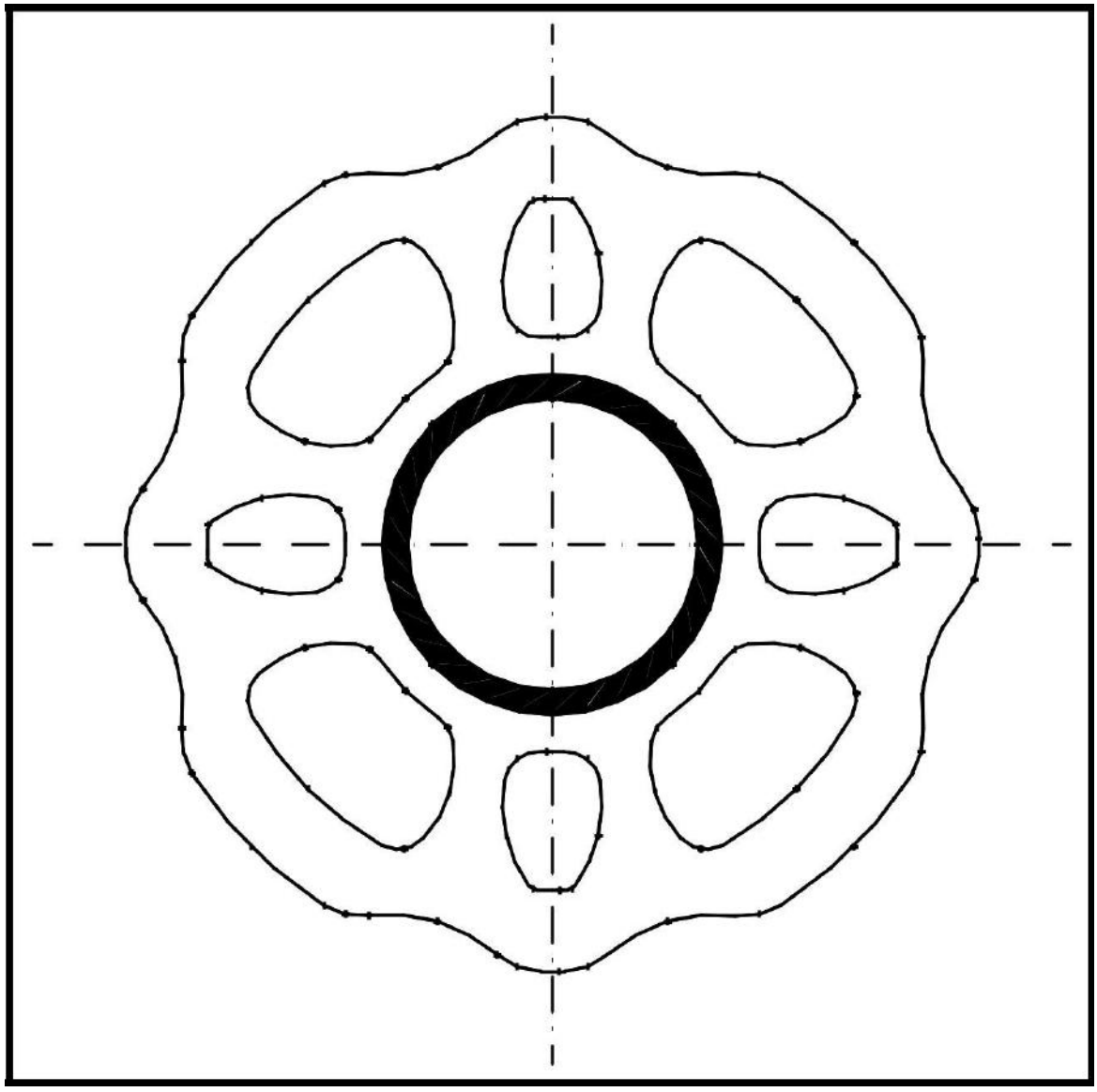
Plettac contur
Modular system

Guide for erection and use

Version: December 2011



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1. General

1.1 Preliminary notes

With regard to the following guide for the erection and use of the Plettac contur modular system, please note that as a basic requirement, scaffolding must only be assembled, dismantled and modified under the supervision of a qualified person and by professionally qualified staff who have received appropriate instructions for performing this work. In addition, we also refer to the requirements of the German Industrial Safety Ordinance (BetrSichV). Within the scope of the following guide for erection and use, we provide the assembler and user with options based on our risk assessment in order to take the requirements of the BetrSichV into consideration in each respective assembly situation.

Construction of the Plettac contur modular system under the supervision of a qualified individual by professionally qualified staff on the basis of the hazard assessment taking these A&V into account using components marked with the approval

Z-8.22-843

The technical details listed in these guide for erection and use, which should be of use to the assembler and user for compliance with the requirements of the BetrSichV, are not mandatory requirements for these workers. The assembler and user should comply with the necessary measures according to their best judgement based on the risk assessment they are required to perform in accordance with the requirements of the BetrSichV. The special features of each individual situation should be taken into consideration.

Essentially, however, is that attention is given to the following guide for erection and use. It should be noted that all information, in particular with regard to stability, is only applicable when using original Plettac assco components marked with the approval **Z-8.22-843**. The incorporation of components from other manufacturers may result in safety defects and insufficient stability.

A plan for the assembly, modification and dismantling (assembly instructions) is to be prepared by the scaffolding contractor responsible for the construction according to the complexity of the work or alternatively, this contractor should arrange for such a plan to be prepared by a specific qualified individual. These Guide for erection and use, supplemented by details for the specific scaffolding type, can be used for this purpose.

This guide for erection and use must be provided to the site supervisor and relevant employees.

The pictograms used in the notes in the margins have the following meanings:

Information

Important note or warning

Fall hazard

1.2 Scaffolding system

The Plettac contur modular system consists of hot-dip galvanized steel uprights and ledgers. The vertical standards have welded perforated discs at intervals of 50 cm, while the ledgers have connecting heads at their ends which are keyed to the perforated discs. The field lengths and widths are 0.75 m, 1.00 m, 1.50 m, 2,00 m, 2.50 m and 3.00 m. Shorter transoms in the width of the SL-frame scaffolding (0.74 m {SL70} and 1.06 m {SL100}) are also available. The deck level is 2.00 m, whereby vertical distance requirements height class H1 according to DIN EN 12811 -1 are met.
The vertical standards are hitched using a pipe connector attached to the head.

The scaffold is braced using vertical and horizontal diagonals.
The manufacture and labelling of the components is regulated by the general building inspectorate approval **Z-8.22-843**.

1.3 Obligatory testing and documentation

"Access forbidden"

The Plettac contur modular system must be inspected after every assembly by the assembler and before every use by the user, whereby the inspection must be performed by competent individuals. The inspection must be documented. If certain areas of the scaffolding is not safe for use, in particular during assembly, modification or dismantling, these areas are to be marked with an "Access prohibited" sign. The area should also be blocked off to make clear that the scaffolding is not ready for use and that no one should access the area for this reason.

After completion and inspection, the scaffolding should be marked. The sign should be displayed in a clearly visible location and should contain the following information in addition to general safety instructions:

- Work scaffolding according to EN 12811 -1 and / or DIN 4420-1
- Width class W06 and load class: 3
- Evenly distributed load: max. 2.0 kN/m²
- Date of inspection
- Scaffolding construction firm .....
- Postcode City · Tel. .....

The Plettac contur modular system should be inspected before each use.

This inspection must be documented.

The results of the inspection are to be documented in the form of an inspection record and stored for a reasonable period, usually for three months after the scaffolding has been dismantled.

1.4 Safety guidelines for scaffold users

- Each user must inspect the Plettac contur modular system before use for obvious defects (see paragraph 1.3).
- Each user is responsible for the correct use of the scaffold and maintenance of its operational safety. The BG information "Instructions for the use of work and safety scaffolds" (BGI 663) is recommended as a guide for this purpose.
- Any defects caused by bad weather or as a result of construction work etc. during the period of use are to be immediately reported to the scaffolding contractor.
- The Plettac contur modular system must only be accessed and vacated using an appropriate entry or steps. Climbing and jumping is prohibited.
- The scaffold user should ensure that unauthorised individuals cannot gain access.
- The Plettac contur modular system must not be accessed by individuals under the influence of alcohol or drugs.
- Jumping off and throwing objects from scaffold platforms is prohibited.
- Flaps in trapdoor covers must be kept closed during work on the scaffold level.
- Work on several consecutive levels at the same time is to be avoided. There is an increased risk of accidents due to falling objects.
- Leaning over the side rails is prohibited.
- The Plettac contur modular system can be loaded with a maximum payload of p = 2.0 kN / m² in one location in the standard set-up as a façade scaffold in accordance with the approval. Larger area loads are possible but must be verified separately. The scaffolding or sections of the scaffolding may collapse if overloaded.
- When used as a safety or roof safety scaffold, no materials should be stored and no equipment should be placed in the fall area. This would increase the risk of injury to falling persons.
- The scaffold user is not permitted to expand the side rail sections or scaffold brackets or make any changes to the foundation set-up. The user should also ensure that others participating in the construction work do not make any such changes. Missing scaffold brackets and insufficient foundations for the scaffold uprights may result in the collapse of the entire scaffold structure. If changes to the scaffold are required during the construction process, these changes must be performed by the scaffold contractor.
- The scaffold user must not subsequently install any elevators, debris slides or cladding, such as nets and tarpaulins. This also applies to advertising banners.
- As a basic principle, the Plettac contur modular system must only be modified by the scaffolding contractor.

Climbing on and jumping from the scaffold involves an increased risk of accidents!

When overloaded, the Plettac contur modular system may collapse!

Following the expansion of components, the façade scaffolding may collapse and people could fall!

Only the scaffolding contractor is authorised to make modifications to the Plettac contur modular system!

1.5 Assembling the modular connection

The wedge lock principle was selected as the modular connection (ledger - vertical standard). Even when the wedge is only loosely inserted, this gives the scaffold stability. When the wedge is secured by hitting it with a hammer, creating a frictional connection. The upper and lower bearing surface of the head piece is pressed against the vertical standards (Fig.1), creating an extremely rigid connection.

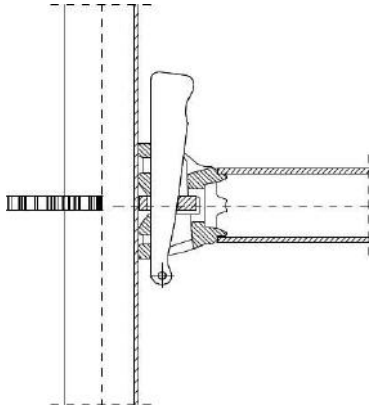


Fig. 1: Wedge lock connection

The ledger head is pushed laterally over the perforated disc. The wedge is firmly fixed in a horizontal position to the ledger pipe (Fig. 2) by a rivet at the tip.

