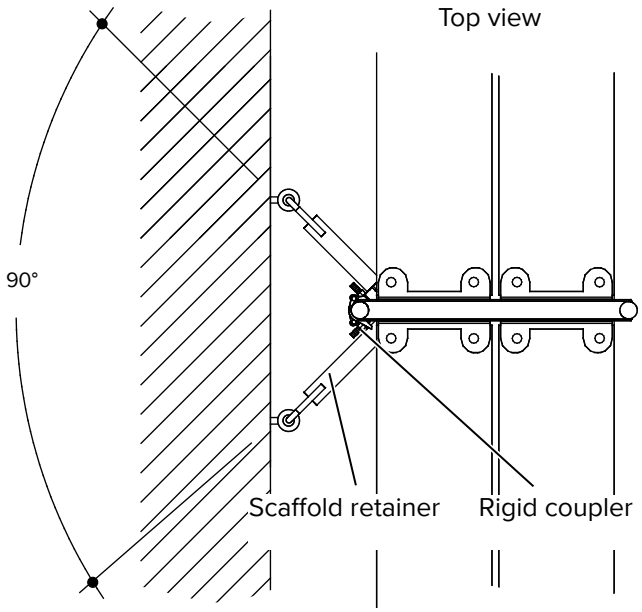
Unless stated otherwise, all dimensions are in mm.

Tying solution A2: Short scaffold retainer



More about tying with the facade insulation system see page 97.

Tying solution A2: Every 3rd tying point in V shape



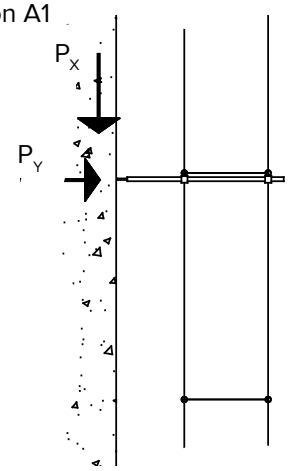
NOTE

Note

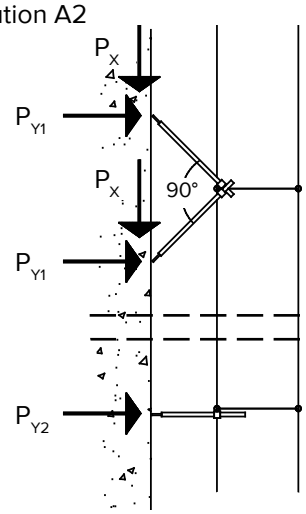
The tie pattern for standard scaffolds, can be found starting on page 77.

The tables starting on page 77 differentiate between the tying solutions A1 and A2 and uncovered scaffolds or scaffolds covered with nets or tarpaulins, scaffold lengths between 2.50 m to 3.00 m, as well as “open” and “closed” building facades.

Tying solution A1



Tying solution A2



9.3 Notes concerning the layout and testing of tying points

- All tie forces must be transferred through the scaffold retainer and fastening elements into an appropriate load-bearing anchor surface (e.g. building facade). Appropriate fastening elements are devices referred to in DIN 4426 “Equipment for building maintenance safety requirements”. Wires and strings must not be used to tie the scaffold. The following surfaces can be used as load-bearing surfaces:

- concrete ceilings, walls, and support structures made from reinforced concrete.

- carrying walls according to DIN 1053.

WARNING

Warning!

It is not permitted to use snow fences, lightning rods, drain pipes, or window frames to tie the scaffold.

- The load capacity of the fastening elements between the scaffold retainers and the load-bearing surface must be proven.
  The approval of the load bearing capacity of the fixing elements can be made by e.g.:
  - A certificate from the “Institut für Bautechnik” in Berlin.
  - Load tests
- If fixing elements with a certificate are used, the requirements of this certificate must be adhered to.
  The requirements may include:
  - approval of tying ground,
  - required component dimensions
  - edge distances.
  - specific installation instructions.
- If load tests are required, perform them at the point of use.

- Appropriate testing equipment must be used when performing load tests. Proper equipment is considered any device having met the approval of the Technical Committee “Bau” of the “Zentralstelle für Unfallverhütung und Arbeitsmedizin (ZefU)” [German authority for the prevention of accidents at the workplace]. An expert in this field must determine the number and locations of tie-in points, which will be selected for the required load tests. Such an expert must have the necessary technical knowledge and must have sufficient understanding in the area of scaffold installation. He must also be familiar with the relevant federal industrial health and safety standards, and regulations for the prevention of accidents at the workplace. He should have general knowledge of acceptable technical standards (e.g.: DIN Standards) in order to properly access and evaluate the condition of the scaffold tie-in points.
- Load tests must be conducted based on the following criterion:
  - The test load must be 1.2 times the required tie load P_y,

  When using concrete as anchor surface for load testing,
  - the scope of the test must include at least 10% of all dowels and a minimum of 5 different load tests must be performed.
  - for all other building materials, 30% of all dowels must be tested and a minimum of 5 different load tests must be performed.
- If some or several fastening elements fail the load test, the expert must
  - determine the cause,
  - find another substitute fastening location and,
  - if necessary, increase the scope of the test.
- All test results must be recorded and retained during the operation time, while the scaffold is being used.
- Therefore the scaffold tie certificate in the appendix on page 125 can be used.

Overview of applicable planks and their allocation to the load classes according to DIN EN 12811-1

		Classification in load classes according to DIN EN 12811-1 within length of bay in [cm]						
Type of plank	**Width [cm]**	**74**	**125**	**150**	**200**	**250**	**300**	**400**
Timber plank (TP)	32	6	6	6	5	4	3	
Hollow box plank (HBP)	32	6	6	6	5	4	3	
Steel plank (SP)	32		6	6	6	5	4	3
Alu plank (AP)	32		6	6	6	6	5	3
Alu frame deck (AFD)	65				3	3	3	

Live loads according to DIN EN 12811-1

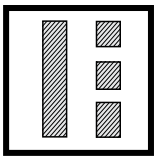
Load class LC	Nominal load per area p [kN/m²]	Single load 1) P_1 [kN]	P_2 [kN]	Partial area load kN/m²	Ac
1	0.75 2)	1.5	1.0	-	-
2	1.50	1.5	1.0	-	-
3	2.00	1.5	1.0	-	-
4	3.00	3.0	1.0	5.0	0.4 x AP
5	4.50	3.0	1.0	7.5	0.4 x AP
6	6.00	3.0	1.0	10.0	0.4 x AP

[1] P_1 load area 0.5 m x 0.5 m, min. 1.5 kN per plank
P_2 load area 0.2 m x 0.2 m

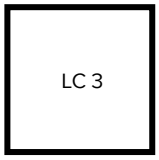
[2] for planks p = 1.50 kN/m²
A_B = plank surface according to DIN EN 12811-1

Explanation of pictogrammes

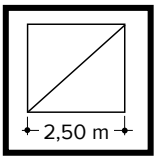
With or without cladding



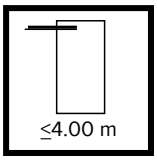
Closed + open facade



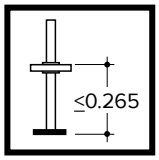
Load class 3



Bay length (e.g. 2.50m)



First tying point (e.g. 4.00 m)



Jack extension (e.g. ≤26-5 cm

Unless stated otherwise, all dimensions are in mm.

9.4 Standard layout of tie pattern for load class 3

9.4.1 Scaffold without cladding tying solution A1

- Diagonal bracing continuously or in one bay shifting (as shown) or in one direction.
- One diagonal braces maximum 5 scaffold bays.
  Each scaffold level must be equipped with a 3-part side protection (exceptions see page 51).

1.) Additional ties at:
- Open facades with all planks except alu frame deck with L ≤2.50 m.
- Use of one 4.00 m bay.

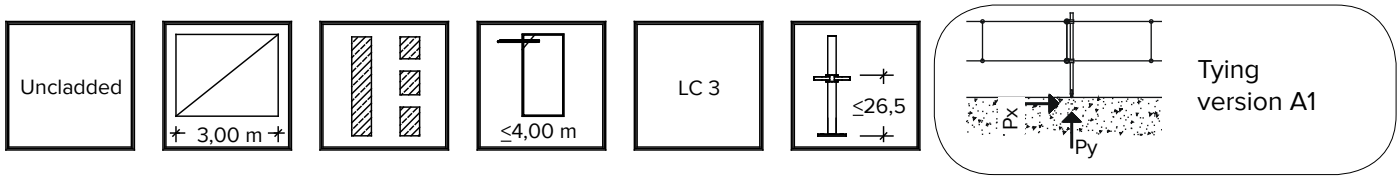
2.) Additional ties when using the adjustment stand, tube and coupler connection at the adjustment stand, guard rail as lateral bracing at the inside and outside.

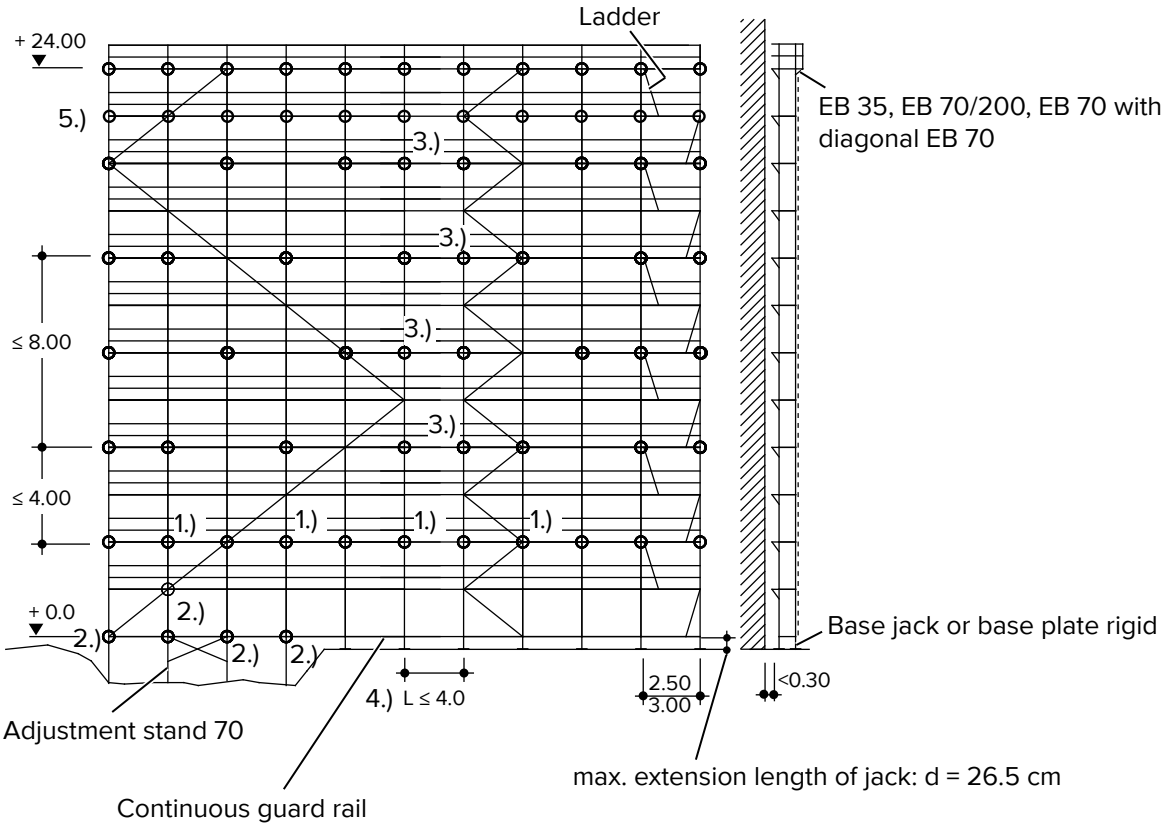
3.) Additional ties with open facade and 4.00 m bay.

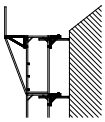
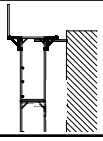
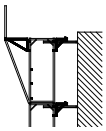
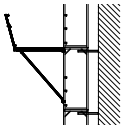
4.) One 4.00 m bay is permitted per 5 bays.

5.) Additional ties when using the enlargement bracket 70/200

1





Type of scaffold	Tie pattern	Length of scaffold bay = 3.00 m	
		open + closed facade	
		Px [kN]	Py [kN]
Protective roof scaffold level with outside bracket 0.70 m and inside bracket 0.35 m 	Upper tie	0.90	+1.95 / -3.10
	Lower tie	0.60	+3.85 / -2.7 0
Safety scaffold with outside bracket 0.35 cm and inside bracket 0.35 cm 	Upper tie	0.95	±1.95
	Lower tie	-	-
Safety scaffold with outside bracket 0.70 cm and inside bracket 0.35 cm 	Upper tie	0.80	+1.20 / -2.15
	Lower tie	0.65	+4.20 / -3.25
Protective roof level 	Upper tie	0.70	+3.00 / -6.90
	Lower tie	0.50	+5.05 / -1.10

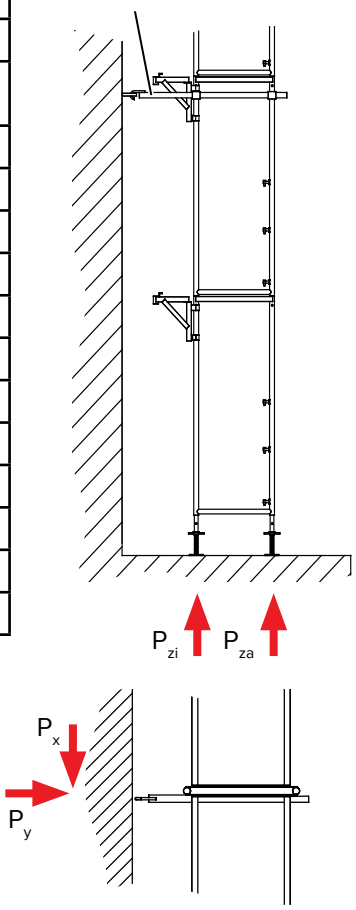
(- = tension) (+ = pressure)

Scaffold uncladded, tying version A1

Tie forces: open facade			Tie forces: closed facade	
	Long retainer		Long retainer	
Tie level H [m]	Px [kN]	±Py [kN]	Px [kN]	±Py [kN]
24	1.01	2.63	1.01	1.06
22	-	-	-	-
20	1.39	4.55	1.39	1.79
18	-	-	-	-
16	1.31	4.02	1.31	1.58
14	-	-	-	-
12	1.20	3.72	1.20	1.36
10	-	-	-	-
8	1.06	3.21	1.06	1.20
6	-	-	-	-
4	0.90	3.10	0.90	1.24
2	-	-	-	-

Support	P_{zi} = 16.80 kN
	P_{za} = 19.05 kN

Scaffold retainer



Unless stated otherwise, all dimensions are in mm.

9.4.2 Scaffold without cladding tying version A2

- Diagonal bracing continuously or in one bay shifting (as shown) or in one direction.
- One diagonal braces maximum 5 scaffold bays.
  Each scaffold level must be equipped with a 3-part side protection (exceptions see page 51).

1.) Additional ties at:
- Open facades with all planks except alu frame deck with L ≤2.50 m.
- Use of one 4.00 m bay.

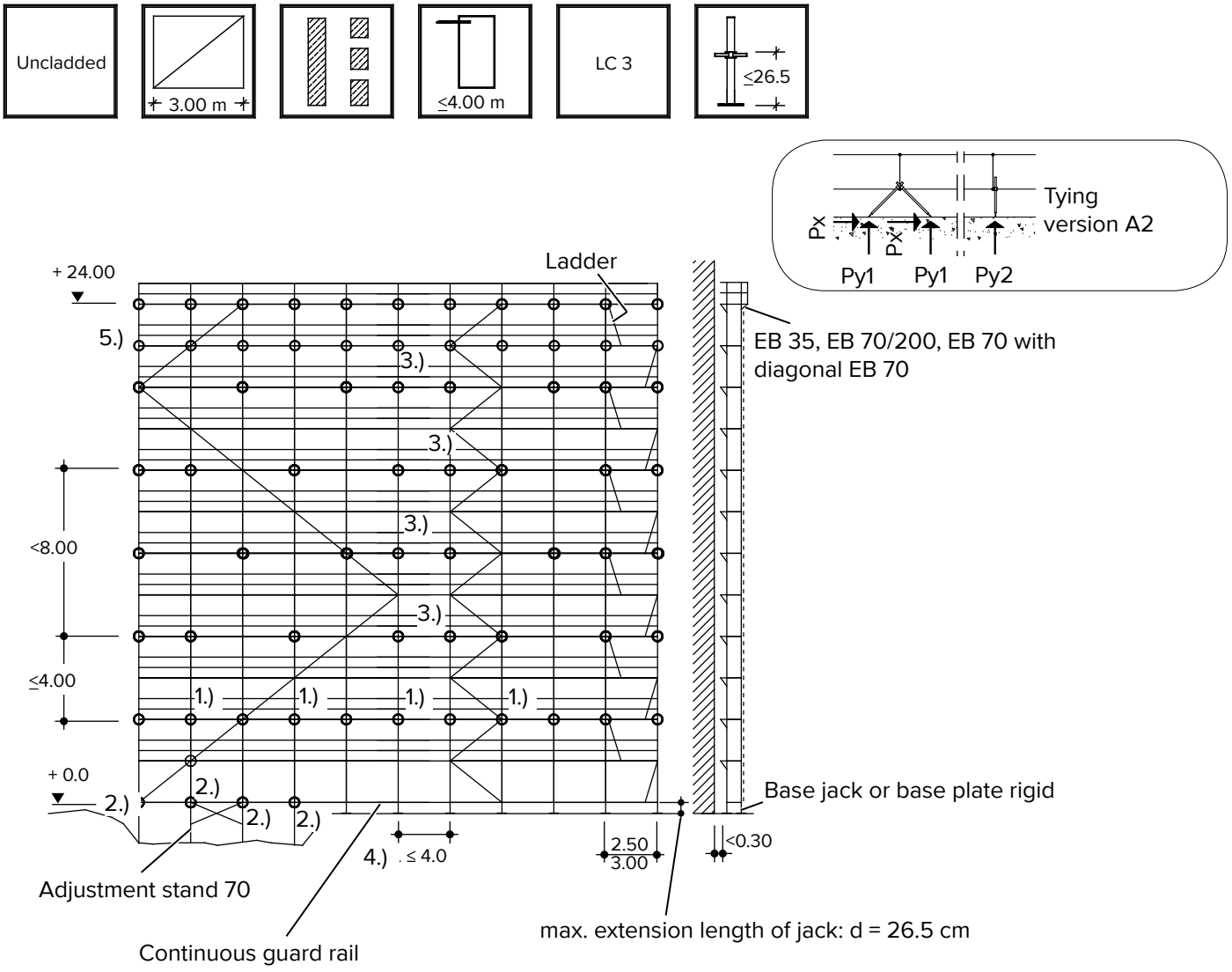
2.) Additional ties when using the adjustment stand, tube and coupler connection at the adjustment stand, guard rail as lateral bracing at the inside and outside.

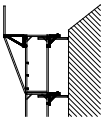
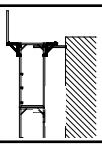
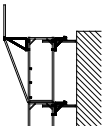
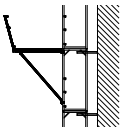
3.) Additional ties with open facade and 4.00 m bay.

4.) One 4.00 m bay is permitted per 5 bays.

5.) Additional ties when using the enlargement bracket 70/200.

2

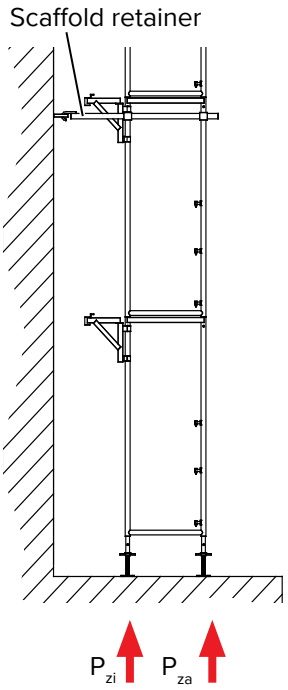


Type of scaffold	Tie pattern	Length of scaffold bay = 3.00 m		
		open + closed facade		
		Px [kN]	Py1 [kN]	Py2 [kN]
Protective roof scaffold level with outside bracket 0.70 m and inside bracket 0.35 m 	Upper tie	1.55	+1.15 / -1.55	+1.95 / -3.10
	Lower tie	1.90	+1.90 / -1.35	+3.85 / -2.70
Safety scaffold with outside bracket 0.35 cm and inside bracket 0.35 cm 	Upper tie	1.05	±1.05	±1.95
	Lower tie	-	-	-
Safety scaffold with outside bracket 0.70 cm and inside bracket 0.35 cm 	Upper tie	1.10	+1.00 / -1.10	+1.20 / -2.15
	Lower tie	2.10	+2.10 / -1.60	+4.20 / -3.25
Protective roof level 	Upper tie	3.45	+1.50 / -3.45	+3.00 / -6.90
	Lower tie	2.55	+2.55 / -0.85	+5.05 / -1.10

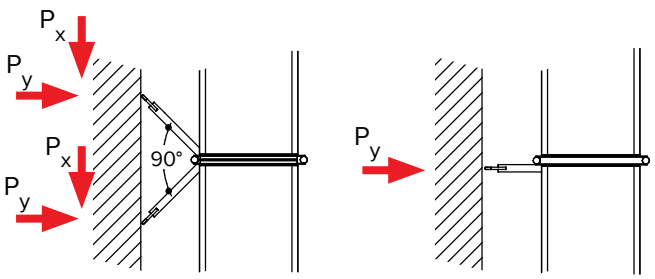
(- = tension) (+ = pressure)

Scaffold uncladded, tying version A2

Tie forces: open facade				Tie forces: closed facade		
	V-shaped tying point		Short retainer	V-shaped tying point		Short retainer
Tie level H [m]	Px [kN]	±Py [kN]	±Py [kN]	Px [kN]	±Py [kN]	±Py [kN]
24	1.31	1.31	2.63	1.18	1.18	1.06
22	-	-	-	-	-	-
20	2.62	2.62	4.55	2.62	2.62	1.79
18	-	-	-	-	-	-
16	2.33	2.33	4.02	2.33	2.33	1.58
14	-	-	-	-	-	-
12	2.12	2.12	3.72	2.12	2.12	1.36
10	-	-	-	-	-	-
8	1.99	1.99	3.21	1.99	1.99	1.20
6	-	-	-	-	-	-
4	1.87	1.87	3.10	1.87	1.87	1.24
2	-	-	-	-	-	-



Support	P_{zi} = 16.80 kN
	P_{za} = 19.05 kN



Unless stated otherwise, all dimensions are in mm.

