

**INSTRUCTION
FOR ERECTION
AND USE**

ALBLITZ 70 A

Instructions for Erection and Use

ALBLITZ 70 A

Approval No. Z-8.1-897

Standard Version
(as of December 20, 2004)



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1. General

The façade scaffolding, ALBLITZ 70 A, is a frame-type aluminium scaffolding of prefabricated components. The bay sizes are 1.57 m, 2.07 m, 2.57 m, 3.07 m; the scaffolding width is 0.73 m.

The scaffold may be used as a working scaffold for the scaffolding groups 1 to 3 in compliance with DIN 4420-1 (effective load per unit area 200 kg/m² in scaffolding group 3) and as a safety and roof safety scaffold (falling height max. 2.0 m). Proof of standard version is furnished for an erection height of 24 m plus spindle extension length.

These Instructions for Erection and Use shall only apply to scaffold uses as technological equipment for industrial purposes. These Instructions describe how to erect, convert and dismantle the standard version of this scaffold. Scaffolds may only be erected, converted or dismantled under the supervision of a qualified person and by personnel specially instructed on how to carry out such work. Any deviations from these Instructions shall only be admissible if such deviations have been assessed on the basis of the Technical Building Regulations and the rules of national technical approval Z-8.1-897 and calculated on a case-to-case basis.

The individual decks may be used in accordance with the data of Table 1 with live loads of the scaffolding groups as per DIN 4420-1 and for safety and roof safety scaffolds.

Table 1: Use of decking

Designation	Z-8.1-897 annex	Bay size l [m]	Use for safety and roof safety scaffold	Use in scaffolding group
Aluminium deck/ Aluminium chequer plate deck 0.32 m	32	≤ 1.57	admissible	≤ 6
		2.07		≤ 5
		2.57		≤ 4
		3.07		≤ 3
Sturdy deck 0.61 m	20	≤ 3.07	admissible	≤ 3
Sturdy hatch-type access	21 and 22	≤ 3.07	admissible	≤ 3
		≤ 1.57		≤ 6
Sturdy deck 0.32 m	23	2.07	admissible	≤ 5
		2.57		≤ 4
		3.07		≤ 3
Aluminium box-type deck	24	≤ 2.57	admissible	≤ 6
		3.07		≤ 5
Combined stacking deck 0.61 m	25 and 26	≤ 3.07	admissible	≤ 3
Hatch-type access combined stacking deck	27 and 28	≤ 3.07	admissible	≤ 3
Combined deck	29 and 30	≤ 3.07	not admissible	≤ 3
Combined hatch-type deck	31	≤ 3.07	not admissible	≤ 3

2. Erecting the scaffold

2.1 General requirements

Prior to erection check the scaffold components for any defects. Never use defective components. Erect the scaffold in the order described below.

2.2 Erecting the first bay

2.2.1 Load-distributing bed

The scaffold must always be set up on a sufficiently strong base. If this is not the case use load-distributing beds in the form of timber planks to be provided under the two scaffold standards, see Fig. 1. No such timber planks will be needed for concrete decks.

2.2.2 Foot plates, foot spindles (base jacks)

Provide a foot plate or foot spindle (base jack) under each scaffold standard. The foot spindles may be fully extended but not more than 25 cm, see Fig. 1. For this purpose observe the instructions for the individual standard version in Chapter 3.

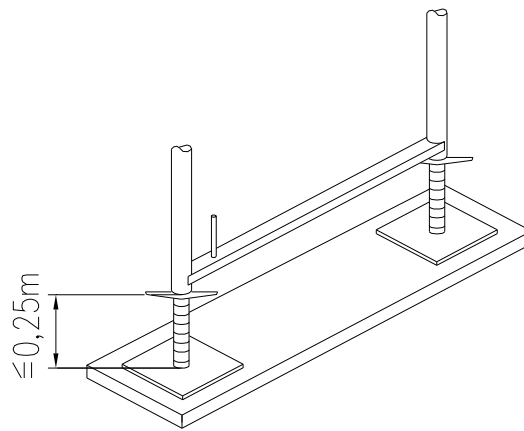


Fig. 1: Load-distributing beds with timber planks, spindle extension

2.2.3 Levelling frame

For slopes, sharp elevation differences and to specific certain scaffold layer heights levelling frames can be used at the foot of the scaffold, see Fig. 2.

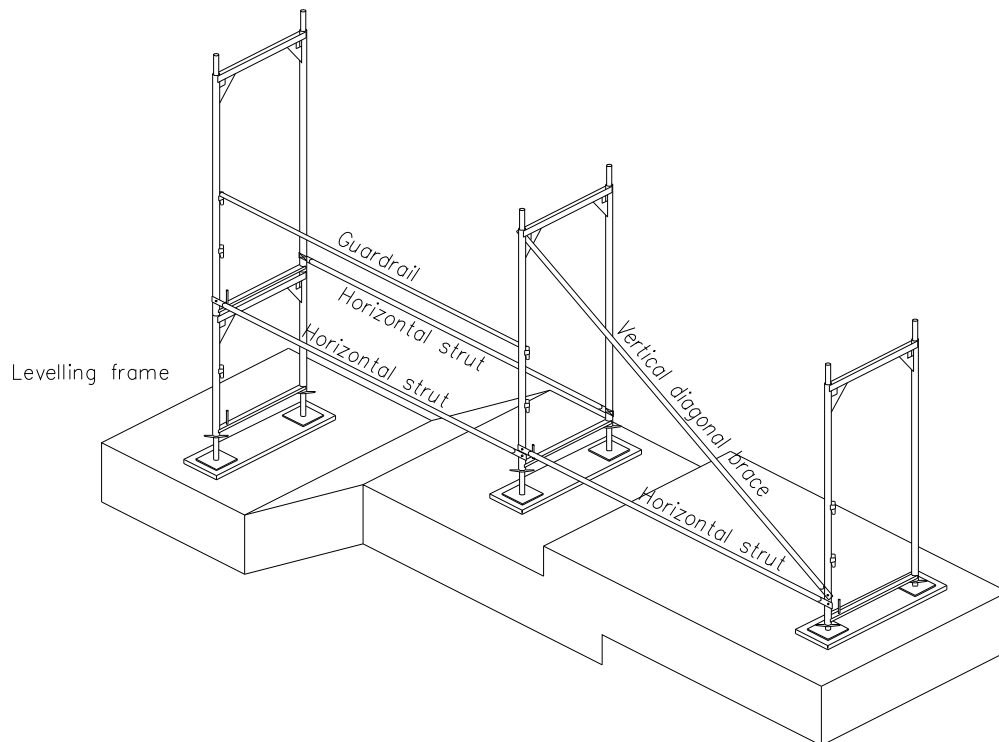


Fig. 2: Levelling frame

2.2.4 Frames

Position vertical or passageway frames vertically and at the given distance to the façade onto the foot plates or foot spindles and protect the same against falling by installing a guardrail brace.

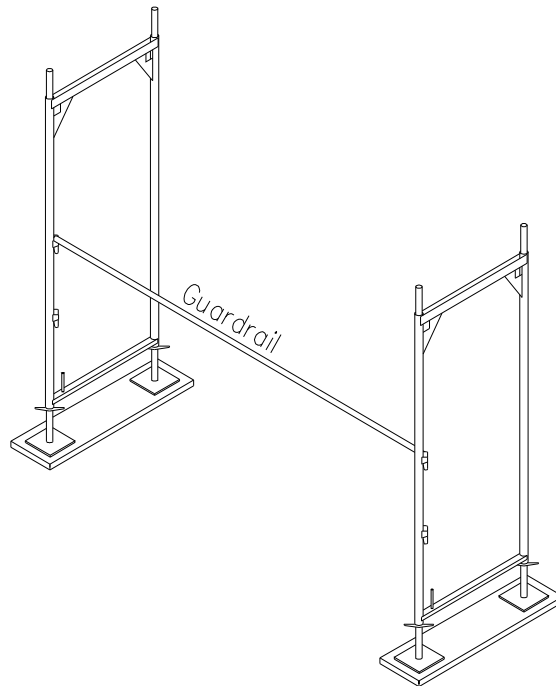


Fig. 3: Erecting the first scaffold bay

2.2.5 Decking

Suspend decks between the upper U-ledgers of the vertical frame. Use two narrow decks (32 cm in width) or one wide deck (60 cm in width) for the 0.73 cm wide vertical frames. When using passageway frames provide decks over the entire width, i.e. four narrow or two wide decks. In scaffolding group 3 all kinds of decks can be used.

2.2.6 Diagonal braces

Provide a diagonal brace as longitudinal bracing at the exterior of the bay, also see Fig. 4. For this purpose insert the shaped end of the diagonal brace into the opening of the gusset plate, swivel downwards until the halfcoupler can be closed at the opposite frame. Also install in this bay a horizontal strut at the exterior of the scaffold above the lower transoms.

With some kinds of erection it will also be necessary to provide diagonal braces and horizontal struts on the inside of the scaffold.

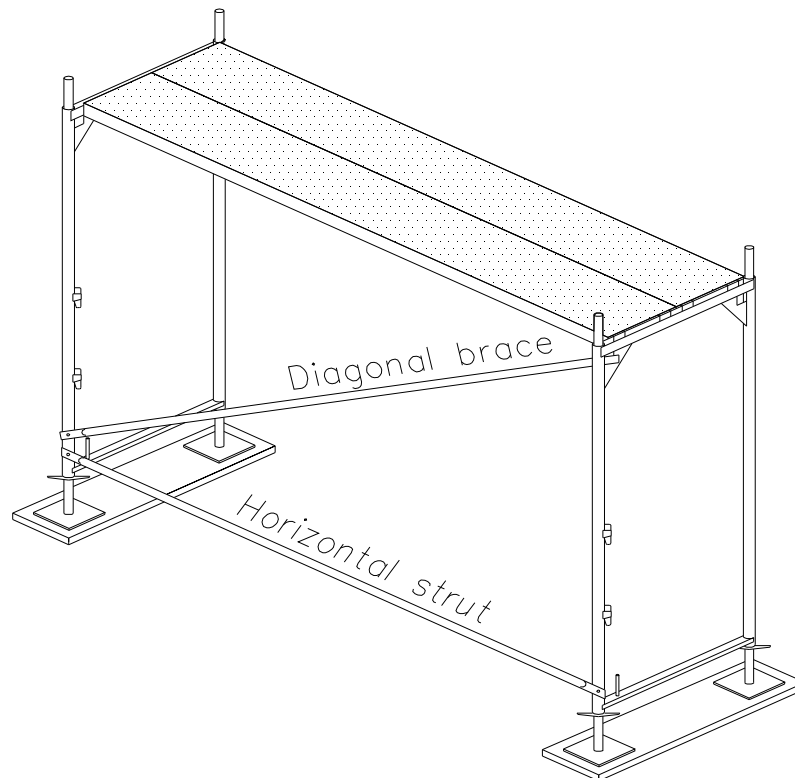


Fig. 4: Completed first bay

2.2.7 Aligning

Align the first bay vertically and horizontally. Check the wall distance.

2.3 Erecting further bays

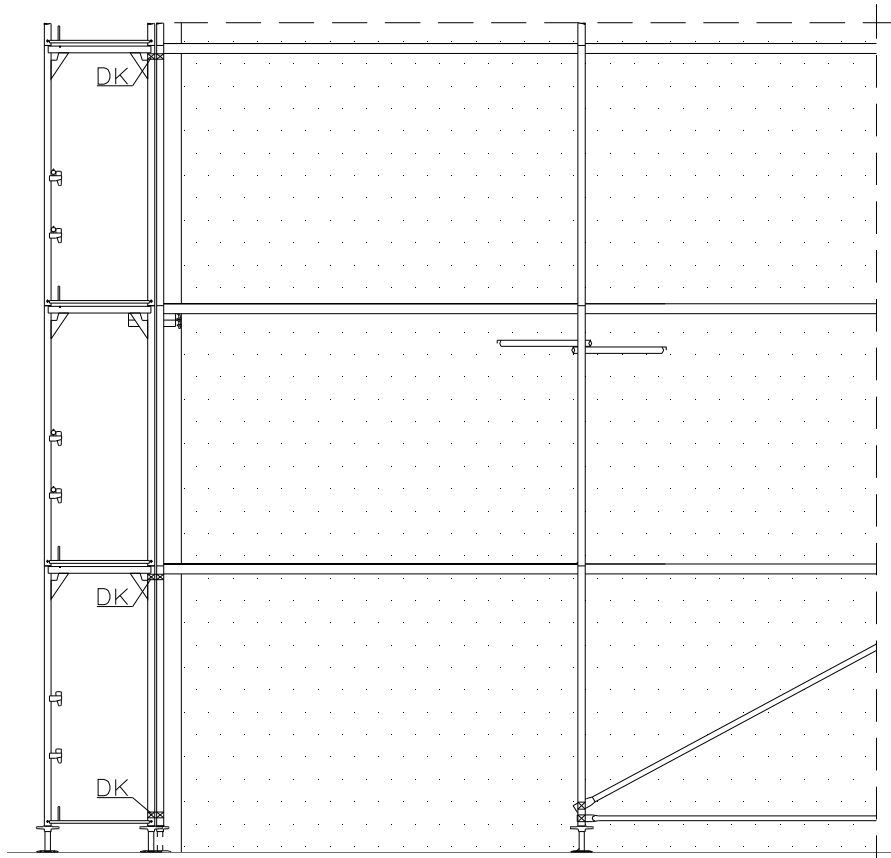
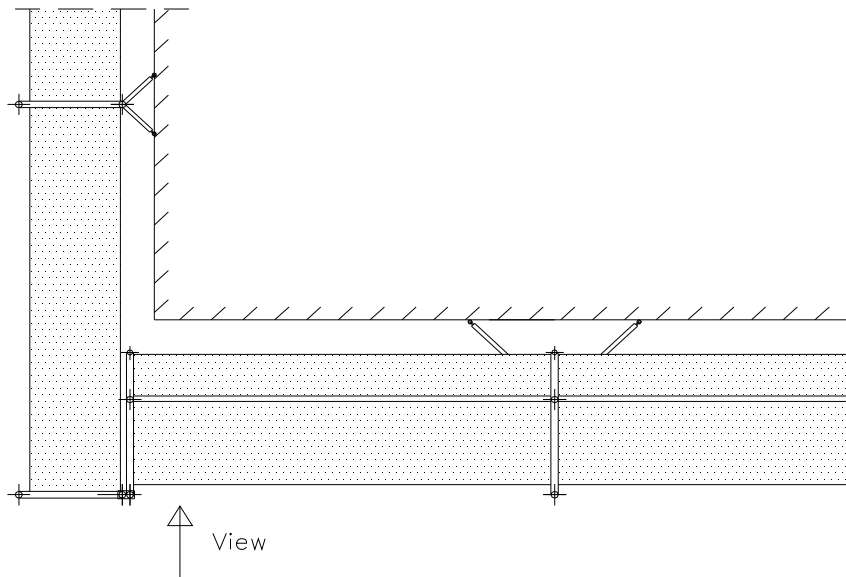
2.3.1 Standard bay

The other bays have to be erected as described above starting from the first bay. As a minimum provide each 5th bay again with a longitudinal brace that consists of a diagonal brace and a horizontal strut. The required number of diagonal and horizontal braces can be gathered from the standard version given in chapter 2. Several kinds of erection will also need cross diagonal braces to be provided in the lower vertical frames.

For versions using brackets it is absolutely essential to provide aluminium double guardrails!

2.3.2 Corner figuration

The scaffold for building corners has to be provided as shown in Fig. 5. Connect two vertical frames at an angle of 90° using two swivel couplers – one of them in the recess of the gusset plates. Now, provide a base jack only under these standards. In the course of further erection these standards have to be connected with a swivel coupler again at a height distance of 4 m. Also anchor the neighbouring standards at a height distance of maximum 4 m using triangular ties.



DK= Swivel coupler

Fig. 5: Corner figuration (side protection not shown)

2.3.3 Ladder access

Before you start working on the first scaffold layer provide an inner ladder for access to higher levels. For this purpose different hatch-type access decks are available. On the lowest level of the ladder area install two transoms or U-transoms into which a deck supporting the first ladder is to be placed.

Always keep the hatches of the access decks closed when not used for access. Preferably arrange the passageways in a staggered manner.

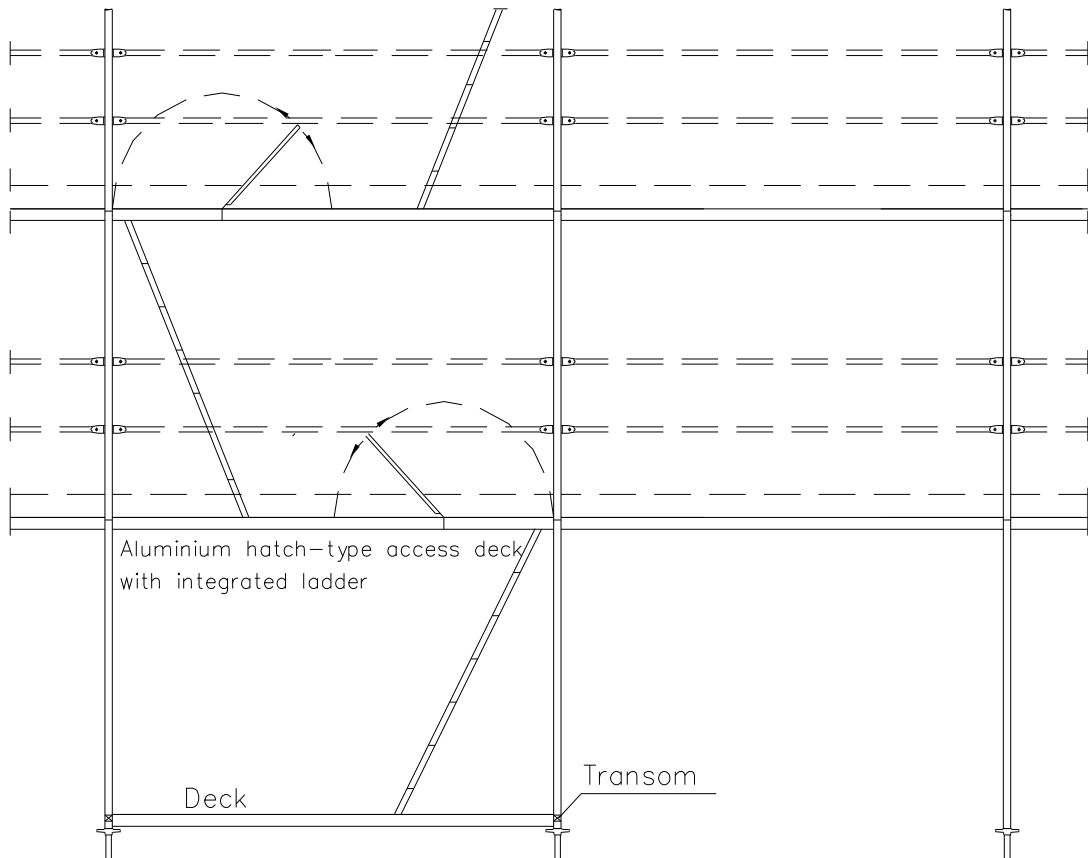


Fig. 6: Ladder access

2.4 Erecting further scaffold layers

2.4.1 Principles

Carry out all scaffolding so that falling is prevented or the risk of falling is kept at a minimum. Protective measures are:

- technological protective measures
- personal protective equipment to prevent falling
- specific instructions

As a technological protective measure ALFIX provides the advanced guardrail post with telescopic guardrail, see chapter 2.4.3.1. If the scaffold contractor concludes after risk assessment that another protective measure should be taken, this has to be documented in separate use instructions. If 'personal protective equipment to prevent falling in compliance with BGR 198¹⁾ is to be used, it will be necessary to use the fastening points provided at the scaffold as shown in chapter 2.4.3.2. Risk assessment must also include any potential rescue of a person who has fallen down. Personal protective equipment may be life lines with integrated fall damper with the rope being max. 4 m long. The self-securing one-hand spring hook must have an opening width of min. 50 mm.