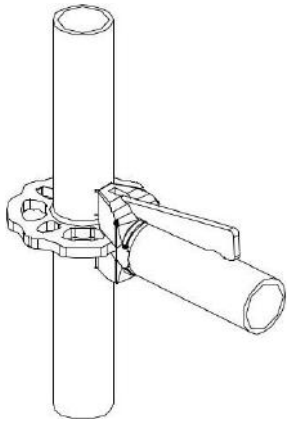


Fig. 2: Insertion of the headpiece

By lifting and inserting the wedge, the ledger is locked and is then firmly connected firmly to the vertical standards by applying a 500 g hammer until they click into place (Fig. 3).

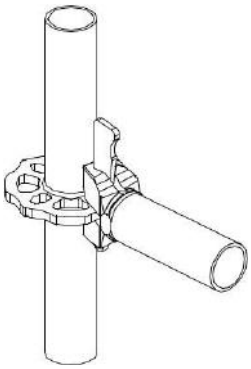


Fig. 3: Wedging the headpiece

Immediately hammer in the wedges after installation of the components using a 500 g hammer until they click into place!

The perforated disc (Fig. 4) has four small holes which are offset by 90 °. The ledgers are attached here if a right angle is required for the basic configuration. This then forms automatically once wedged into place.

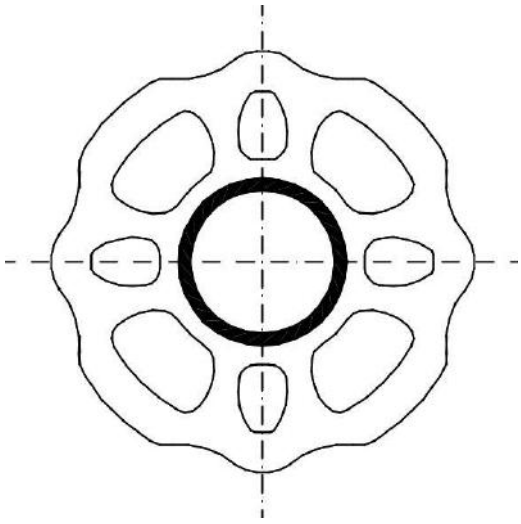


Fig. 4: Rosette

Longer holes are located between the small holes which can be used to create variable ledger connections of ±15°. This allows the construction of basic configurations which do not have a 90° grid.

The recesses on the outer edge of the perforated disk not only form the special **"contur"** of the scaffold connection, but also reduce weight and make the uprights easier to stack on the palette. The resulting non-circular shape prevents them from rolling away on a sloping surface.

2. Plettac contur as façade scaffolding

2.1 Standard set-up

When installing the Plettac contur modular system as façade scaffolding, the following is applicable:

Regulation in approval notification Z-8.22-843

Load class 3

Payloads: Cl 3 = 2.0 kN / m²

Max standing height = 24 m as standard set-up

in the event of deviations from the standard set-up, additional documented evidence of conformity is required.

The assembly and dismantling of the standard set-up as façade scaffolding in accordance with approval **Z-8.22-843** is described in Chapter 2. The Plettac contur modular system can be used according to this standard set-up for work scaffolds of load class 3, in addition to safety scaffolds and roof safety scaffolds.

The scaffold components regulated in the approval are listed in Chapter 8. The scaffolding platforms which can be used for safety scaffolds and roof safety scaffolds are listed in Table 1.

The maximum height of the standard set-up is 24 m plus jack extension length.

If the Plettac contur modular system is used for scaffolds which deviate from this standard set-up as a façade scaffold, these scaffolds must be assessed and, if necessary, calculated on the basis of construction law, according to the technical building regulations and the provisions of general building inspectorate approval Z-8.22-843.

This guide for erection and use are only applicable in connection with the use of original Plettac assco components that are marked in accordance with approval Z-8.22-843. All scaffolding components are to be visually inspected before installation to ensure they are free of defects.

Damaged scaffold components must not be used.

The Plettac contur modular system is to be set up as façade scaffold following the order of the sections below.

2.2 Construction of the first scaffold section

2.2.1 Base of the scaffold

The base of the scaffold consists of base jacks, starting collars and horizontal ledgers parallel and transverse to the façade (Fig. 5).

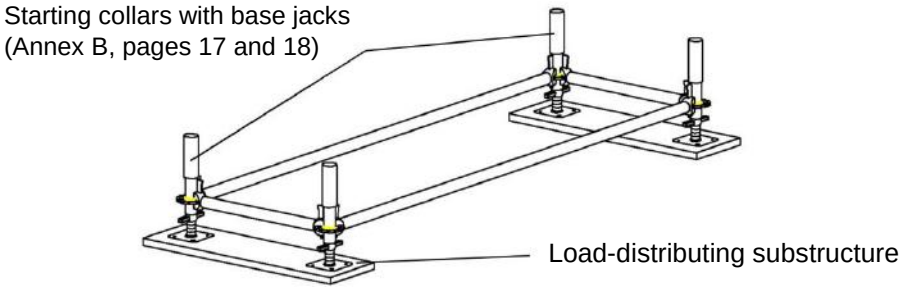


Fig. 5: Base of the scaffold

The starting collars are first placed on the base jacks and connected to the horizontal ledgers according to Fig. 5. Insert the wedges loosely and align the braces horizontally using a spirit level. The wedges should not be locked into place until this step is complete. The exact base of the scaffold has now been created. Due to the low weight, the base of the scaffold can be moved easily and placed into the correct position against the façade. A distance should be selected which ensures that the inner edge of the decks to be incorporated at a later date are no further than 30 cm away from the façade.

2.2.2 Load-distributing substructure

The Plettac contur modular system must only be installed on sufficiently load-bearing ground. If the substructure is not sufficiently load-bearing, load-distributing substructures should be used, e.g. a scaffolding brace as shown in Fig. 5. If appropriate, one-piece pads can be placed under each of the uprights (Fig. 6).

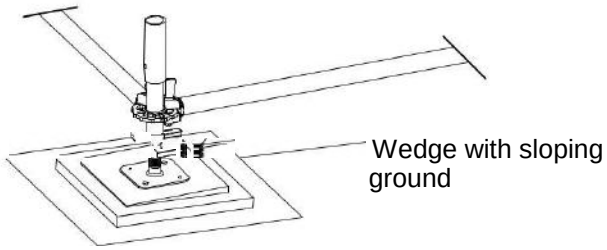
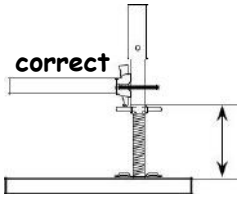


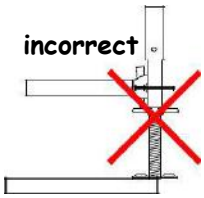
Fig. 6: Load-distributing substructure (one-piece)

In the case of sloping ground, the substructures should be secured to stop them from sliding. If possible, the ground should be flattened accordingly so that a horizontal base is available.

Base pads must lie completely flat.

The jacks may bend otherwise!





2.2.3 Base jacks

An adjustable base jacks is to be installed under each modular upright (Fig. 5). Base jacks should usually be drill-finished up to 25 cm.

The possible drill-finish lengths w (UK base plate to OK spindle nut) are as follows for the scaffold uprights listed in the approval notification, Annex B, page 18:

Overall length L1 (cm)	**Drill-finish length w** (cm)
40	25.5
60	45.5
80	60.5

The thread of the spindles is destroyed at the corresponding locations so that they can no longer be unscrewed.

2.2.4 Vertical uprights

The vertical uprights are inserted into the starting collars. 4.0 m long uprights should be inserted on the façade side and 3.0 m uprights on the outer side (see Fig. 16). A further ledger transverse to the façade may be required 50 cm above the base ledger (see the set-up variants).

The length of the lower transverse ledgers should be selected on the basis of the planned covering system for the façade scaffolding. In the case of SL decks, ledgers with a system length of 74 cm should be used, or a system length of 75 cm in the case of round pipe supports.

Tip: The net length between the head tips is 5 cm lower in each case.

***) This horizontal ledger is only used to stabilise the first scaffold section! This is not required for the further construction of the standard set-up.**

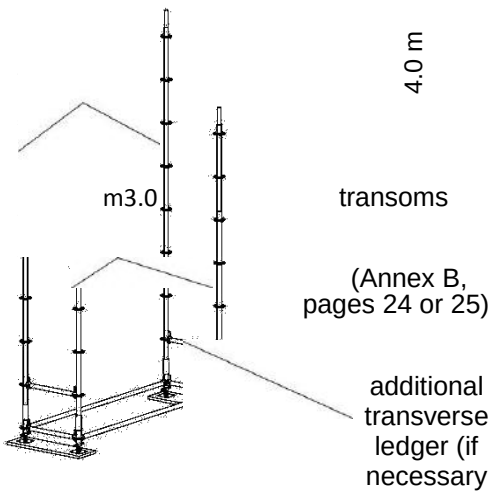


Fig. 7: Installation of vertical uprights

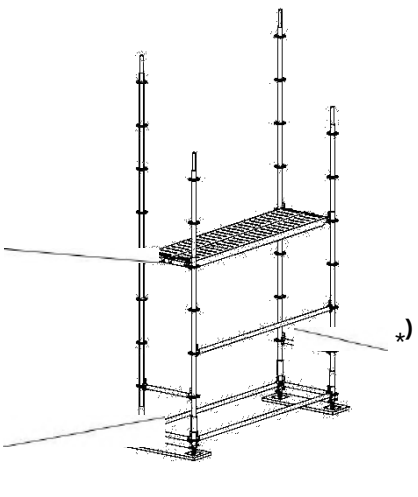


Fig. 8: Installation of decks

2.2.5 Installation of decks

Only those decks listed in Table 1 should be used.

Decks for SL support
The transoms with a system length of 74 cm should be used to accommodate the SL decks (Annex B, page 25). The holes located on the head pieces of the decks are pushed through the star ledgers of the transoms. The decks then form a horizontal rigid disc and stabilize the scaffolding. Two 32 cm-wide steel decks or an aluminium access platform may be required for each field with a width of 74 cm. The deck retainer according to Annex B, page 29 is to be installed across the transverse joint to secure the decks. If this is not possible, the decks should be secured to prevent lifting using other appropriate measures.