9.4.3 Scaffold with net tying version A1

- Diagonal bracing continuously or in one bay shifting (as shown) or in one direction.
- One diagonal braces maximum 5 scaffold bays. Each scaffold level must be equipped with a 3-part side protection (exceptions see page 51).

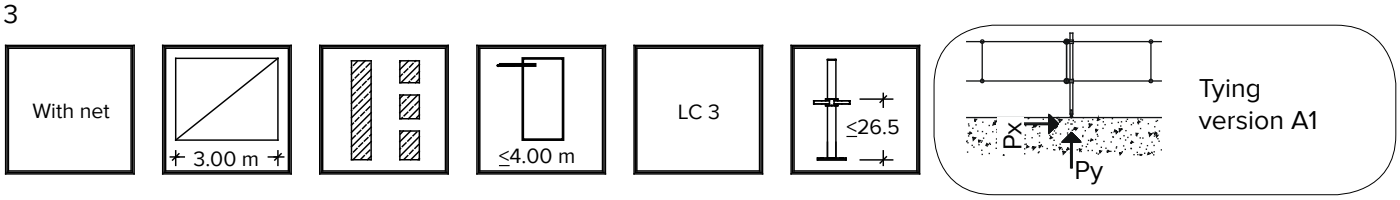
1.) Additional ties when using the adjustment stand, tube and coupler connection at the adjustment stand, guard rail as lateral bracing at the inside and outside.

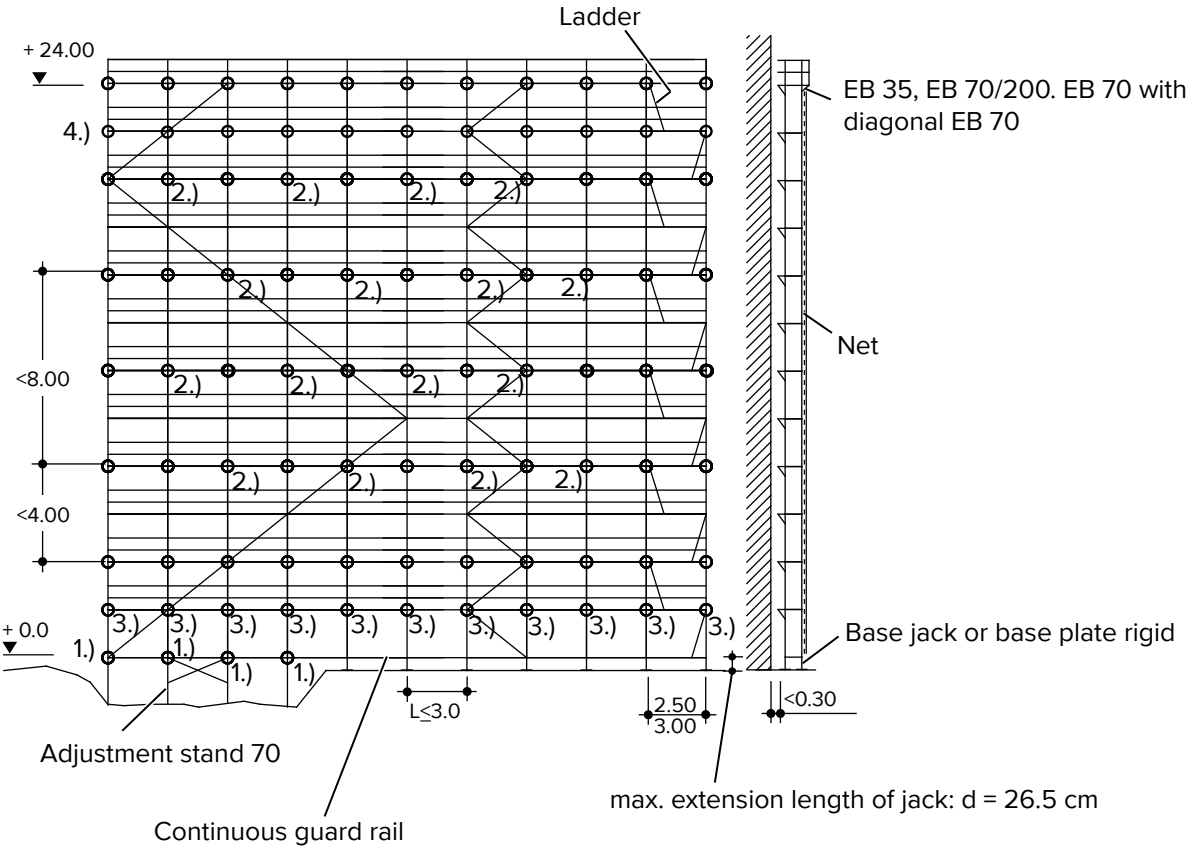
2.) Additional ties with open facade.

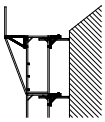
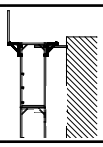
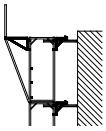
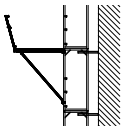
3.) Additional ties with open facade and 3.00 m bay.

4.) Additional ties when using the enlargement bracket 70/200

3





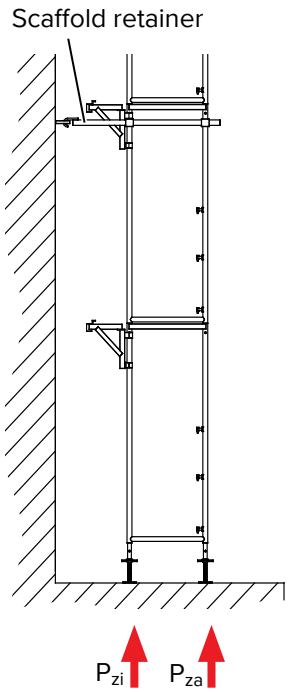
Type of scaffold	Tie pattern	Length of scaffold bay = 3.00 m open + closed facade	
		Px [kN]	Py [kN]
Protective roof scaffold level with outside bracket 0.70 m and inside bracket 0.35 m 	Upper tie	1.20	2.35 / -3.50
	Lower tie	0.90	+2.65 / -1.50
Safety scaffold with outside bracket 0.35 cm and inside bracket 0.35 cm 	Upper tie	1.30	±2.45
	Lower tie	-	-
Safety scaffold with outside bracket 0.70 cm and inside bracket 0.35 cm 	Upper tie	1.10	+1.60 / -2.55
	Lower tie	0.95	+3.00 / -2.,05
Protective roof level 	Upper tie	1.25	+3.35 / -7.30
	Lower tie	1.00	+5.45 / -1.50

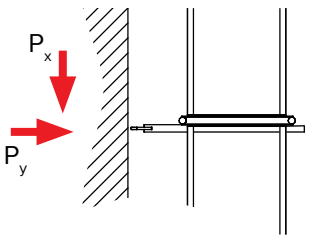
(- = tension) (+ = pressure)

Scaffold with net, tying version A1

Tie forces: open facade			Tie forces: closed facade	
	Long retainer		Long retainer	
Tie level H [m]	Px [kN]	±Py [kN]	Px [kN]	±Py [kN]
24	1.38	3.02	0.99	1.52
22	-	-	-	-
20	1.50	4.70	1.38	2.45
18	-	-	-	-
16	1.41	3.75	1.30	3.09
14	-	-	-	-
12	1.29	3.61	1.18	2.56
10	-	-	-	-
8	1.12	3.54	1.02	1.74
6	-	-	-	-
4	0.93	3.24	0.65	1.87
2	0.70	1.63	-	-

Support	P_{zi} = 14.10 kN
	P_{za} = 16.25 kN





Unless stated otherwise, all dimensions are in mm.

9.4.4 Scaffold with net tying version A2

Diagonal bracing continuously or in one bay shifting (as shown) or in one direction.

- One diagonal braces maximum 5 scaffold bays.
  Each scaffold level must be equipped with a 3-part side protection (exceptions see page 51).

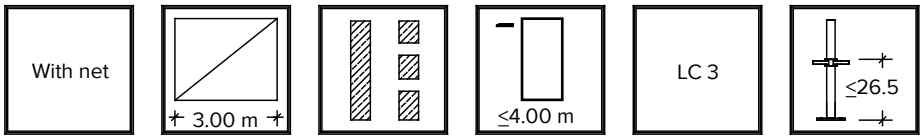
1.) Additional ties when using the adjustment stand, tube and coupler connection at the adjustment stand, guard rail as lateral bracing at the inside and outside.

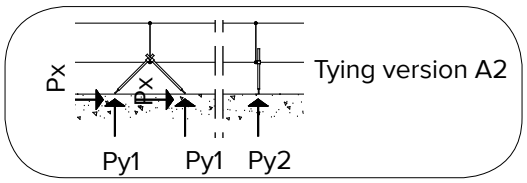
2.) Additional ties with open facade.

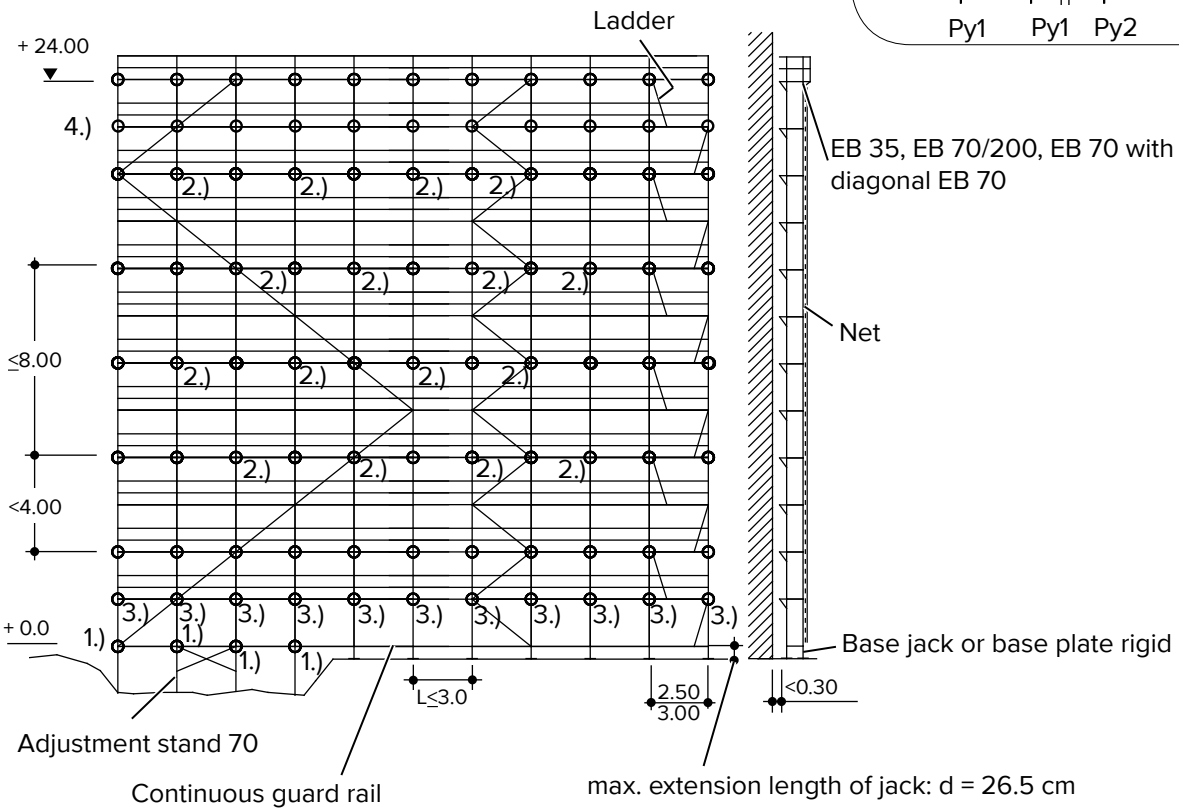
3.) Additional ties with open facade and 3.00 m bay.

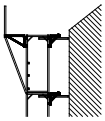
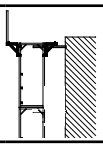
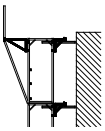
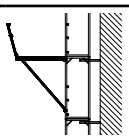
4.) Additional ties when using the enlargement bracket 70/200.

4





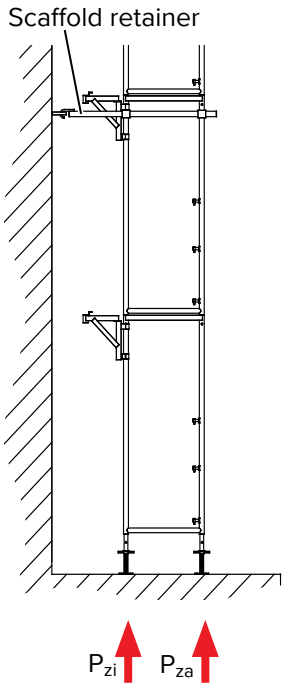


Type of scaffold	Tie pattern	Length of scaffold bay = 3.00 m open + closed facade		
		Px [kN]	Py1 [kN]	Py2 [kN]
Protective roof scaffold level with outside bracket 0.70 m and inside bracket 0.35 m 	Upper tie	1.75	+1.60 / -1.75	+2.35 / -3.50
	Lower tie	1.30	+1.30 / -1.20	+2.65 / -1.50
Safety scaffold with outside bracket 0.35 cm and inside bracket 0.35 cm 	Upper tie	1.75	±1.75	±2.45
	Lower tie	-	-	-
Safety scaffold with outside bracket 0.70 cm and inside bracket 0.35 cm 	Upper tie	1.50	±1.50	+1.60 / -2.55
	Lower tie	1.50	+1.50 / -1.25	+3.00 / -2.05
Protective roof level 	Upper tie	3.65	+2.00 / -3.65	+3.35 / -7.30
	Lower tie	2.70	+2.70 / -1.65	+5.45 / -1.50

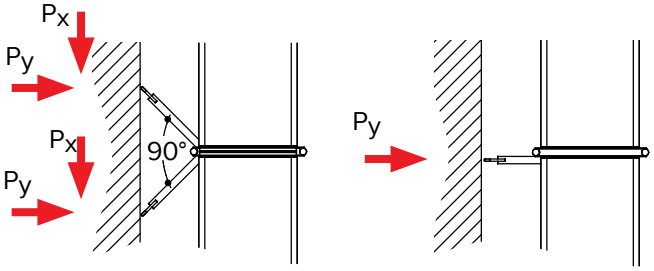
(- = tension) (+ = pressure)

Scaffold with net, tying version A1

Tie forces: open facade				Tie forces: closed facade		
	V-shaped tying point		Short retainer	V-shaped tying point		Short retainer
Tie level H [m]	Px [kN]	±Py [kN]	±Py [kN]	Px [kN]	±Py [kN]	±Py [kN]
24	1.89	1.89	3.02	1.13	1.13	1.52
22	-	-	-	-	-	-
20	2.37	2.37	4.70	2.60	2.60	2.45
18	-	-	-	-	-	-
16	2.27	2.27	3.75	2.38	2.38	3.09
14	-	-	-	-	-	
12	2.12	2.12	3.61	2.20	2.20	2.56
10	-	-	-	-	-	-
8	1.91	1.91	3.54	2.08	2.08	1.74
6	-	-	-	-	-	-
4	1.73	1.73	3.24	0.98	0.98	1.87
2	1.12	1.12	1.63	-	-	-



Support	P_{zi} = 14.10 kN
	P_{za} = 16.25 kN



Unless stated otherwise, all dimensions are in mm.

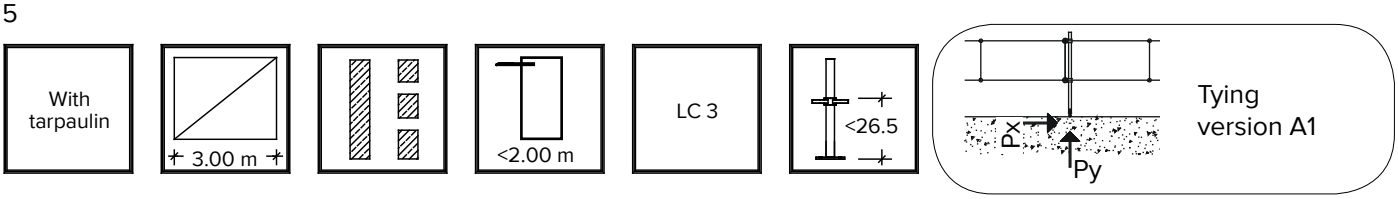
9.4.5 Scaffold with tarpaulin tying version A1

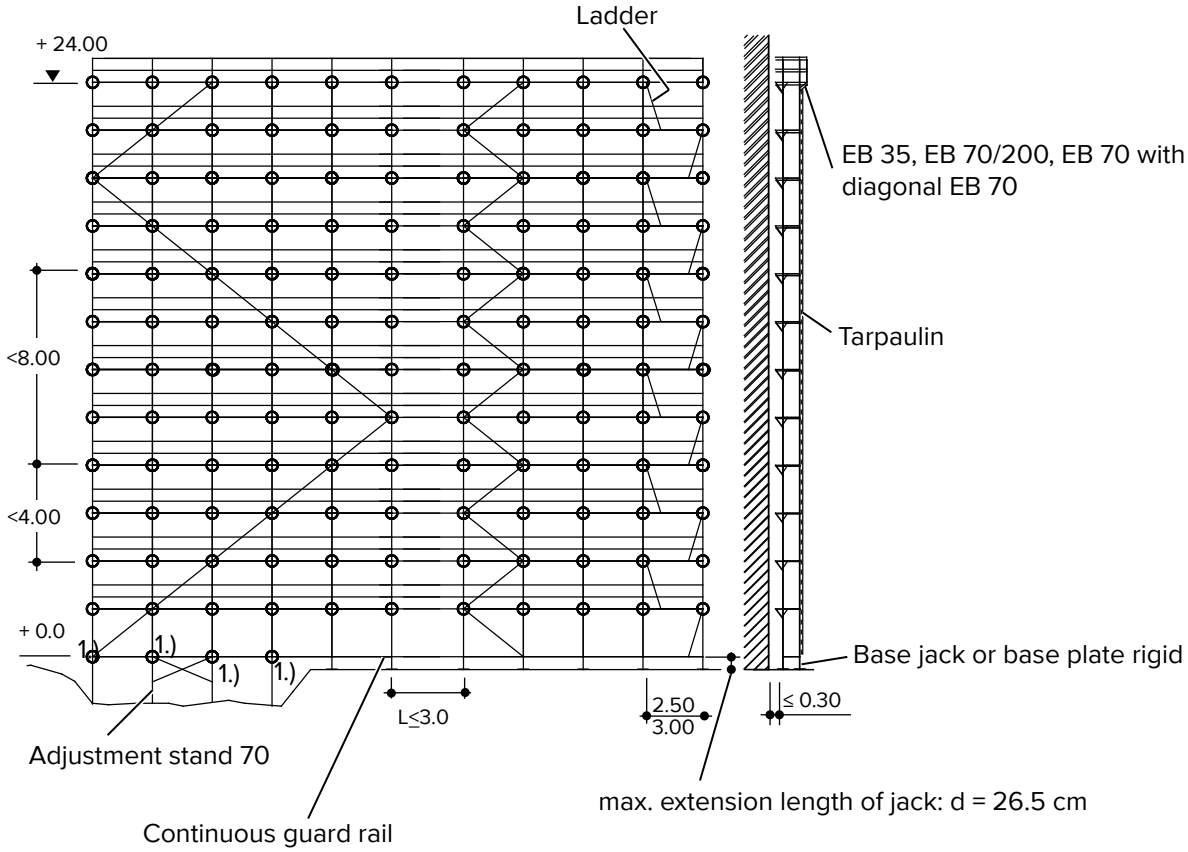
Diagonal bracing continuously or in one bay shifting (as shown) or in one direction.

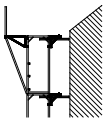
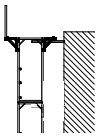
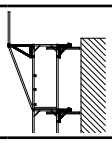
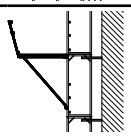
- One diagonal braces maximum 5 scaffold bays.
  Each scaffold level must be equipped with a 3-part side protection (exceptions see page 51).

1.) Additional ties when using the adjustment stand, tube and coupler connection at the adjustment stand, guard rail as lateral bracing at the inside and outside.