¹⁾ BGR 198 (formerly ZH 1/709): Use of personal protective equipment against falling. Hauptverband der gewerblichen Berufsgenossenschaften; as amended in 2000. Regulations by employer's insurance association can be downloaded from www.fabau.de.

2.4.2 Handling scaffold components

For scaffolds higher than 8 m (deck height over erection area) it is necessary to use builder's hoists. This also includes hand-operated pulley tackles. No such builder's hoist need to be used if the scaffold height does not exceed 14 m and the linear extension of the scaffold is maximum 10 m.

In scaffold bays where vertical handling is done by hand, guardrail and intermediate braces must be in place. For such manual handling at least one person must be involved on each scaffold layer.

2.4.3 Assembling vertical frames and guardrails

2.4.3.1 Advanced guardrails

Advanced guardrail posts with telescopic guardrails provide a temporary side protection over the entire scaffold layer.

On the first layer (standing height 2 m) the components have to be assembled from the floor. On the other levels the advanced guardrail post and the two connected telescopic guardrails have to be relocated vertically only.

Erection shall start at the front face of the scaffold. Mount the advanced end guardrail on the guardrail post, see Fig. 7-1. Suspend a telescopic guardrail in the hook at the post and mount the post on the corner member of the scaffold, see Fig. 7-2:

- Put up the guardrail post on the outer side of the assembly frame with the lower fork located on the guardrail brace of the lower scaffold layer.
- The upper fork embraces the standard tube below the gusset plate and is secured by closing the wedge (hammer blow).

Now, mount a guardrail post on the inner member threading the end guardrail into the suspension hooks, see Fig. 7-3. Then, mount the guardrail along the façade. Suspend the other end of the telescopic guardrail in the next guardrail post, and also another telescopic guardrail, Fig. 7-4. Now, lift the guardrail post and the telescopic and install it in the next assembly frame as described before, see Fig. 7-5. Suspension of the telescopic guardrails and installation of the next guardrail post with guardrails being suspended is repeated over the entire length of the scaffold.

The advanced guardrail must have been provided on the entire scaffold layer before this level may be accessed and the assembly frames and the normal three-piece side protection erected, see Fig. 7-6. The following scaffold layer has to be protected to prevent falling by vertically relocating the advanced guardrail post with telescoping guardrails being connected on both sides, see Fig. 7-7.

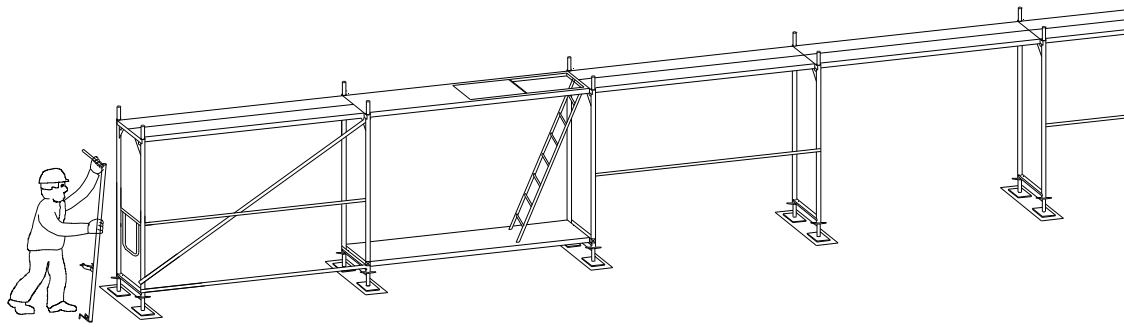


Fig. 7-1: Preparing the guardrail post with advanced end guardrail

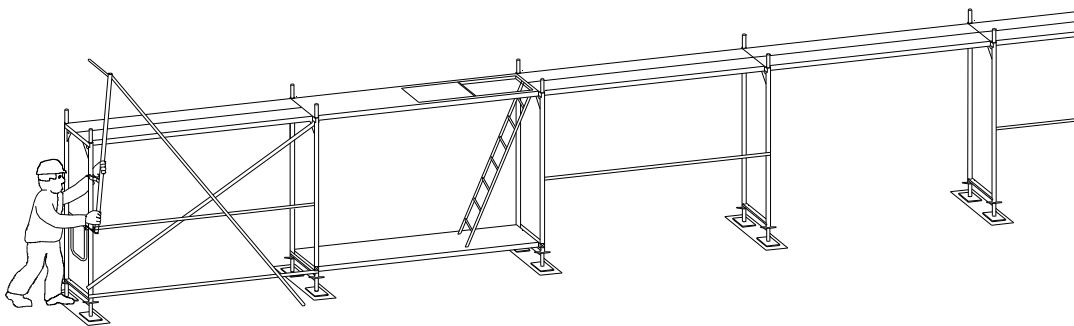


Fig. 7-2: Mounting an advanced guardrail post with end guardrail and telescopic guardrail

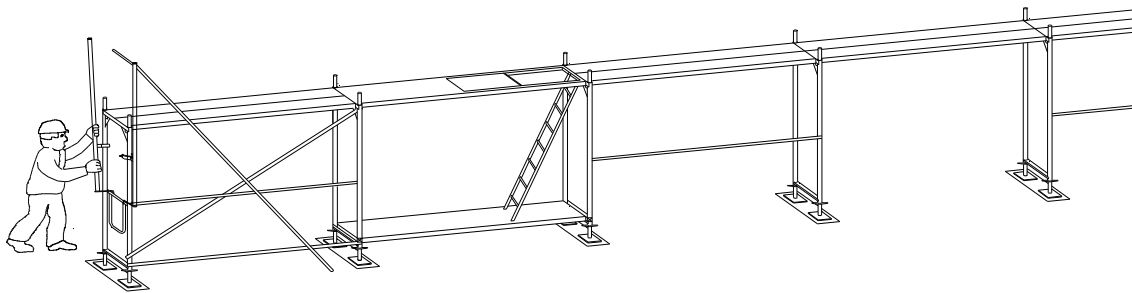


Fig. 7-3: Mounting the advanced guardrail post on inner member

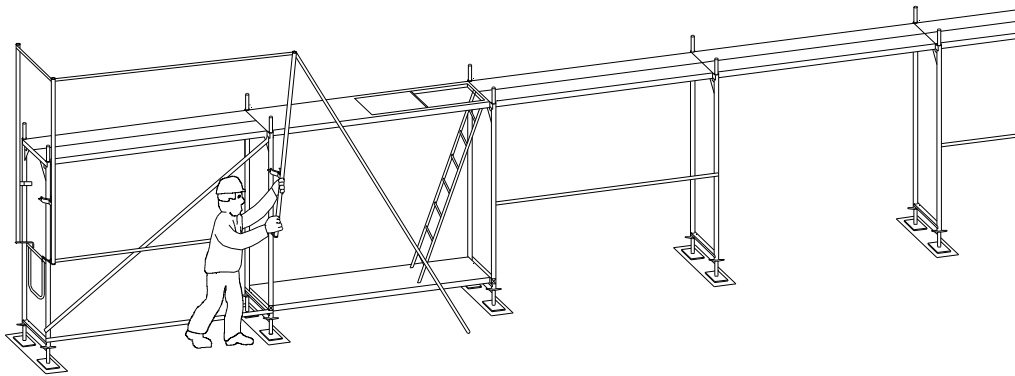


Fig. 7-4: Mounting the guardrail post. other end of telescopic guardrail and another telescopic guardrail.

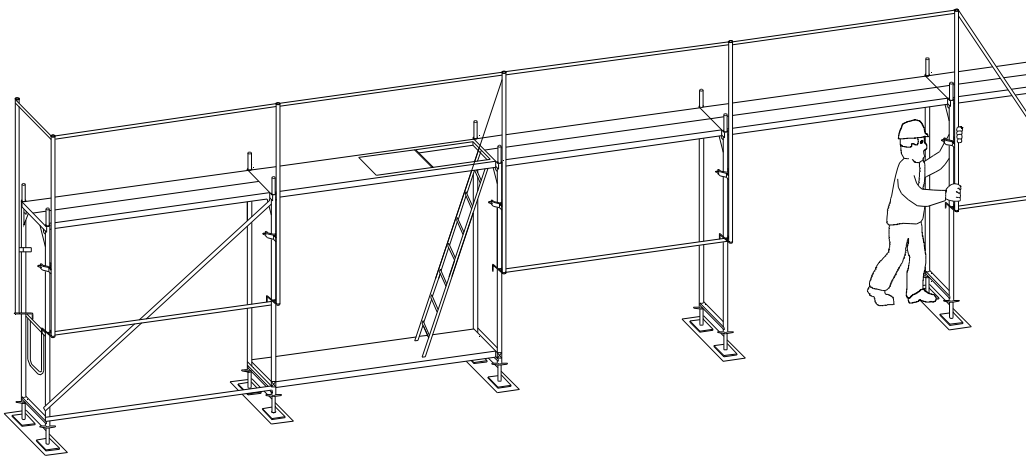


Fig. 7-5: Completing the advanced guardrail over entire scaffold layer

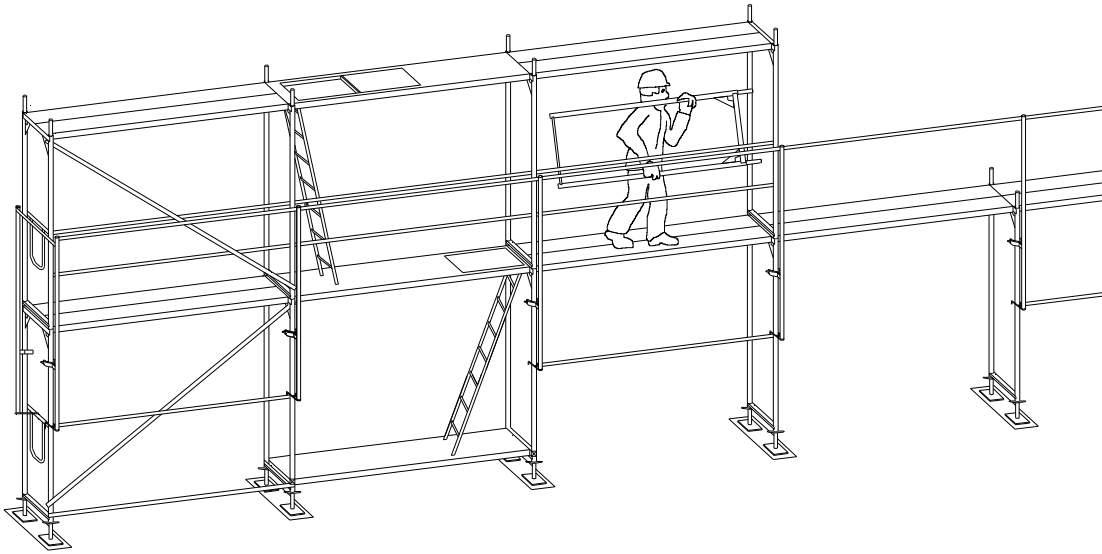


Fig. 7-6: Erecting the next scaffold layer (assembly frame, decks, stiffener, 3-piece side protection) protected by the advanced guardrail.

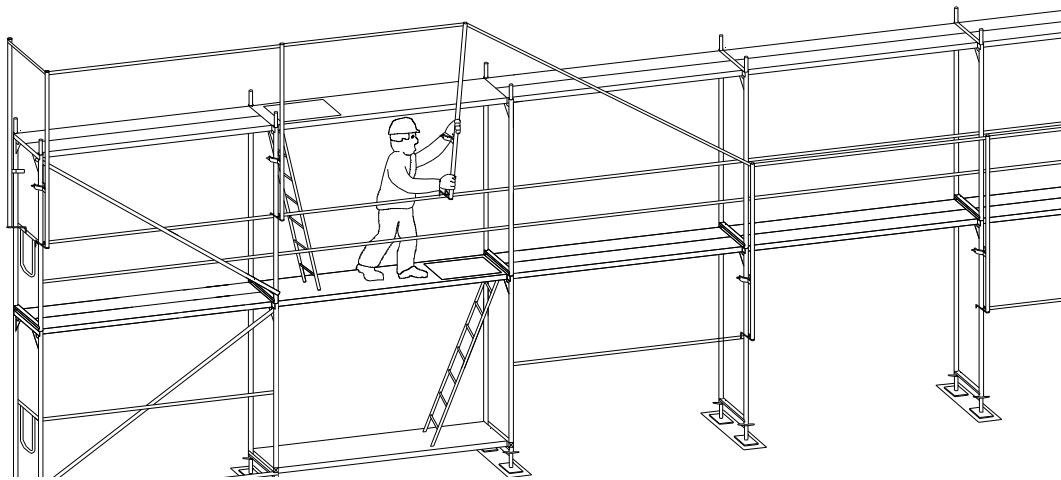


Fig. 7-7: Vertical relocation of advanced guardrail post and telescopic guardrail

2.4.3.2 Fixing points for personal protective equipment against falling

If personal protective equipment is to be worn, the following fixing points can be used:

- frame corner (in gusset plate or at standard tube in the corner) (Fig. 8-1)
- assembly frame over scaffold box (Fig. 8-2)
- guardrail brace (Fig. 8-3)

Use spring hooks in accordance with DIN EN 362 with an opening width of ≥ 50 mm as lifting tackle.

First access to scaffold layer: Fix the spring hook in the frame corner on the external side of scaffold . For this purpose hook the spring hook from above, while standing on the ladder, on the external side in the frame corner, see Fig. 8-4. A scaffold bay consisting of two assembly frames and a guardrail brace can be put up using this kind of protection.

For further erection work the a. m. fixing points may also be used at freestanding assembly frames.

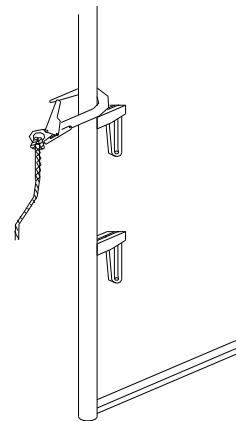


Fig. 8-1: Fixing point in frame corner Fig. 8-2: Fixing point over scaffold box (outside and inside of scaffold)

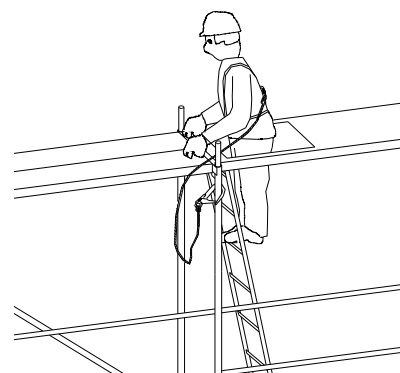
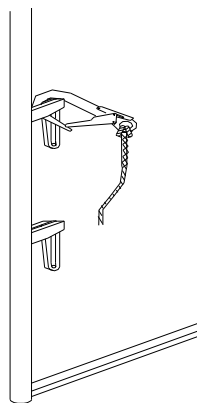


Fig. 8-3: Fixing point at guardrail brace

Fig. 8-4: Fixing in frame corner on the outside of scaffold for initial access of scaffold layer

2.4.4 Decking

Provide the decking as described in chapter 2.2.5. Always mount the decking starting from the lower secured scaffold layer. Protect the decks against accidental lift-out by the foot ledgers of the next scaffold layer, on the top scaffold layer by the guardrail post or guard system support. Always provide separate deck retainers if there is no protection against lift-out by components arranged above, see Fig. 12, for example. Secure the deck retainers by locking clips. The bracket 0.36 has a lift-out protection for the bracket deck.

2.4.5 Diagonal braces

Mount diagonal braces continually as the scaffold erection progresses. They may be mounted either in a tower-like manner or continuously.

The necessary number of diagonal braces can be gathered from the standard versions in chapter 3.

2.4.6 Completing the side protection

Provide missing intermediate stringers and toeboards and the complete side protection at the end on all scaffold layers that are not exclusively used for scaffold erection.

2.4.7 Scaffold retainers

To anchor the scaffold in the façade, quick-release anchors with U-shaped armature end connection, scaffold retainer and anchor couplers are available.

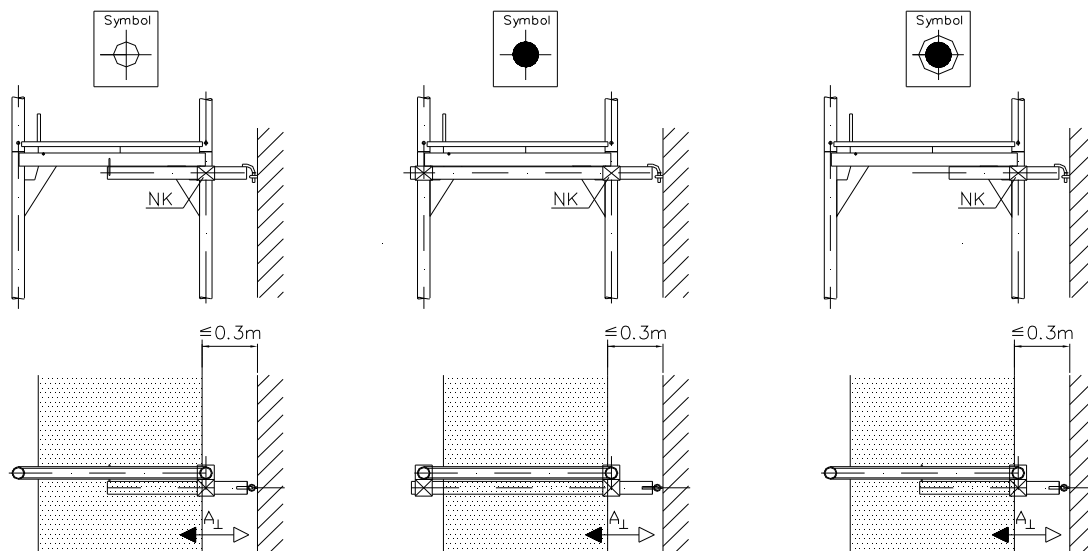
If no inner bracket is provided in the opening of the gusset plant, the scaffold retainer or quick-release anchor can be connected there by a standard coupler, see Fig. 9a. The armature end connection of the quick-release anchor embraces the U-transom of the vertical frame. Connect the scaffold retainer to the outer standard using a second standard coupler.