Decks for pipe support
The horizontal ledgers with a system length of 75 cm (Annex B, page 24) should be used to accommodate the pipe support decks. The base boards are laid across the ledgers using the claws and are pushed into the correct position. The anti-lift latches click into place automatically (check). Two 32 cm-wide steel decks or a 64 cm wide aluminium access platforms must also be installed for each field.

All scaffold levels must be fully constructed! Levels with only a 32 cm-wide covering will not give the scaffold a sufficiently secure structure!

In the case of the decks for pipe supports, it should be checked whether the anti-lifting latches are closed following installation. If necessary, they may need to be closed by hand. It must be ensures that the safety levels can always move easily inside the bracket (see also Section 3.3.1)

Table 1: Deck elements for the standard set-up

Description	Approval Z-8.22-843, (Annex B, Page	Use in catch and Roof safety Scaffolding	Field length L (m)	Load class (max)
Steel deck 32 SL support	38	permitted	≤ 2.00 2.50 3.00	**6** **5** **4**
Steel deck 32 Pipe support	41	permitted	≤ 2.00 2.50 3.00	**6** **5** **4**
Aluminium access platform with plywood flooring SL support	59	permitted	2.50 3.00	**3** **3**
Aluminium access platform with aluminium covering SL support	63	permitted	2.50 3.00	**4** **3**
Aluminium access platform with aluminium covering Pipe support	65	permitted	≤ 2.50 3.00	**4** **3**

For detailed information about the carrying capacity of the decks, See Table 7 in Chapter 6.6.

2.3 Construction of the additional scaffold sections

2.3.1 Normal area

The construction of the additional scaffold sections is performed as described in the previous section. The longitudinal ledgers at the base points are to be arranged consecutively (Fig. 9). An aluminium access platform should be installed in the climbing area instead of the steel decks. Steel deck plates should be placed on the lower cross ledgers to provide proper support for the leads.

These horizontal ledgers can be removed after installation of the side rails in the deck levels + 2 m!

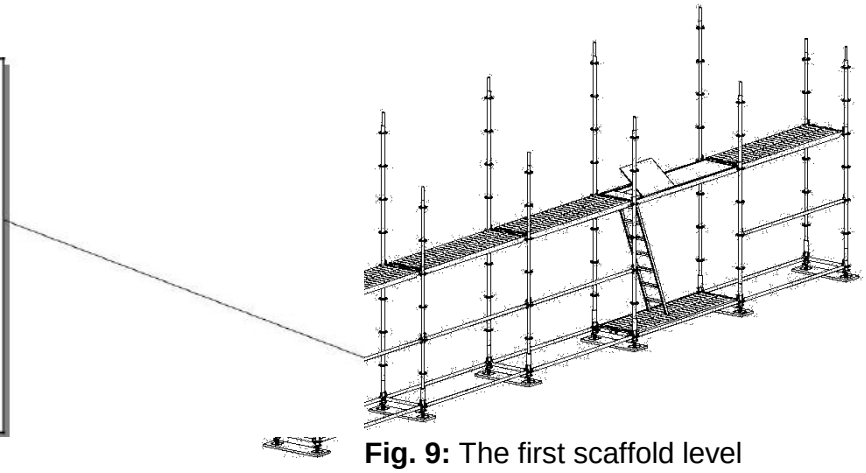


Fig. 9: The first scaffold level

2.3.2 Uneven terrain

In the case of sloping terrain and height differences or if specific location heights are required, correspondingly longer vertical shafts should be installed. These should be braced longitudinally and transversely using ledgers, along with additional diagonal ledgers if required.

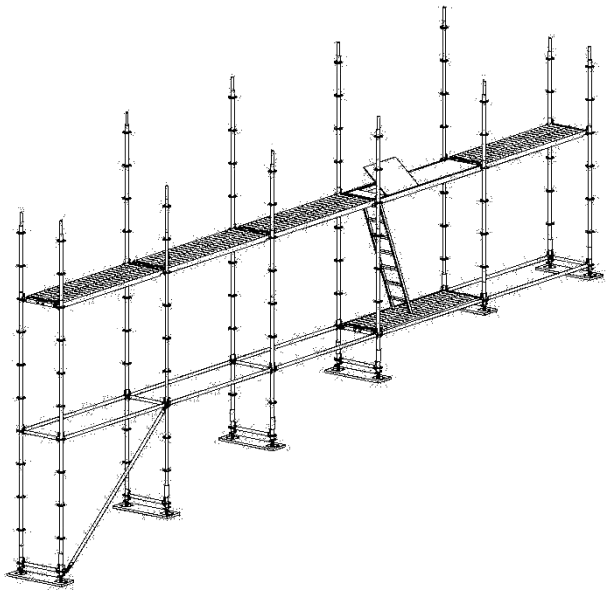
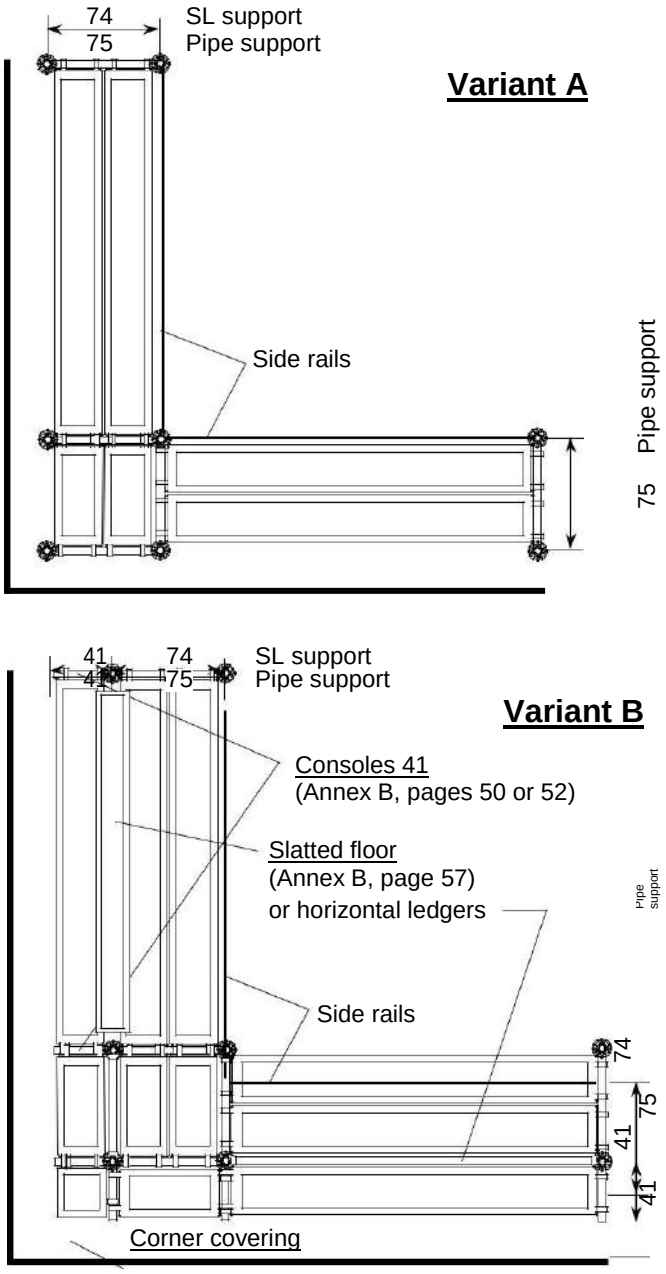


Fig. 10: Height compensation on uneven terrain

2.3.3 Corner formation

A range of corner configurations can be created with the Plettac contur modular system. A differentiation must be made between the inner and outer corners. It is important that the chosen construction allows consoles to be attached to the façade side of the scaffolding and that the three-part side rails can be installed on the outer side of the scaffolding. Fig. 11 shows the best construction design for an inner corner, Variant A with no consoles and variant B with consoles in front of the façade. Variant A can be used for an outer corner in this way. All variants can be built with either the pipe supports or SL supports (the pipe supports are shown here).

Select a design which allows the three-part side rails to be correctly installed on the outer side of the scaffolding.

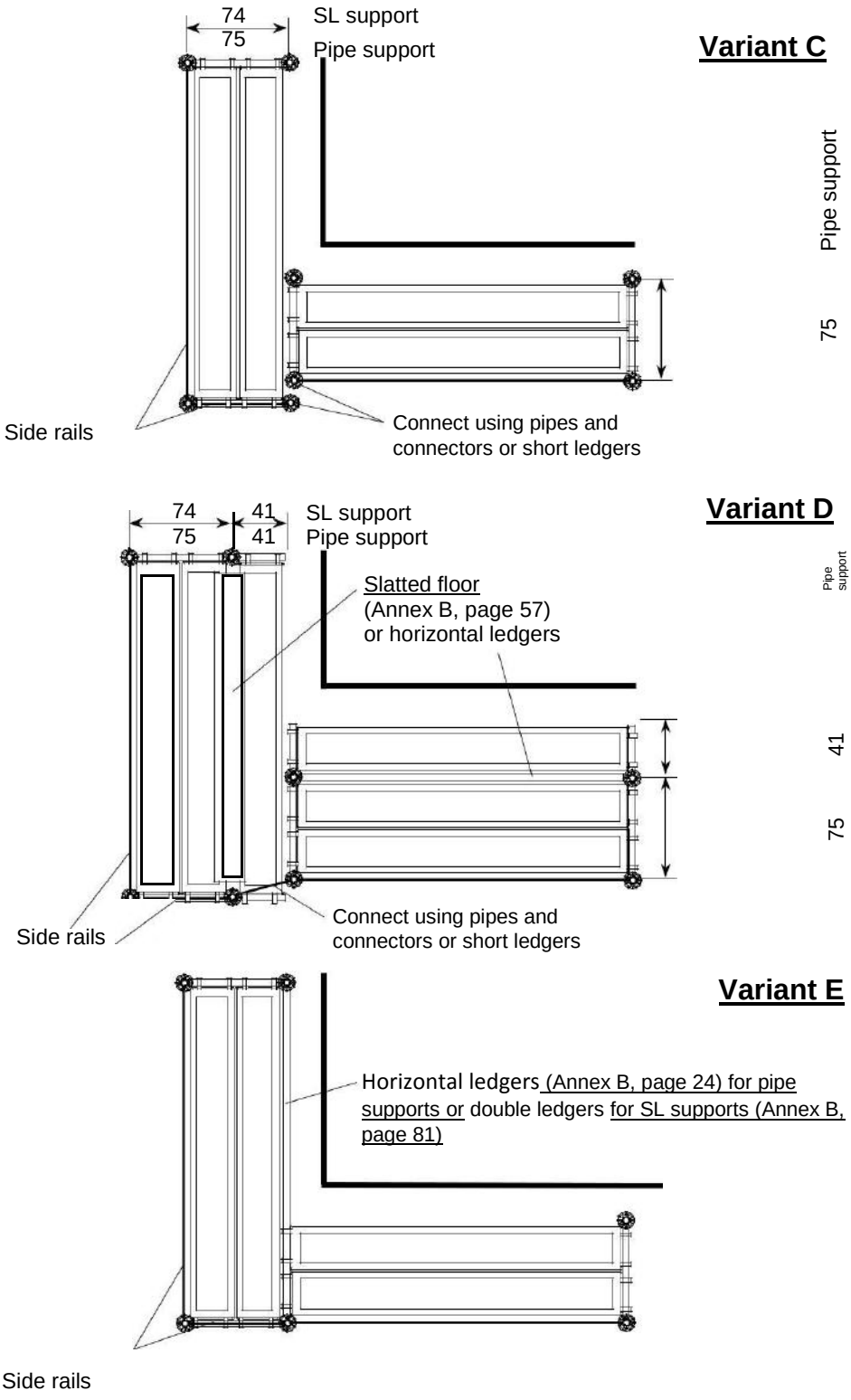


The variants shown can be built with either the pipe supports or SL supports.