5



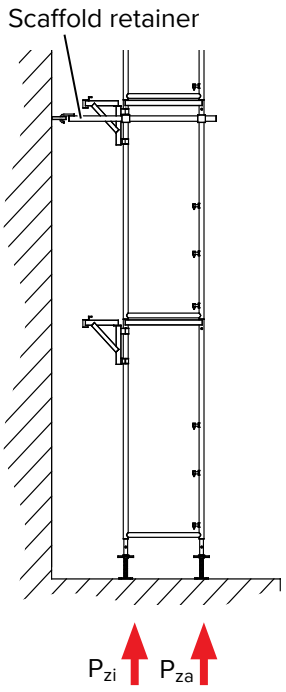


Type of scaffold	Tie pattern	Length of scaffold bay = 3.00 m	
		open + closed facade	
		Px [kN]	Py [kN]
Protective roof scaffold level with outside bracket 0.70 m and inside bracket 0.35 m 	Upper tie	1.05	3.80 / -4.75
	Lower tie	0.80	+6.95 / -5.15
Safety scaffold with outside bracket 0.35 cm and inside bracket 0.35 cm 	Upper tie	0.85	+3.20 / -2.95
	Lower tie	-	-
Safety scaffold with outside bracket 0.70 cm and inside bracket 0.35 cm 	Upper tie	1.00	+3.05 / -3.75
	Lower tie	0.80	+7.30 / -5.70
Protective roof level 	Upper tie	1.00	+5.85 / -9.30
	Lower tie	0.75	+7.95 / -3.50

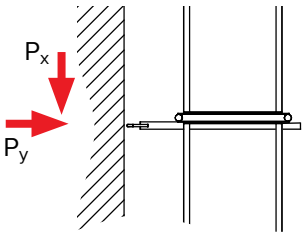
(- = tension) (+ = pressure)

Scaffold with tarpaulin, tying version A1

Tie forces: open facade				Tie forces: closed facade		
	Long retainer			Long retainer		
Tie level H [m]	Px [kN]	±Py [kN]	±Py [kN]	Long retainer	±Py [kN]	±Py [kN]
24	0.83	+3.78	-4.03	0.83	+3.78	-1.55
22	0.87	+7.13	-5.35	0.87	+7.13	-1.62
20	0.84	+5.73	-5.18	0.84	+5.73	-1.45
18	0.81	+5.68	-5.07	0.81	+5.68	-1.42
16	0.79	+5.49	-4.94	0.79	+5.49	-1.37
14	0.76	+5.36	-4.82	0.76	+5.36	-1.34
12	0.73	+5.21	-4.69	0.73	+5.21	-1.31
10	0.70	+5.09	-4.58	0.70	+5.09	-1.27
8	0.67	+4.91	-4.42	0.67	+4.91	-1.23
6	0.64	+4.92	-4.43	0.64	+4.92	-1.23
4	0.60	+4.24	-3.82	0.60	+4.24	-1.06
2	0.59	+5.85	-5.27	0.59	+5.85	-1.46



Support	P_{zi} = 14.10 kN
	P_{za} = 16.25 kN



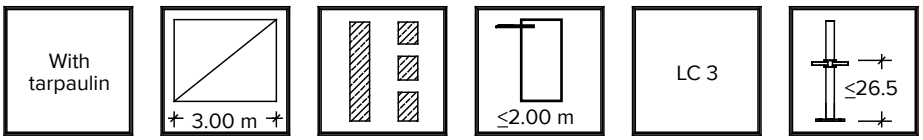
Unless stated otherwise, all dimensions are in mm.

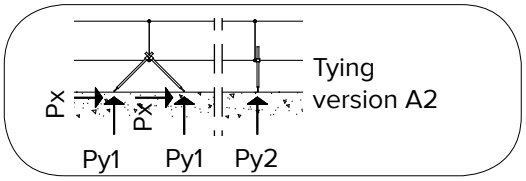
9.4.6 Scaffold with tarpaulin tying version A2

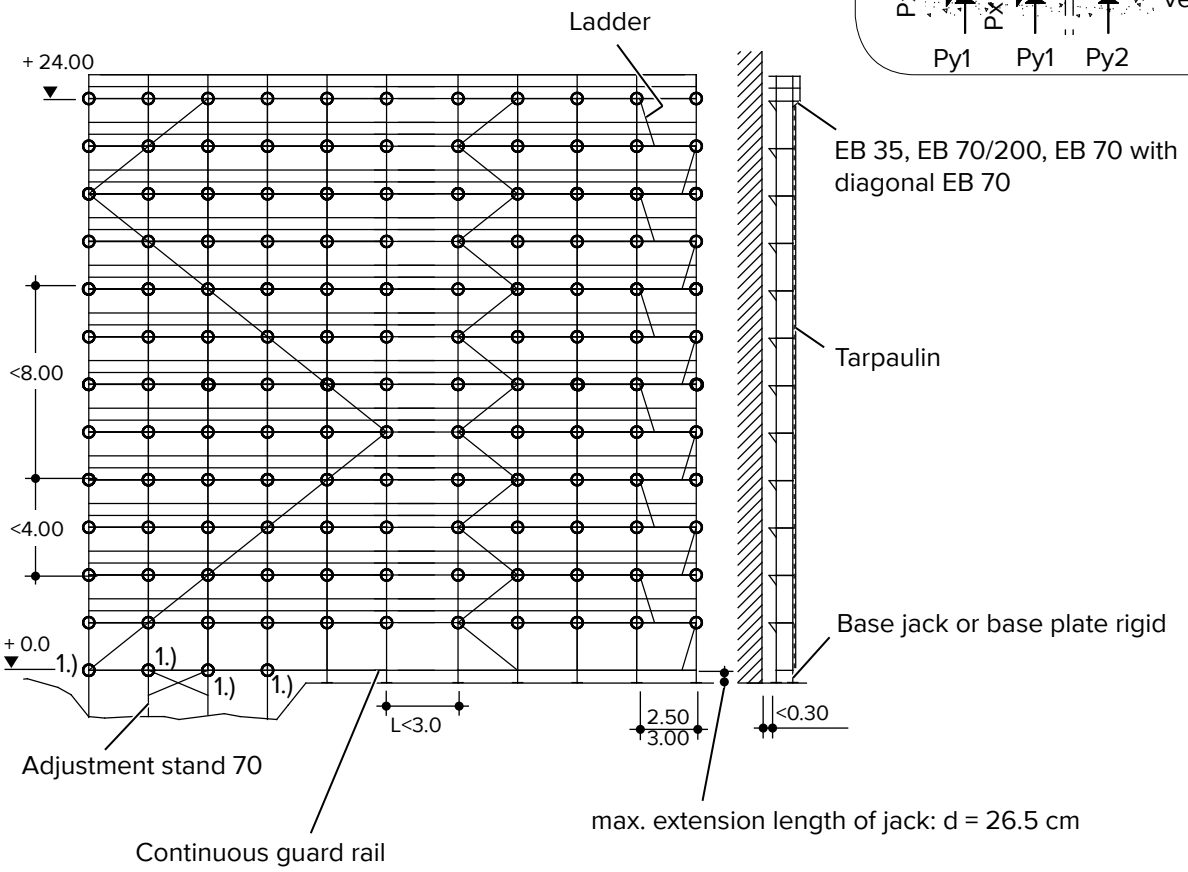
- Diagonal bracing continuously or in one bay shifting (as shown) or in one direction.
- One diagonal braces maximum 5 scaffold bays.
  Each scaffold level must be equipped with a 3-part side protection (exceptions see page 51).

1.) Additional ties when using the adjustment stand, tube and coupler connection at the adjustment stand, guard rail as lateral bracing at the inside and outside.

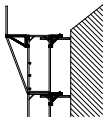
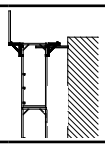
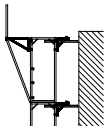
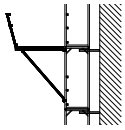
6



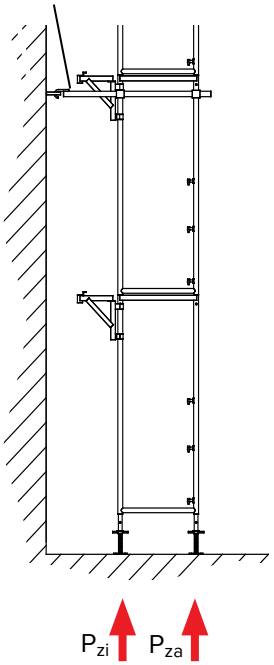




Unless stated otherwise, all dimensions are in mm.

Type of scaffold	Tie pattern	Length of scaffold bay = 3.00 m open + closed facade		
		Px [kN]	Py1 [kN]	Py2 [kN]
Protective roof scaffold level with ouside bracket 0.70 m and inside bracket 0.35 m 	Upper tie	2.35	+1.90 / -2.35	+3.80 / -4.75
	Lower tie	3.50	+3.50 / -2.60	+6.95 / -5.15
Safety scaffold with outside bracket 0.35 cm and inside bracket 0.35 cm 	Upper tie	1.60	+1.60 / -1.50	+3.20 / -2.95
	Lower tie	-	-	-
Safety scaffold with outside bracket 0.70 cm and inside bracket 0.35 cm 	Upper tie	1.90	+1.55 / -1.90	+3.05 / -3.75
	Lower tie	3.65	+3.65 / -2.85	+7.30 / -5.70
Protective roof level 	Upper tie	4.65	+2.95 / -4.65	+5.85 / -9.30
	Lower tie	3.95	+3.95 / -1.75	+7.95 / -3.50

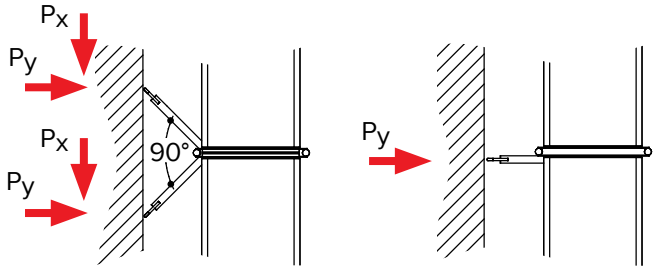
Scaffold retainer



Scaffold with tarpaulin, tying version A2

	Tie forces: open facade					Tie forces: closed facade				
	V-shaped tying point			Short retainer		V-shaped tying point			Short retainer	
Tie level		**Pressure**	**Tension**	**Pressure**	**Tension**		**Pressure**	**Tension**	**Pressure**	**Tension**
H [m]	Px [kN]	+Py [kN]	-Py [kN]	+Py [kN]	-Py [kN]	Px [kN]	+Py [kN]	-Py [kN]	+Py [kN]	-Py [kN]
24	2.02	1.89	- 2.02	3.78	- 4.03	1.89	1.89	- 1.18	3.78	- 1.55
22	3.57	3.57	- 2.68	7.13	- 5.35	3.57	3.57	- 1.36	7.13	- 1.62
20	2.87	2.87	- 2.59	5.73	- 5.18	2.87	2.87	- 1.27	5.73	- 1.45
18	2.84	2.84	- 2.54	5.68	- 5.07	2.84	2.84	- 1.24	5.68	- 1.42
16	2.75	2.75	- 2.47	5.49	- 4.94	2.75	2.75	- 1.20	5.49	- 1.37
14	2.68	2.68	- 2.41	5.36	- 4.82	2.68	2.68	- 1.16	5.36	- 1.34
12	2.61	2.61	- 2.35	5.21	- 4.69	2.61	2.61	- 1.13	5.21	- 1.31
10	2.55	2.55	- 2.29	5.09	- 4.58	2.55	2.55	- 1.10	5.09	- 1.27
8	2.46	2.46	- 2.21	4.91	- 4.42	2.46	2.46	- 1.07	4.91	- 1.23
6	2.46	2.46	- 2.22	4.92	- 4.43	2.46	2.46	- 1.04	4.92	- 1.23
4	2.12	2.12	- 1.91	4.24	- 3.82	2.12	2.12	- 0.98	4.24	- 1.06
2	2.93	2.93	- 2.64	5.85	-5.27	2.93	2.93	- 1.10	5.85	- 1.46

Support	P_{zi} = 16.80 kN
	P_{za} = 19.05 kN



Unless stated otherwise, all dimensions are in mm.

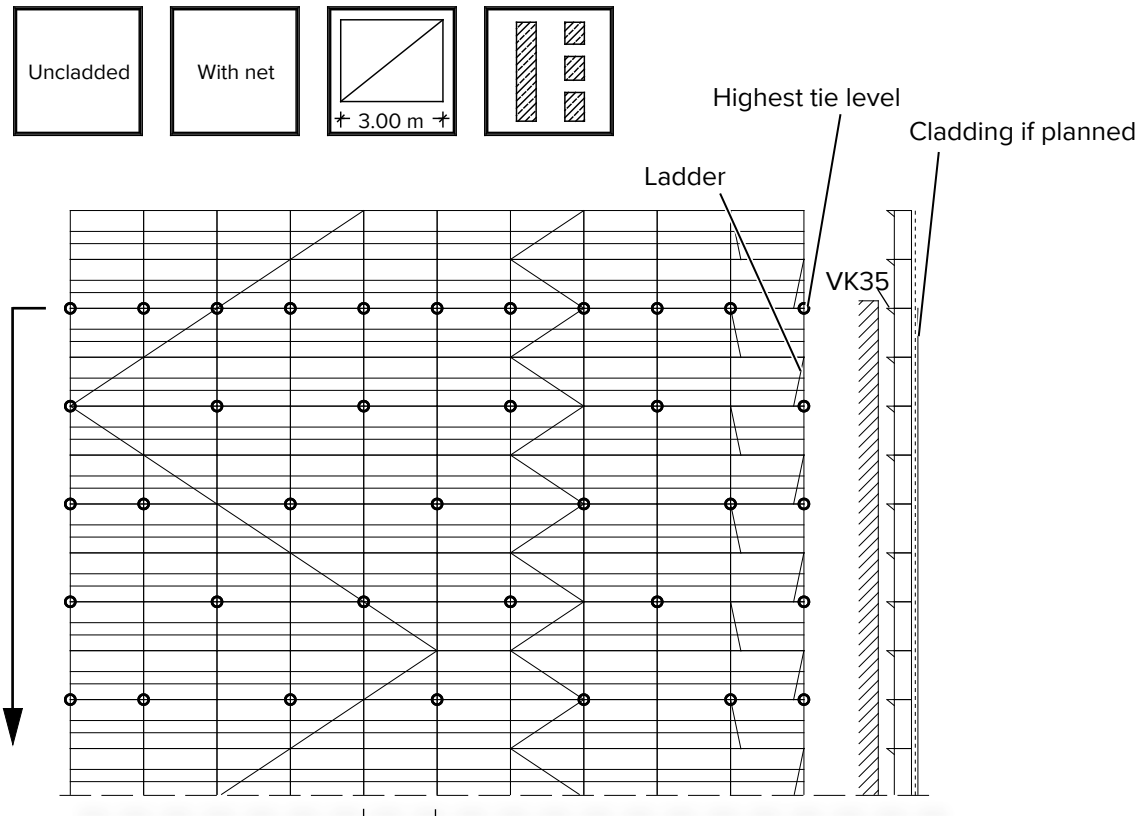
9.4.7 Standard model of the last tie level of free standing scaffold levels

This standard model is valid for open and closed facades, for uncladded and scaffolds with net cladding and scaffold levels above the highest tying level.

The tying conditions and other determinations for cladded or uncladded scaffolds have to be taken from the valid standard model.

Tie forces for each tying point in the highest tying level:

$P_{\perp}$ = +5.35 kN;
P_{II} = 1.80 kN

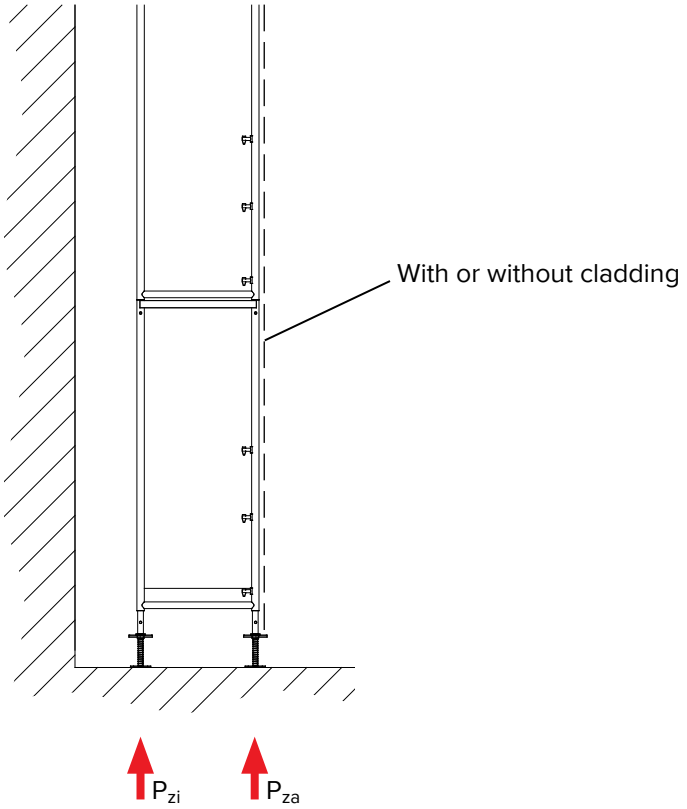


Jack forces for facade scaffolds

BOSTA 70 cladded and uncladded support reactions at the ground level

(characteristic values in kN)

Scaffold height [m]	Length of bay [m]	without bridging		Bridge girder 500		Bridge girder 750	
		Pzi [kN]	Pza [kN]	Pzi [kN]	Pza [kN]	Pzi [kN]	Pza [kN]
24	2.50	12.25	13.85	18.05	19.95	21.30	23.50
	3.00	14.10	16.05	-	-	-	-
18	2.50	10.40	12.35	15.30	17.70	18.35	21.20
	3.00	12.05	14.20	-	-	-	-
12	2.50	8.55	10.85	12.50	15.40	15.40	18.90
	3.00	10.00	12.35	-	-	-	-



Unless stated otherwise, all dimensions are in mm.

10 Installation tips for additional equipment

10.1 Passage frame 150

The passage frame (post distance 1.55 m) permits the installation of a pedestrian passage.

Diagonals, acting as longitudinal stiffeners, must be installed in the passage frame of every fifth bay at the front and rear face of the scaffold. In addition, continuous guard rails must be installed.

Scaffold ties must be installed at each vertical frame or, if necessary, at each passage frame as shown.

NOTE

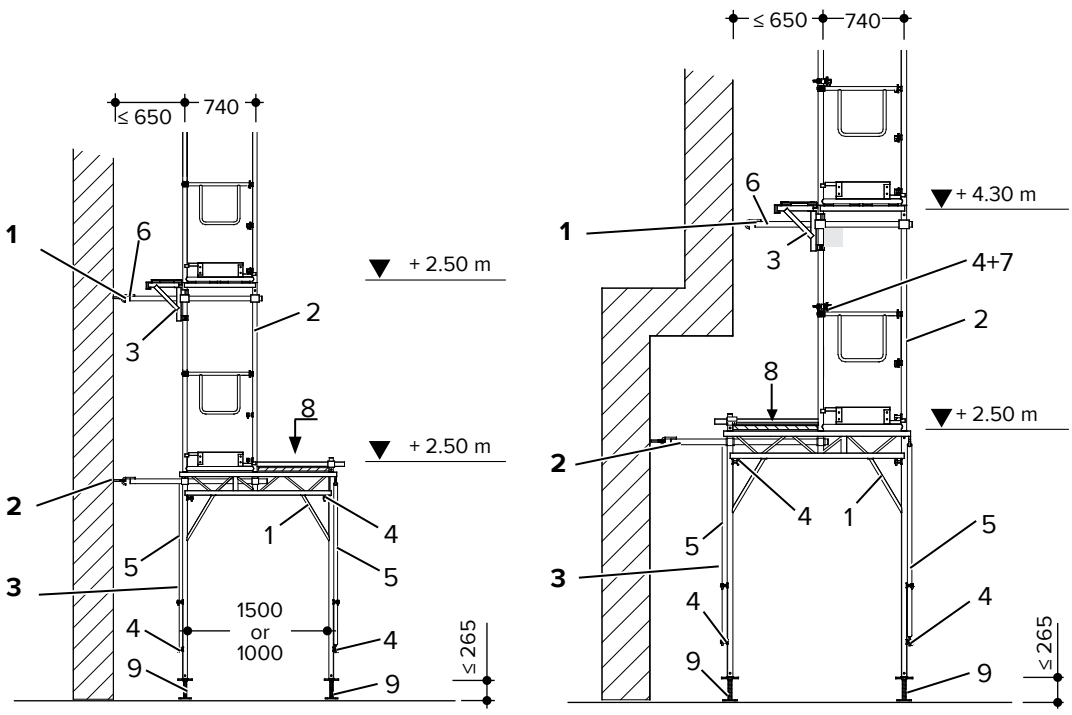
Note

A passage frame cannot be installed next to a bridge girder!

WARNING

Warning!

Danger of falling during installation!
Appropriate safety precautions according to the risk assessment must be taken!