If an inner bracket has been provided, the scaffold retainer must be connected there by an anchor coupler, or the scaffold retainer must be connected below the bracket brace to the inner and outer standard using standard couplers, see Fig. 9b.

With some erection types individual scaffold retainers are connected to the inner standard only.

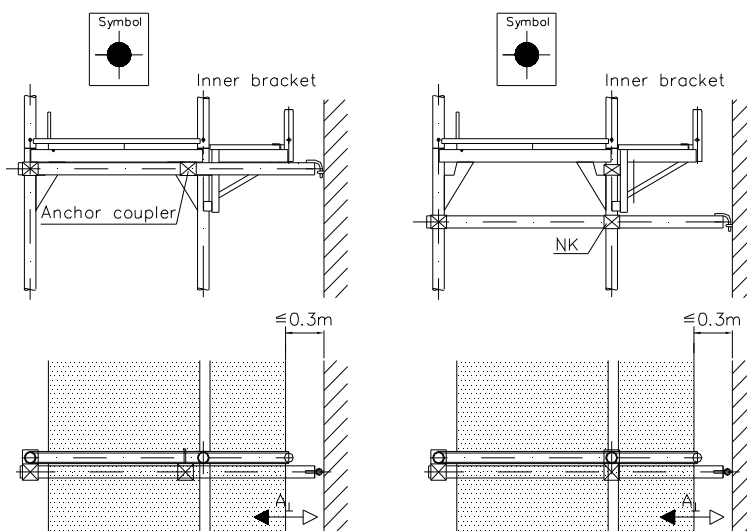
Some kinds of erection require triangular ties (Fig. 10). They are formed by retainer pairs in V-shape arrangement to be connected to the inner standard at an angle of approx. 45° to become the vertical frame level.

In individual cases connections up to 0.4 m below the transom are admissible.



NK= Standard coupler

Fig. 9a: Connecting scaffold retainers with scaffolds without inner brackets.



NK= Standard coupler

Fig. 9b: Connecting scaffold retainers with scaffolds provided with inner brackets

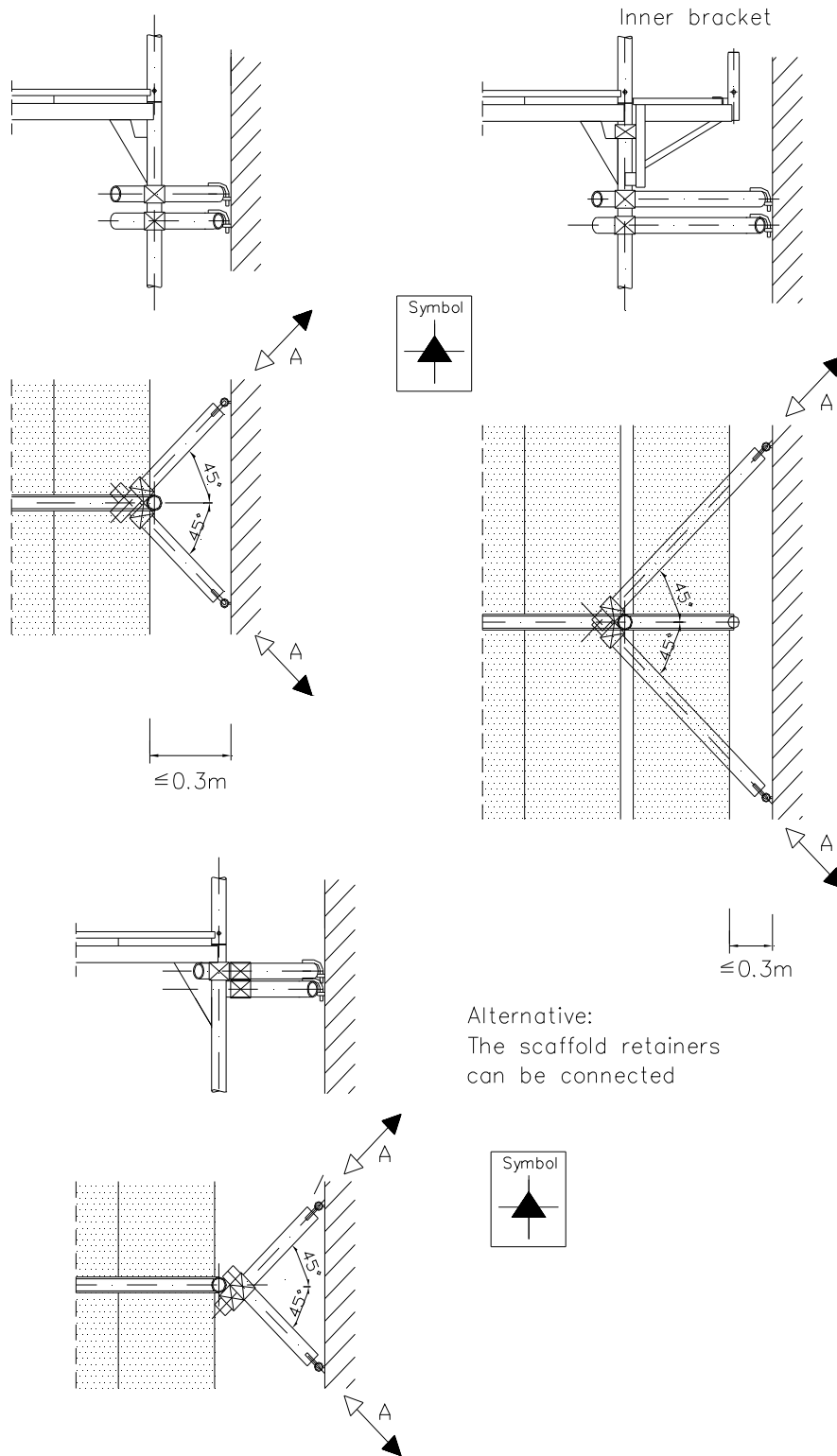


Fig. 10: Triangular ties

2.4.8 Scaffold anchors

Provide the scaffold anchors in line with scaffold erection. For this also see chapter 7.6 "Anchoring" of BGR 166¹⁾. As fasteners use eye bolts for scaffold erection that are minimum 12 mm in diameter and plastic expansion fasteners or similar depending on the load-carrying capacities required.

¹⁾ BGR 166: System scaffolds (frame and modular scaffolds)

When applying the content of BGR 166 also observe the operational safety regulations (BetrSichV).

2.4.9 Anchor grids and forces

The planned anchor grids can be gathered from the standard versions shown in the Figs. 17 to 34. The relevant anchor forces are shown there. All kinds of erection and attachments are covered herein. The indicated forces are service loads.

2.5 Installing supplementary components

2.5.1 Widening brackets

To widen the decks, two brackets are available. The brackets and – if possible – the decks may only be mounted from the secured lower scaffold layer. Otherwise safety measures have to be defined and applied after separate risk assessment.

Inner bracket (bracket 0.36 m)

Use the inner bracket together with a narrow deck (32 cm wide) inside the scaffold, see Fig. 11. Connect the semicoupler welded to the bracket in the opening of the gusset plate of the vertical frame. The decks that have to be inclined when built in, will be protected against accidental lift-out by the retainer of the bracket. The bracket may be installed on the inside on every scaffold layer.

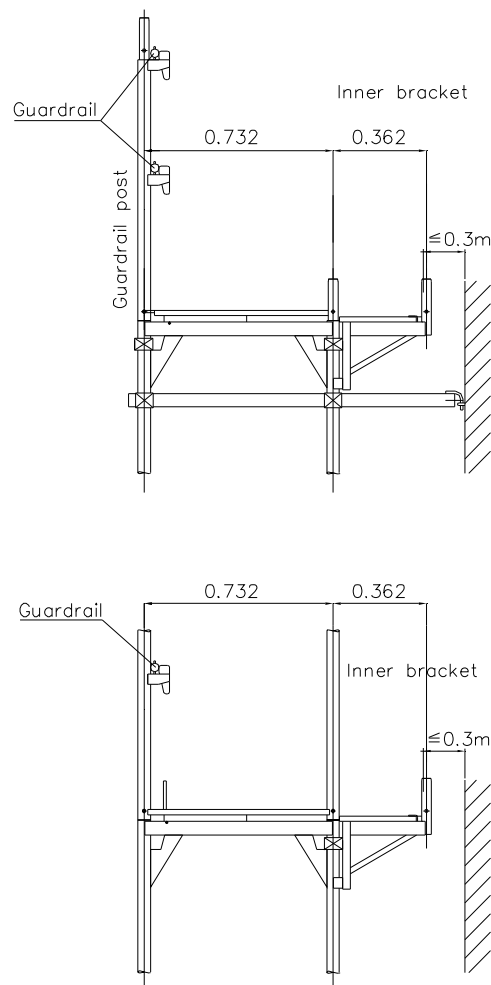
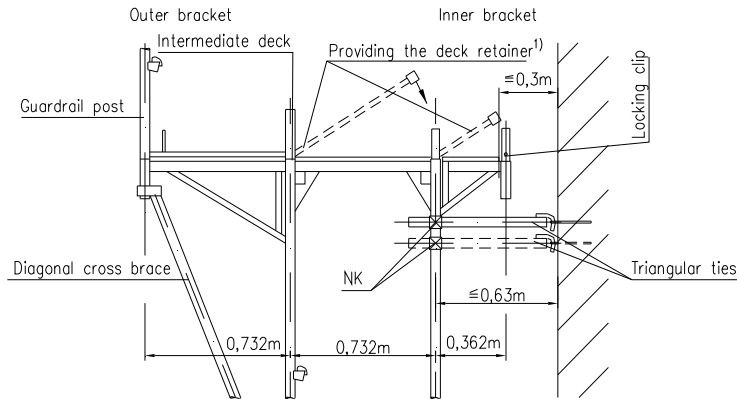


Fig. 11: Inner bracket (bracket 0.36 m)

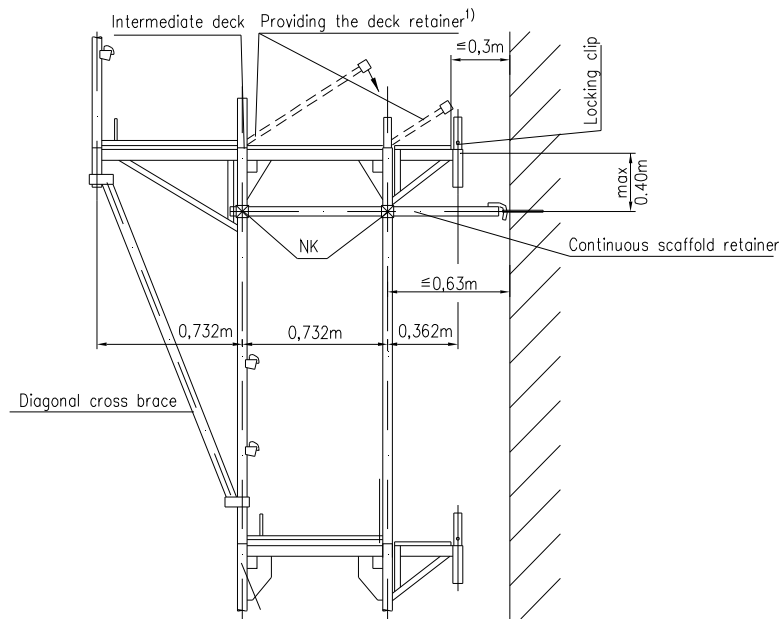
Outer bracket (bracket 0.73 m)

The outer bracket shall be used with a wide deck (60 cm wide) or two narrow decks (32 cm each) at the outside of the scaffold, see Fig. 12. Connect it to the vertical frame in the same way as the inner bracket. The gusset plate opening provides for the joint connection of the bracket and a vertical diagonal brace. Make sure the outer bracket is supported by a diagonal cross bracket towards the level below. Close the gap between the outer bracket deck and the bay deck using a gap cover.

By providing the guardrail posts or guard system support with integrated deck retainers the decks are protected against accidental lift-out. The outer bracket may only be installed in the topmost scaffold layer.



NK = Standard coupler



Use of deck retainer for inner bracket 0,36m only necessary for former design (without integrated deck retainer)

Fig.12:Outerbracket(bracket0.73m)

2.5.2 Protective shelter

Put up the protective shelter by using the protective shelter brackets as shown in the Figures 13 and 14. Provide the deck as described in chapter 2.5.1 and additionally floor it up to the structure. Provide a wide deck or two narrow decks at the post of the protective shelter.

Separate the protective shelter from the working area by guardrail braces. Never store material on the shelter.

The shelter may only be installed on the level of the second scaffold layer (H = 4 m). Anchor the vertical frame on the level of the protective shelter at each gusset.

Mount the protective shelter brackets and – if possible – the decks from the secured lower scaffold layer only. Otherwise protective measures have to be defined and applied after separate risk assessment.

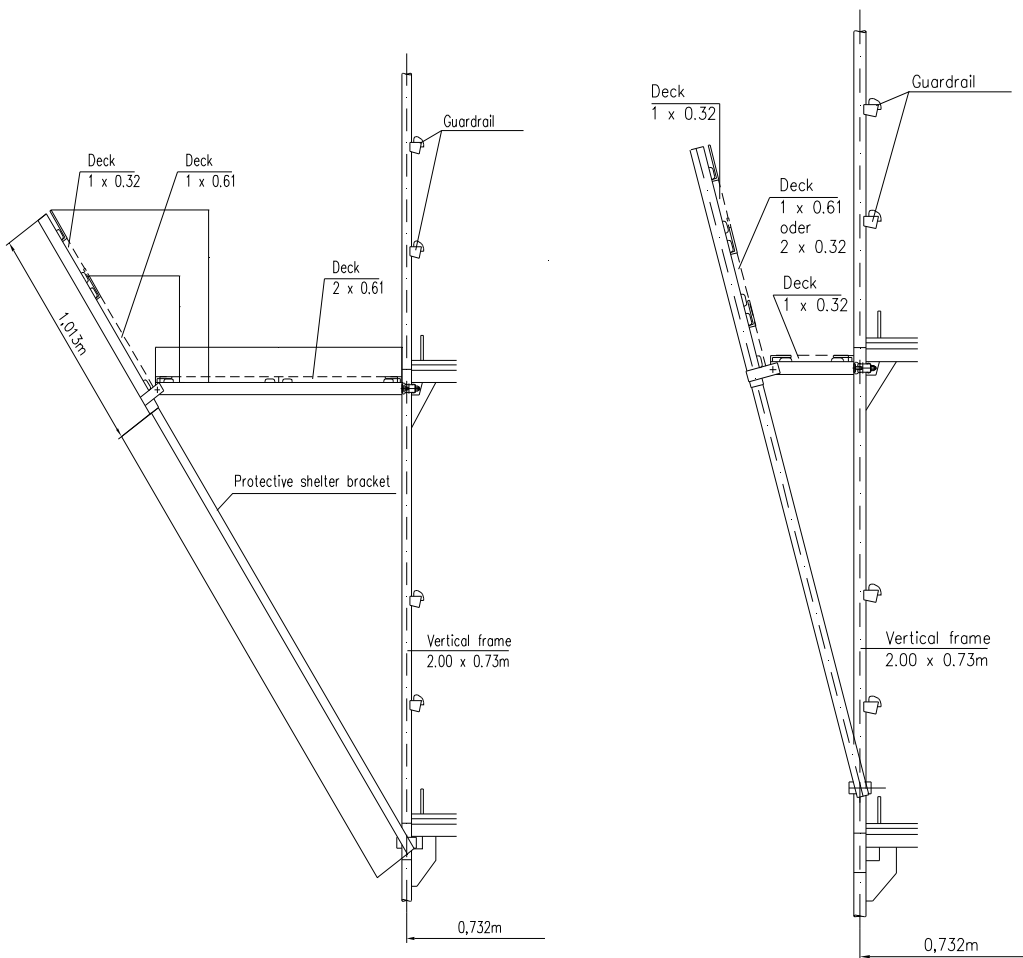


Fig. 13: Protective shelter w. protective shelter bracket

Fig. 14: Protective shelter w. prot.shelter bracket 1.30 m

2.5.3 Roof safety scaffold

The roof safety scaffold consists of safety meshguards or safety nets and safety meshguard supports. For larger eaves the roof safety scaffold can be provided with the bracket 0.73 and diagonal cross brace placed underneath. The distance between the eave and the guard system must be at least 0.7 m. At a guard system height of 2.0 m the decking must not be lower than 1.2 m below the eave. Both versions are shown in Fig. 15.

Never provide a hatch-type access deck on the outer bracket.

Mount the brackets and – if possible – the decks from the secured lower scaffold layer only. Otherwise safety measures must be defined and taken after separate risk assessment.