Fig. 11: Scaffolding the inner corners

Fig. 12 shows different ways of scaffolding an outer corner. Variants C (without consoles) and D (with consoles in front of the façade) are variable with regard to the position of abutting scaffolding. Variant E is the optimum design with the least number of uprights. However, a horizontal ledger (pipe support) or an SL double ledger is required here as a supporting beam.

Select a design which allows the three-part side rails to be correctly installed on the outer side of the scaffolding.



All variants shown can be built with either pipe supports or SL supports.

Fig. 12: Scaffolding the outer corner

2.4 Construction of additional platforms

12.4.1 General

During the assembly, modification and dismantling of the other layers of the modular system Plettac Contur, there may be a risk of falling. The scaffolding work must be performed in such a way that the risk of falling is avoided or the remaining risk is kept as low as possible. The contractor (scaffold installer) must establish suitable for individual cases or for the respective activities to avoid or minimise risks on the basis of their risk assessment.

Risk of falling when assembling, modifying and dismantling the scaffolding!

The measures are to be selected in consideration of the actual existing risk, usefulness and practical possibilities based on the following conditions:

- Qualifications of the staff,
- Nature and duration of the activity in the hazardous area,
- Potential fall height,
- Type of surface which staff could fall onto
- Nature of the workplace and its access

Technical and personnel measures can be applied for the assembly, modification and dismantling of the Plettac contur modular system. Possible measures to avoid risks can, for example, include

- the use of installation guard rails ISR)
- the use of personal protective gear to prevent falls (PPE to prevent falling)
- or
- be a combination of the two.

Measures to prevent the risk of falling should be identified in a risk assessment!

The use of ISR or PPE to prevent falling can be waived in individual cases if ISR and PPE to prevent falling do not provide sufficient protection or cannot be used due to the structural and framework-specific circumstances.

The use of ISR or PPE to prevent falling can only be waived if

- the work is performed by qualified and physically fit individuals.
- the employer has issued special instructions for the justified exceptional case and
- the precipitous edge is clearly visible for the individual.

Measures to protect against falls are not required if the work and access areas are no more than 0.30 m away from other load-bearing and sufficiently large areas.

Danger of tilting on the first scaffold level!

Temporary tilt safety device on the first scaffold level

When building the scaffold, there may be a danger of tipping on the first scaffold level where the vertical transportation takes place. This can be prevented with e.g. temporary braces or anchors at the height of the decks (2m).

2.4.2 Scaffolding assembly

2.4.2.1 Vertical transportation of scaffolding parts

Builder's hoists should be used during assembly and dismantling for scaffolds with a standing height of over 8 m over the erection area. Hand-operated pulley hoists can also be used as a builder's hoist.
However, no builder's hoist is required if the standing height is no more than 14 m and the length of the scaffold does not extend more than 10 m. Guardrails and handrails must be available in scaffold sections were vertical transportation needs to be performed by hand. At least one employee must be on each scaffolding platform for this manual transportation (Fig. 13 and 14).

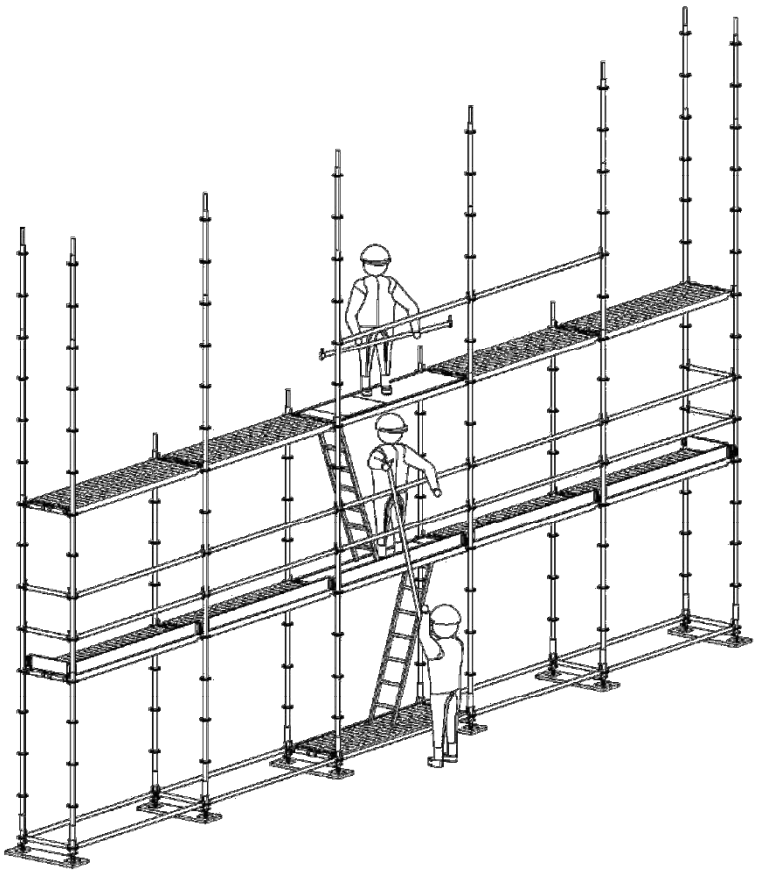


Fig. 13: Hand-transporting scaffold components

2.4.2.2 Installation of vertical uprights and horizontal ledgers

Depending on the level, the uprights on the outer side of the top level are either 1 m or 3 m apart (see Fig. 16). As an initial measure, horizontal ledgers are installed as side rails at a height of 1 m along the entire scaffold and at the ends. The uprights ending here on the side of the façade (Fig. 14) and / or the outer uprights overhanging by 1 m according to the requirements for the planned scaffold height are then extended and the transoms are installed at a height of 2 m. (Fig. 14).

There is an increased risk of falling when leaving the protected horizontal ledger area!

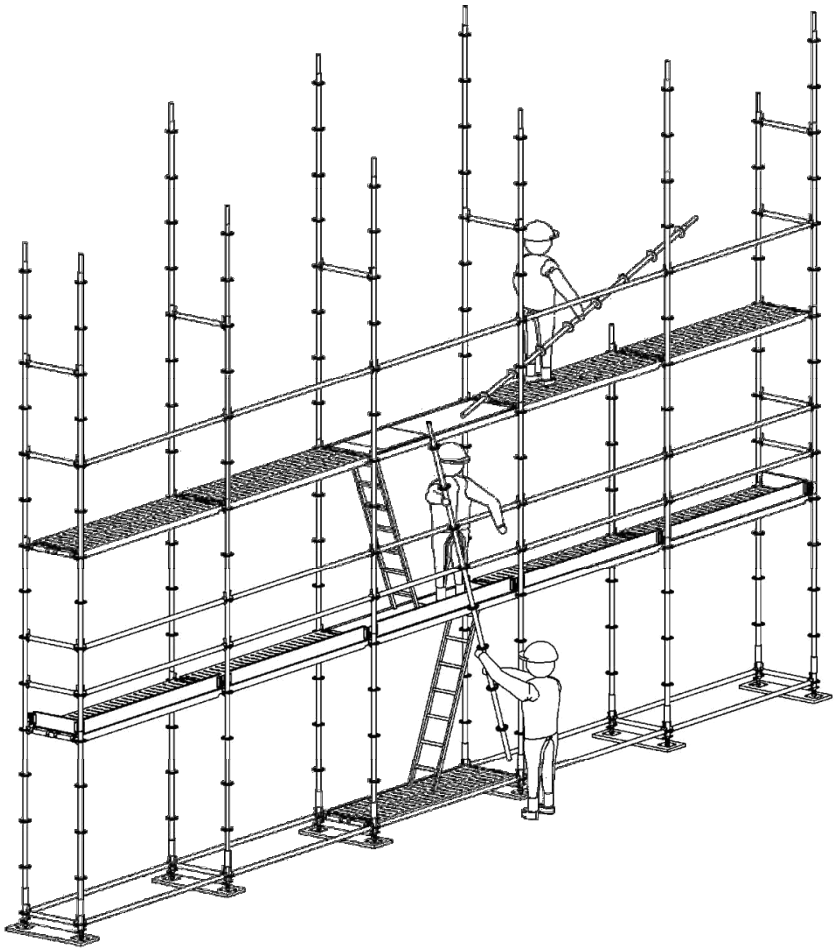


Fig. 14: Installation of vertical uprights

In the next step, horizontal ledgers should be mounted as knee rails at a height of 50 cm. Together with the side rails, this stabilises the scaffolding parallel to the façade, so they must both be installed before leaving the construction site up to the highest level completed at this point. Finally, the deck level needs to be fitted with toe boards and the decks for the next level up should be placed on top.

Install knee rails immediately after the side rails. This helps to stabilise the scaffolding!

As a rule 4 m uprights should be installed apart from in the foot area (see Fig. 16). Upright lengths for the head area should be selected according to the planned scaffold height.