1 First tie level for scaffold bay length ≤2.50 m. If alu frame decks are used, the scaffold length can be ≤3.00 m.
2 First tie level for scaffold bay length ≤3.00 m
3 Diagonals on both sides in every 5th scaffold bay

1 Passage frame 150
2 Vertical frame
3 Enlargement bracket
4 Guard rail
5 Diagonal
6 Scaffold tie point
7 Half coupler 48FB
8 Secure planks against lift-off (e.g. use tube or coupler).
9 Base jack 50 / 3.3

NOTE

Note

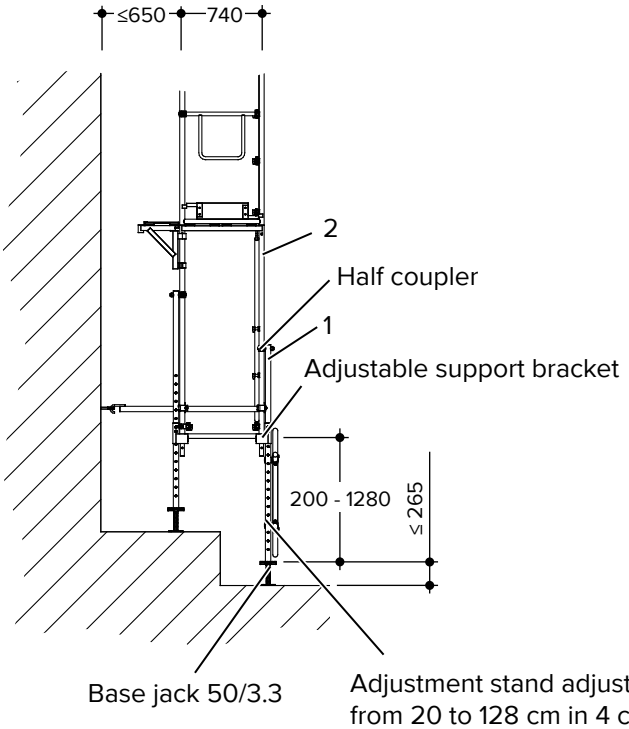
Only use base jack Ø33 mm.

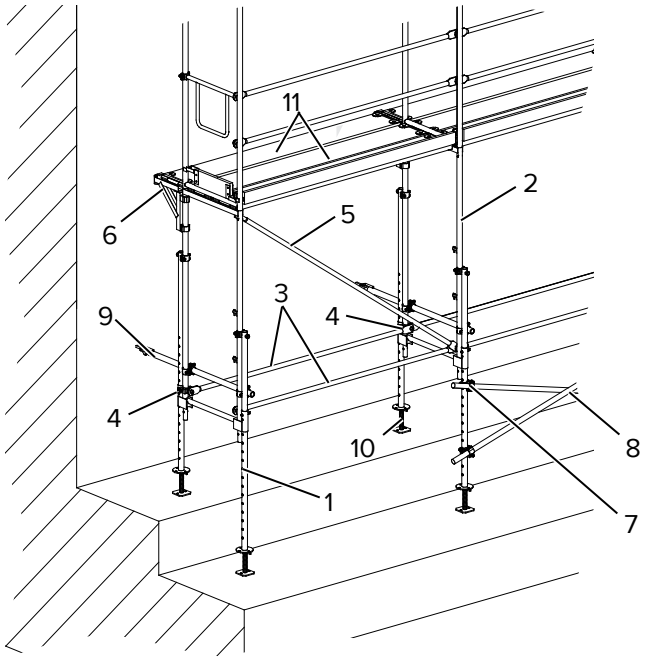
10.2 Adjustment stand

Adjustment stands are used to adapt to larger changes in elevation at the erection site.

Please note the following:

1. Cross bracing, using tubes and couplers, must be installed in every 5th scaffold bay.
2. When using half couplers 48FB, a second guard rail must be installed in the lower vertical frame facing the building.
3. An additional tie must be installed above every adjustment stand in each scaffold bay.
4. Do not use adjustment stands adjacent to bridge girders.





1 Adjustment stand
2 Vertical frame
3 Guard rail
4 Half coupler 48FB
5 Diagonal
6 Enlargement bracket 35
7 Coupler
8 Scaffold tube
9 Scaffold tie
10 Base jack 50 / 3.3
11 Plank

10.3 Bridge 400, 500 and 750

10.3.1 Bridged bay 400

The bridged bay 400 is treated in the same way as a normal scaffold bay; but, with additional ties in this area (see page 77, 79 and 94). A bridge girder is not used in this case.

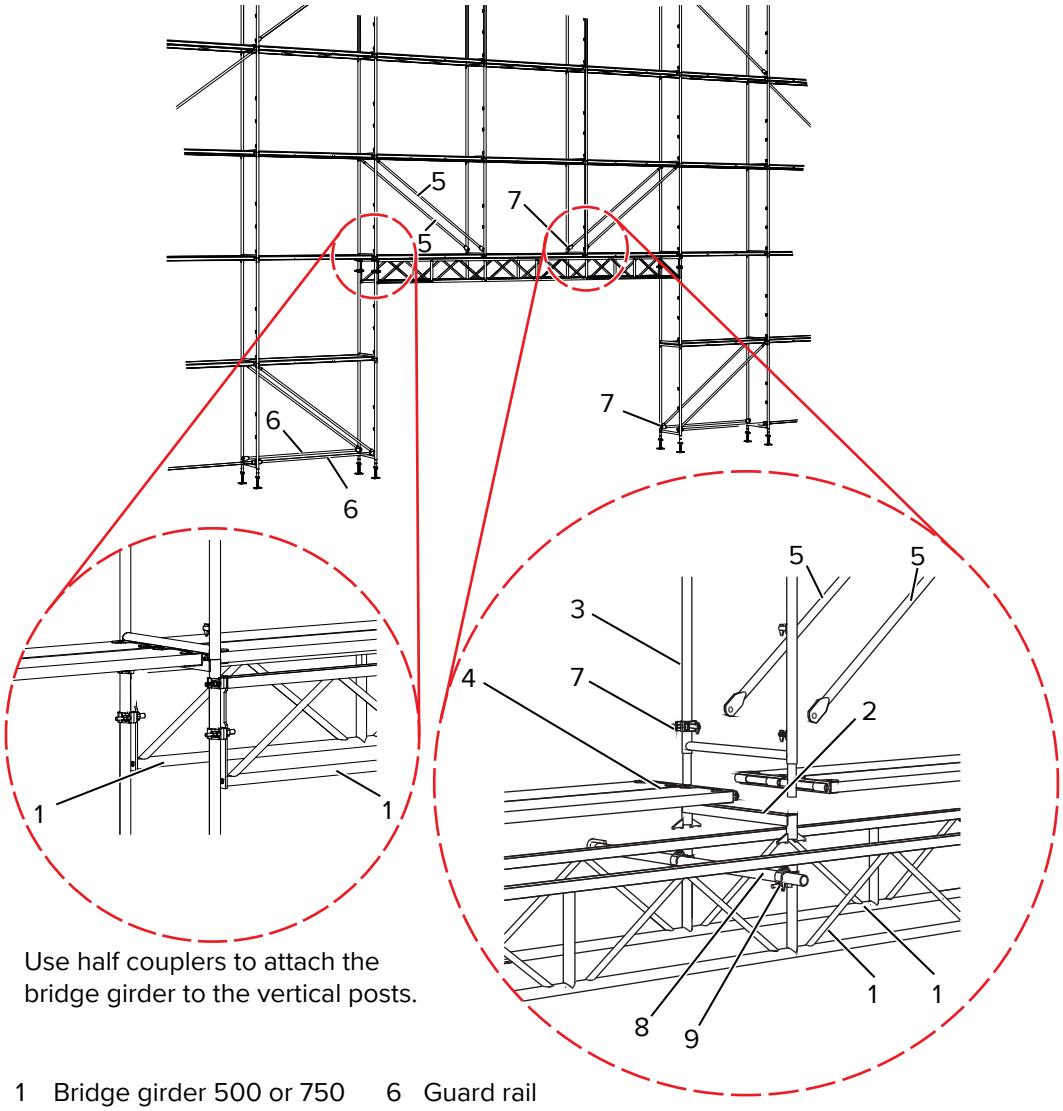
10.3.2 Bridge 500 and 750

The bridge girders 500 and 750 can be used to bridge 2 or 3 scaffold bays (500: 2 x 2.50 m; 750: 3 x 2.50 m).

The bridge girders are connected in pairs with the attached half couplers to the vertical

Unless stated otherwise, all dimensions are in mm.

frames subsequently. Then the crossbar 70 is inserted and scaffold planks are placed onto the bridge girder. Bridge girders are designed to carry a max. of 10 scaffold levels. The adjacent scaffold bays and those above, must be stiffened by installing additional diagonals in front and the rear of the scaffold. Use half couplers 48FB to attach the diagonals at the bottom. All types of planks are permitted in the bridged scaffold bays and the adjacent scaffold bays next to the bridge girder 500 (<2.50 m). When using the bridge girder 750 only alu frame decks are permitted on the bridge girder 750. The bridged area must be tied to the facade depending on the tie pattern of the remaining scaffold.



Use half couplers to attach the bridge girder to the vertical posts.

1 Bridge girder 500 or 750
2 Cross beam 70
3 Vertical frame
4 Planks
5 Diagonal
6 Guard rail
7 Half coupler 48FB
8 Scaffold ties
9 Rigid coupler

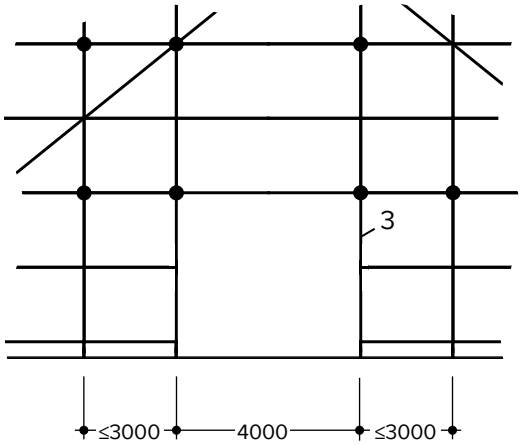
WARNING

Warning!

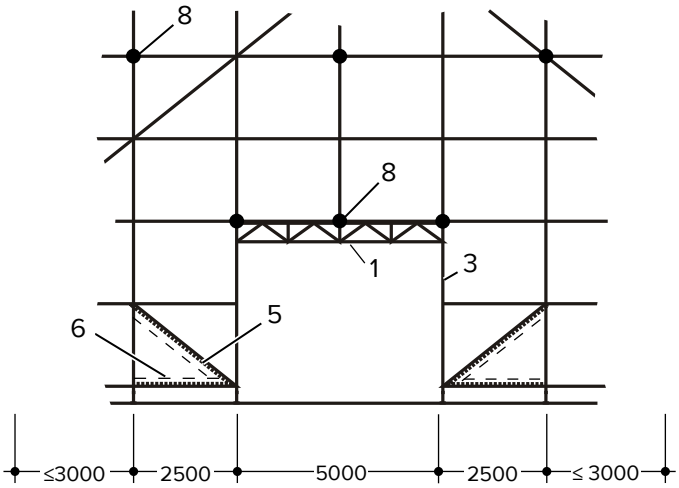
Danger of falling during installation!
Appropriate safety precautions according to the risk assessment must be taken.

Installation tips for additional equipment

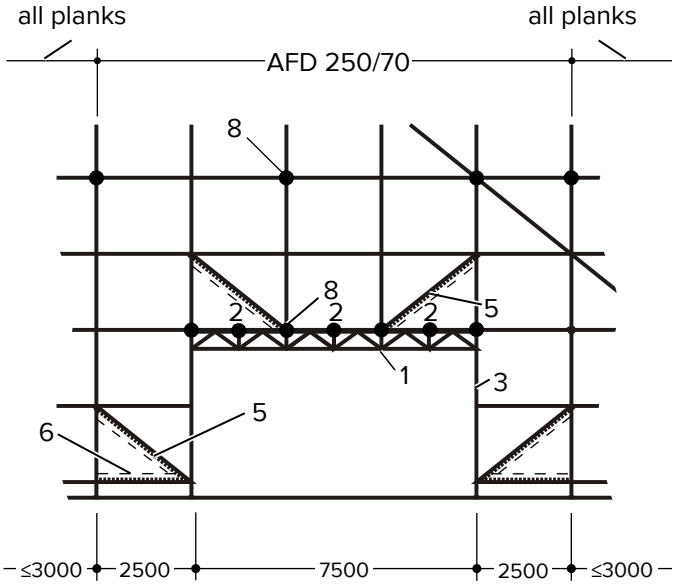
Bridged bay 400



Bridged bay 500



Bridged bay 700



Tie pattern for bridged bays

1 Bridge girder 500 or 750
2 Cross beam 70
3 Vertical frame
4 Planks
5 Diagonal
6 Guard rail
7 Half coupler 48FB
8 Scaffold ties

Unless stated otherwise, all dimensions are in mm.

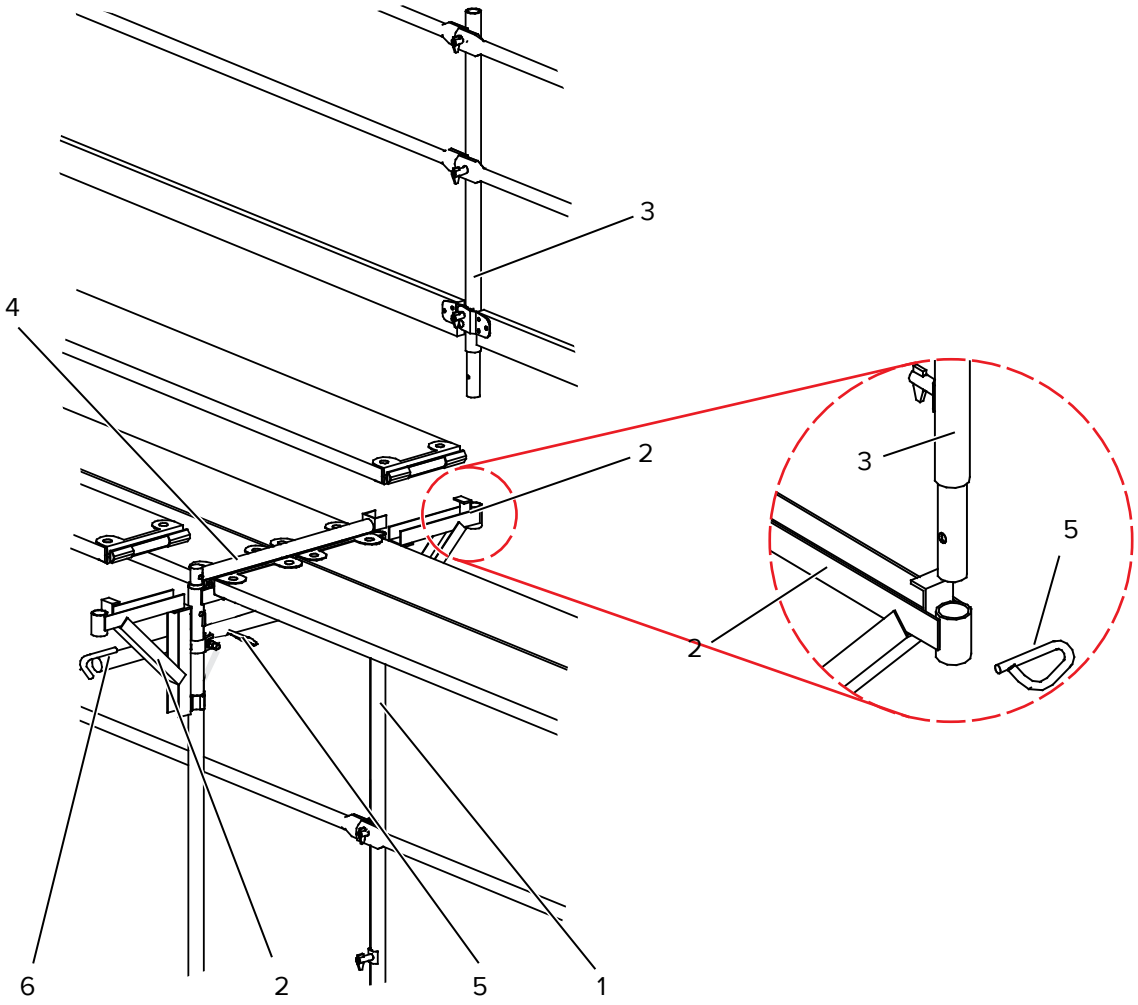
10.4 Enlargement bracket

When using enlargement brackets BOSTA 70, scaffolds can be widened by either 35 cm or by the entire system width of 74 cm.

Enlargement bracket 35

For assembly insert the upper claw into the vertical post. Then fix the lower half coupler. Frame pins are not required to distribute the load but they may be used as an adjustment aid. The planks must be secured against lift-off immediately after installation.

To secure the planks to the scaffold install the bracket 70 plank retainer and the Ø8 mm frame pin.



NOTE

Note

Always secure the handrail posts and the bracket 70 plank retainers with a frame pin Ø8 mm.

The enlargement bracket 35 can be used at the inside of the scaffold in each scaffold level and additionally in the uppermost scaffold level on the outside of the scaffold.

1 Vertical frame
2 Enlargement bracket
3 Handrail post
4 Plank retainer
5 Frame pin Ø8 mm
6 Scaffold tie

WARNING

Warning!

Secure the uppermost scaffold level as described in chapter *Uppermost scaffold level* on page 49.

Enlargement bracket 70/200

The working space of the uppermost scaffold level is extended by the enlargement bracket 70 / 200 for 74 cm. With an additional enlargement bracket 35 at the inner side of the scaffold, the overall working space of the platform increases by 1.80 cm.

The enlargement bracket 70/200 is attached to the vertical frame with the two integrated half couplers.

NOTE

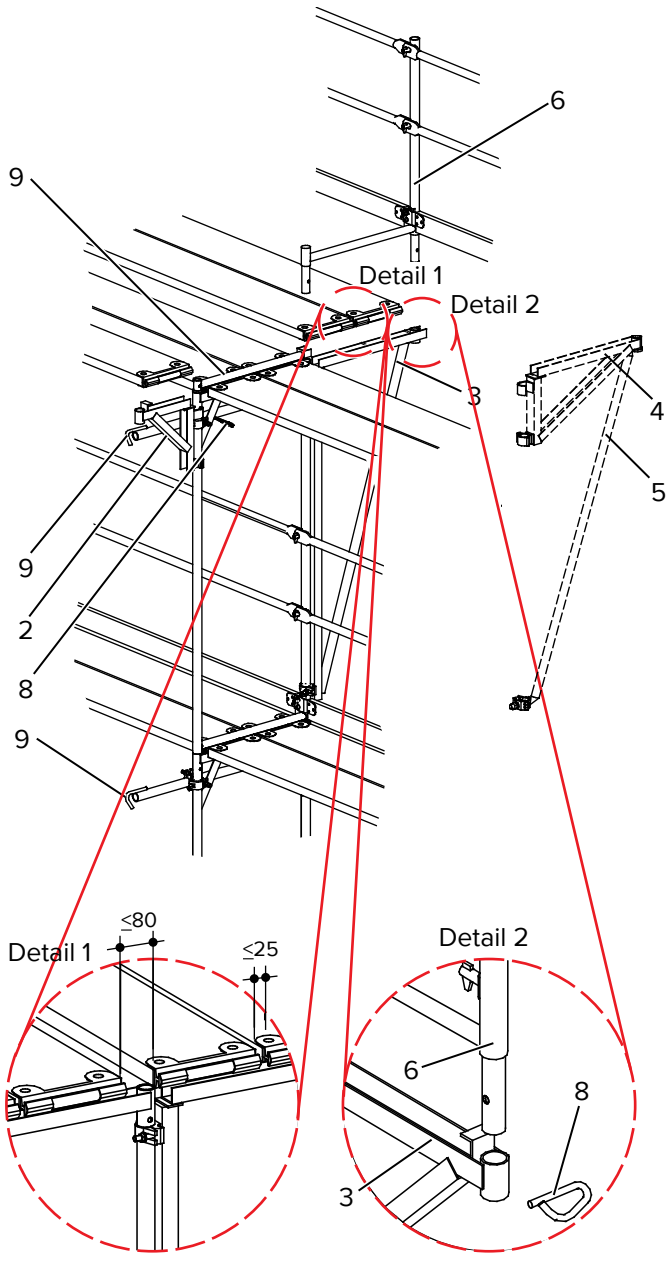
Note

The planks are secured to the scaffold with the bracket 70 plank retainer and to the bracket with the railing post 70.

WARNING

Warning!

The scaffold must be tied at each bracket level and at the level below.



Unless stated otherwise, all dimensions are in mm.

1 Vertical frame 200/70
2 Enlargement bracket 35
3 Enlargement bracket 70/200
4 Enlargement bracket 70
5 Diagonal EB 70 cpl.
6 Railing post 70
7 Bracket 70 plank retainer
8 Frame pin Ø8 mm
9 Scaffold ties

The longitudinal gap between bracket and main planks must not exceed 8 cm. The gap between two planks placed onto an enlargement bracket must not exceed 2.5 cm.

The assembly of the side railing is depending on the type of application.

WARNING

Warning!

Secure the uppermost scaffold level as described in chapter *Uppermost scaffold level* on page 49.

NOTE

Note

As an alternative to the enlargement bracket 70/200, the enlargement bracket 70 in combination with the diagonal EB 70 can be used.