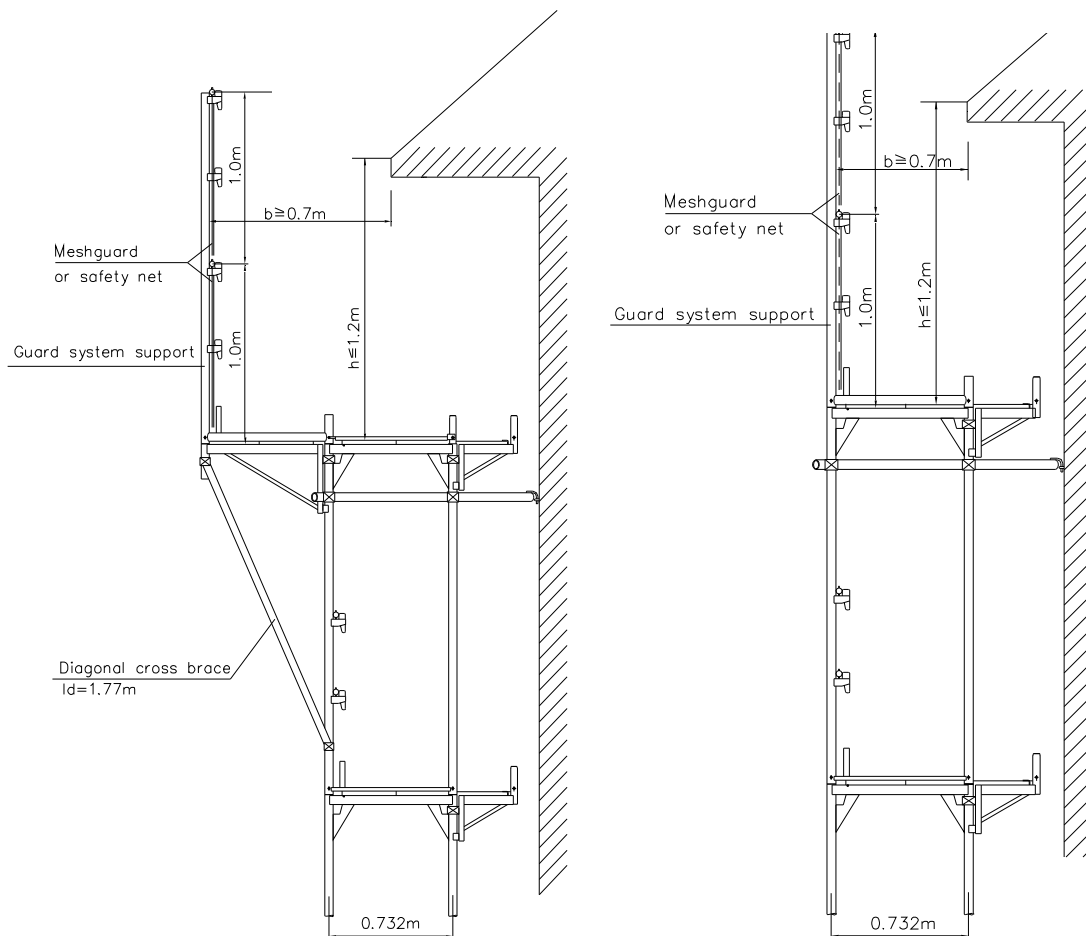


Fig. 15: Roof safety scaffold

2.5.4 Passageway frame

With passageway frames it is possible to erect façade scaffolds and keep the sidewalks open and safe.

The necessary stiffening of the passageway frames is shown in the figures 21, 22, 30 and 31.

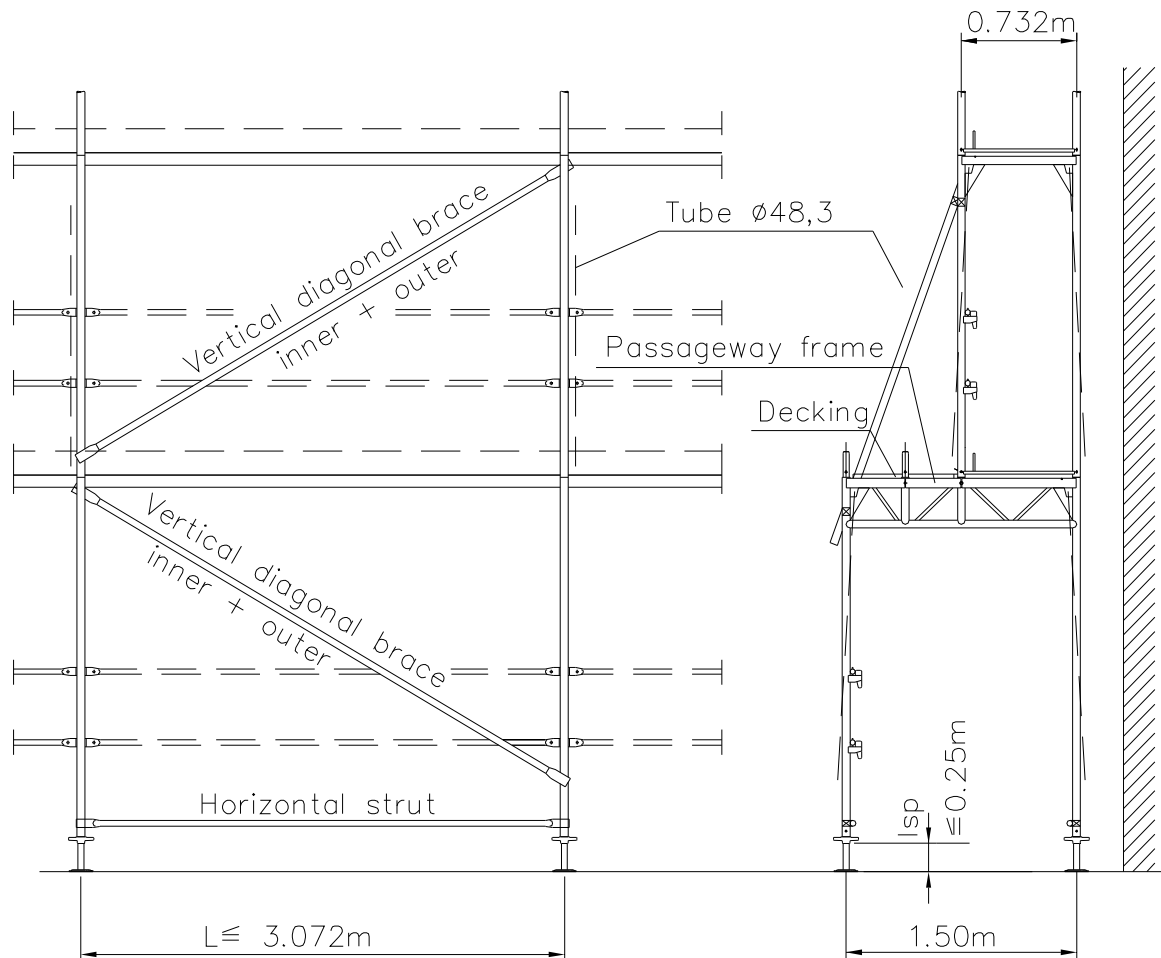


Fig. 16: Passageway frame

2.5.5 Bridging

Use the following lattice girders for bridging:

Bay size 3.07 m w. lattice girder 6.14 m

Bay size 2.57 m w. lattice girder 5.14 m

Lattice girders are usually mounted on a level of 4 m. With their joint pieces they are suspended in the vertical frame and fastened with the bottom chords with lattice girder couplers to the standards. A lattice girder ledger receiving the decks is suspended in the tube coupling for lattice girders.

Safety measures for the mounting of lattice girders, decks and side protection have to be defined and applied after separate risk assessment.

It will be necessary to stabilize the lattice girders against lateral deflection by anchoring the two lattice girder top chords in the façade. The necessary anchoring, the provision with diagonal braces and horizontal struts for the different kinds of erection are shown in the figures 23 through 25 and 32 through 34.

2.6 Scaffold covering

Fasten scaffold nets at the outer upright of the scaffold frame using disposable binders at a maximum distance of 20 cm. Make sure the eye strips have a proper distance to the system dimension of the scaffold.

3. Variations and installation of supplementary components

3.1 General

The following describes the different kinds of erection and anchor grids of the ALBLITZ 70 A façade scaffolds. They also depend on the wind permeability of the façade and the kind of covering that may be used. The following applies to all kinds of erection:

- Max. erection height 24 m plus spindle extension
- Max. spindle extension 25 cm
- Edge standards to be anchored at a distance of max. 4 m with a corner figuration in accordance with chapter 2.3.2 using triangular ties.
- With standard versions a 'closed' façade has no openings. With 'open' façades the view face of the openings shall amount to max. 60 % of the façade.
- Nets at the front face to be drawn up to the façade.
- Nets used must meet the force coefficients $C_{fx} \leq 0.6$ and $C_{fy} \leq 0.2$ based on an aerodynamic expert opinion.
- According to the standard versions shown below diagonal braces have to be provided in the outer lift, in connection with passageway frames and bridging in the inner lift, too.

For the die individual versions measures are described that are to be taken when installing supplementary components (widening brackets, protective shelter, guard system bridging, passageway frame).

The erection height, the attachment of any supplementary components and the planned scaffolding group will determine the support reaction forces in the load case 'service load' as given in Table 2. It takes into account the dead weight of the heaviest deck. The forces given are service values.

Any deviating versions with respect to erection heights, above 24 m, for example, have to be checked on a case-to-case basis by way of stress analysis, also see chapter 1.

Table 2a: Support reaction forces [kN] for standard version

Kind of erection	Uncovered scaffold	Net-covered scaffold
Scaffold w/o brackets, w. guard system, protective shelter	11.8	10.9
Scaffold w. inner brackets, guard system, protective shelter	14.1	16.5
Scaffold w. inner brackets, outer bracket, guard system, protective shelter	17.7	18.4

Table 2b: Support reaction forces [kN] for standard version w. passageway frame

Kind of erection	Uncovered scaffold	Net-covered scaffold
Scaffold w/o brackets, w. guard system, protective shelter	12.6	13.7
Scaffold w. inner brackets, guard system, protective shelter	19.6	19.4
Scaffold w. inner brackets, outer bracket, guard system, protective shelter	23.2	23.5

Table 2c: Support reaction forces [kN] for standard version w. bridging

Kind of erection	Uncovered scaffold	Net-covered scaffold
Scaffold w/o brackets, w. guard system, protective shelter	13.4	14.0
Scaffold w. inner brackets, guard system, protective shelter	21.2	21.9
Scaffold w. inner brackets, outer bracket, guard system, protective shelter	24.3	25.1

3.2 Standard versions of uncovered scaffolds

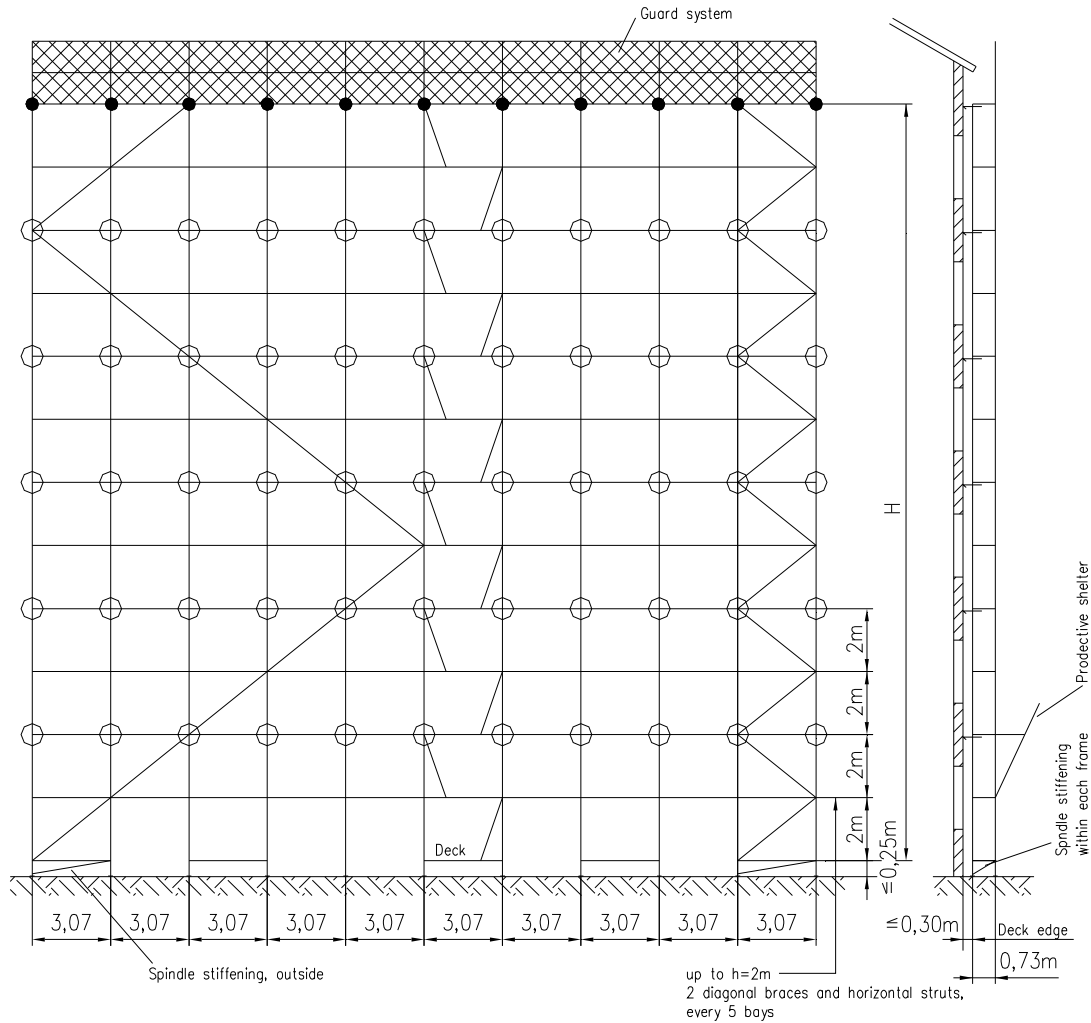
Standard versions of uncovered scaffolds are shown for different outfits with brackets and other attachments in accordance with Table 3. More versions are shown in Table 4.

Table 3: Standard versions of uncovered scaffolds in front of open or closed façades

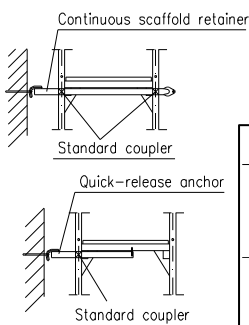
Max. bay length [m]	Scaffolds provided with	Open / closed façade Fig.
3.07	Guard system, protective shelter	17, 18
3.07	Guard system, protective shelter inner brackets	19
3.07	Guard system, protective shelter inner brackets, outer bracket	20

**Fig. 17: Standard version
uncovered scaffold, w/o attachments
in front of open façade**

- uncovered scaffold
- all decks $l \leq 3.07$ m
- w/o brackets
- w. / w/o guard system
- w. / w/o protective shelter



Detail



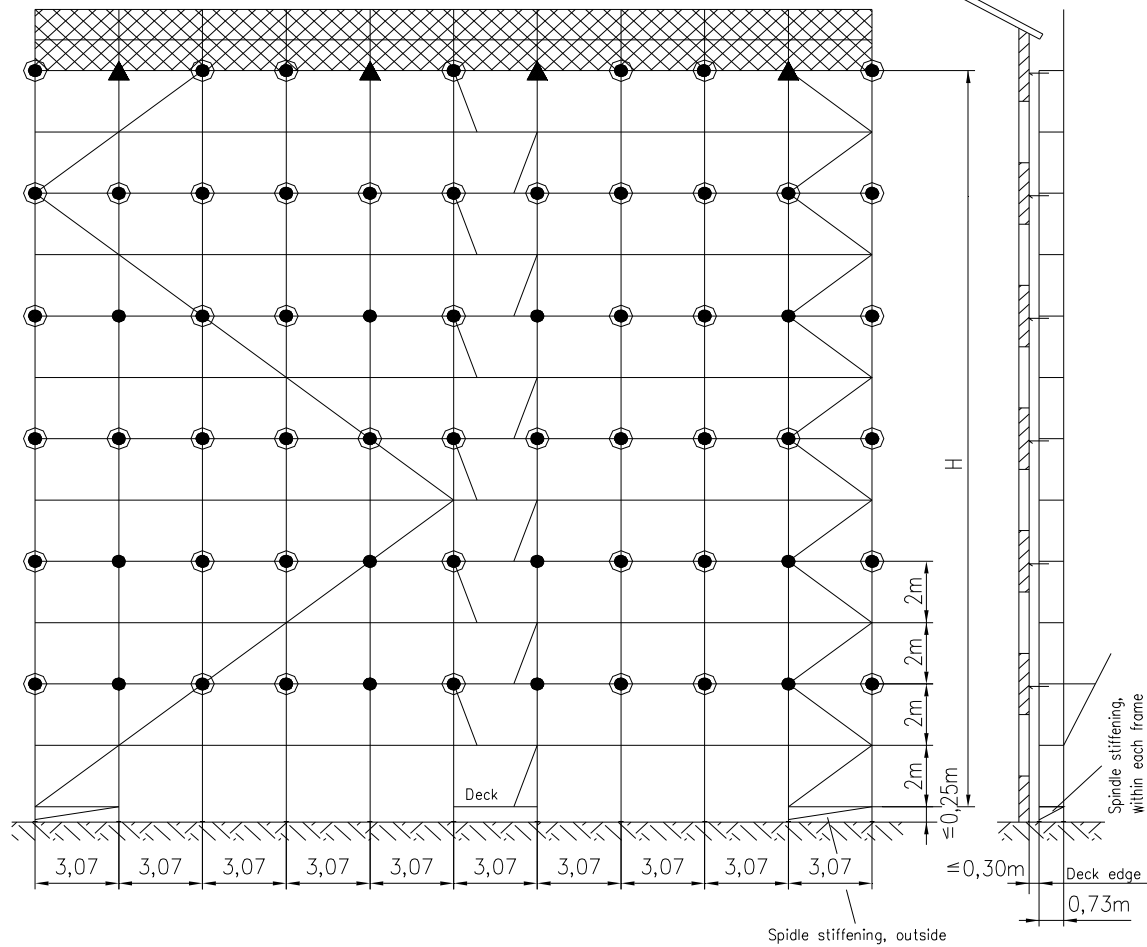
- Continuous scaffold retainer
- ⊕ Quick-release anchor

(-) -value applicable for types w. protective shelter, on the level of protective shelter

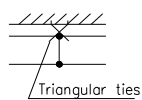
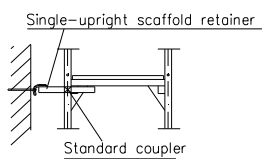
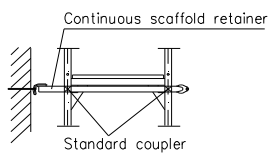
		Anchor forces [kN]					
		Quick-release anchor			Scaffold retainer		
Height		8 m	16 m	24 m	8 m	16 m	24 m
at right angle to façade	A_{\perp}	1,9 (3,5)	1,9 (3,5)	2,1 (3,5)	2,1	2,3	2,5
	parallel to façade	standard type	0,8	0,8	1,0	1,2	1,3
corner type		1,7 (2,6)	1,8 (2,6)	2,1 (2,8)	2,3	2,5	2,7
triangular tie (inclined load per tube)		—	—	—	—	—	—

**Fig. 18: Standard version
uncovered scaffold, w/o attachments
in front of open façade**

- uncovered scaffold
- all decks $l \leq 3.07$ m
- w/o brackets
- w. / w/o guard system
- w. / w/o protective shelter