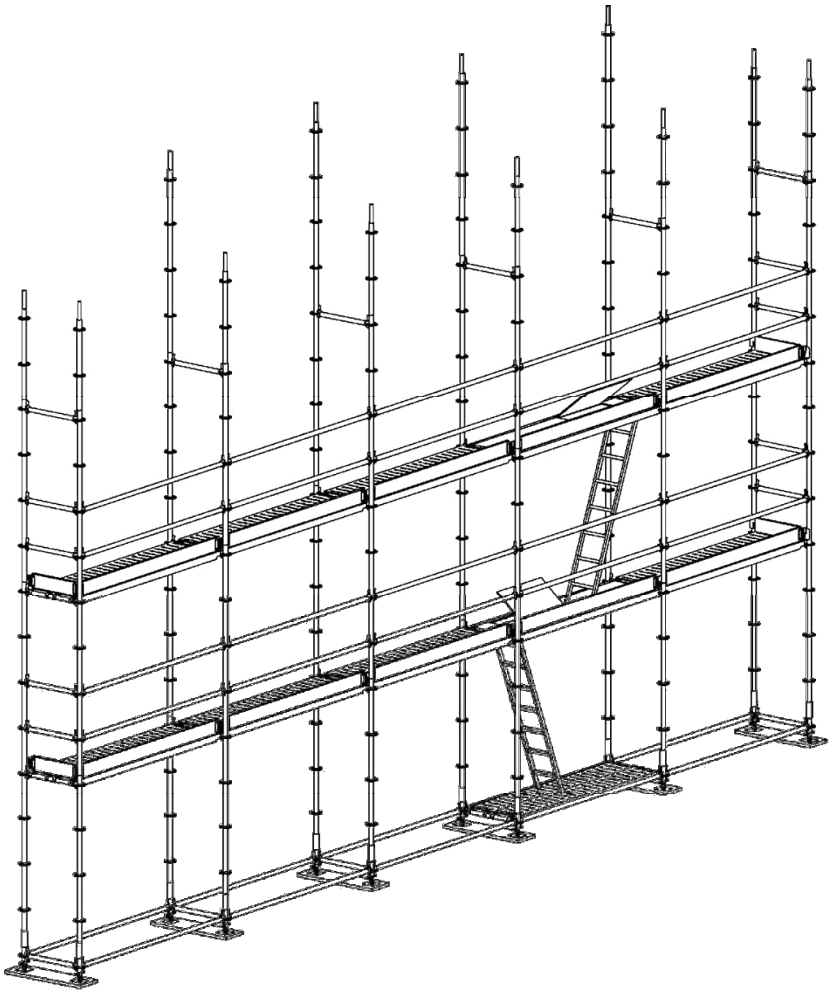
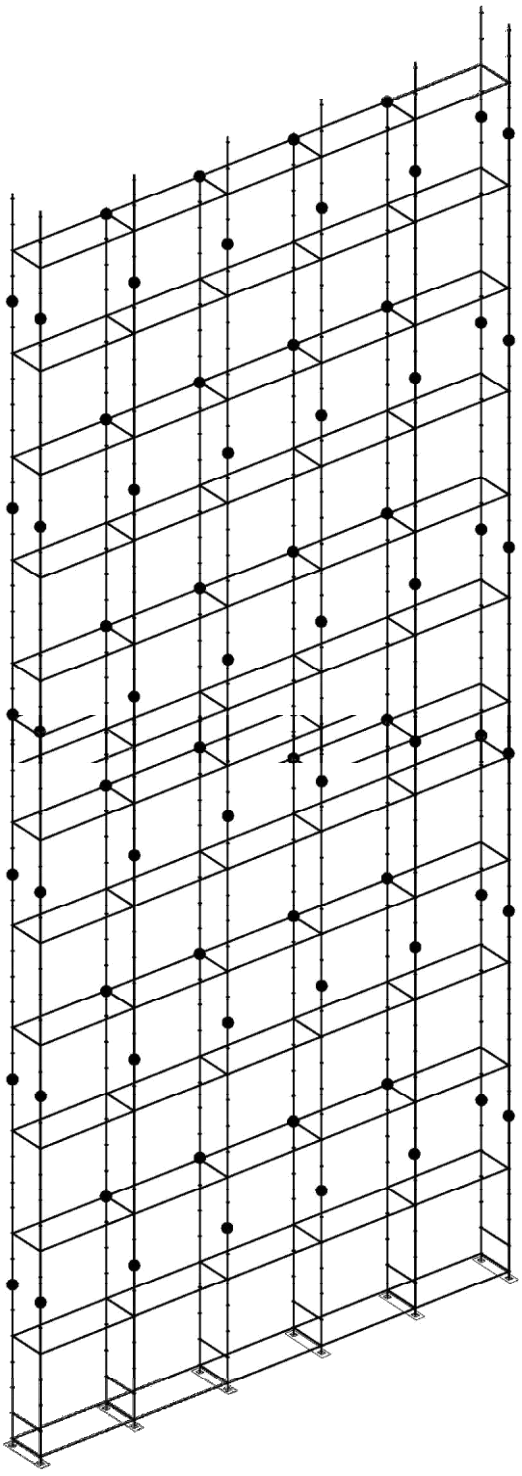


Fig. 15: The second scaffold level



The upright joints on the façade side are at the level of the decks, while at the outer side and the ends, they are positioned 1 m above the deck levels.

• = upright joint

(decks and side rails are not shown in Fig. 16. no longitudinal ledgers are required for the deck levels).

Fig. 16: Position of upright joints

2.4.2.3 Installation of decks

The decks are to be installed in accordance with Section 2.2.5.

Close the trapdoors after every use!

If the trapdoors are not closed, there is a risk of falling into the opening!

Before descending, check that the trapdoors below are closed.

If they are not closed, there is also a risk of falling into the opening!

2.4.2.4 Scaffolding access

The scaffold access should be installed before starting work on the first scaffold level (see Section 2.3.1 and Fig. 9). In the case of the Plettac contur modular system, this is an internal ladder passage consisting of an aluminium access platform with an integrated ladder. During installation, the openings should be staggered (Fig. 15) and the trapdoors should be closed after **every** use. The trapdoors should never be propped up or fixed by folding them back or in any other way. If the trapdoors are **not** closed after use, there will be a risk of falling into the opening.

2.4.2.5 Crossbeams

Crossbeams (vertical diagonals) are not required in the standard set-up. Only the horizontal ledgers for the side rails are used to reinforce the scaffolding parallel to the façade.

2.4.2.6 Finish installing the side rails

Missing side rails and toe boards, in addition to the full side rails at the ends of the contur scaffolding are to be installed on all scaffold levels which are not used for the construction of the scaffold. Double longitudinal ledgers are always required at every level, even on levels not intended for working operations.

The toe boards in the SL set-up are placed with their end fittings against the toe board pins in such a way that their upper edges are continuously at a height. The longitudinal toe boards are identical to those in the SL frame scaffolding, where the cross-toe boards are on the deck retainer and are therefore only 125 mm high. They can be identified by the words "cross" (Annex B, page 46). The toe board pins are integrated in to the deck retainer (Annex B, page 29). In special cases, individual toe board holder (Annex B, page 47) can be installed.

The toe boards for pipe supports (Annex B, page 4 8) are on the steel decks. The fittings are clamped between the wedge and vertical standards.

2.4.3 Safety measures during construction

2.4.3.1 Installation guard rails

General

There may be a risk of falling during the ascent to the uppermost scaffold level and subsequent assembly of the uprights and ledgers.

It is therefore recommended that the assembly safety railings (ISR) are used for safety in the access area as a security measure for the ascent to the uppermost scaffold level. If no uprights running up from below are available in the access area, the assembler can hold onto the ISR post. The strut acts as a side rail to attach the first upright and the horizontal ledger (railing) in the area.

The installation guard railings are assembled from the level underneath before accessing the upper level of the scaffolding. To reduce risks during assembly of the ISR, complete three-sided side rails are to be installed beforehand.

Recommendation

Use installation guard railings (ISR) use in the access area!

Safety during the ascent

Description of the installation guard railings

The set-up with lockable posts and telescopic struts is described here (see Annex A, pages 138 and 139 of the SL70 approval dated 2010).

The installation guard railings consist of individual posts and telescopic railings (see Fig. 17). Two posts and a guardrail are required for the first section and then one post and a strut for each additional section.

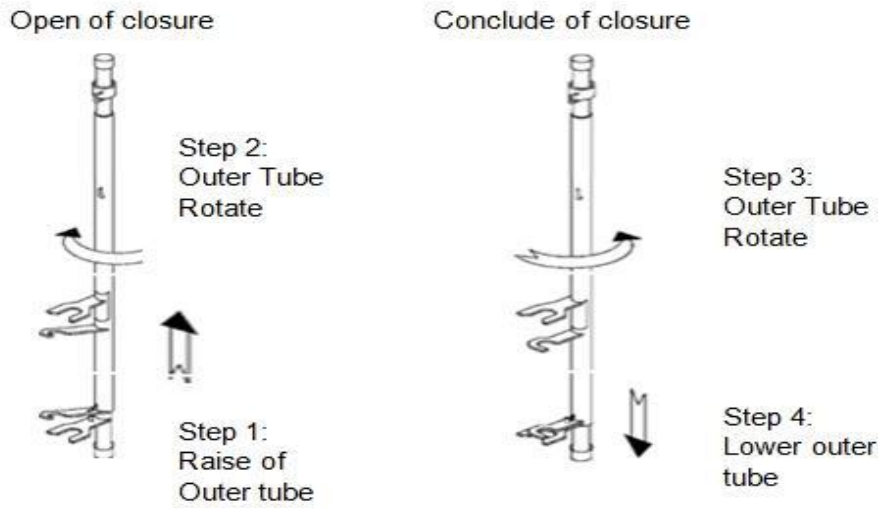


Fig. 17: Installation guard railings

There is an increased risk of falling during assembly of the ISR!

Full three-sided side rails should therefore be installed in advance!

The posts consist of an outer and an inner tube. The forks and the attachment hooks for the telescopic rails are secured to the inner tube and the closing bracket to the outer tube. The locking device for the railings can be pushed freely over the inner tube (see Fig. 17). The lower closing bracket has a hole which is located over a fastening bolt on the lower fork.

Assembly of installation guard railings

The posts are mounted externally in front of the vertical standards. They can be operated from above and from below. During construction, they can be released from above by lifting (unlocking the closing bracket) and rotating the outer pipe clockwise (Fig. 18, steps 1 and 2) and installed 2 m higher so that the lower fork comes to rest against the wedges of the scaffolding horizontal ledgers at a height of approx. 1 m above the platform. To lock them into place, rotate the outer pipe counter-clockwise and lower it so that the lower closing bracket moves over the safety ledger (Fig. 18, steps 3 and 4).