10.5 Facade insulation accessories

10.5.1 Facade insulation bridge

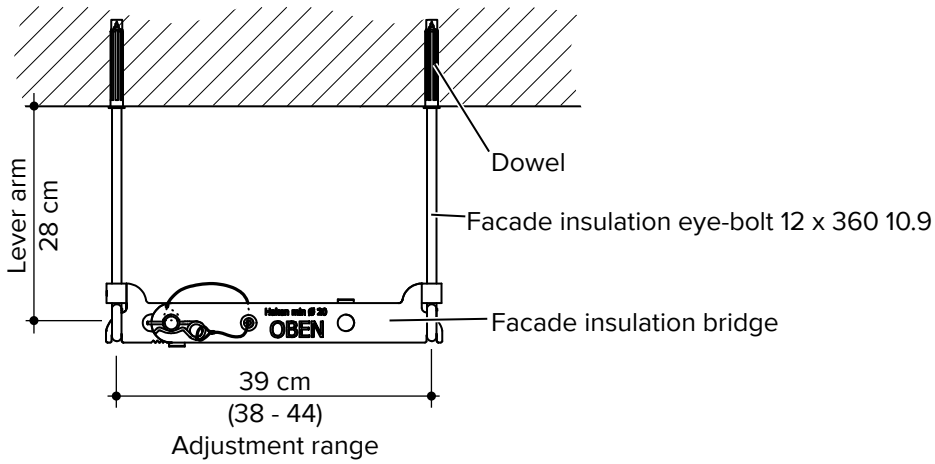
With the bridge for facade insulation systems it is possible to create new, stable tying points and additionally it is possible to reinforce existing but not stable tying points. The load bearing capacity of the facade insulation scaffold tying system is up to 2.35 kN parallel to the facade und with a lever arm of 28.5 cm (possible thickness of the attached facade insulation: max. 22 cm).

Assembly

Ties of a facade scaffold must be attached to the vertical posts beneath the planks, but as close to the scaffold node as possible. The scaffold retainer has to be fixed with rigid couplers 48/48 to both vertical posts of the vertical frames.

If it is not possible to fix the scaffold retainer directly beneath the node, it is possible to place the scaffold retainer at a distance to the planks of max. 30 cm.

Depending on the local conditions, the scaffold retainer can be fixed from both sides of the vertical post.

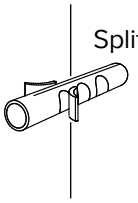


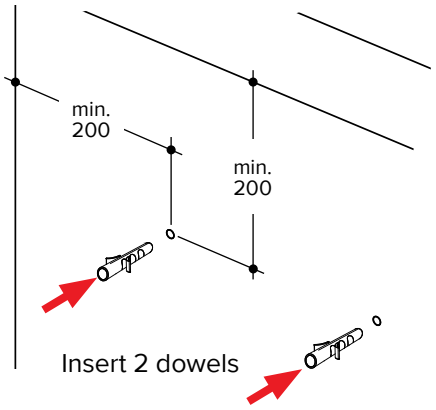
NOTE

Note

When mounting the scaffold retainer, pay attention to the required passage height.

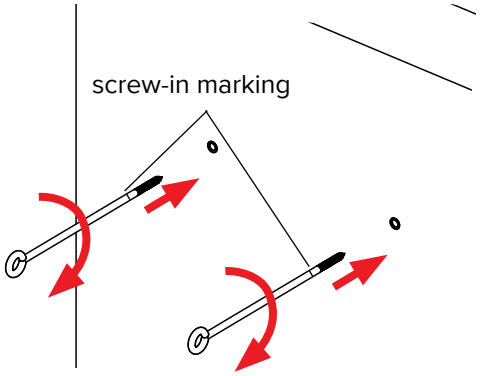
Use the facade insulation bridge to mark the holes for the dowels and drill them with appropriate tools.





NOTE	**Note** Do undercut below the minimum distance of 20 cm to the edge of the facade! Pay attention to the information of the dowel manufacturer!

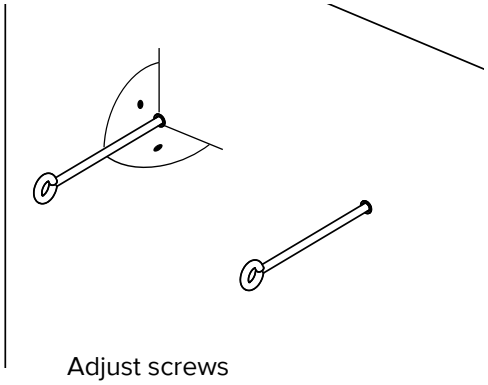
Now screw in the facade insulation bolts with the same depth and with the complete length of the thread into the dowels.



Screw in both facade insulation eye-bolt

WARNING	**Warning!** Both facade insulation eyebolts must be screwed in up to the marking!

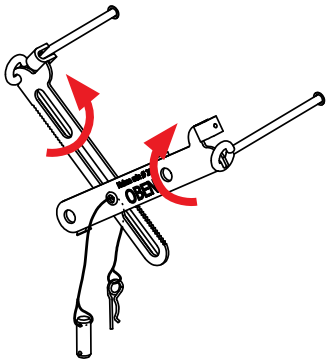
Make sure that the axis of the eyebolts is rectangular aligned to the facade. Furthermore, make sure that the eyes of the screws are aligned in vertical position.



Adjust screws

Unless stated otherwise, all dimensions are in mm.

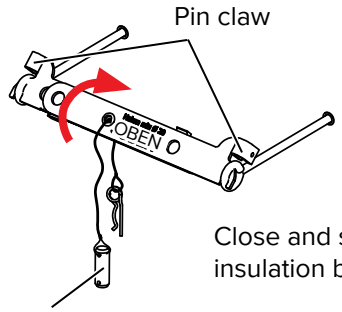
Now the open facade insulation bridge is hooked in the eyes of the facade insulation eye-bolts. The pin claws must face up and towards the facade. The lettering on the facade insulation bridge is readable from above.



Hook in facade insulation bridge

Now close the open facade insulation bridge.

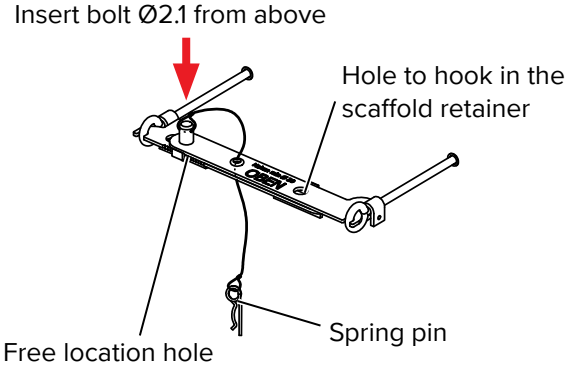
The closed facade insulation bridge must now be turned into horizontal position and the pin claws must completely encompass the facade insulation eyebolts.

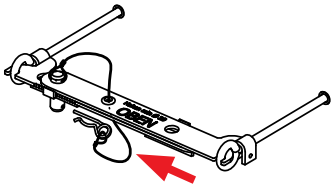


By doing so, the legs of the facade insulation bridge are brought over each other...

...and the hole for the hook of the scaffold retainer is brought over the slotted hole. The pin claws now encompass the shaft of the facade insulation eyebolts.

Then the insert bolt Ø21 is placed from above into the free location hole for the scaffold retainer and...



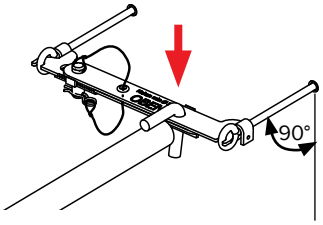


Secure with spring pin from below

...is secured with a spring pin.

Now the hook of the scaffold retainer is inserted into the free location hole.

By doing so, the facade insulation bridge is stiffened and gets its load bearing capacity.

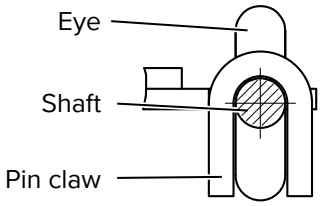


Hook in scaffold retainer

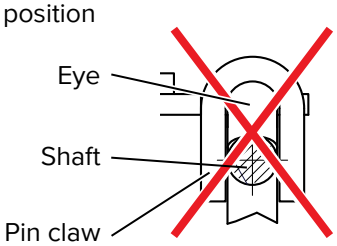
NOTE	**Note** For the perfect transfer of the loads occurring, it is necessary that the scaffold retainer and the facade insulation eyebolts are on the same horizontal level (scaffold retainer perpendicular to the facade).

Correct position of the pin claw

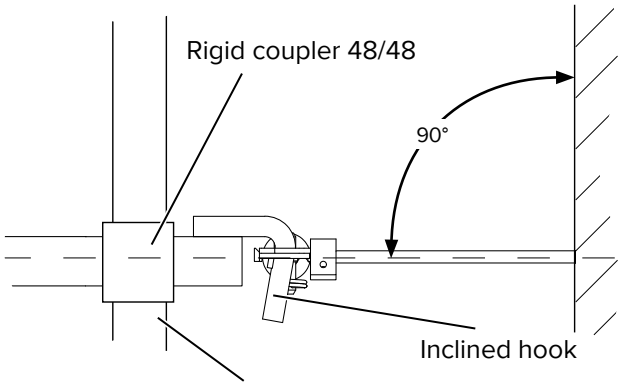
Correct position



Wrong position

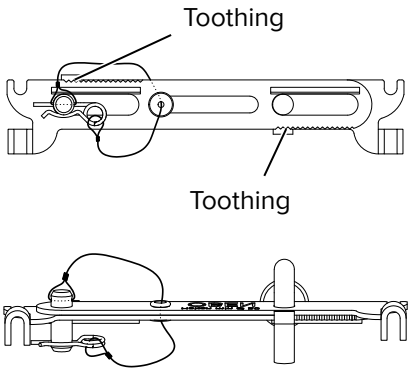


NOTE	**Note** The pin claw must completely encompass the shaft of the facade insulation eyebolt (see illustration on the left). The shaft of the insulation eyebolt must touch the ground of the pin claw. A wrong position of the eyebolt (see illustration on the left) lowers the load bearing capacity of the tying point.



Unless stated otherwise, all dimensions are in mm.

Correct position of the facade insulation bridge



NOTE

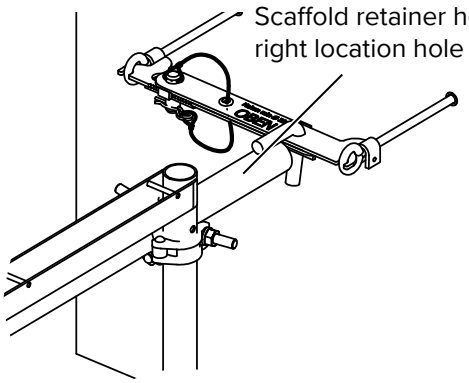
Note

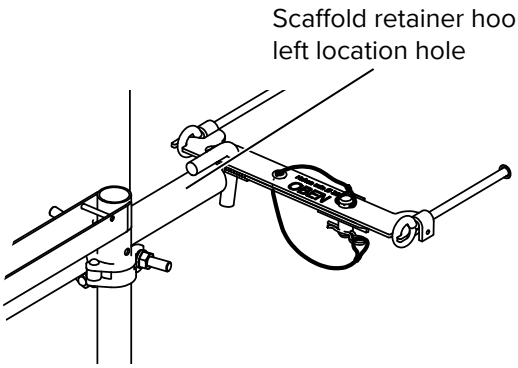
Due to the inclination of the scaffold retainer the facade insulation bridge is tensed and the toothing is closed. Only use original HÜNNEBECK scaffold retainers.

Mounting of the scaffold retainer to the BOSTA 70 vertical frame

In the last step, the scaffold retainer is fixed with rigid couplers, according to DIN EN 74-1, and a torque of 50 Nm to the vertical posts of the frame.

Now the tying point is ready to keep the loads when applied.





NOTE

Note

Scaffold retainer with other dimensions can be ordered as an option by HÜNNEBECK.

As an alternative to the description above, the hook of the scaffold retainer can also be inserted into the location hole on the left side of the facade insulation bridge. The same guidelines and assembly steps are valid like for the right location hole.

Facade insulation plank

To meet the requirements for a safe facade scaffold for the attachment of facade insulation systems, this plank expands the existing BOSTA 70 program.

Facade insulation plank		Scaffold plank				
Length [cm]	Weight [kg]	SP 32	AP 32	HBP 32	TP 32	AFD 70
300	19	LC3				
250	16					
200	13					

The BOSTA 70 facade insulation plank can be extended in 10 steps of 3.2 cm each. It can be implemented without big effort into the BOSTA 70 scaffold system.

The BOSTA 70 facade insulation plank is available for a bay length of 2.00 m, 2.50 m and 3.00 m. The maximum load is 2 kN/m² (LC 3). With a weight of less than 20 kg (3.00 m plank), it is easy to handle.

DANGER

Danger!

It is not allowed to use the BOSTA 70 facade insulation planks and the facade insulation telescopic bracket for decks in a protective scaffold!

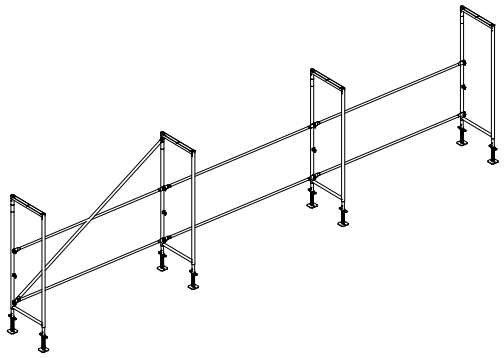
NOTE

Note

The facade insulation plank cannot be used with ladder access decks.

Mounting

Step 1 The base level of the scaffold is assembled as usual.



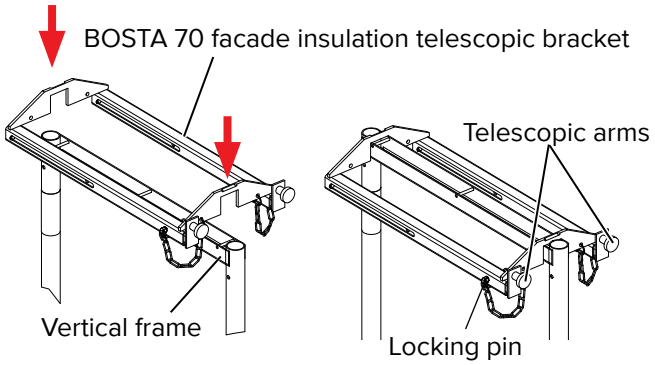
WARNING

Warning!

Follow the instructions in chapter *Assembly* on page 36!

Unless stated otherwise, all dimensions are in mm.

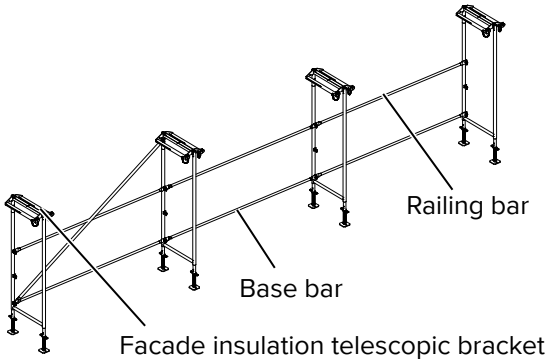
Step 2 Prior to the installation of the next scaffold level in addition to the standard assembly the BOSTA 70 facade insulation telescopic bracket are placed on top of the vertical frames. The telescopic arms must face the building.
The BOSTA 70 facade insulation planks are hooked to the telescopic arms later.



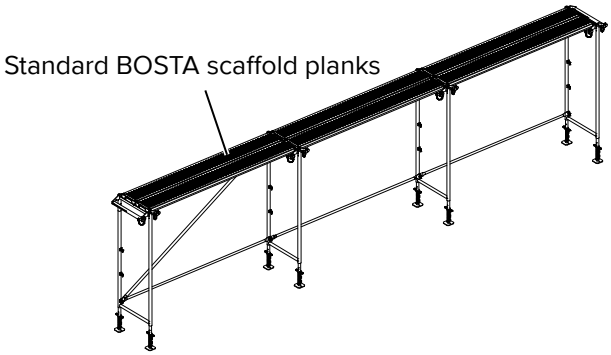
CAUTION

Caution!
Always block the telescopic arms with the safety pins!

Lowest scaffold level with attached
BOSTA 70 facade insulation telescopic bracket

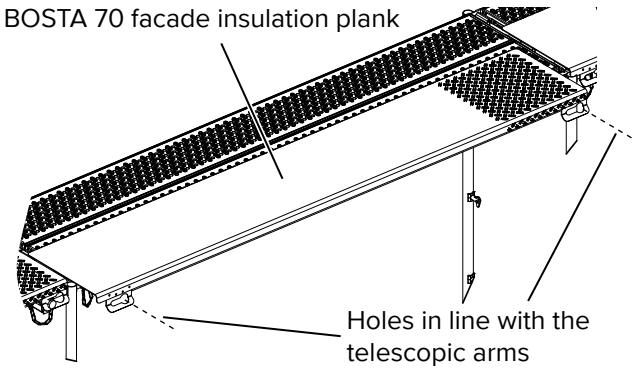


Step 3 After placing the BOSTA 70 planks, the railing bars can be removed in the base level of the scaffold. The base bar must stay in the scaffold.

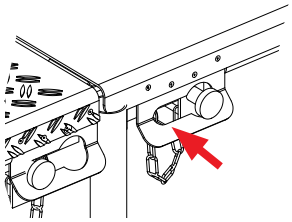


Step 4 Now the BOSTA 70 facade insulation plank is placed from the lower level onto the BOSTA 70 planks.
Bring the holes in the BOSTA 70 facade insulation planks in line with the telescopic arms und push the plank over the retainer of the telescopic arm.
Push the plank sideways to secure it.
Now the plank is aligned to the middle of the scaffold bay and secured to the facade insulation telescopic bracket.

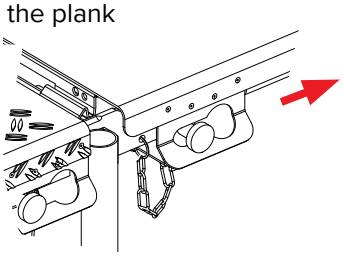
Step 5 Assemble the next levels in the same way.



Push plank over the retainer of the telescopic arm



Push sideways to secure the plank



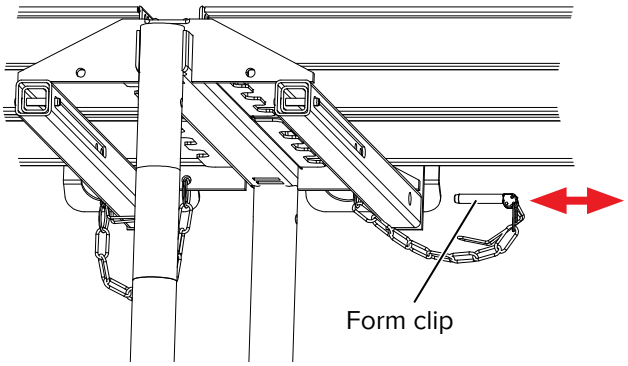
WARNING

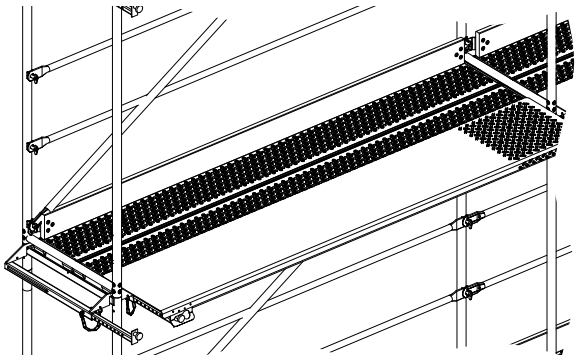
Warning!

Follow the instructions in chapter *Assembly* on page 36!

Step 6 The vertical frames of the next level secure the BOSTA 70 facade insulation planks and prevent sideway slipping.

Step 7 The adjustment of the facade insulation plank is done from below.
To pull out the plank the form clips in both facade insulation telescopic brackets are removed and the plank is adjusted according to the required distance to the building.
Then the form clips are inserted again.

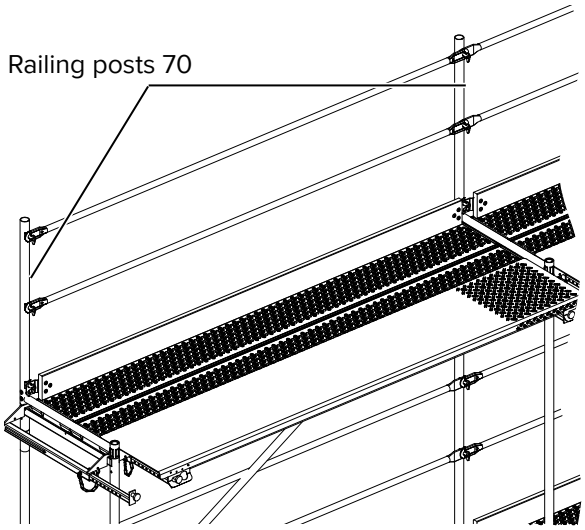




BOSTA 70 facade insulation plank pulled out

Unless stated otherwise, all dimensions are in mm.

Step 8 The uppermost level of the scaffold with mounted BOSTA 70 facade insulation planks must always be equipped with railing posts 70. The railing posts 70 must be secured with frame pins Ø8 mm to prevent uplift of the planks in the uppermost level.