Detail



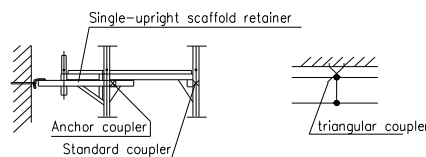
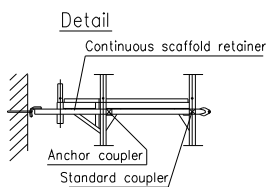
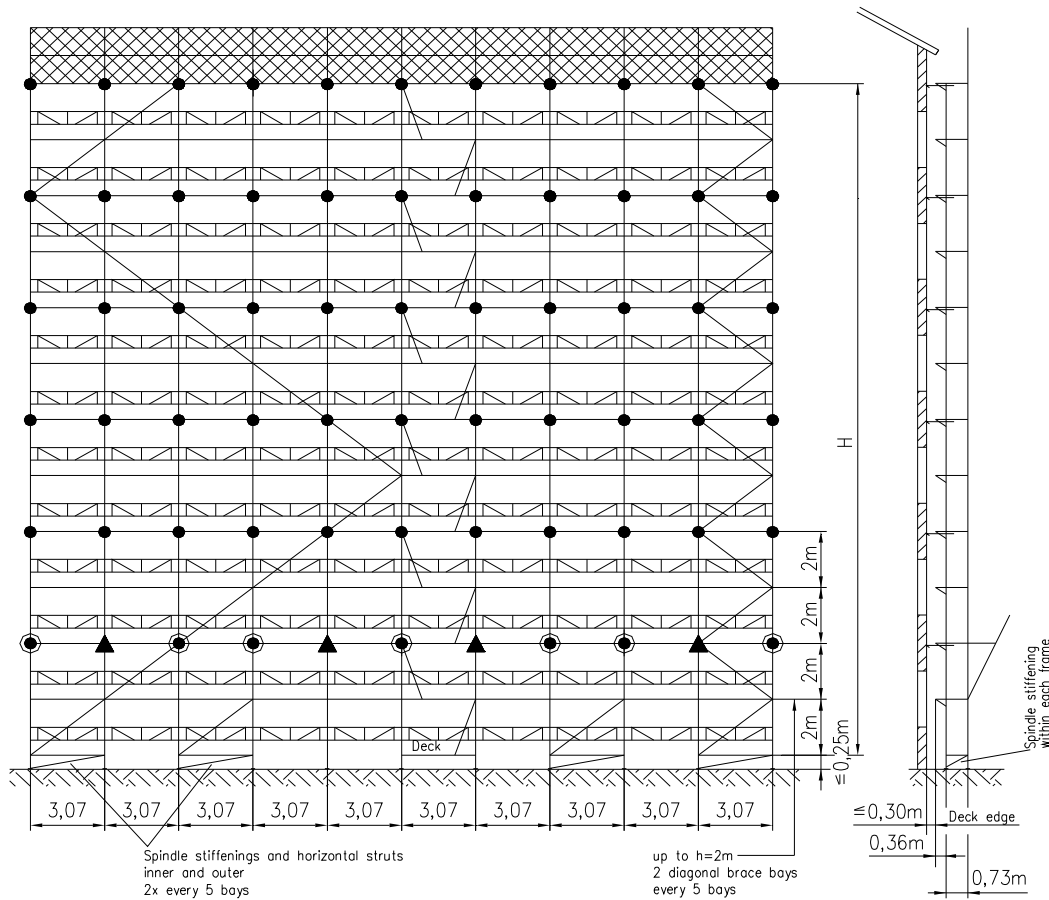
(-) (-)-value applicable for types w. protective shelter, on the level of protective shelter

- Continuous scaffold retainer
- Single-upright scaffold retainer
- ▲ Triangular ties

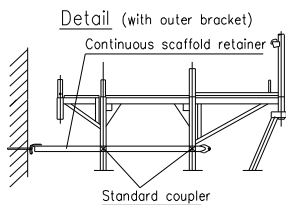
Anchor forces [kN]							
Height		Scaffolder retainer at inner standard			Scaffold retainer		
		8 m	16 m	24 m	8 m	16 m	24 m
at right angle to façade	A_{\perp}	2,1	2,3	2,5	1,9	1,9	2,1
		(3,5)	(3,5)	(3,5)	(3,5)	(3,5)	(3,5)
parallel to façade	A_{\parallel}	0,5	0,5	0,5	1,1	1,4	1,9
		1,5 (2,3)	1,7 (2,3)	1,7 (2,3)	2,1 (2,9)	2,4 (3,2)	2,9 (3,7)
triangular tie (inclined load per tube)		2,6	2,8	3,0	—	—	—

**Fig. 19: Standard version
uncovered Scaffold, w. attachments
in front of open façade**

- uncovered scaffold
- all decks $l \leq 3.07$ m
- w. inner brackets 0.36 m
- w. / without guard system
- w. protective shelter
- w.alum. double guardrail



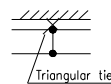
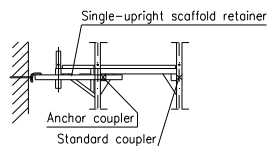
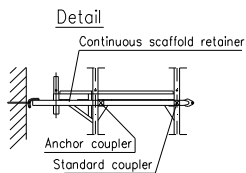
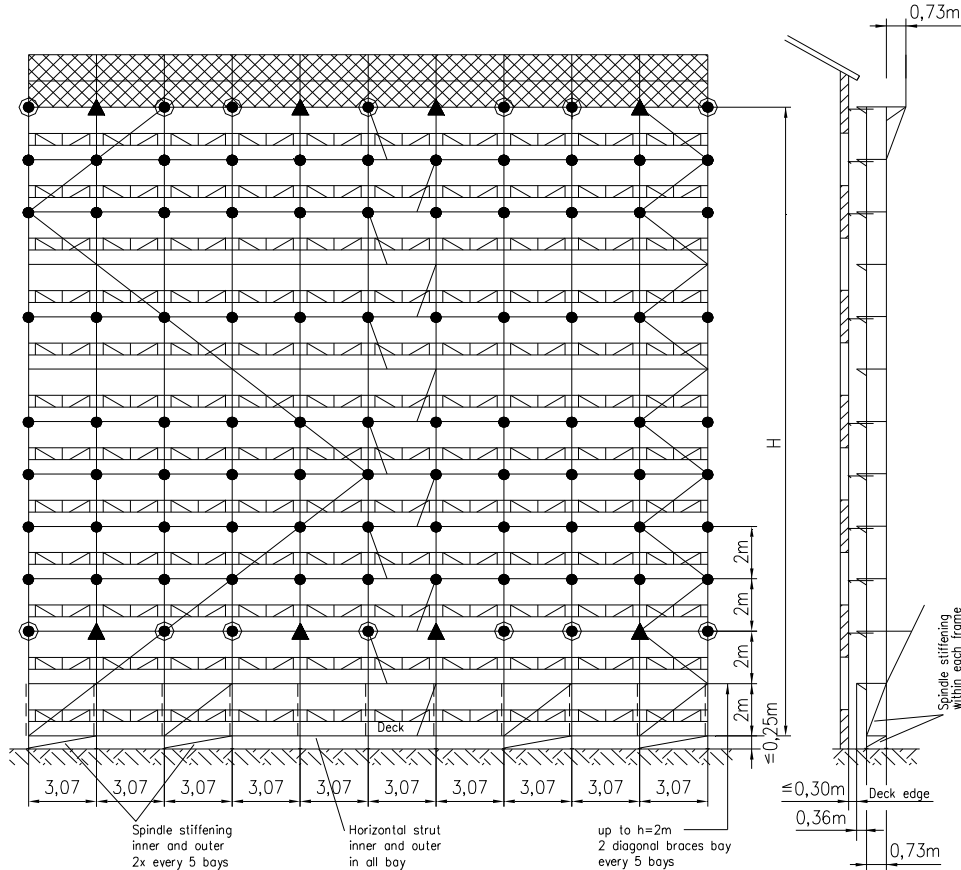
- Continuous scaffold retainer
- ⊙ Single-upright scaffold retainer
- ▲ Triangular tie



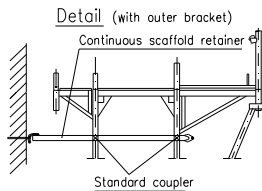
		Anchor forces [kN]						
		Scaffold retainer at inner standard			Scaffold retainer			
Height		8 m	16 m	24 m	8 m	16 m	24 m	
at right angle to façade	A_{\perp}	3,6	3,6	3,6	2,3	2,5	2,7	
parallel to façade	A_{\parallel}	standard type	0,1	0,1	0,1	1,1	1,1	1,2
		corner type	1,9	1,9	1,9	2,2	2,4	2,5
triangular tie (inclined load per tube)		2,9	2,9	2,9	—	—	—	

**Fig. 20: Standard version
uncovered scaffold, w. attachments
in front of open façade**

- uncovered scaffold
- all decks $l \leq 3.07$ m
- w. inner brackets 0.36 m
- w. outer brackets 0.73 m
- w.alum. double guardrail
- w. / w/o protective shelter
- w. / w/o guard system on outer brackets 0.73 m



- Continuous scaffold retainer
- Single-upright scaffold retainer
- ▲ Triangular tie



()-value applicable for types w. protective shelter, on the level of protective shelter

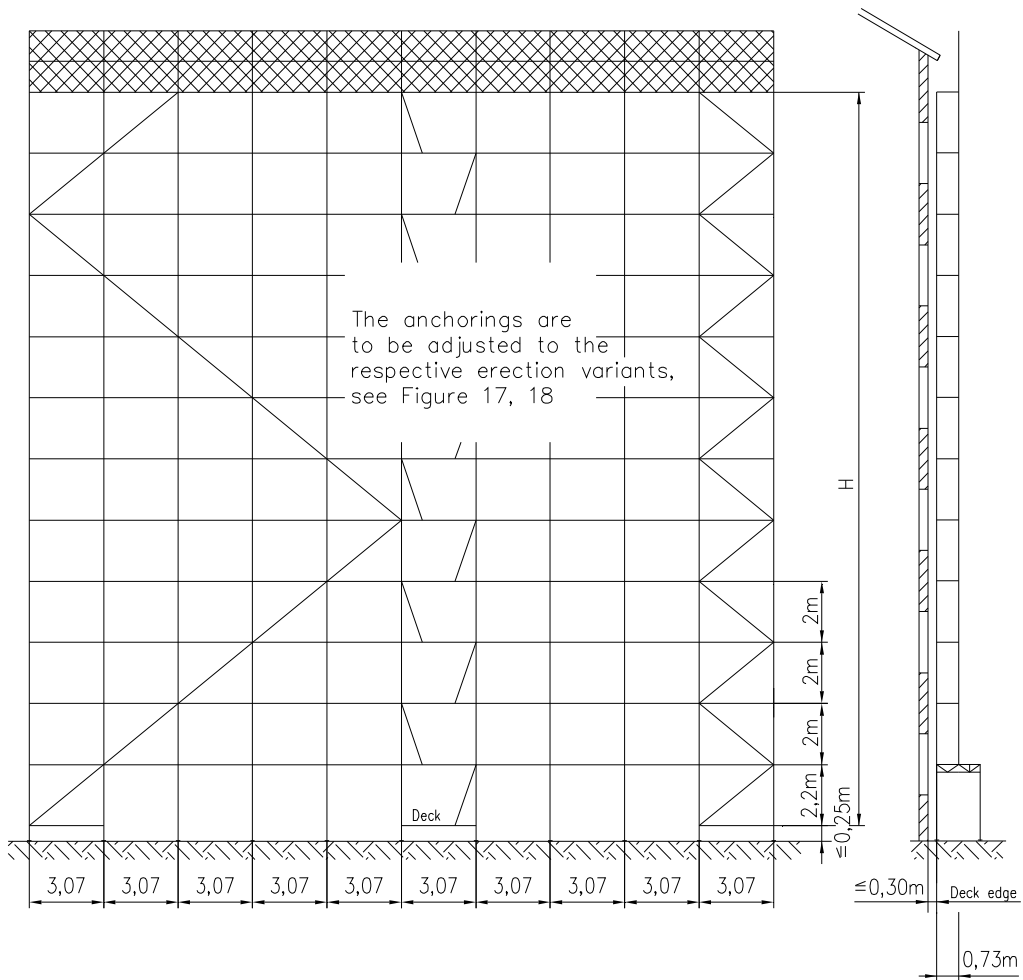
		Anchor forces [kN]					
		Scaffold retainer at inner standard			Scaffold retainer		
Height		8 m	16 m	24 m	8 m	16 m	24 m
at right angle to façade	A_{\perp}	2,1 (2,9)	2,3 (2,9)	2,5 (2,9)	1,0	1,1	2,1
	parallel to façade	A_{\parallel}	0,1	0,1	0,1	0,4	0,4
		corner type	1,2 (1,6)	1,3 (1,6)	1,4 (1,6)	0,9	0,9
triangular tie (inclined load per tube)		2,6	2,8	3,0	—	—	—

Table 4: Versions of uncovered scaffolds in front of open or closed façade

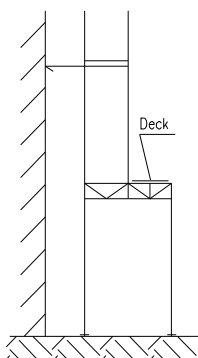
Max bay length [m]	Scaffolds provided with	Passageway frame Fig.	Bridging w. lattice girders Fig.
3.07	Guard system, protective shelter	21	23, 24
3.07	Guard system, protective shelter, inner brackets, outer bracket	22	25

**Fig. 21: Standard version
uncovered scaffold, w/o attachments
in front of open façade**

- uncovered scaffold
- all decks $l \leq 3.07$ m
- w/o brackets
- w. / without guard system
- w. passageway frame



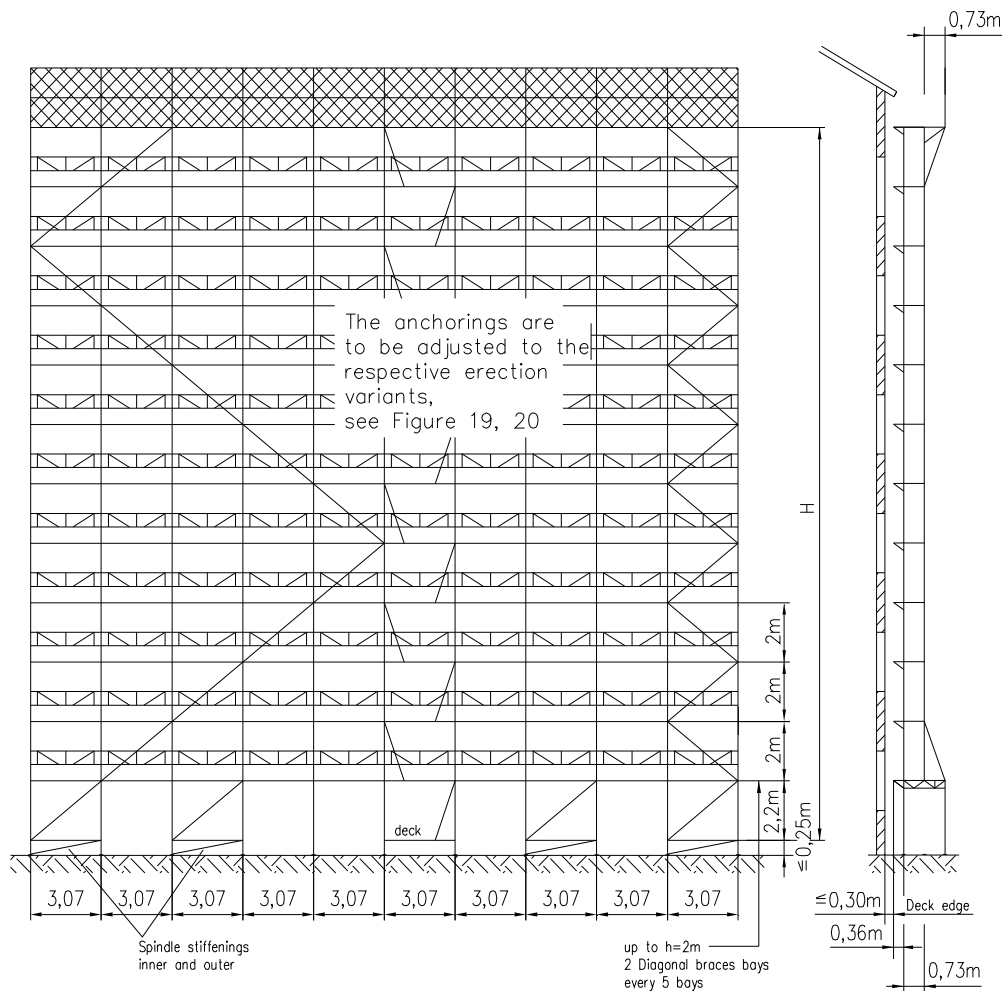
Detail



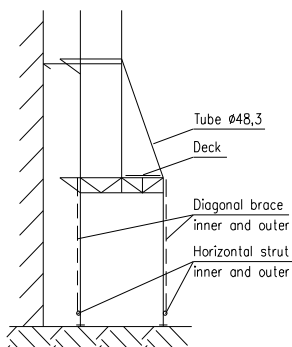
		Anchor forces [kN]								
		Scaffold retainer at inner standard			Scaffold retainer			Quick-release anchor		
Height		8 m	16 m	24 m	8 m	16 m	24 m	8 m	16 m	24 m
at right angle to facade	A_{\perp}	2,3	2,3	2,5	2,2	2,3	2,5	2,3	2,3	2,3
parallel to facade	standard type	0,5	0,5	0,5	1,3	1,3	1,9	1,0	1,0	1,1
	corner type	1,6	1,7	1,7	2,4	2,5	3,0	2,1	2,1	2,2
triangular tie (inclined load per tube)		2,6	2,8	3,0	—	—	—	—	—	—

**Fig. 22: Standard version
uncovered scaffold, w. attachments
in front of open façade**

- uncovered scaffold
- all decks $l \leq 3.07$ m
- w. inner brackets 0.36 m
- w. outer brackets 0.73 m
- w. alum. double guardrail
- w. / without guard system
- w. passageway frame