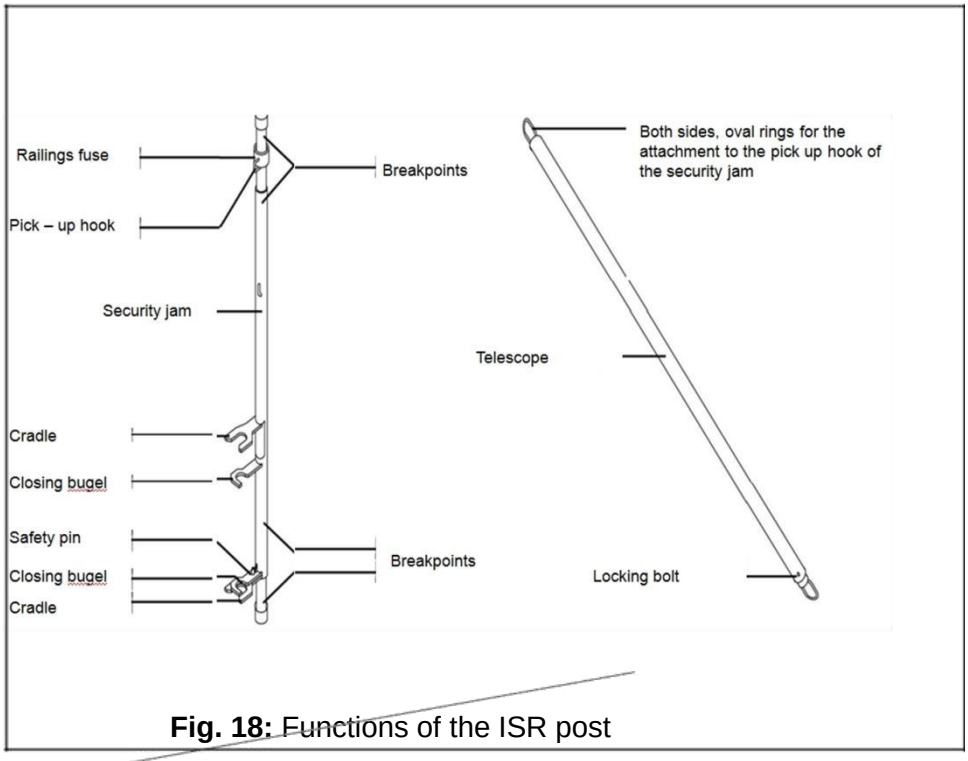
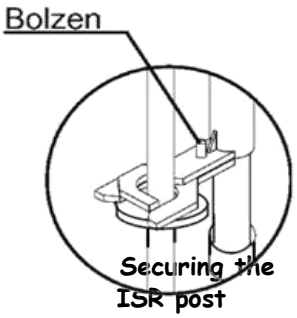


Fig. 18: Functions of the ISR post



Securing the ISR post

During the first installation, the telescopic railing posts are pushed over the attachment hooks, where they remain until the end of use. The locking sleeve prevents them from falling out unintentionally.

The telescopic railings are positioned upwards from level to level using the posts. Their telescopic function can be used to cover both the horizontal and the diagonal length of the access area (Fig. 19 and 20).

Fig. 19: Construction of the first post

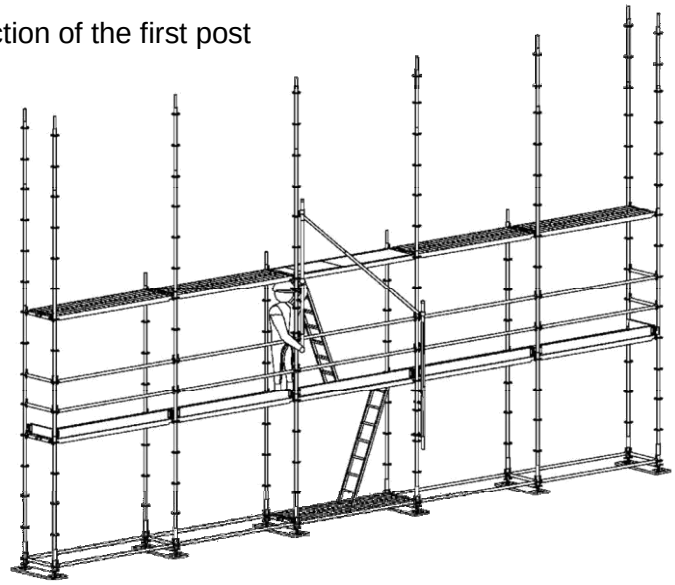
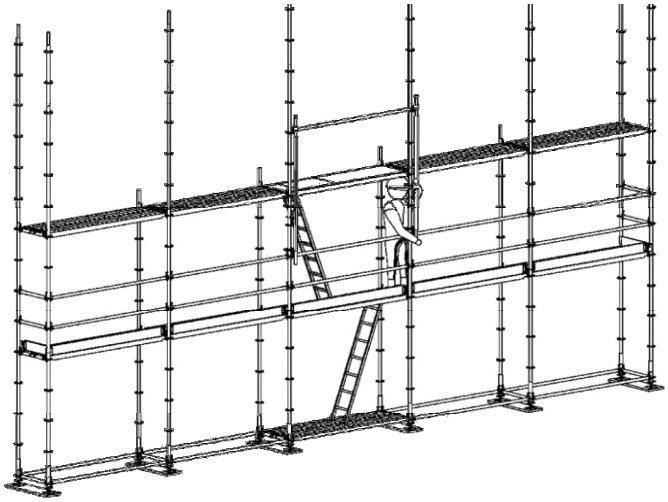
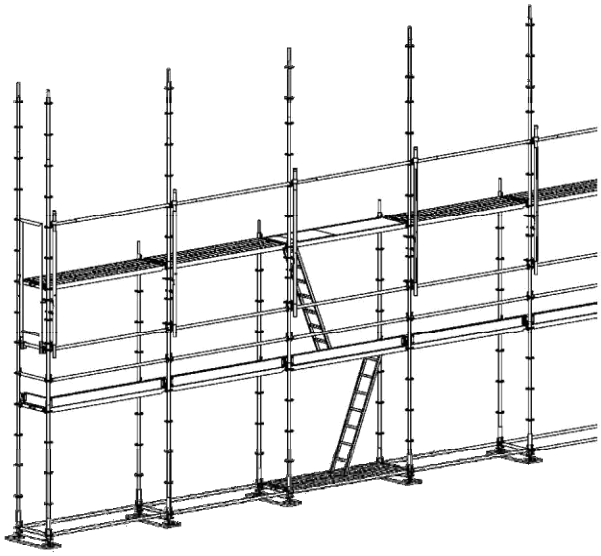


Fig. 20: Construction of the second post



ISR across the entire length

When assembling the top scaffolding level, the uppermost scaffold level can be temporarily secured with the installation guard railings. (Fig. 20a).



(Fig. 20a). Temporary securing of the uppermost level with ISR

2.4.3.2 Personal protective equipment to prevent falls

Only use PSA suitable to prevent falls for the scaffolding!

If the use of suitable PPE to prevent falling is provided for particular situations during the assembly of the Plettac contur modular system, an attachment point which has been tested as depicted in Fig. 21 and 22 should be used.

Appropriate fasteners in accordance with DIN EN 362 are to be used to attach the PSA to the scaffolding, e.g. safety carabiners with a rim width of ≥ 50 mm. The suitability of a PSA to prevent falls should be checked.

The use of a PPE to prevent falling is only permissible in the case of platforms with a standing height of + 4m with an attachment at + 6 m. At lower heights, impact with the ground in the event of a fall cannot be avoided with sufficient certainty.

Individuals climbing to the uppermost level should be protected by an ISR in accordance with Chapter 2.4.3.1. In order to climb the scaffold outside of the area protected by the ISR, the worker can attach their PPE to prevent falling to the projecting uprights attached to ledgers at a height of + 2 m (above a standing height of 4 m) (Fig. 21). It should be attached using carabiner hooks in a large hole in the corresponding disk at a height of + 2 m height and the ledger at any required position.

Do not attach to the PPE to prevent falling until a platform height of 4 m standing height in ≥ + 6 m.

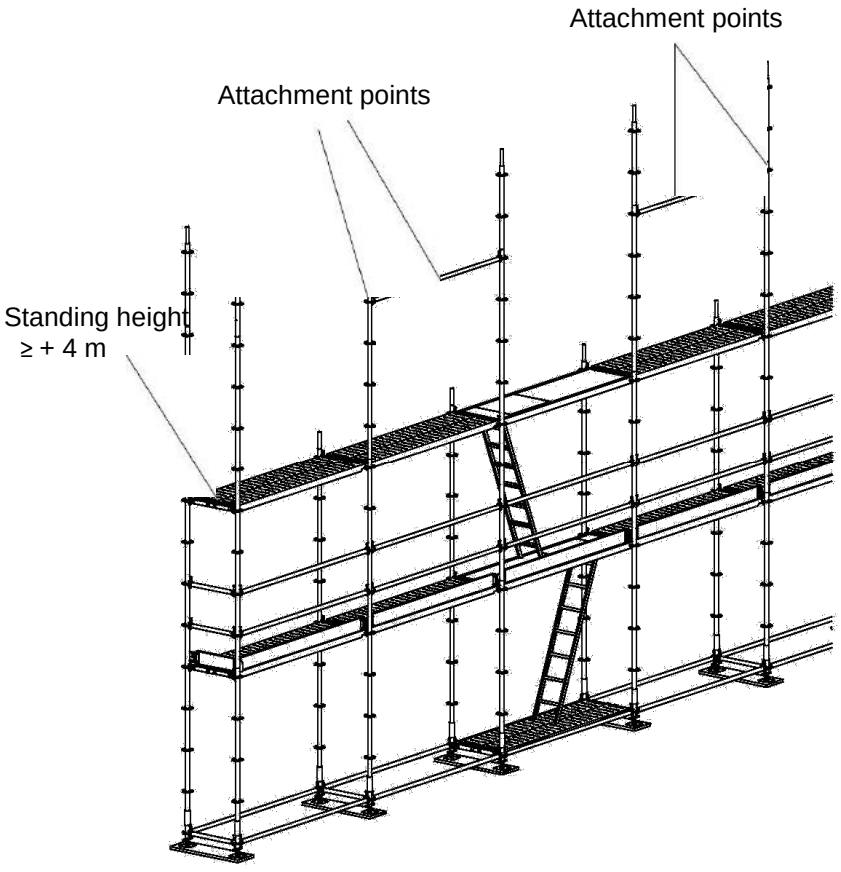
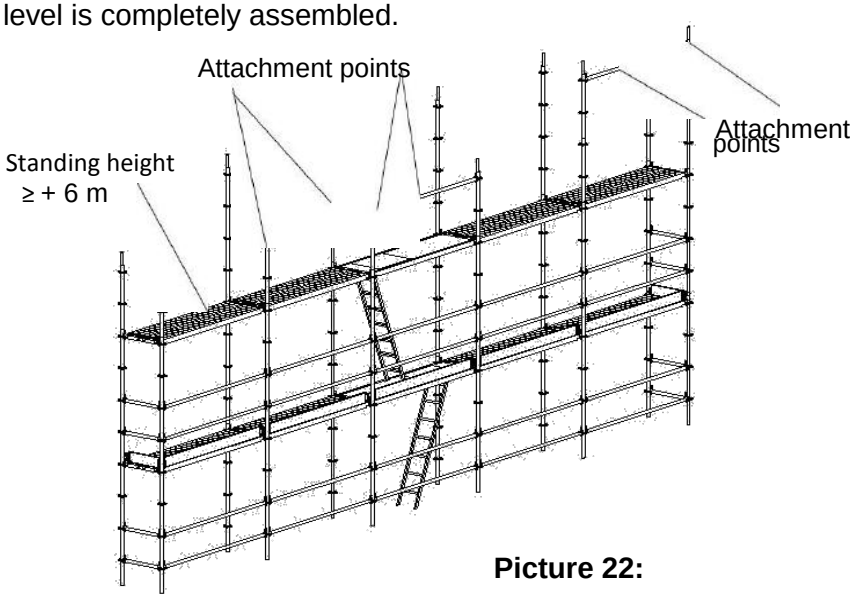