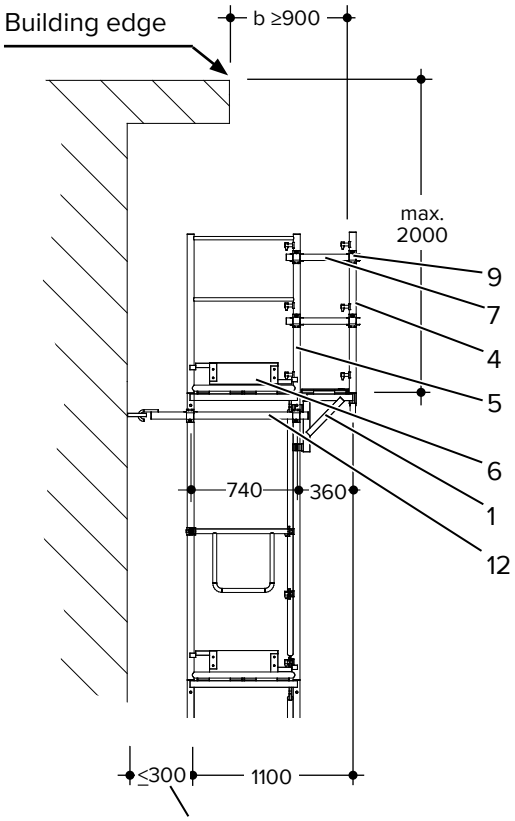
WARNING

Warning!

Only step onto the facade insulation planks when the planks are secured against uplift.

11 Use as fall protection

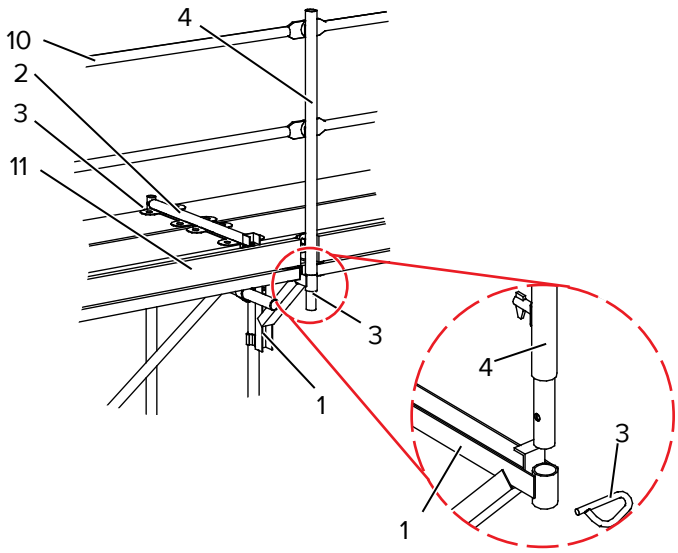
When using as a protective scaffold, the vertical distance between the building's edge and the working platform must not exceed 2.00 m. The distance b1 between the building's edge and the inside of the side protection, must be at least 0.90 m. When used as protective scaffold, the valid regulations to the health and safety standards must be observed.



11.1 With enlargement bracket 35 outside

The planks at the top vertical frame are secured with a bracket plank retainer and a frame pin Ø8 mm. The enlargement bracket is fastened at plank level to the vertical frame. Then the plank is placed on it and directly secured against uplift. The longitudinal side protection is comprised of handrail posts, guard rails and toe boards. The short side of the scaffold is secured with twin railing posts 70 trans and toe boards.

2 scaffold tubes 0.50 m with one coupler each close the gap in the side protection.



1 Enlargement bracket 35
2 Bracket 70 plank retainer
3 Frame pin Ø8 mm
4 Handrail post
5 Twin railing post 70 trans
7 Scaffold tube 50
8 Scaffold tube 150
9 Rigid coupler 48/48
10 Guard rail
11 Toe board
12 Scaffold tie

WARNING

Warning!

All railing posts must be secured with the frame pin Ø8 mm (see also chapter *Uppermost scaffold level* on page 49)!

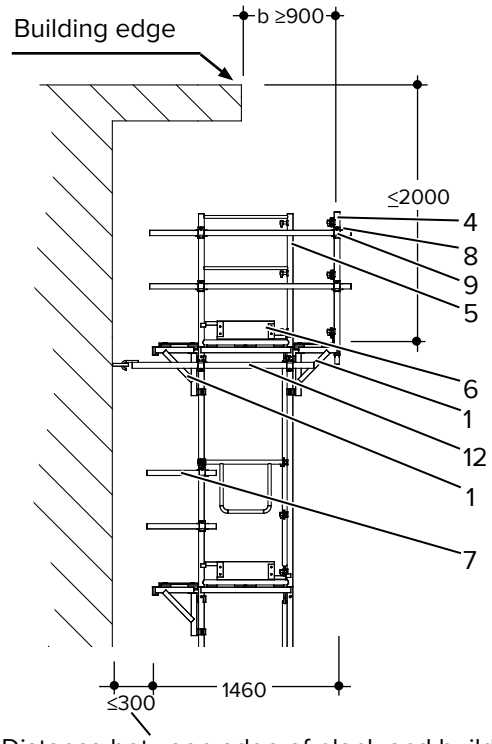
Unless stated otherwise, all dimensions are in mm.

11.2 With enlargement bracket 35 inside and outside

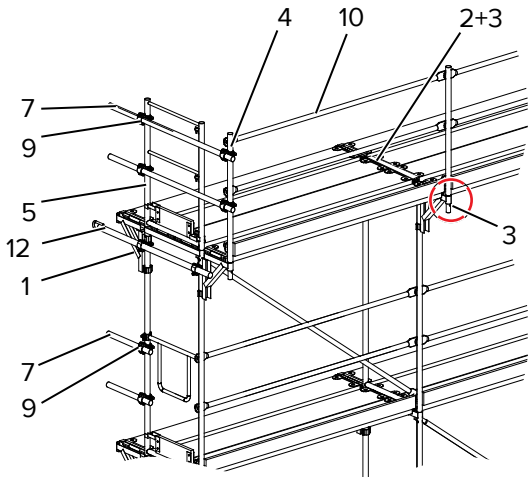
When using enlargement bracket 35 on both sides, the width of the uppermost deck is increased to a width of 146 cm.

The short side of the scaffold is secured with twin railing posts 70 trans and toe boards.

2 scaffold tubes 1.50 m with 2 couplers each are closing the gap in the side protection.



Distance between edge of plank and building



1 Enlargement bracket 35
2 Bracket 70 plank retainer
3 Frame pin Ø8 mm
4 Handrail post
5 Twin railing post 70 trans
6 Toe board 70 trans.
7 Scaffold tube 50
8 Scaffold tube 150
9 Rigid coupler 48/48
10 Guard rail
11 Toe board
12 Scaffold tie

Tie forces see chapter *Tying* on page 72.

WARNING

Warning!

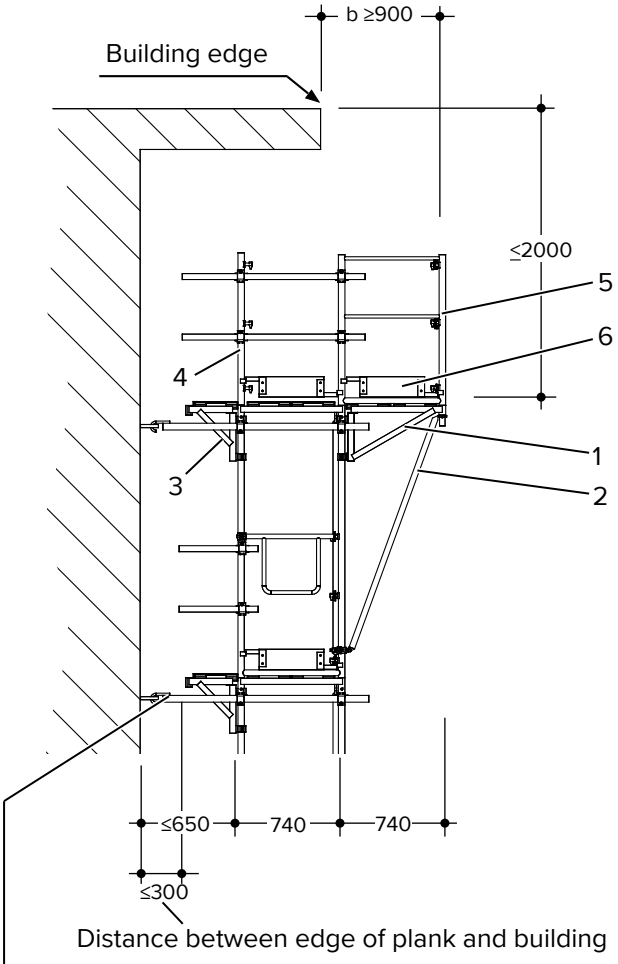
All railing posts must be secured with the frame pin Ø8 mm (see also chapter *Uppermost scaffold level* on page 49)!

11.3 With enlargement bracket 70/200 outside

The enlargement bracket 70/200 doubles the width of the uppermost scaffold storey. An additional enlargement bracket 35 installed at the side facing the building, increases the total platform width to 184 cm. Bracket 70 plank retainer with one frame pin Ø8 mm and the railing post 70 forms the plank retaining unit.

The short side of the scaffold is secured with twin railing posts 70 trans, a handrail post and 2 scaffold tubes 1.50 m with 2 couplers each.

In addition 2 toe board 70 trans must be installed there.



The use of enlargement brackets 70/ 200 or enlargement brackets 70 and the diagonal EB 70 cpl. requires additional ties at each scaffold node.

1 Enlargement bracket 70
2 Diagonal EB 70 cpl.
3 Enlargement bracket 35
4 Twin railing post 70 trans
5 Handrail post
6 Toe board 70 trans

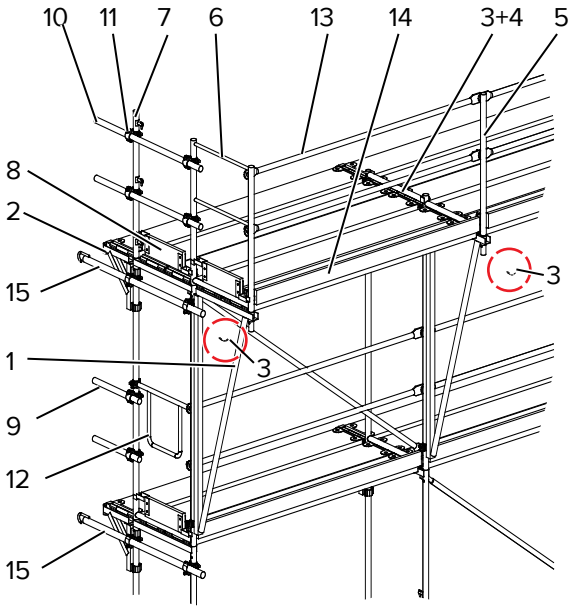
Tie forces see chapter *Tying* on page 72.

WARNING

Warning!

All railing posts must be secured with the frame pin Ø8 mm (see also chapter *Uppermost scaffold level* on page 49)!

Unless stated otherwise, all dimensions are in mm.

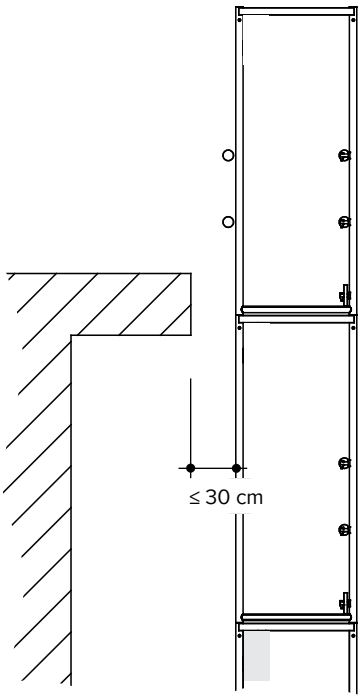


1 Enlargement bracket 70/200
2 Enlargement bracket 35
3 Bracket 70 plank retainer
4 Frame pin Ø8 mm
5 Railing post 70
6 Twin railing post 70 trans
7 Handrail post
8 Toe board 70 trans
9 Scaffold tube 50
10 Scaffold tube 150
11 Coupler
12 Double rail 70 trans
13 Guard rail
14 Toe board
15 Scaffold tie

NOTE	**Note** As an alternative to the enlargement bracket 70/200, the enlargement bracket 70 in combination with diagonal EB 70 can be used.

11.4 Use as fall protection

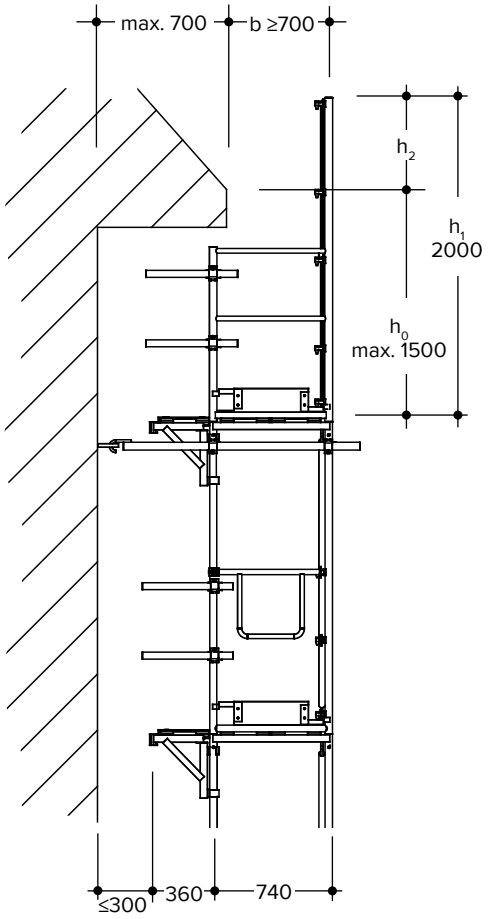
Scaffold as supporting structure for fall protection at the building's edge.



12 Use as roof protection

When using the BOSTA 70 scaffold as a roof protection scaffold, the vertical distance between the edge of the eaves and the uppermost deck elevation must not exceed 1.50 m. The distance b between the edge of the eaves and the inside of the side protection must be at least 0.70 m.

The protective wall must be at least h_1 = 1.50 m -b (in m) higher than the eaves. When used as a roof protection, all valid regulations on safety working procedures must be adhered to.



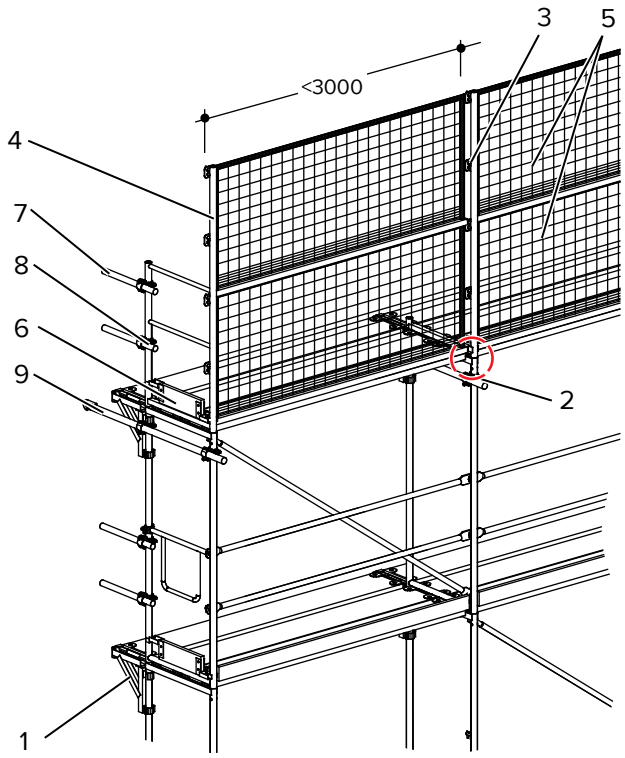
$h_2 = h_1 - h_0 \geq 1.50 - b$

NOTE	**Note**
	All roofer's safety posts must be secured with frame pins Ø8 mm.

Unless stated otherwise, all dimensions are in mm.

12.1 With enlargement bracket 35 inside

Due to the projection of the eaves, it is necessary to widen the uppermost working platform and to maintain a minimum distance of >70 cm between the edge of the eaves and the protective wall. When the enlargement bracket is installed facing the wall of the building, the width of the walkway is extended to 110 cm. The roofer's safety post 70 secures the planks and both roofer's safety grates, 1 m high, are attached to it. The roofer's post 70 trans, one transversal toe board 70, as well as 2 scaffold tubes 50 c/w one coupler secure the narrow side of the scaffold.



1 Enlargement bracket 35
2 Frame pin Ø8 mm
3 Roofer's post 70
4 Roofer's post 70 trans
5 Roofer's safety grate
6 Toe board 70 trans
7 Scaffold tube 50
8 Rigid coupler 48/48
9 Scaffold tie

WARNING

Warning!

At the uppermost elevation, the scaffold must be tied across the entire width.

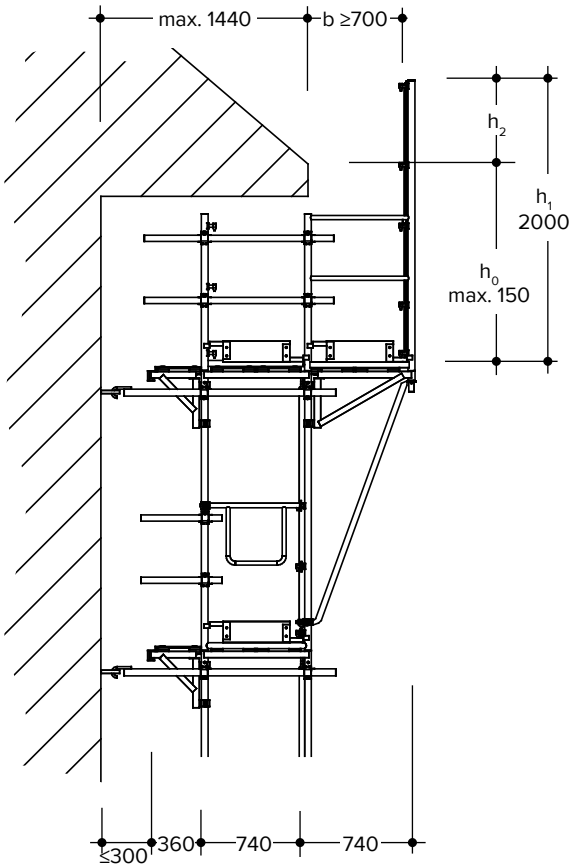
Tie forces see chapter *Tying* on page 72.

12.2 With enlargement bracket 35 inside and enlargement bracket 70/200 or enlargement bracket 70 outside

When installing enlargement brackets 35 and 70/200 as shown, the working platform at the uppermost scaffold level can be increased to 184 cm.
Eaves projection up to max. 140 cm possible. Bracket 70 plank retainer and frame pin Ø8 mm secure the planks to the vertical frame. At the narrow end of the scaffold, the roofer's post 70 trans, one handrail post and board 74 plank retainer are installed.

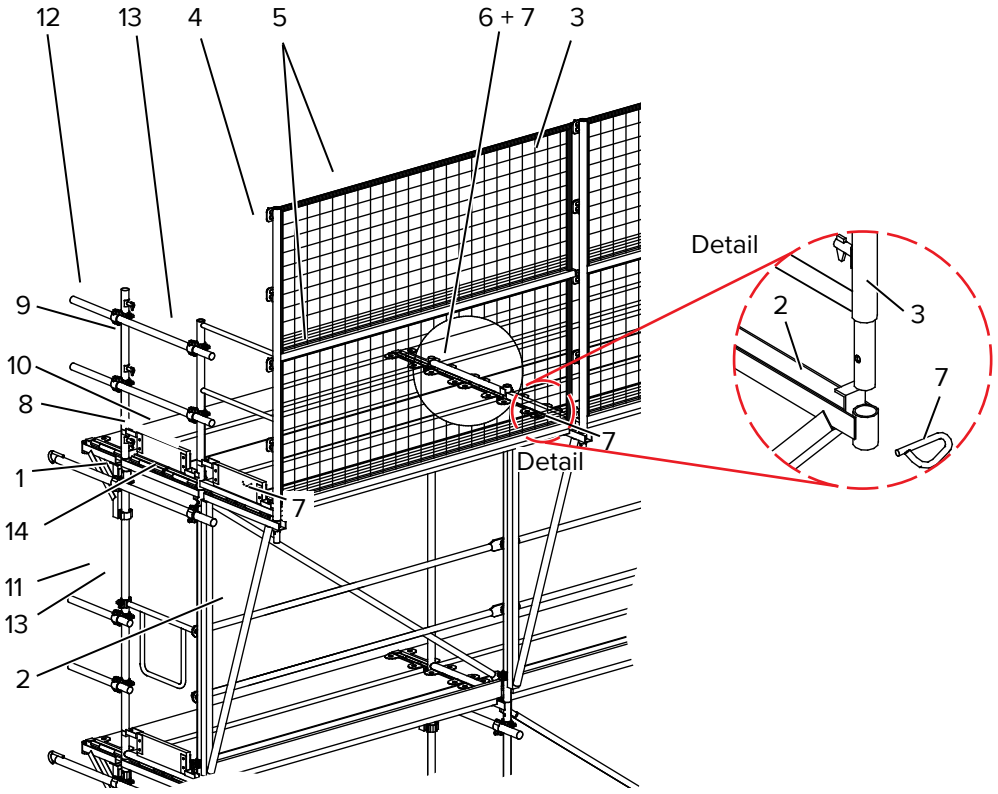
As an option, the enlargement bracket 70 c/w diagonal EB 70 can be installed.

In the fall protection area of the roof, the scaffold is tied to the building at the same level as the bracket.



$h_2 = h_1 - h_0 \geq 1.50 - b$

Unless stated otherwise, all dimensions are in mm.