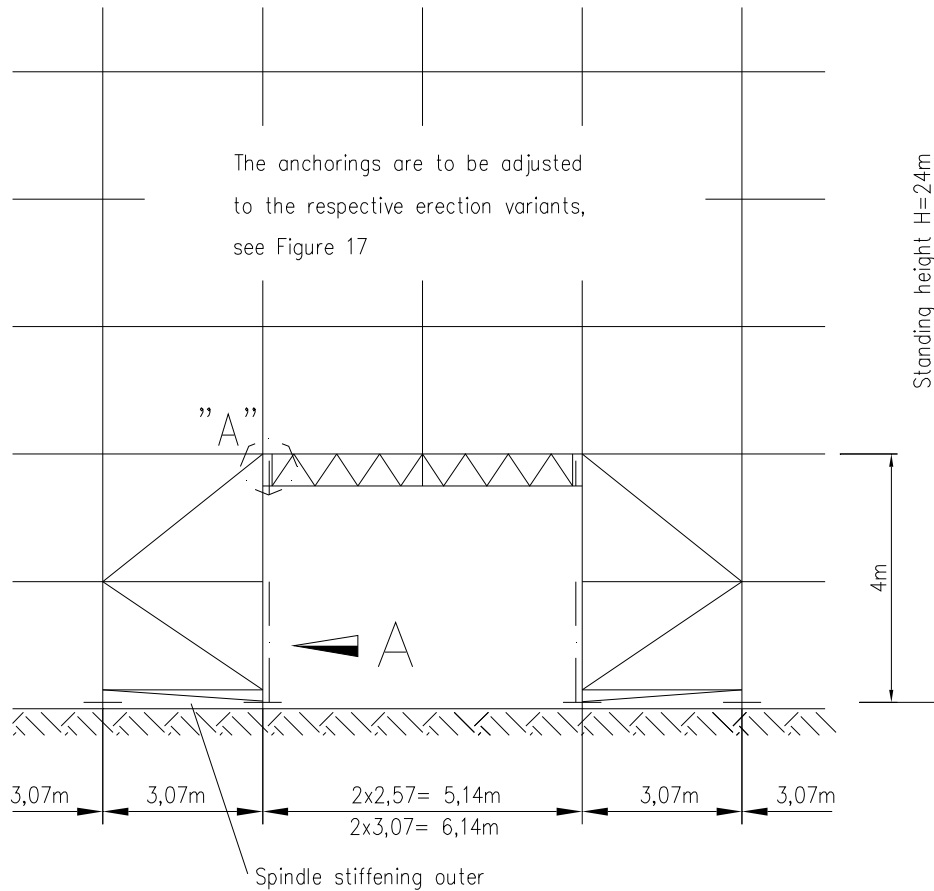
Detail



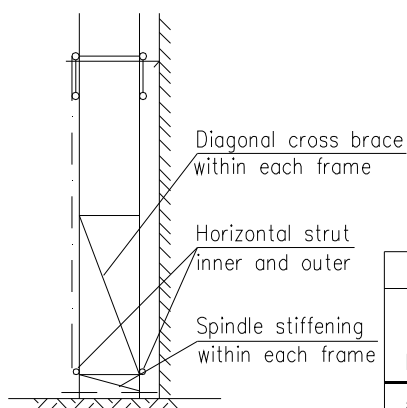
		Anchor forces [kN]					
		Scaffold retainer at inner standard			Scaffold retainer		
Height		8 m	16 m	24 m	8 m	16 m	24 m
at right angle to facade	A_{\perp}	2,5	2,5	2,5	2,3	2,5	2,7
parallel to facade	Standard type	0,2	0,3	0,3	1,1	1,1	1,2
	Corner type	1,3	1,4	1,5	2,2	2,4	2,5
triangular tie (inclined load per tube)		2,5	2,7	2,9	—	—	—

**Fig. 23: Standard version
Bridging, w/o attachments
in front of open façade**

- bridging
- uncovered scaffold
- w/o brackets

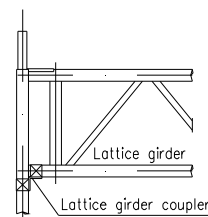


View A



()-value applicable for types w. protective shelter, on the level of protective shelter

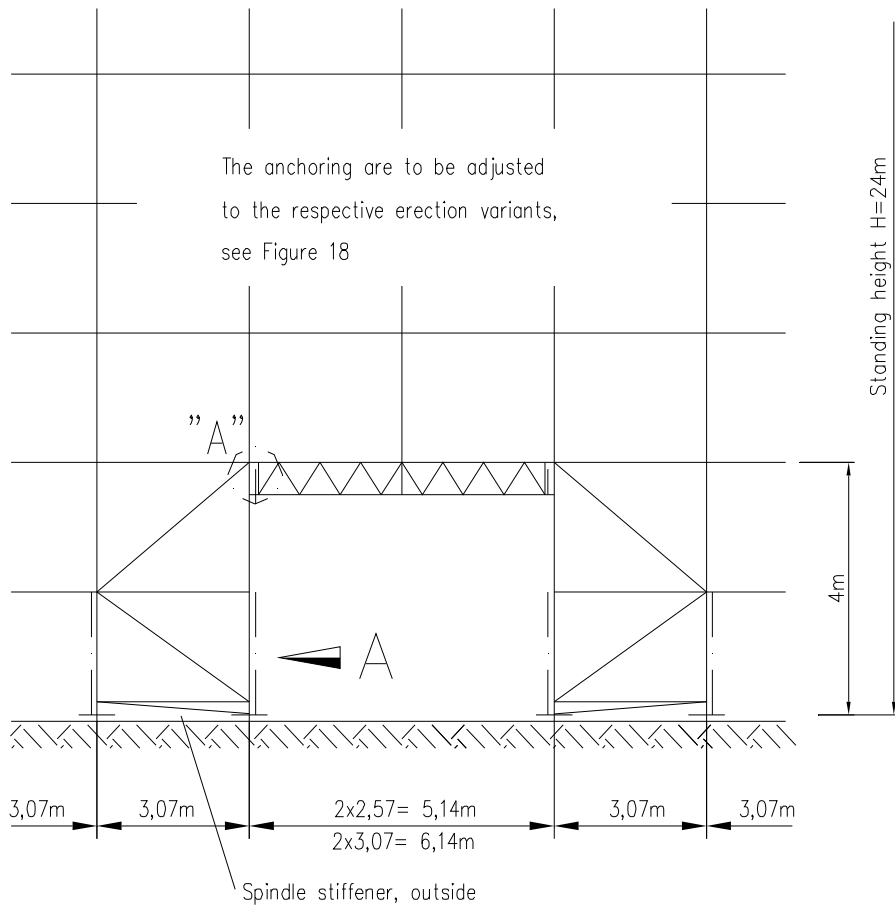
Detail A



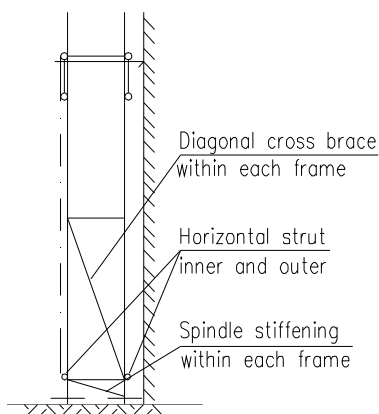
		Anchor forces[kN]						
		Quick-release anchor			Scaffold retainer			
Height		8 m	16 m	24 m	8 m	16 m	24 m	
at right angle to façade	A_{\perp}	1,9 (3,5)	1,9 (3,5)	2,1 (3,5)	2,2	2,3	2,5	
parallel to façade	A_{\parallel}	standard type	1,1	1,1	1,1	1,2	1,3	1,4
		corner type	2,1 (2,9)	2,1 (2,9)	2,2 (2,9)	2,3	2,5	2,7
triangular tie (inclined load per tube)		—	—	—	—	—	—	

**Fig. 24: Standard version
Bridging, w/o attachments
in front of open façade**

- bridging
- uncovered scaffold
- w/o brackets

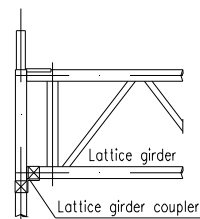


View A



()-value applicable for types w. protective shelter, on the level of protective shelter

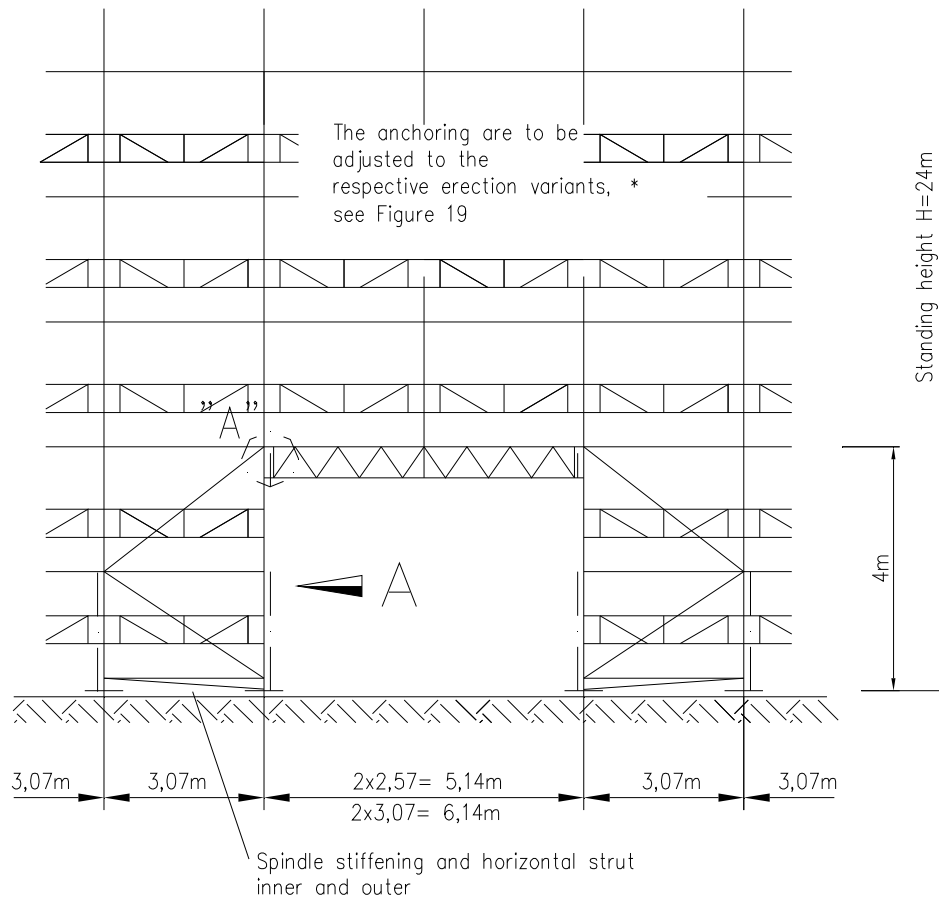
Detail A



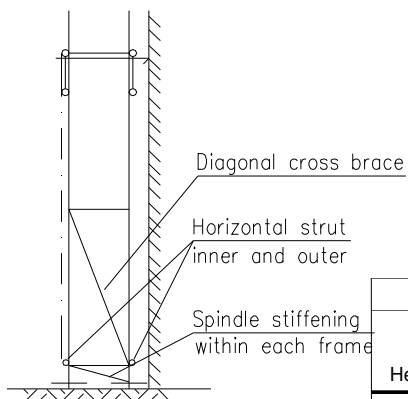
		Anchor forces [kN]					
		Scaffold retainer at inner standard			Scaffold retainer		
Height		8 m	16 m	24 m	8 m	16 m	24 m
at right angle to facade	A_{\perp}	2,1	2,3	2,5	1,9	1,9	2,0
		(3,5)	(3,5)	(3,5)	(3,5)	(3,5)	(3,5)
parallel to facade	A_{\parallel}	0,5	0,5	0,5	1,5	1,5	1,8
		1,5 (2,3)	1,7 (2,3)	1,7 (2,3)	2,5 (3,2)	2,5 (3,2)	2,8 (3,5)
triangular tie (inclined load per tube)		2,6	2,8	3,0	—	—	—

**Fig. 25: Standard version
Bridging, w. attachments
in front of open façade**

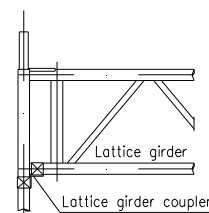
- bridging
- uncovered scaffold
- w. inner brackets 0.36 m
- w. alum. double guardrail



View A



Detail A



		Anchor forces [kN]					
		Scaffold retainer at inner standard			Scaffold retainer		
Height		8 m	16 m	24 m	8 m	16 m	24 m
at right angle to façade	A_{\perp}	3,5	3,5	3,5	2,3	2,5	2,7
parallel to façade	standard type	0,2	0,2	0,2	1,1	1,1	1,2
	corner type	2,0	2,0	2,0	2,2	2,4	2,5
triangular ti (inclined load per tube)		3,5	3,5	3,5	—	—	—

3.3 Standard versions of net-covered scaffolds

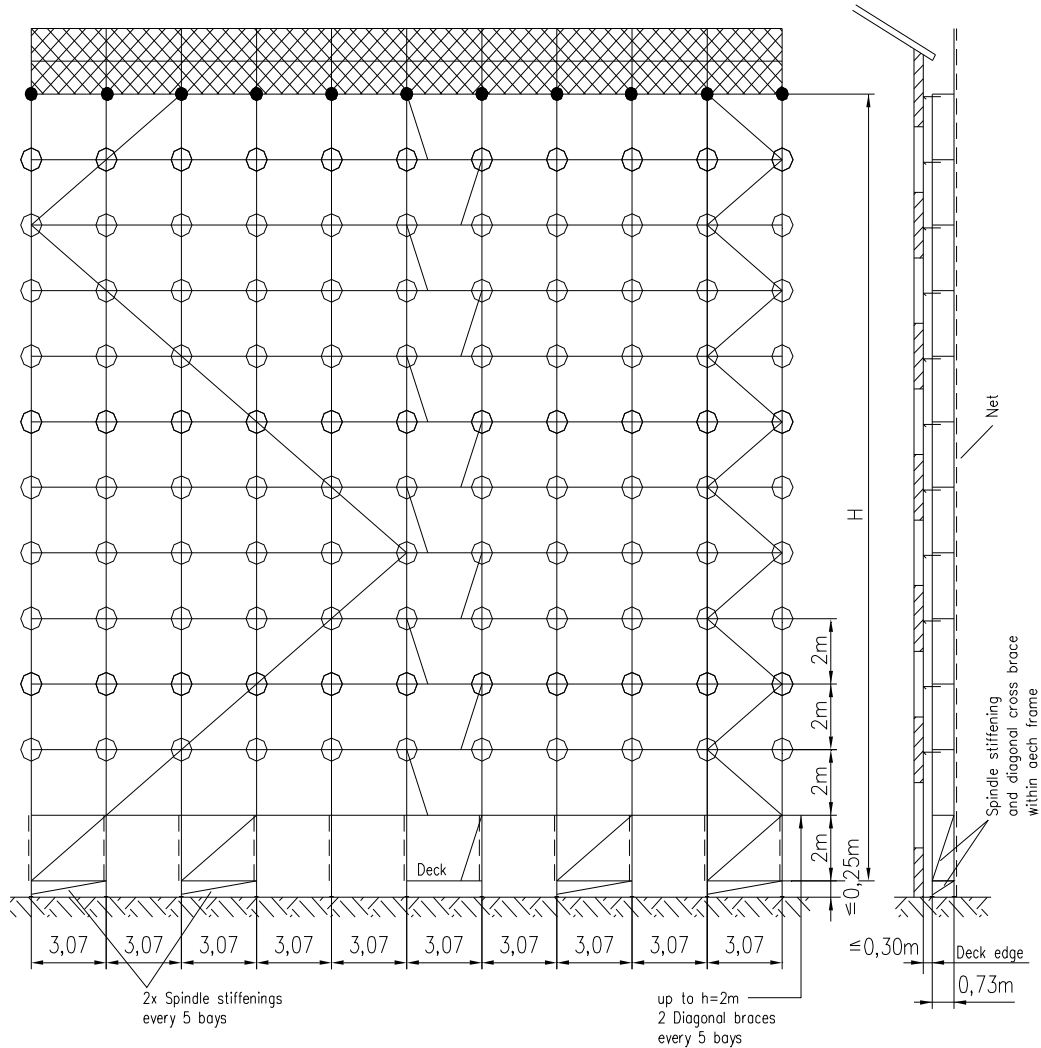
Standard versions of net-covered scaffolds are shown for different outfits with brackets and other attachments as given in Table 5.