Fig. 21: The first attachment points at a height of + 6 m

From a standing height of + 6 m, the PPE to prevent falling can be attached to the projecting uprights at a height of + 1 m (Fig. 22). However, it is important to ensure that these uprights are not slotted into the respective deck level and that they extend further down. It should be attached using carabiner hooks in a large hole in the corresponding disk. Alternatively, the carabiner can also be attached to the vertical standard so that it comes to rest on this disc (only if the upright extends upward, not on the final disc).
Additional attachment points as shown in Fig. 21 can also be used. In this way, the assembler can move along area by area until the level is completely assembled.



Picture 22:

Possible attachment points from a standing height of ≥+ 6 m

The last anchorages must be on either the uppermost level or one level below!

It does not matter whether the final anchorage is on the current scaffold level or the level below with regard to the reliability of the connection points in the uppermost level.

2.4.4 Anchoring

2.4.4.1 Anchor grid and anchor forces

The anchoring forces are listed as "working loads".

These should be multiplied by 1.5 as documented evidence of conformity of the introduction of force on other components.

The anchoring forces are specified in the set-up options. They represent "working loads".
The loads per anchor are indicated at right angles (⊥) to the façade and

parallel (∥) to the façade per triangular bracket (usually every 5 fields).

Anchorages are to be continuously integrated with the scaffolding structure. Screws of at least 12 mm in diameter or an equivalent design should be used to secure the anchorages.

The scaffold brackets are to be assembled in accordance with paragraph 2.4.4.2. All scaffold brackets should be secured using normal connectors Æ 48 mm. These must have a certification mark or be marked according to EN 74: 1988-12 and EN 74-1: 2005-12 and meet the requirements of coupling class B or BB.

2.4.4.2 Scaffold brackets

Short scaffold brackets (Fig. 23) are only attached to the vertical uprights on the façade side. They take up anchoring forces perpendicular to the façade.

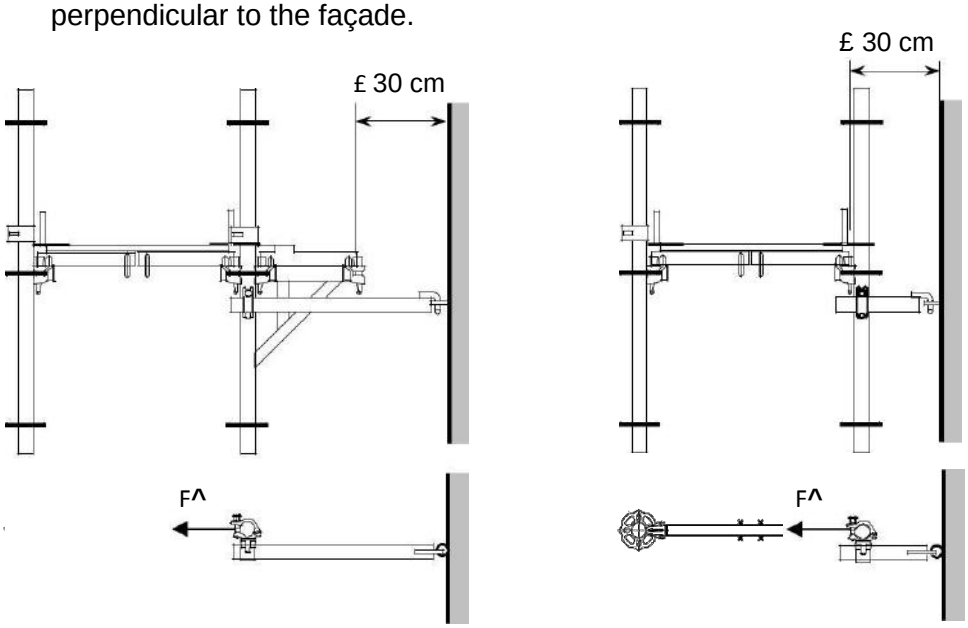


Fig. 23: Short scaffold brackets

The SL set-up version is shown. This also applies accordingly to the pipe support.

Long scaffold brackets (Fig. 24) are attached to both uprights and can therefore take up forces perpendicular and parallel to the façade. However, the carrying capacity and rigidity is considerably lower than that of the triangular bracket (Fig. 25). At least two long scaffold brackets should be installed as a substitute for a triangular bracket.

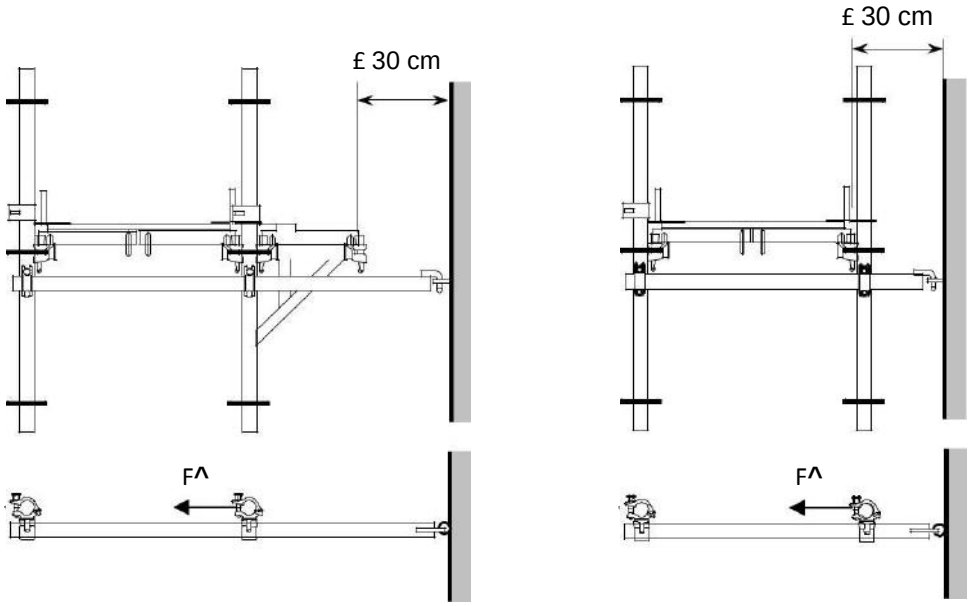
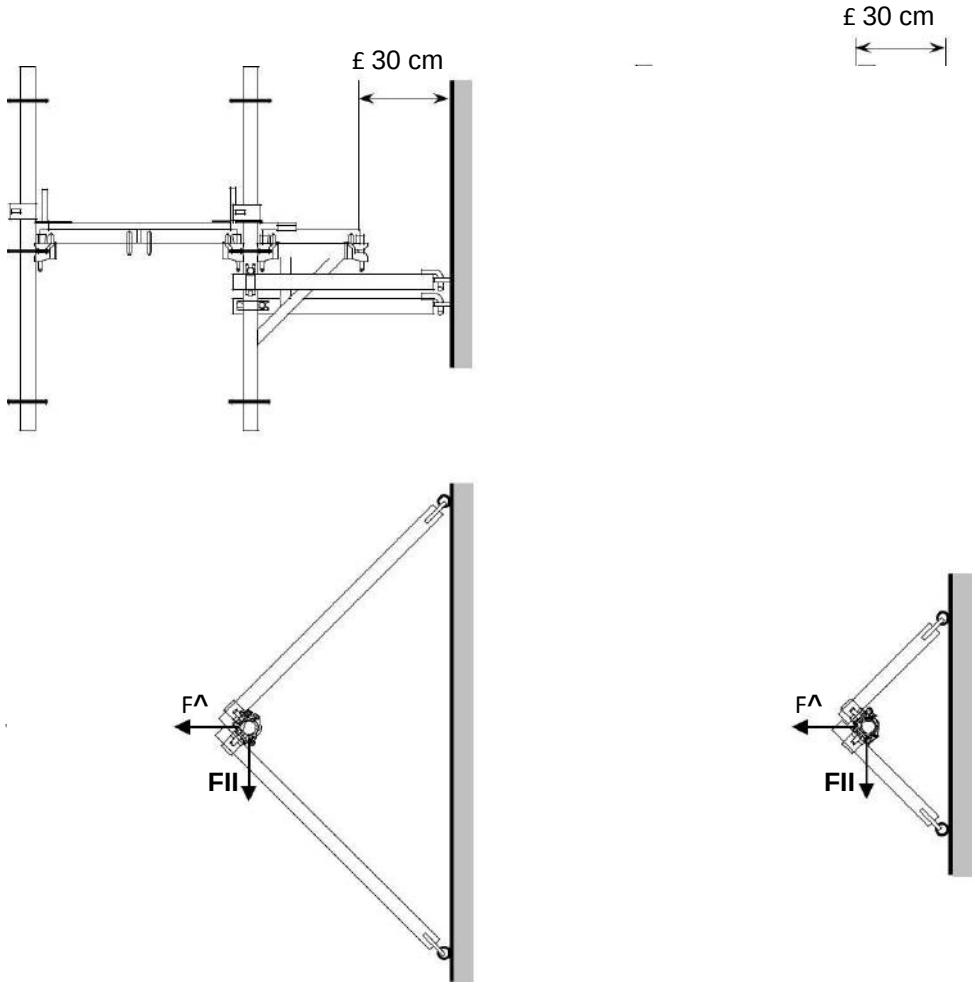


Fig. 24: Long scaffold brackets

Triangular brackets (Fig. 25) consist of two short brackets which are attached to the vertical uprights on the façade side and form a triangle in ground view. This allows them to take up relatively large anchor forces perpendicular and parallel to the façade. They are very stiff and can stabilise heavy scaffolding, even if only a low number are used.