1 Enlargement bracket 35
2 Enlargement bracket 70/200 optional enlargement bracket 70 + diagonal
3 Roofer's post 70
4 Roofer's post 70 trans
5 Roofer's safety grate
6 Bracket 70 plank retainer
7 Frame pin Ø8 mm
8 Plank retainer 74
9 Handrail post
10 Toe board 70 trans
11 Scaffold tube 50
12 Scaffold tube 150
13 Coupler
14 Scaffold tie

Tie forces see chapter *Tying* on page 72.

NOTE

Note

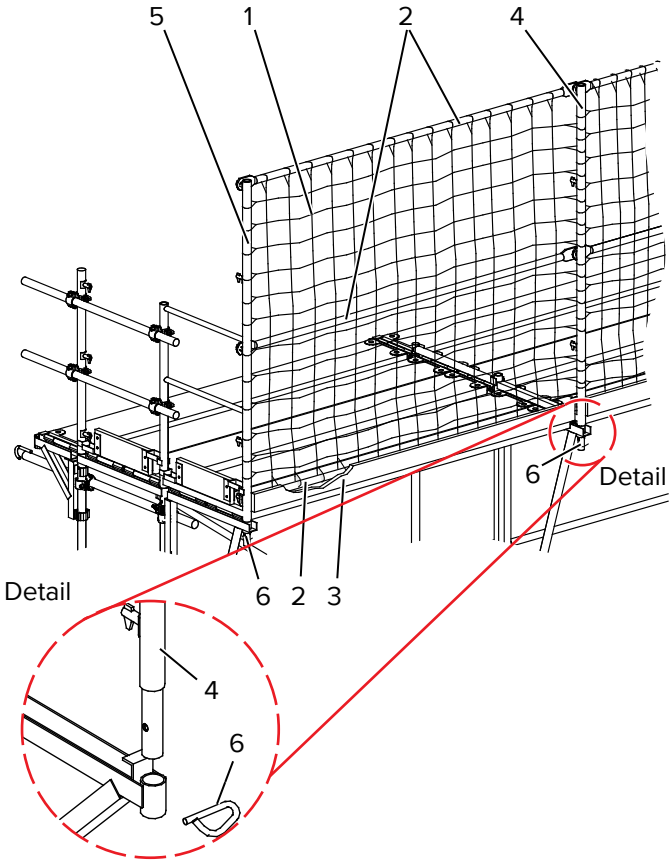
As an alternative to the enlargement bracket 70/200, the enlargement bracket 70 in combination with the diagonal EB 70 can be used.

12.3 Roof protection with safety net

Safety nets may be used instead of roofer's safety grates with roof protection scaffolds.

When using safety nets, the scaffold length can be increased to 4.0 m.

To fasten the safety nets at each scaffold bay, a complete safety railing is mounted to the roofer's safety post. A toe board is used to close the gap between the lower guard rail and the scaffold plank.



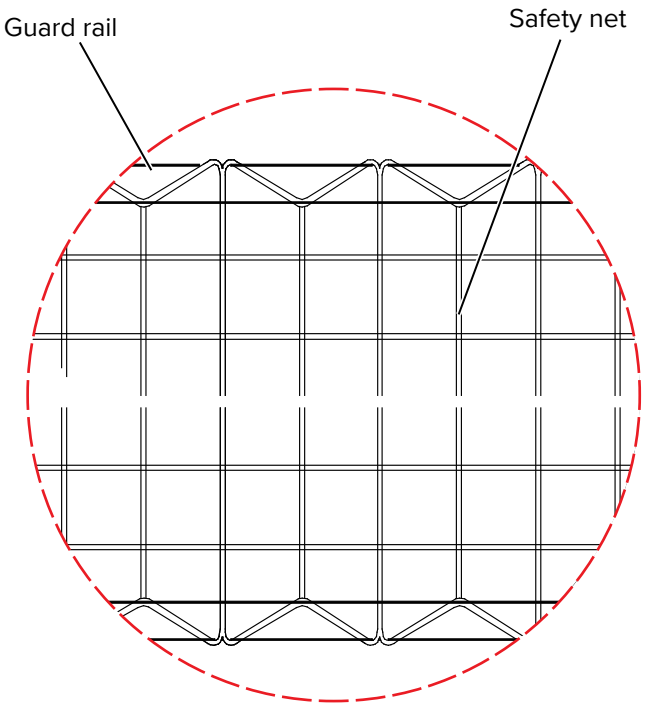
1 Safety net
2 Guard rail
3 Toe board
6 Roofer's post
7 Roofer's post trans
8 Frame pin Ø8 mm

The mesh aperture should not exceed 100 mm and must comply with DIN EN 1253, Part 1 + 2 "Safety Nets and Accessories; Safety requirements, testing" The safety net must be threaded onto the upper and lower guard rail, one mesh at a time.

The remainder of the protection scaffold is erected in a manner similar to that described in the installation of safety grates above (see chapter *Use as roof protection* on page 110).

Guard rail

Two scaffold tubes Ø48.3 mm, having a wall thickness of min. 3.2 mm may also be used.



Tie forces see chapter *Tying* on page 72.

13 Protective roof

To protect against falling objects, a protective roof can be installed at the appropriate height on top of the BOSTA 70 scaffold.

This protective roof is not a working platform and must be separated from the scaffold by two guard rails.

Use a nut and bolt M8x80 MuZ to secure the deck bracket at the top of the vertical frame, use the attached half coupler to fasten the bracket on the bottom. Insert the bracket post into the deck bracket and secure with frame pin Ø12 mm.

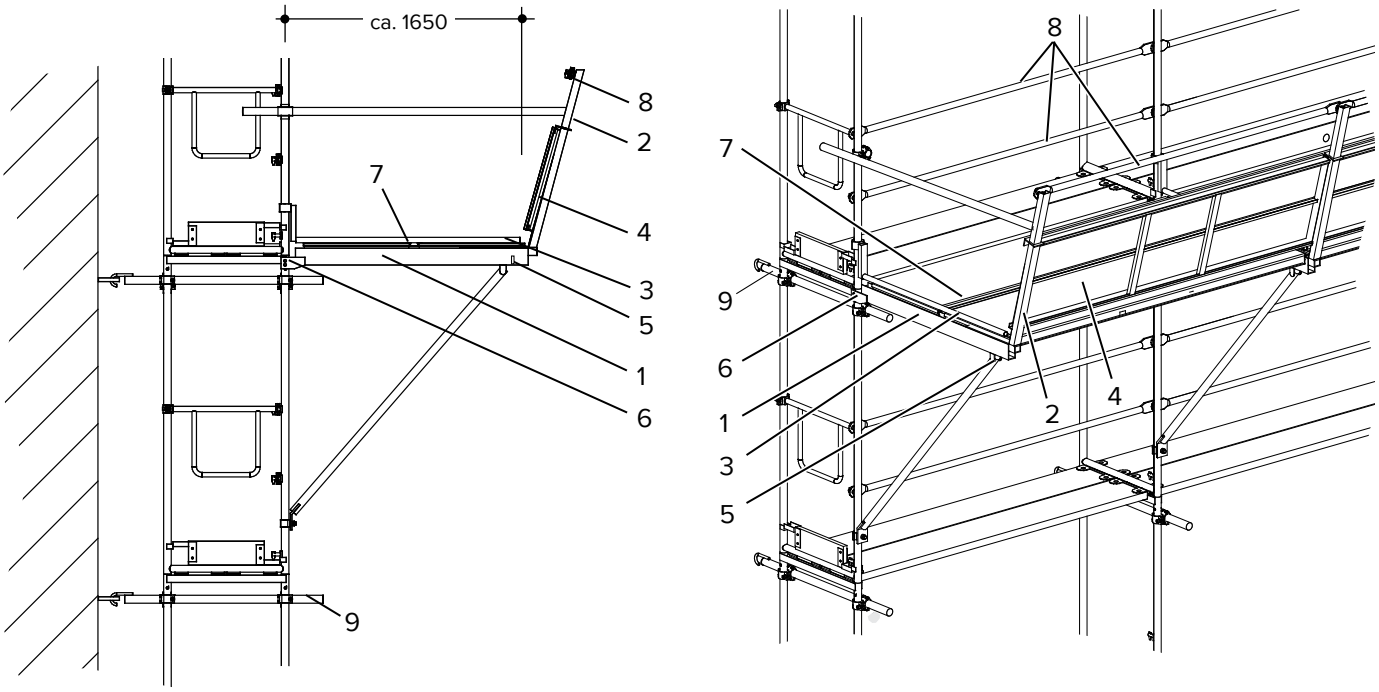
Install the plywood deck and close any gaps with gap plate. Use a plank retainer to prevent all planks from lifting off.

In the area of the protective roof, the scaffold is tied above and at the support level of the protective roof.

WARNING

Warning!

Danger of falling during installation!
Appropriate safety precautions according to the risk assessment must be taken.



1 Deck bracket 180
2 Bracket post
3 Plank retainer
4 Alu frame deck
5 Frame pin Ø12 mm
6 Bolt M 8 x 80 with nut
7 Gap plate
8 Guard rail
9 Scaffold tie

Tie forces see chapter *Tying* on page 72.

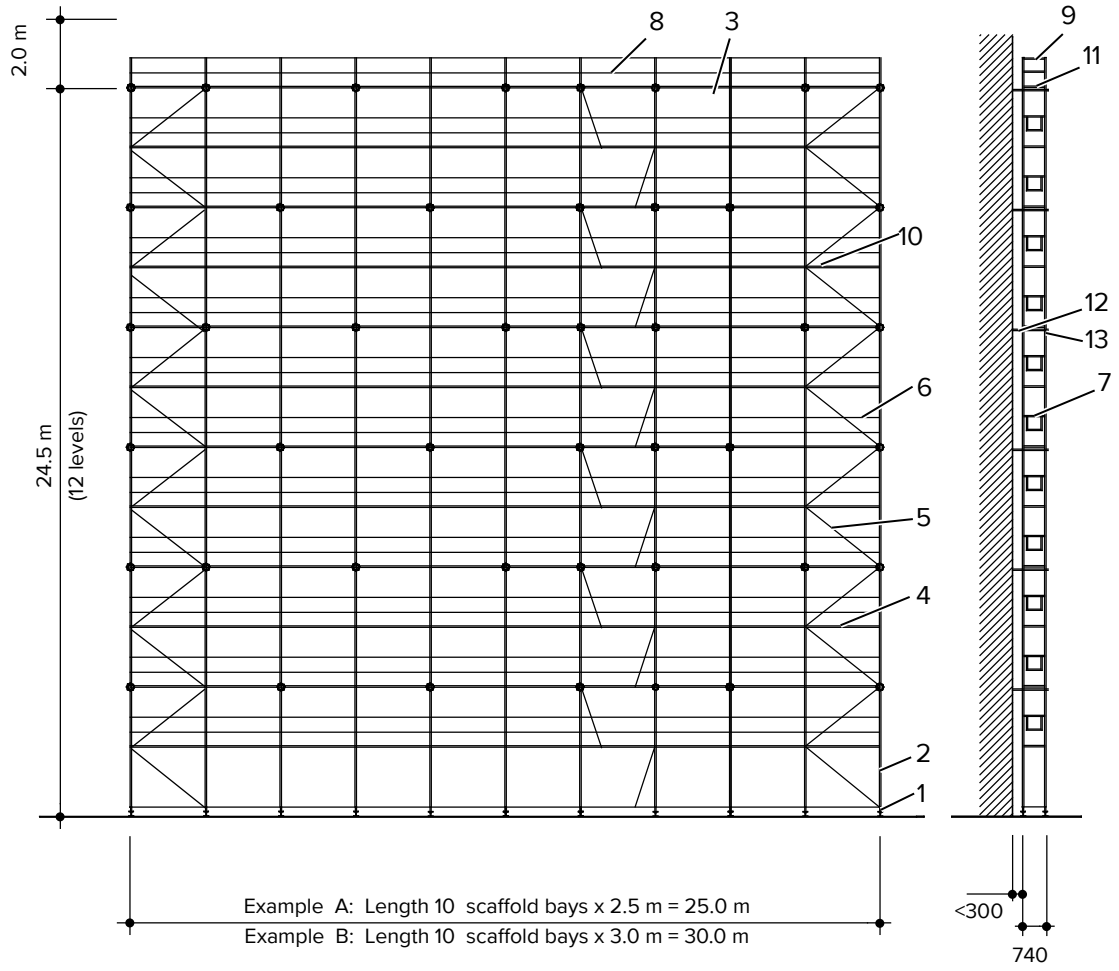
Unless stated otherwise, all dimensions are in mm.

14 Calculation of material

Two examples of how to calculate the necessary material.

Example A:
Length 25.0 m x height 26.5 m = working area 662.5 m²

Example B:
Length 30.0 m x height 26.5 m = working area 795.0 m²



Pos	Unit	Component
1	22	Base jack
2	132	Vertical frame 200/70
3	108 or 216	Alu frame deck 250/70 TP, SP, HBP 250/32
4	12	Alu passage deck with ladder 250/70
5	24	Diagonal 200
6	250	Guard rail 250
7	22	Double rail 70 trans
8	9	Railing post70
9	2	Twin railing post 70 trans
10	120	Toe board 250
11	24	Toe board 70 trans
12	45	Scaffold retainer 110
13	90	Rigid coupler 48/48

Pos	Unit	Component
1	22	Base jack
2	132	Vertical frame 200/70
3	108 or 216	Alu frame deck 300/70 Timber, steel, hollow box planks 300/32
4	12	Alu passage deck with ladder 300/70
5	24	Diagonal 203
6	250	Guard rail 300
7	22	Double rail 70 trans
8	9	Railing post 70
9	2	Twin railing post 70 trans
10	120	Toe board 300
11	24	Toe board 70 trans
12	45	Scaffold retainer 110
13	90	Rigid coupler 48/48

Unless stated otherwise, all dimensions are in mm.

14.3.1 Bill of material for single slope stairway

62.5	62	4	12	31	60	2	31	1	31	30	31	1	2	2	18	9	63	3,662.0
60.5	60	4	11	30	58	2	30	1	30	29	30	1	2	2	16	8	56	3,513.8
58.5	58	4	11	29	56	2	29	1	29	28	29	1	2	2	16	8	56	3,411.0
56.5	56	4	11	28	54	2	28	1	28	27	28	1	2	2	16	8	56	3,308.2
54.5	54	4	11	27	52	2	27	1	27	26	27	1	2	2	16	8	56	3,205.4
52.5	52	4	10	26	50	2	26	1	26	25	26	1	2	2	14	7	49	3,057.2
50.5	50	4	10	25	48	2	25	1	25	24	25	1	2	2	14	7	49	2,954.4
48.5	48	4	10	24	46	2	24	1	24	23	24	1	2	2	14	7	49	2,851.6
46.5	46	4	10	23	44	2	23	1	23	22	23	1	2	2	14	7	49	2,748.8
44.5	44	4	9	22	42	2	22	1	22	21	22	1	2	2	12	6	42	2,600.6
42.5	42	4	9	21	40	2	21	1	21	20	21	1	2	2	12	6	42	2,497.8
40.5	40	4	9	20	38	2	20	1	20	19	20	1	2	2	12	6	42	2,395.0
38.5	38	4	9	19	36	2	19	1	19	18	19	1	2	2	12	6	42	2,292.2
36.5	36	4	8	18	34	2	18	1	18	17	18	1	2	2	10	5	35	2,144.0
34.5	34	4	8	17	32	2	17	1	17	16	17	1	2	2	10	5	35	2,041.2
32.5	32	4	8	16	30	2	16	1	16	15	16	1	2	2	10	5	35	1,938.4
30.5	30	4	8	15	28	2	15	1	15	14	15	1	2	2	10	5	35	1,835.6
28.5	28	4	7	14	26	2	14	1	14	13	14	1	2	2	8	4	28	1,687.4
26.5	26	4	7	13	24	2	13	1	13	12	13	1	2	2	8	4	28	1,584.6
24.5	24	4	7	12	22	2	12	1	12	11	12	1	2	2	8	4	28	1,481.8
22.5	22	4	7	11	20	2	11	1	11	10	11	1	2	2	8	4	28	1,379.0
20.5	20	4	6	10	18	2	10	1	10	9	10	1	2	2	6	3	21	1,230.8
18.5	18	4	6	9	16	2	9	1	9	8	9	1	2	2	6	3	21	1,128.0
16.5	16	4	6	8	14	2	8	1	8	7	8	1	2	2	6	3	21	1,025.0
14.5	14	4	6	7	12	2	7	1	7	6	7	1	2	2	6	3	21	922.4
12.5	12	4	5	6	10	2	6	1	6	5	6	1	2	2	4	2	14	774.2
10.5	10	4	5	5	8	2	5	1	5	4	5	1	2	2	4	2	14	671.4
8.5	8	4	5	4	6	2	4	1	4	3	4	1	2	2	4	2	14	568.6
6.5	6	4	5	3	4	2	3	1	3	2	3	1	2	2	4	2	14	465.8
4.5	4	4	4	2	2	2	2	1	2	1	2	1	2	2	2	1	7	317.6
2.5	2	4	4	1	-	2	1	1	1	-	1	1	2	2	2	1	7	214.8
Height [m] / Component	V-frame 200/70	B-jack 50/3.3	Guard rail 250	Diagonal 200	Double rail 70 trans	Twin railing post 70 trans	Alu stairway 250	Stairway access	Exterior railing	Gap plate bottom	Gap plate top	Handrail post	Guard rail 190	Half coupler 48FB	Scaffold retainer 250	Scaffold retainer 350	Rigid coupler 48/48	Weight [kg]
Prod. code	119000	144131	002113	110020	534419	452970	464633	553656	464655	467626	467670	547669	547658	116370	467041	467063	002514	

Unless stated otherwise, all dimensions are in mm.

15 Safety Instructions

The compiled safety-related guidelines should draw the scaffold erector's attention to the safety related difficulties with the erection and handling of scaffolds. This list includes only the most important instructions and is not complete. It also does not replace a professional analysis about working health and safety while working on scaffolds

- Visually check all scaffold components for any damage
- Do no use damaged parts
- Damaged parts may only be repaired by the manufacturer.
- Using a hoist to lift and unload material onto scaffolds LC 3 is not permitted.
- For all load classes with standard design, only one working deck within a scaffold bay can be subjected to the complete working load.
- Base plates and base jacks must always be attached to the posts.
- Place load-distributing planks under the base jacks and base plates.
- The erection and user manual describes the required stiffening.
- No more than five scaffold bays may be vertically stiffened by only one 1 diagonal.
- In the event of early disassembly of bracings and ties, make sure in advance there is an equivalent replacement.
- Do not jump onto decks or drop objects onto them.
- Planks must be placed close to each other. They should neither teeter nor give way.
- When erecting a scaffold, a minimum deck width of 50.0 cm is required.
- If storing material on planks, the minimum free passage way must be 20 cm wide.
- A 3-sectional side protection must be installed on all decks (exceptions see page 51).
- Storing material on decks of fall protection scaffolds is not allowed.
- If the date and location of a scaffold assembly is scheduled when other contractors have to work on their site, these contractors have to be consulted to coordinate the work to avoid danger.
- Define the assembly procedure that has to be used already during the technical planning of the project. Make sure that the danger of falling is minimized.
- Do not execute scaffold work under deadline pressure. Take this into consideration during planning.
- All material required at the site must be available in sufficient quantities, in sound condition, and freely accessible.
- When material must be transported manually, one worker must be located on each scaffold lift, including the ground level.
- Scaffold parts must not be dropped to the ground below.
- If scaffold components are stored, they must be sheltered from the weather.
- When storing scaffold components, they should be handled with care.

The contractor erecting the scaffold is responsible for the safe erection, modification and dismantling of the scaffold. He must keep his employees informed about all work to be completed. The contractor must communicate new safety-related developments in the erection of scaffolds to his employees. He should repeatedly encourage his employees to maintain safe work habits. Every contractor who uses the scaffold, is responsible for observing and maintaining safety at the work place in accordance with all by-laws. The following regulations pertaining to safety at the workplace as applied in the erection of scaffolds for Germany at the time of printing are:

- Arbeitssicherheitsgesetz (ASiG) dated 10.31.2006 [German By-law for Safety at the Work Place],
- Rahmenrichtline 89/319EWG dated 06.12.1989 [European Framework Directive],
- Arbeitsmittelbenutzungsrichtlinie 89/665/EWG dated 11.30.1989 [European Guideline for the Use of Tools and Supplies] and European guideline 2001/45/EG dated 06.27.2001,
- Baustellenrichtlinie 92/57/EWG dated 06. 24.1992 [European Building Site Guidelines],
- Arbeitsschutzgesetz (ArbSchG) dated 08.31.2015 [German Occupational Health and Safety Act]
- VII Sozialgesetzbuch (SGB) dated 10.19.2013 [German Social Code, Part VII],
- Produktsicherheitsgesetz (ProdSG) dated 11.08.2011 [GermanProduct Safety Act],
- Betriebssicherheitsverordnung (BetrSichV) dated 01.07.2015 [German Workplace Safety Ordinance].
- Handlungsanleitung für den Umgang mit Arbeits- und Schutzgerüsten (BGI 663) [Handling Instructions for the Use of Working and Protective Scaffolding], Scaffold work BGI 5101)
- Use of personal protection equipment to prevent falling (BGR 198) [German Accident Prevention & Insurance Association].
- Use of personal protection equipment for rescue purposes (BGR 199) [German Accident Prevention & Insurance Association].
- TRBS 1203 Qualified persons of 18.11.2004
- TRBS 2121 Risk to people from working of 23.03.2007
- TRBS 2140 Risk of falling while using work and protective scaffolds of 05.04.2005

Furthermore, significant parts of the regulation for the erection of scaffolds are covered in the following standards:

- DIN 4420-1:2004-03,
- DIN EN12810-1:2004-03,
- DIN EN12810-2:2004-03,
- DIN EN12811-1:2004-03,
- DIN EN12811-2:2004-04,
- DIN EN12811-3:2003-02.