Table 5: Standard versions of net-covered scaffolds in front of open or closed façades

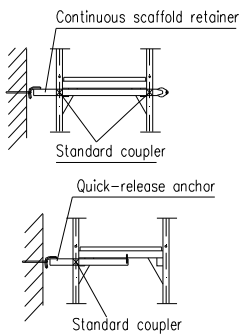
Bay length [m]	Scaffolds provided with	Open / closed façade Fig.
3.07	Guard system	26, 27
3.07	Guard system, inner brackets	28
3.07	Guard system, inner brackets, outer bracket	29

**Fig. 26: Standard version
net covered scaffold, w/o attachments
in front of open façade**

- net-covered scaffold
- all decks $l \leq 3.07$ m
- w/o brackets
- w. / w/o guard system



Detail



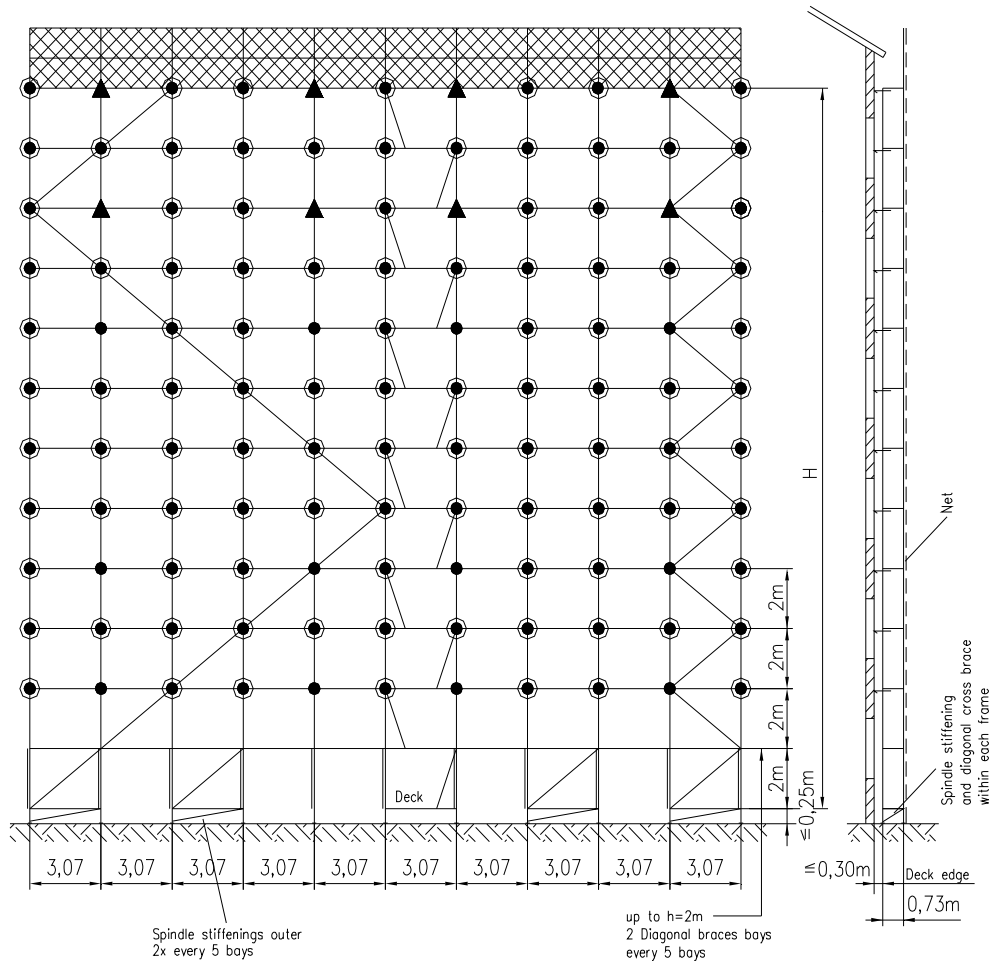
● Continuous scaffold retainer

⊕ Quick-release anchor

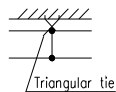
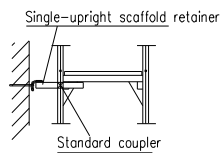
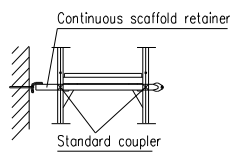
		Anchor forces [kN]						
		Quick-release anchor			Scaffold retainer			
Height		8 m	16 m	24 m	8 m	16 m	24 m	
at right angle to façade	A_{\perp}	2,0	2,0	2,1	2,2	2,3	2,5	
parallel to façade	A_{\parallel}	standard type	0,9	0,9	1,1	1,3	1,4	1,5
		corner type	1,9	1,9	2,2	2,5	2,6	2,8
triangular tie (inclined load per tube)		—	—	—	—	—	—	

Fig. 27: Standard version of net-covered scaffold, w/o attachments in front of open façade

- net-covered scaffold
- all decks $l \leq 3.07$ m
- w/o brackets
- w. / w/o guard system



Detail

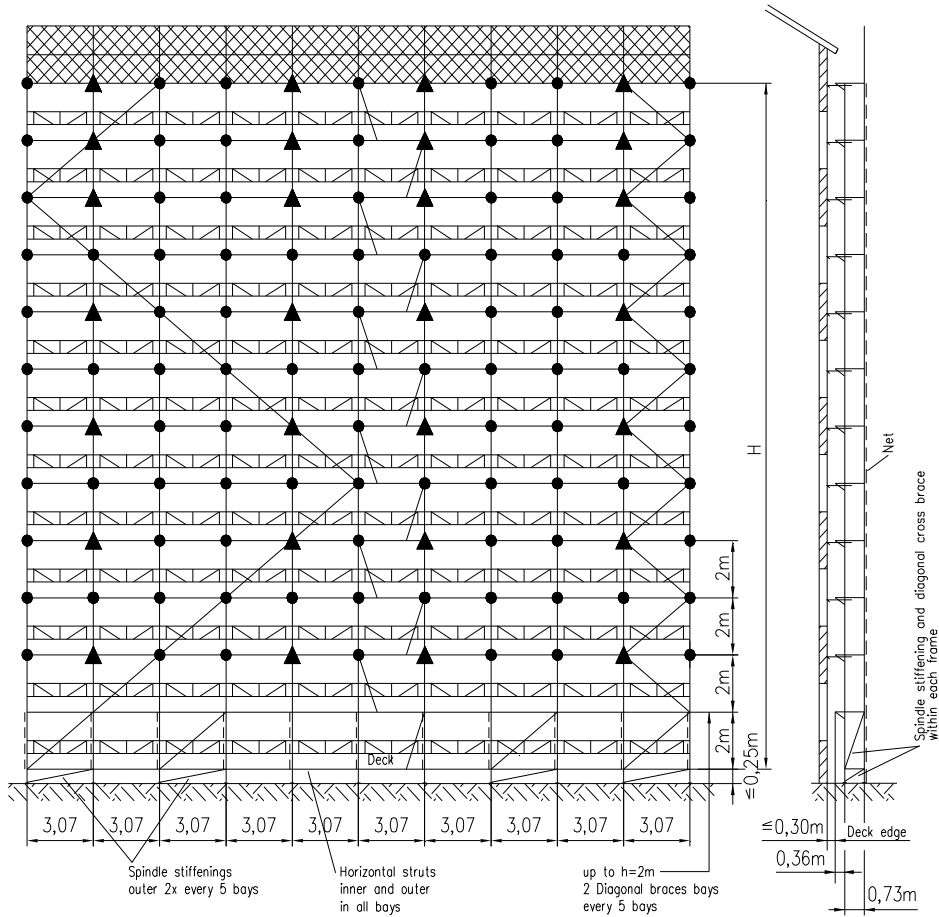


- ◆ Continuous scaffold retainer
- Single-upright scaffold retainer
- ▲ Triangular tie

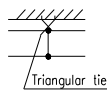
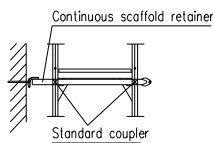
		Anchor forces [kN]						
		scaffold retainer at inner standard			Scaffold retainer			
Height		8 m	16 m	24 m	8 m	16 m	24 m	
at reight angle to façade	A_{\perp}	2,1	2,3	2,5	—	2,0	2,0	
parallel to façade	A_{\parallel}	Standard type	0,5	0,5	0,5	—	2,0	2,0
		corner	1,6	1,7	1,8	—	3,0	3,0
triangular tie (inclined load per tube)		2,7	2,9	3,1	—	—	—	

Fig. 28: Standard version of net-covered scaffold, w. attachments in front of open façade

- net-covered scaffold
- all decks $l \leq 3.07$ m
- w. inner brackets
- w. alum. double guardrail
- w. / w/o guard system



Detail



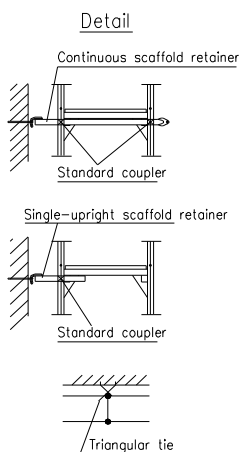
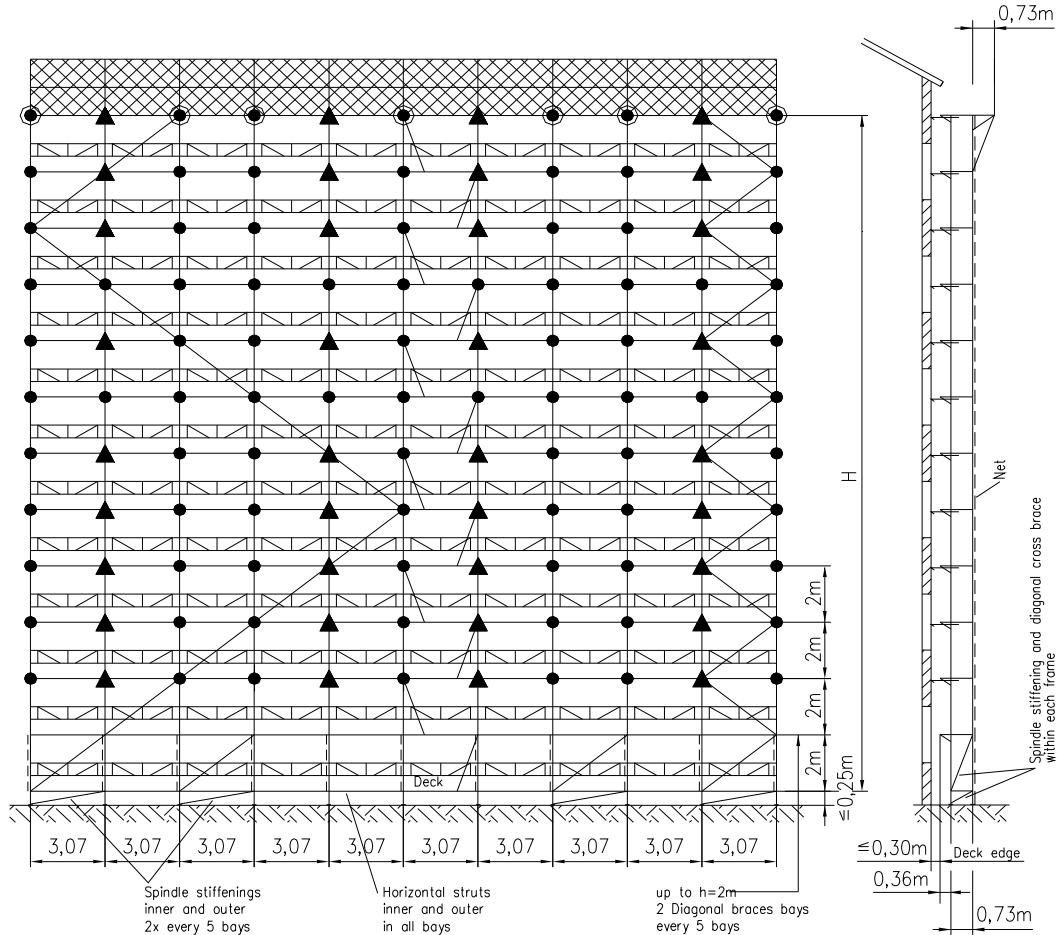
● Continuous scaffold retainer

▲ Triangular tie

Anchor forces [kN]					
		Scaffold retainer			
Height		8 m	16 m	24 m	
at right angle to façade	A_{\perp}	2,3	2,5	2,7	
		parallel to façade	A_{\parallel}	standard type	0,4
	corner type	1,6		1,9	2,0
triangular tie (inclined load per tube)		2,1	2,5	2,5	

**Fig. 29: Standard version
net-covered scaffold, w. attachments
in front of open façade**

- net-covered scaffold
- all decks $l \leq 3.07$ m
- w. inner brackets 0.36 m
- w. outer brackets 0.73 m
- w. alum. double guardrail
- w. / without guard system on outer brackets 0.73 m



- Continuous scaffold retainer
- Single-upright scaffold retainer
- ▲ Triangular tie

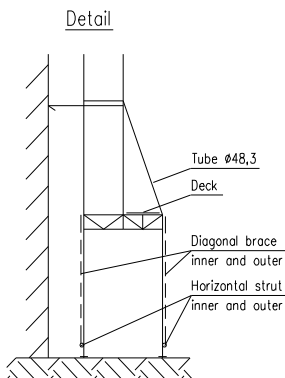
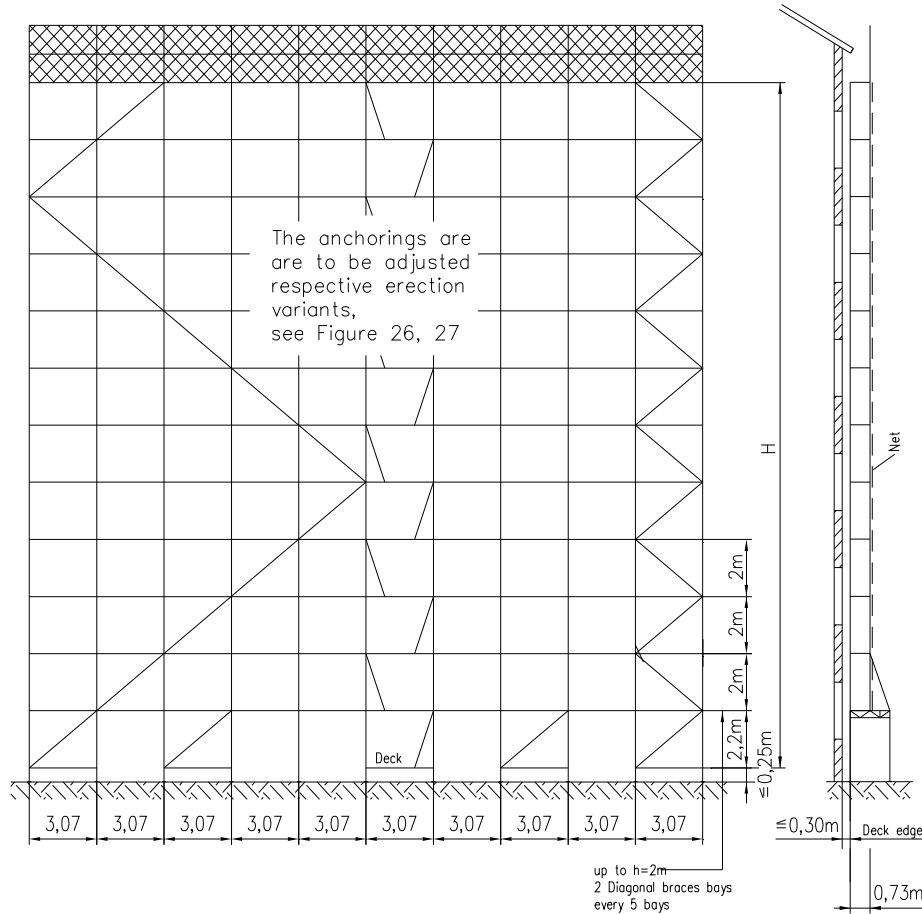
Height		Anchor forces [kN]						
		scaffold retainer at inner standard			Scaffold retainer			
		8 m	16 m	24 m	8 m	16 m	24 m	
at reight angle to façade	A_{\perp}	2,5	2,7	2,9	1,9	1,9	2,1	
parallel to façade	A_{\parallel}	Standard type	0,1	0,1	0,1	0,2	0,4	0,6
		corner	1,4	1,5	1,6	1,2	1,4	1,7
triangular tie (inclined load per tube)		2,3	2,5	2,7	—	—	—	

Table 6: Versions of net-covered scaffolds in front of open or closed façades

Bay size [m]	Scaffold provided with	Passageway frame Fig.	Bridging w. lattice girders Fig.
3.07	Guard system	30	32
3.07	Guard system, inner brackets	31	33
3.07	Guard system, inner brackets, outer bracket	31	34

**Fig. 30: Standard version
net-covered scaffold, w/o attachments
in front of open façade**

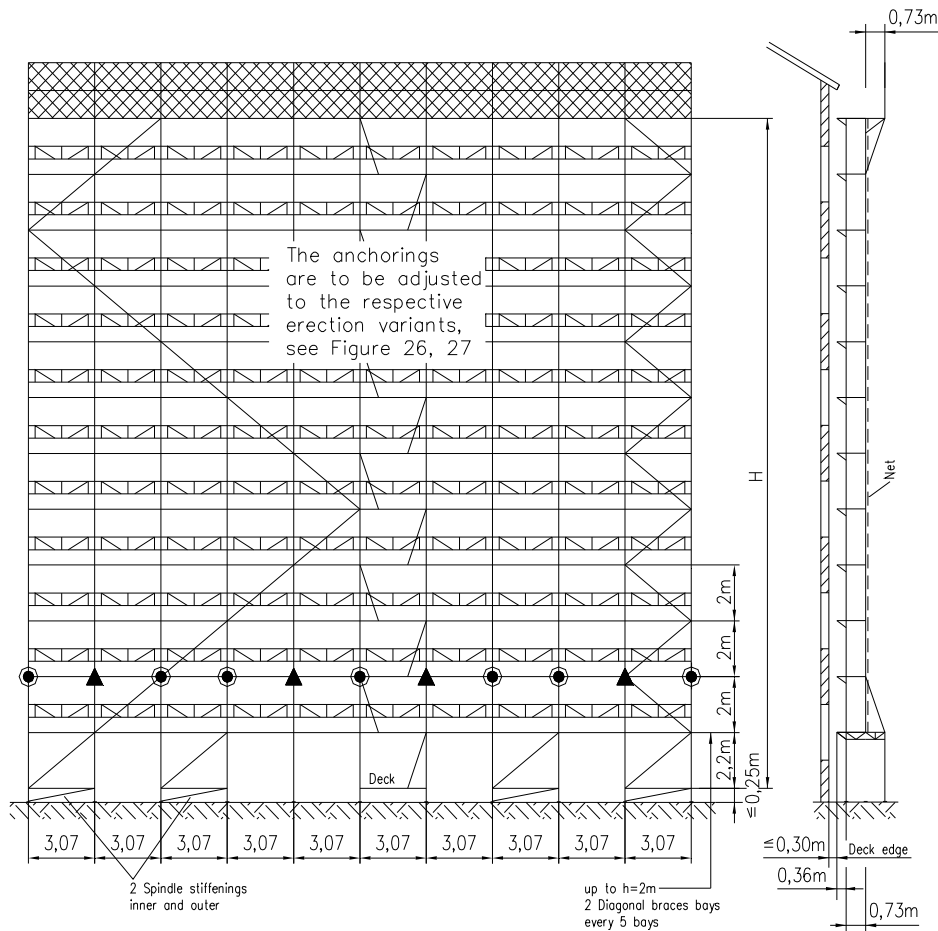
- net-covered scaffold
- all decks $l \leq 3,07$ m
- w/o brackets
- w. / w/o guard system
- w. passageway frame



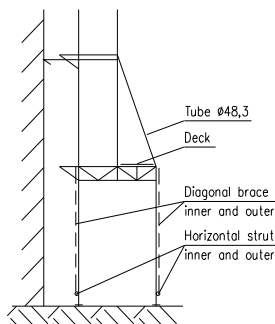
Height		Anchor forces [kN]								
		Scaffold retainer at inner standard			Scaffold retainer			Quick-release anchor		
		8 m	16 m	24 m	8 m	16 m	24 m	8 m	16 m	24 m
at right angle to façade	A_{\perp}	2,9	2,9	2,9	2,3	2,7	2,7	2,9	2,9	2,9
parallel to façade	A_{\parallel} standard type	0,5	0,5	0,5	1,3	1,9	1,9	1,0	1,0	1,0
	A_{\parallel} corner type	2,0	2,0	2,0	2,4	3,3	3,3	2,5	2,5	2,5
triangular tie (inclined load per tube)		2,7	2,9	3,1	-	-	-	-	-	-

Fig. 31: Standard version of net-covered scaffold, w. attachments in front of open façade

- net-covered scaffold
- all decks $l \leq 3.07$ m
- w. inner brackets 0.36 m
- w. outer brackets 0.73 m
- w. alum. double guardrail
- w. / without guard system
- w. passageway frame



Detail



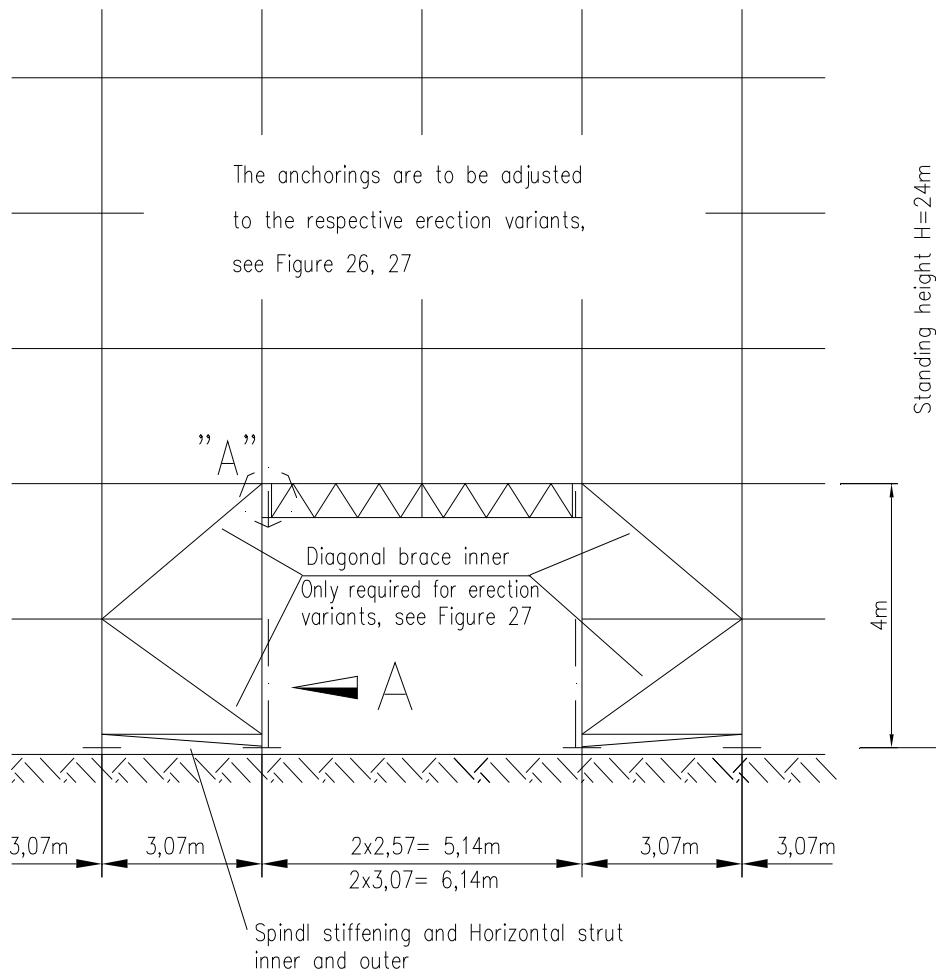
● Single-upright scaffold retainer

▲ Triangular tie

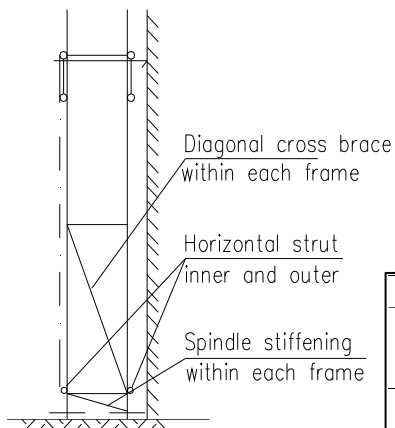
		Anchor forces [kN]						
		Scaffold retainer at inner standard			Scaffold retainer			
Height		8 m	16 m	24 m	8 m	16 m	24 m	
at right to façade	A_{\perp}	2,8	2,8	3,1	2,4	2,6	2,8	
parallel to façade	A_{\parallel}	standard type	0,1	0,1	0,1	0,4	0,6	0,6
		corner type	1,5	1,5	1,7	1,6	1,9	2,0
triangular tie (inclined load per tube)		2,3	2,5	2,7	—	—	—	

**Fig. 32: Standard version
Bridging, net-covered scaffold
w/o attachments, in front of open façade**

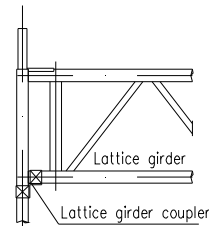
- bridging
- net-covered scaffold
- w/o brackets



View A



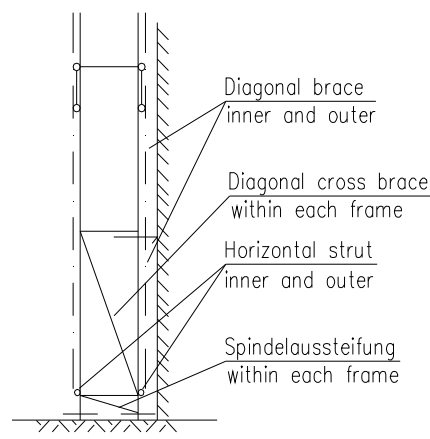
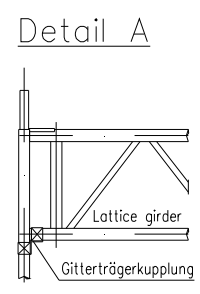
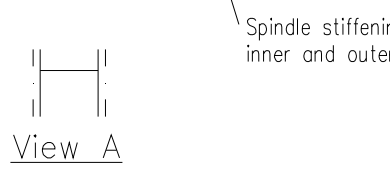
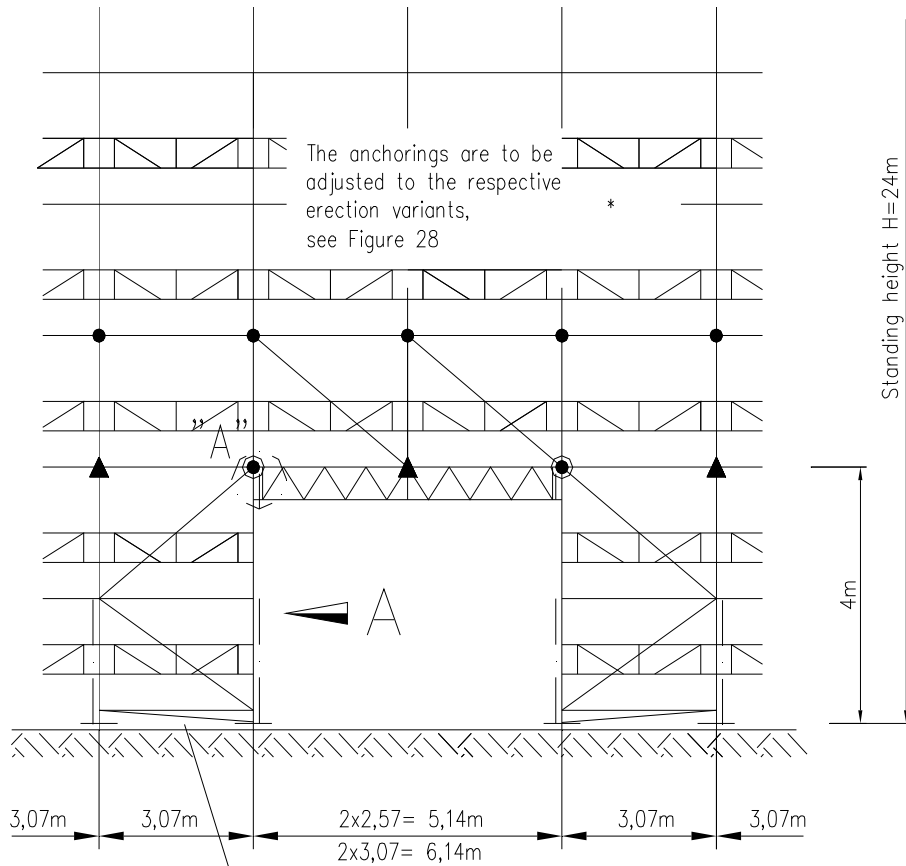
Detail A



		Anchor forces [kN]								
		Scaffold retainer at inner standard			Scaffold retainer			Quick-release anchor		
Height		8 m	16 m	24 m	8 m	16 m	24 m	8 m	16 m	24 m
at right angle to façade	A_{\perp}	2,2	2,4	2,6	2,3	2,5	2,6	2,0	2,0	2,1
parallel to façade	standard type	0,5	0,5	0,5	1,3	1,7	1,9	1,3	1,3	1,3
	Comer Type	1,7	1,7	1,9	2,4	2,7	2,9	2,3	2,3	2,4
triangular tie (inclined load per tube)		2,7	2,9	3,1	—	—	—	—	—	—

**Fig. 33: Standard version
bridging, net-covered scaffold
w. attachments, in front of open façade**

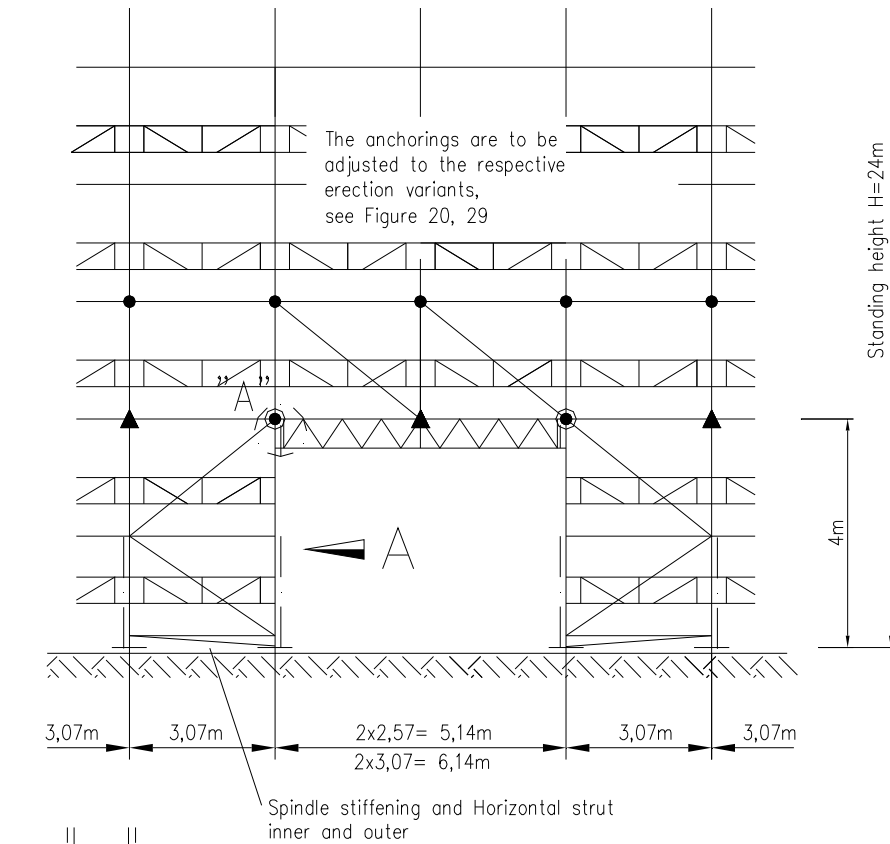
- bridging
- net-covered scaffold
- w. inner brackets 0.36 m
- w. alum. double guardrail



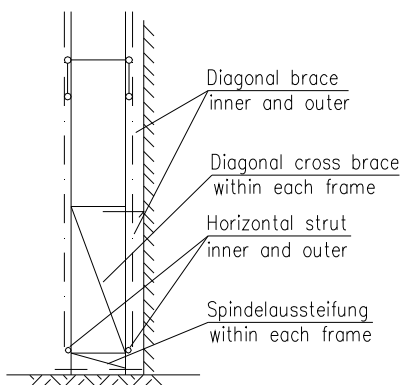
		Anchor forces [kN]					
		Scaffold retainer at inner standard			Scaffold retainer		
Height		8 m	16 m	24 m	8 m	16 m	24 m
at right angle to facade	A_{\perp}	2,0	2,0	2,0	2,5	2,7	2,9
parallel to facade	standard type	0,2	0,2	0,2	0,1	0,5	0,6
	Corner type	1,2	1,2	1,2	1,4	1,9	2,1
triangular tie (inclined load per tube)		3,1	3,1	3,1	—	—	—

**Fig. 34: Standard version
bridging, uncovered / net-covered
scaffold, w. attachments
in front of open façade**

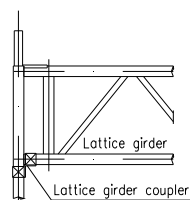
- bridging
- uncovered / net-covered scaffold
- w. inner brackets 0.36 m
- w. outer brackets 0.73 m
- w.alum. double guardrail



View A



Detail A



(-) value applicable for types w. protective shelter, on the level of protective shelter

		Anchor forces[kN]					
		Scaffold retainer at inner standard			Scaffold retainer		
Height		8 m	16 m	24 m	8 m	16 m	24 m
at right angle to façade	A_{\perp}	2,6 (2,9)	2,9 (2,9)	3,1 (2,9)	–	1,9	2,1
parallel to façade	Standard type	0,2	0,2	0,2	–	0,4	0,7
	corner type	1,5 (1,6)	1,7 (1,6)	1,7 (1,6)	–	1,3	1,8
triangular tie (inclined load per tube)		2,6	2,8	3,0	–	–	–

4. Use

The scaffold may be used in accordance with the indicated scaffolding group and the provisions of the operational safety regulations (BetrSichV). The scaffold constructor has to inspect the scaffold after completion. Any unfinished scaffolds or scaffold sections have to be barred from service, cordoned off and the prohibitory sign "No Access" put up.

5. Dismantling scaffolds

Dismantle the scaffold in reverse order to that described in chapter 2.

6. System components

The survey below gives the components used in standard versions.

Bauteil		Weight [kg]	Z-8.1-897 annex
Vertical aluminium frame	2,00 x 0,73 m	8,6	1
	1,00 x 0,73 m	5,1	2
	0,66 x 0,73 m	4,1	2
Aluminium assembly frame	2,00 x 0,73 m	8,6	4
	1,00 x 0,73 m	5,1	4
	0,66 x 0,73 m	4,1	4
Standard spindle	0,40 m	2,9	5
	0,60 m	3,6	5
Heavy duty spindle	0,80 m	4,9	6
Diagonal braces	2,07 x 2,00 m	7,0	7
	257 x 2,00 m	7,8	7
	3,07 x 2,00 m	8,8	7
Diagonal cross brace	1,77 m	6,0	7

Component		Weight [kg]	Z-8.1-897 annex
Aluminium double guardrail	1,57 m	3,5	8
	2,07 m	4,6	8
	2,57 m	5,8	8
	3,07 m	6,7	8
Guardrail	0,73 m	1,4	9
	1,09 m	2,0	9
	1,57 m	3,3	9
	2,07 m	4,4	9
	2,57 m	5,6	9
	3,07 m	6,2	9
	Double guardrail	1,57 m	7,9
2,07 m		9,8	9
2,57 m		11,7	9
3,07 m		14,1	9
End guardrail	0,73 m	2,8	11
Double end guardrail	0,73 m	4,4	11
Aluminium guardrail post, single		2,4	12
Aluminium guardrail post	0,73 m	2,7	12
Aluminium end guardrail post	0,73 m	4,6	12
Scaffold retainer	0,30 m	1,5	13
	0,47 m	1,8	13
	1,00 m	3,8	13
	1,50 m	5,9	13
	2,00 m	7,4	13
Quick-release anchor	0,65 m	3,0	13
Anchor coupler		1,3	13
Toeboard	1,57 m	3,1	14
	2,07 m	4,7	14
	2,57 m	6,1	14
	3,07 m	6,8	14
End toeboard		2,1	14
Bracket 0,36 m		3,7	15
Bracket 0,73 m		6,4	15
Protective shelter bracket 1,30		14,4	16
Protective shelter bracket		18,9	17
Safety meshguard support		14,0	18

Component		Weight [kg]	Z-8.1-897 annex
Safety side meshguard	1,57 m	15,5	19
	2,07 m	17,7	19
	2,57 m	21,1	19
	3,07 m	24,4	19
Sturdy deck 0,61 m	0,73 m	7,2	20
	1,09 m	9,7	20
	1,57 m	13,1	20
	2,07 m	16,4	20
	2,57 m	20,4	20
	3,07 m	25,0	20
Sturdy hatch-type access 0,61 m	2,07 m	17,2	21
	2,57 m	20,5	21
	3,07 m	24,6	21
Sturdy hatch-type access with ladder 0,61 m	2,57 m	25,2	22
	3,07 m	29,0	22
Sturdy deck 0,32 m	0,73 m	6,4	23
	1,09 m	8,4	23
	1,57 m	9,9	23
	2,07 m	11,5	23
	2,57 m	14,7	23
	3,07 m	16,0	23
Aluminium box-type deck 0,32m	0,73 m	4,4	24
	1,09 m	6,9	24
	1,57 m	9,3	24
	2,07 m	11,8	24
	2,57 m	14,3	24
	3,07 m	16,8	24
Combined stacking deck 0,61m	1,57 m	11,8	25
	2,07 m	14,5	25
	2,57 m	17,9	25
	3,07 m	22,0	26
Hatch-type access combined stacking deck 0,61 m	2,07 m	15,8	27
	2,57 m	18,8	27
	3,07 m	22,7	27

Component		Weight [kg]	Z-8.1-897 annex
Hatch-type access combined stacking 0,61 m with	2,57 m	25,9	28
	3,07 m	29,0	28
Combined deck 0,61 m	1,57 m	11,1	29
	2,07 m	14,0	29
	2,57 m	17,4	30
	3,07 m	20,8	30
Combined hatch-type deck 0,61 m	2,57 m	17,9	31
	3,07 m	1,6	31
Aluminium deck	0,73 m	3,1	32
Aluminium chequer plate deck	1,09 m	4,4	32
	1,57 m	6,5	32
	2,07 m	8,0	32
	2,57 m	10,0	32
	3,07 m	11,5	32
Access ladder		8,7	33
Deck retainer	0,36 m	0,9	34
	0,73 m	1,5	34
Locking clip		0,1	34
Horizontal strut	1,57 m	6,3	35
	2,07 m	8,0	35
	2,57 m	10,0	35
	3,07 m	12,0	35
U-start transom	0,73 m	3,8	36
Lattice girder ledger	0,73 m	3,1	36
Lattic girder	5,14 m	52,3	37
	6,14 m	60,9	37
Passageway frame	2,20 x 1,50 m	34,9	38
Advanced guardrail post		5,4	39
Advanced end guardrail		1,4	40
Telescopic guardrail	2,00 - 3,07 m	7,0	40

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