To meet the requirements of the above-mentioned regulations and ordinances, a number of prepared forms have been included with the following pages:

- Table 15.1: Hazard assessment
- Table 15.2: Transfer of contractor’s responsibilities
- Table 15.3: Test flow chart
- Table 15.4: Proof of serviceability
- Table 15.5: Test report
- Table 15.6: Tie report
- Identification of an unfinished scaffold
- Table 15.7: User’s instructions

These documents allow the scaffold contractor to fulfill all requirements of the German Workplace Safety Ordinance (BetrSichV). With the following blank forms, the requirements of the German Workplace Safety Ordinance can be fulfilled efficiently.

Additional information can be found in the manual “Arbeits- und Schutzgerüste” [Working and Safety Scaffolds], Bauingenieur-Praxis, published by Ernst & Sohn Verlag, Berlin, ISBN 3-433-01644-5.

Table 15.1: Hazard assessment

HÜNNEBECK A BRAND COMPANY

Hazard and load assessment
acc. to § 5 ArbSchuG

Manufacturer ..... Contractor .....
Phone: ..... Phone: .....
Construction site ..... Operation time .....

Hazard factor	Hazard	Actions	Defects due to: Technic	ORGA	MA	Defects eliminated until:	Consulting
Construction site	Hazards due to existing equipment in the work area.	Determining hazard due to:	☐	☐	☐	.....	☐
		☐ live wires above ground	☐	☐	☐	.....	☐
		☐ pipes, shafts, ducts	☐	☐	☐	.....	☐
		☐ facilities with explosion hazards	☐	☐	☐	.....	☐
		☐ engine plants, cranes and conveying systems	☐	☐	☐	.....	☐
		☐ inaccessible areas	☐	☐	☐	.....	☐
		☐ road and rail traffic	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
Falling	Danger during erection, modification and dismantling of scaffold	erection, modification and dismantling acc. to A&V	☐	☐	☐	.....	☐
		☐ MSG on flank	☐	☐	☐	.....	☐
		☐ MSG in access bay and personal protective equipment (ppe)	☐	☐	☐	.....	☐
		☐ personal protective equipment	☐	☐	☐	.....	☐
		☐ assembly only with trained and instructed personnel	☐	☐	☐	.....	☐
		☐ personal protective equipment (ppe) (attach. point.)	☐	☐	☐	.....	☐
		☐ measures for the resque of persons secured by ppe	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
	Danger due to faulty planks	system-compatible planks	☐	☐	☐	.....	☐
		☐ Alu-frame planks	☐	☐	☐	.....	☐
		☐ hollow box plank	☐	☐	☐	.....	☐
		☐ steel planks	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
	Danger of falling off the inside of the scaffold	☐ wall distance ≤ 30 cm	☐	☐	☐	.....	☐
		☐ railing (inside)	☐	☐	☐	.....	☐
		☐ intermediate rail (inside)	☐	☐	☐	.....	☐
		☐ brackets (inside)	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
	Danger of falling off the outside of the scaffold	☐ Side protection	☐	☐	☐	.....	☐
		☐ railing	☐	☐	☐	.....	☐
		☐ intermediate rail	☐	☐	☐	.....	☐
		☐ toe board	☐	☐	☐	.....	☐
		☐ narrow sides of scaffold	☐	☐	☐	.....	☐
		☐ brackets	☐	☐	☐	.....	☐
		☐ roof protective wall	☐	☐	☐	.....	☐
		☐ personal protective equipment (ppe) (attach. point.)	☐	☐	☐	.....	☐
		☐ measures for the rescue of persons secured by ppe	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
Design	Danger due to faulty erection, damaged scaffold components, or due to prematurely removed scaffold components	☐ visual inspection of scaffold components	☐	☐	☐	.....	☐
		☐ load-bearing surface	☐	☐	☐	.....	☐
		☐ base plates / base jacks	☐	☐	☐	.....	☐
		☐ horizontal installation	☐	☐	☐	.....	☐
		☐ determine tie-in pattern	☐	☐	☐	.....	☐
		☐ check tie-in points	☐	☐	☐	.....	☐
		☐ only use appropriate dowels	☐	☐	☐	.....	☐
		☐ do not throw scaffold components	☐	☐	☐	.....	☐
		☐ proper storage of scaffold components	☐	☐	☐	.....	☐
		☐ Identification of scaffold	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
Tripping, slipping, falling	Danger due to poor quality and stability of platforms and working areas	☐ removal of obstacles	☐	☐	☐	.....	☐
		☐ remove all debris	☐	☐	☐	.....	☐
		☐ dimensions / quality	☐	☐	☐	.....	☐
		☐ length of scaffold retainers	☐	☐	☐	.....	☐
		☐ climate	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
Non-controllable moving parts	Danger due to objects slipping or falling off the scaffold	☐ barrier / marking / identification	☐	☐	☐	.....	☐
		☐ protective roofs / safety nets	☐	☐	☐	.....	☐
		☐ toe board	☐	☐	☐	.....	☐
		☐ hard hats / safety gloves	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
Moving parts without safety guards	Risk of injury caused by percussion drills, hoists, and scaffold lifts.	☐ equipment only with CE/GS	☐	☐	☐	.....	☐
		☐ briefing the employee, use instructions of assembly and use	☐	☐	☐	.....	☐
		☐ expert maintenance / checking	☐	☐	☐	.....	☐
		☐	☐	☐	☐	.....	☐
Electrical facilities and equipment	Risk of touching live parts of high-voltage wires, defective machines, or faulty wiring	☐ Installation / Maintenance of facilities by expert electricians	☐	☐	☐	.....	☐
		☐ Use of appropriate power sources, lighting and installation material	☐	☐	☐	.....	☐
		☐ monitoring of checklists	☐	☐	☐	.....	☐
		☐ maintaining proper distance to live wires				.....	
		☐	☐	☐	☐	.....	☐
Excessive body strain	Risk of injury, due to carrying or lifting heavy scaffold parts >25 kg	☐ Availability of hoists and scaffold lifts	☐	☐	☐	.....	☐
		☐				.....	

Unless stated otherwise, all dimensions are in mm.

Table 15.2: Transfer of contractor's responsibilities

Confirmation of transfer of contractor's responsibilities
(§ 9 Sect. 2 Nr. 2 OwiG, § 15 Sect. 1 No. 1 SGB VII, § 3 Sect. 1 and 2 ArbSchG)

Mr. / Ms.

will be responsible for the operation / the department *)

of

(Name and postal address of company)

and all aspects pertaining to the industrial health and safety act, the prevention of accidents at the workplace, occupational illnesses, and work-related health hazards. He/She shall be accountable for:

- managing and maintaining facilities *)
- providing instructions and directives *)
- ensuring effective First Aid measurements if necessary *)
- request work-related medical exams or other work-related medical requirements. *)

If the cost does not exceed €.

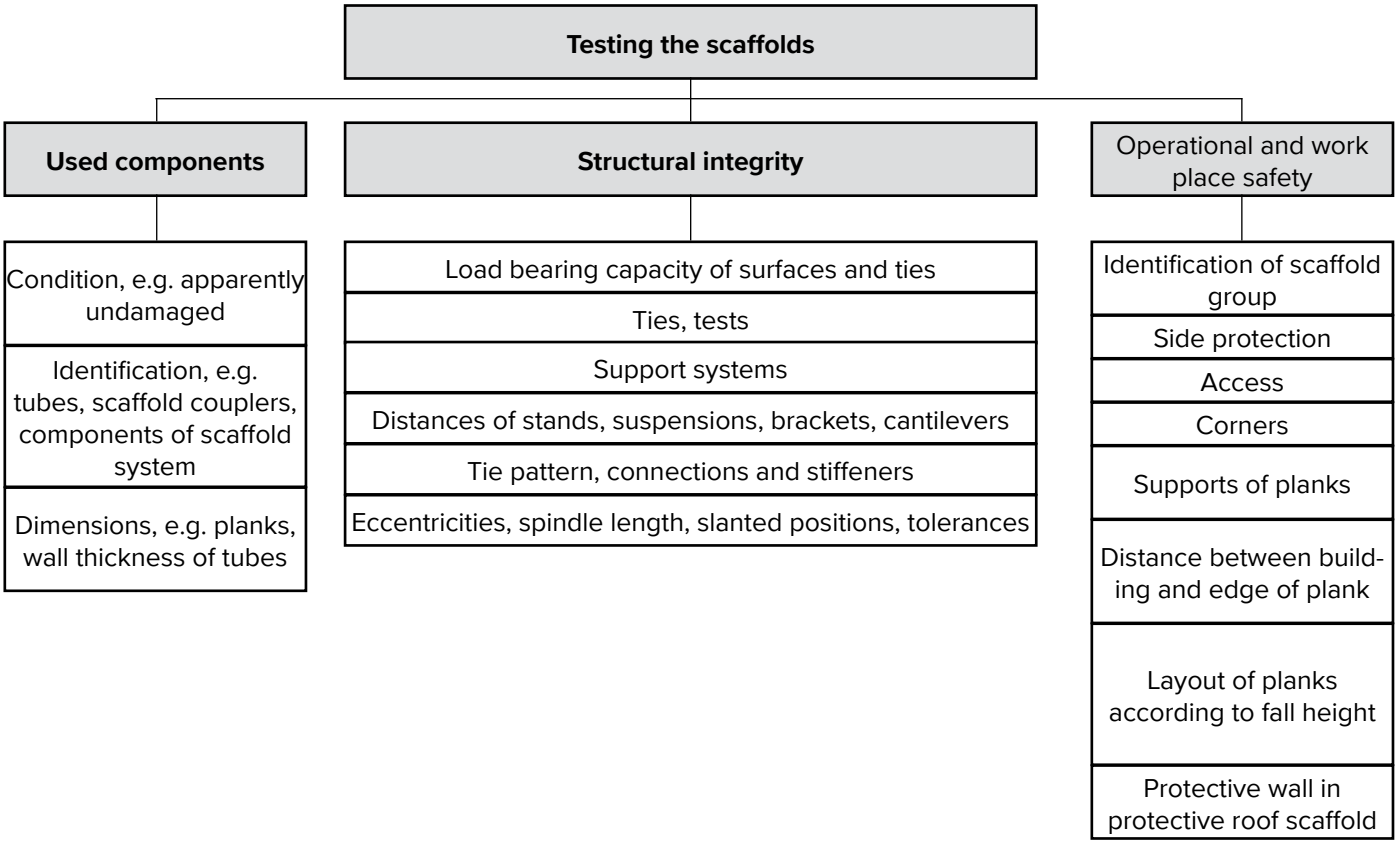
This includes in particular:

City Date

Signature of contractor Signature of responsible person

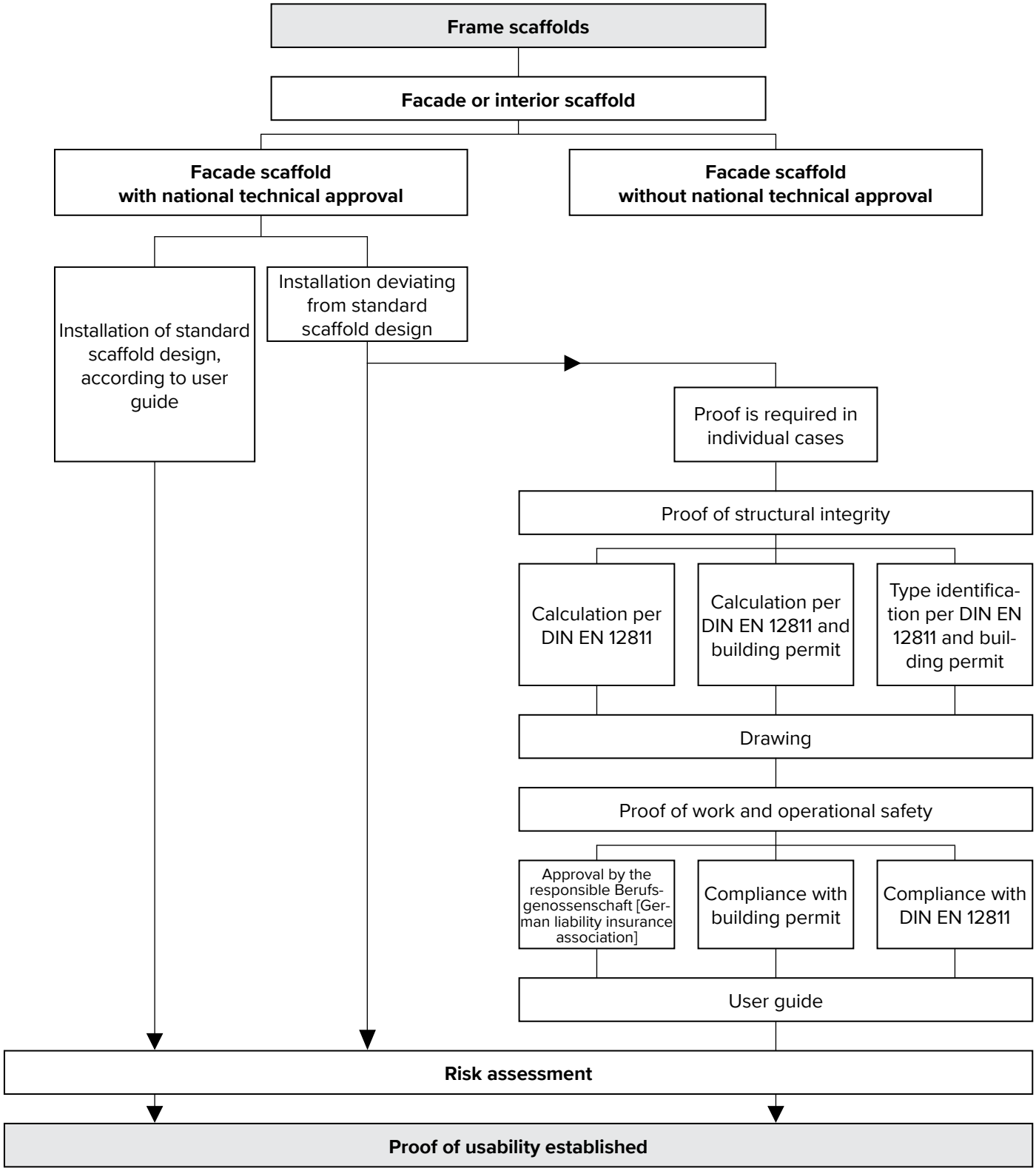
*) strike out where not applicable

Table 15.3: Test Flow Chart



Unless stated otherwise, all dimensions are in mm.

Table 15.4: Proof of serviceability



HÜNNEBECK A BRAND COMPANY

Test report for working and safety scaffolds

acc. to §§ 510 and 11 BetrSichV

Manufacturer ..... Contractor .....
Phone.: ..... Phone.: .....
Construction site ..... Operation time .....

Scaffold type:
☐ Work scaffold ☐ Protective scaffold ☐ Protective roof scaffold ☐ Protective roof
☐ Pedestrian passage ☐ Mobile scaffold ☐ Mobile working platform ☐ Hanging stage
☐ Weather protective roof ☐ Special scaffold

Type	Load class	Scaffold width	Covering	Construction
☐ Facade scaffold	☐ 1 0.75 kN/m²	☐ W06 (0.6 <0.9 m)	☐ Net	☐ Standard ABZ No. Z-.....
☐ Area scaffold	☐ 2 1.50 kN/m²	☐ W09 0.9 <1.2 m	☐ Tarpaulin	☐ Structural analysis
☐ Frame	☐ 3 2.00 kN/m²	☐ W..._____	☐ Others	
☐ Module	☐ 4 3.00 kN/m²	☐ Bracket..._____		Traffic safety
☐ Mast brackets	☐ 5 4.50 kN/m²			☐ Authorisation
☐ Steel tube couplers	☐ 6 6.00 kN/m²			☐ Warning signs
☐ Others				☐ Stopping restriction

Risk assessment	Additional safety precautions (2)	Additional assembly aids
☐ Not existent	☐ Safety net	☐ Auxiliary scaffold
☐ Existent	☐ Personal protective equipment (ppe)	☐ Lifting working platform
	☐ Attachment points for ppe determined	☐ Scaffolding lift
Additional safety precautions (1)	☐ Measures for rescue with ppe taken	☐ Crane
☐ Side protection (inside)		☐ Others
☐ Covering	☐ Others	

Check of components	Planks	Work and operation safety
☐ visually without damage	☐ Scaffold planks	☐ Side protection
☐ Original parts	☐ System planks	☐ Distance to wall
		☐ Access ways
Structural stability	Tying	☐ Corners
☐ Load bearing capacity of ground	☐ Tie pattern	☐ Protective wall in roof prot. scaffold
☐ Jack extension length	☐ Scaffold tie certificate existing	☐ Traffic safety, lighting
☐ Lateral bracing at foot level	☐ Higher loads with covered scaffolds	
☐ Diagonals		Approval
☐ Lattice girder		☐ Scaffold not approved
☐ Special construction according to on site documents		☐ Closed sign attached
		☐ Scaffold is approved
☐ Castor wheels		☐ Labeling attached
		☐ User manual handed over

Handover

☐ Notes: .....

.....

.....

☐ Check of working and protective scaffold completed (scaffold erector)

Place, date: .....

Signature Scaffold assembler:..... Group leader: .....

☐ Working and safety scaffold with test report taken over (scaffold user)

Place, date ..... Signature Contractor: .....

Place, date: ..... Qualified person: .....

Unless stated otherwise, all dimensions are in mm.

Table 15.6: Scaffold tie certificate

Tie report																										
Project:												Component:														
Dowel type:												Bolt typ:														
Tying ground:												Test equippment:														
Total no. of ties:												No. of tested tie:														
x	→	Row of stands from the left hand side											Test load in kN:													
Scaffold elevation starting from below		1	2	3	4	5	6	7	8	9	10	...														
	...																									
	10																									
	9																									
	8																									
	7																									
	6																									
	5																									
	4																									
	3																									
	2																									
↑	1																									
Test load [kN] 1.2 x load of tie		A																								
		B																								
		C																								
		D																								

Place, date

Signature of inspector

Identification of a scaffold still under construction

No access

WARNING

Warning!

Areas of the scaffold not ready for use, must be blocked off and clearly identified with a sign, reading “NO ACCESS“!

Unless stated otherwise, all dimensions are in mm.

Table 15.7 Approval report

Scaffold DIN EN 12810- ..... D - SW...../..... - H1 - ..... - .....

Load class | Width of bay | Length of bay | Cover (A/B) | Access (LA/ST)

General data

Project .....
Manufacturer .....
Contractor .....
Safety coordin. .....

Details on scaffold

DIN EN 12811 part 1: Working scaffold

☐Facade scaffold ☐Area scaffold

☐Net ☐Tarpaulin

DIN 4420 part 1: Protective scaffold

☐Protect. scaf. ☐Protect. scaf. ☐Protect. roof

☐Standard model Approval Z-.....-.....)
(+ manual version .....)

☐Structural analysis

Load class

☐ **1** 0,75 kN/m² ☐ **2** 1,50 kN/m² ☐ **3** 2,00 kN/m²
☐ **4** 3,00 kN/m² ☐ **5** 4,50 kN/m² ☐ **6** 6,00 kN/m²

Attention: As sum of evenly distributed live loads in each scaffold bay

Check by qualified person

For the manufacturer .....
Name / Date / Signature

For the scaffold user .....
(1 Name / Date / Signature

.....
(2 Name / Date / Signature

.....
(3 Name / Date / Signature

.....
(4 Name / Date / Signature

.....
(5 Name / Date / Signature

.....
(6 Name / Date / Signature

15.3.1 Instructions for use

NOTE

Note
The following instructions must be handed over to the user of the scaffold.

The compiled safety-related guidelines in this manual are intended to draw the scaffold user's attention to the requirements when using a scaffold. This list includes only the most important instructions and is not exhaustive. During a professional dispute regarding occupational health and safety while working on scaffolding, this list should not be considered as a replacement for such discussions.

- Prior to entering a scaffold, a visual inspection for any damage is required.
- The scaffold may only be entered by using access ways specifically designed for this purpose (ladders, stairways).
- Damaged scaffolds must not be used.
- Using a hoist to lift and unload material onto scaffolds load class 3 is not permitted.
- Within all scaffold groups / load categories of the standard design, a general rule applies, stipulating that only one working deck within a scaffold bay (referring to the area between two posts and the overall scaffold height) can be subjected to the total dead load.

Unless stated otherwise, all dimensions are in mm.

- The user must not change the scaffold's construction after the erection has been completed.
- Jumping onto the deck below or dropping objects onto planks is not permitted.
- Planks must be placed close to each other. They should neither teeter nor give way.
- If material is stored on top of the planks, the minimum passageway must be 20 cm wide.
- A 3-sectional side protection must be installed on all decks.
- Material may not be stored on the deck of any fall protection scaffolds.
- Careful handling of all scaffold components must be guaranteed.

16 Chronology

Changes compared to issue 2018-10		
Changes	**Page**	**Date**
Section Components updated	8	2019-04
Alu-Staircase G2 added	66	2019-04

Unless stated otherwise, all dimensions are in mm.

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

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

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Keep for later use!

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