The SL set-up version is shown. This also applies accordingly to the pipe support.

Fig. 25: Triangular brackets

2.4.5 Feeding the pinning forces into the anchorage

2.4.5.1 The pinning forces must be fed in using scaffold brackets (Section 2.4.4.2) and fasteners with sufficiently load-bearing anchorages (e.g. masonry).

Suitable fastening methods include, for example, the anchoring device in accordance with DIN 4426 "Safety devices for building maintenance, safety barriers".

Unsuitable fastenings include tie wires and cords.

Sufficiently load-bearing anchorages include, for instance,

- reinforced concrete ceilings, panels and supports
- Bearing masonry according to DIN 1053 "masonry"

Insufficiently load-bearing anchorages include, for instance,

snow hampers, lightning rods, down-spouts, window frames

The assessment of the anchorage and the carrying capacity of the fasteners should only be performed by a qualified person!

2.4.5.2 The carrying capacity of the fasteners between scaffold fixtures and the anchorages must be verified for the pinning forces. The documented evidence of conformity is to be provided as

- a type approval by the German Institute for Building Technology, Berlin
- static calculation or
- test load according to Section 2.4.6.

2.4.5.3 If fastening with a type approval are used for anchorage, the conditions in the type approval must be complied with.

These conditions include, for example,

- verification of the anchorage
- required component dimensions and edge distances
- special installation instructions.

2.4.5.4 notwithstanding section 2.4.5.2, the documented evidence of conformity for the carrying capacity can be waived if an individual qualified to do so assesses the sufficient carrying capacity and

- the required pinning force F ^ is no greater than 1.5 kN or
- the anchoring force F ^ is no more than 6.0 kN in the case of reinforced concrete according to DIN 1045 as an anchorage.

2.4.6 Proof loads for anchorages

2.4.6.1 If test loads are required according to Section 2.4.5.2, these must be performed at the point of use.

2.4.6.2 Suitable test equipment must be used to perform the test loads.

Suitable testing equipment has been tested by the Technical "Construction" Committee at the Central Office for Accident Prevention and Occupational Medicine (ZefU) of the Central Office of the Professional Trade Associations (Hauptverband der gewerblichen Berufsgenossenschaften e.V).

2.4.6.3 pinning forces where test loads need to be performed are to be determined by a competent person on the basis of the number and location.

Implementation of load tests and the evaluation of results must only take under the guidance of a qualified person!

2.4.6.4 The test loads must be performed in accordance with the following criteria:

- the test load must be 1.2 times the required anchoring forces F ^
- With an anchorage made up of
  - at least 10% concrete
  - at least 30% other building materials, the scope of testing must

    include all anchors used, but at least five test loads.

2.4.6.5 If one or more fastenings do not hold the test load, the qualified person must

- determine the causes of this
- procure a replacement fastening

and

- increase the scope of testing, if appropriate.

2.4.6.6 The test results must be documented and kept for at least three months after the disassembly of the scaffolding.

2.5 Set-up options
Installing additional components

2.5.1 General

This section describes the calculated set-up options and the installation of supplementary components such as consoles, roof safety scaffolds and bridging girders for the Plettac contur modular system as façade scaffolding. The maximum standing height is 24 m plus the drill-finish length of the threaded base plates. The standard set-up is verified for

working operation on just one single scaffold

The required anchor distances depend on the wind permeability of the façade. They are shown as a regular grid. The peripheral frames are always anchored at a vertical distance of no more than 4 m.

Before setting up the scaffold, check wither the construction process might change a closed façade into a partially open façade.

In a partially open façade, the wind pressure can be 3 x higher!

A basic distinction is made between a "closed" and a "partially open" façade. The following applies to the design options shown:

A "closed" façade has no openings, while in the "partially open" façade, up to 60% of the surface area may consist of openings. If there is a larger proportion of openings, the anchorages need to be verified in each individual case. A "closed" façade can be assumed for standard renovation work (the windows will not be removed). In the case of larger reconstruction projects (the windows are replaced) and new buildings, it should be assumed that the façade is "partially open".

The decks are bracing elements of the Plettac contur modular system as façade scaffolding. All working levels therefore need to be designed fully as a basic principle (see 2.2.5). Levels where no work will be performed can alternatively be stabilised using horizontal ledgers running along the inside and outside and at least one horizontal diagonal (Annex B, page 35) for each five scaffolding fields.

2.5.2 Set-up options

Basic variant (GV) and console variants (KV), L ≤ 3:00 m

SL support	Fig. 26
Round pipe support	Fig. 27

GV and KV with protective wall, L ≤ 3:00 m

SL support	Fig. 28
Round pipe support	Fig. 29

Scaffolding with bridging girders, L ≤ 6:00 m

SL and round pipe support	Fig. 30

Depending on the equipment and the construction height, the vertical standard loads are specified in Tables 2 and 3 for the "work mode" load case. No distinction is made between "SL supports" and "pipe supports". The difference is very small. The "working loads" are shown.

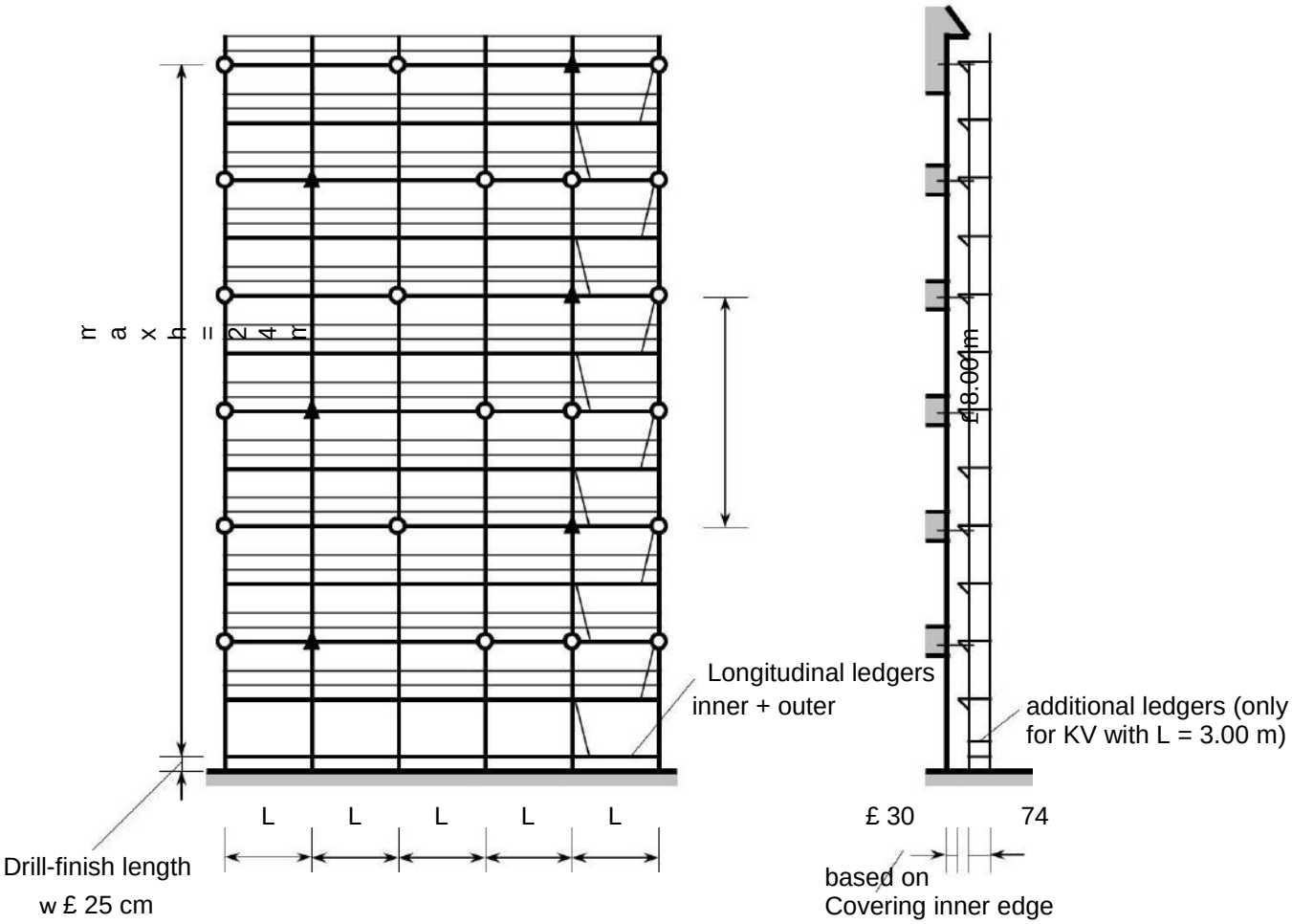
Table 2: Vertical standard loads, normal range

Upright	Facilities	Field length	h = 8 m	h = 16 m	h = 24m
Inner	none	2.50 m	3.8 kN	5.0 kN	6.2 kN
		3.00 m	4.5 kN	5.9 kN	7.3 kN
	Console 41 in each level	2.50 m	7.5 kN	10.1 kN	12.7 kN
		3.00 m	9.0 kN	12.0 kN	15.0 kN
Outer	easier Side rails above	2.50 m	4.7 kN	6.7 kN	8.7 kN
		3.00 m	5.5 kN	7.8 kN	10.2 kN
	be Protective wall	2.50 m	5.0 kN	7.0 kN	9.0 kN
		3.00 m	5.8 kN	8.2 kN	10.5 kN

Table 3: Vertical standard loads under the bridge girders

Upright	Facilities	Field length	h = 8 m	h = 16 m	h = 24m
Inner	none	2.50 m	5.9 kN	7.8 kN	9.6 kN
		3.00 m	6.9 kN	9.1 kN	11.2 kN
	Console 41 in each level	2.50 m	11.2 kN	15.0 kN	18.9 kN
		3.00 m	13.2 kN	17.8 kN	22.3 kN
Outer	easier Side rails above	2.50 m	7.0 kN	10.0 kN	13.0 kN
		3.00 m	8.2 kN	11.8 kN	15.3 kN
	be Protective wall	2.50 m	7.5 kN	10.5 kN	13.5 kN
		3.00 m	8.8 kN	12.4 kN	15.9 kN

Fig. 26: Basic variant (GV) and console variant (KV), L 3.00 m
SL support



Field length:
L = 3.00 m / 2.50 m / 2.00 m / 1.50 m

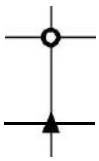
decks:

Steel covering 32

Permitted equipment:
Inner consoles 41 on each level

Use:
As exposed scaffolding before partially open or in front of closed façade.

Anchoring:

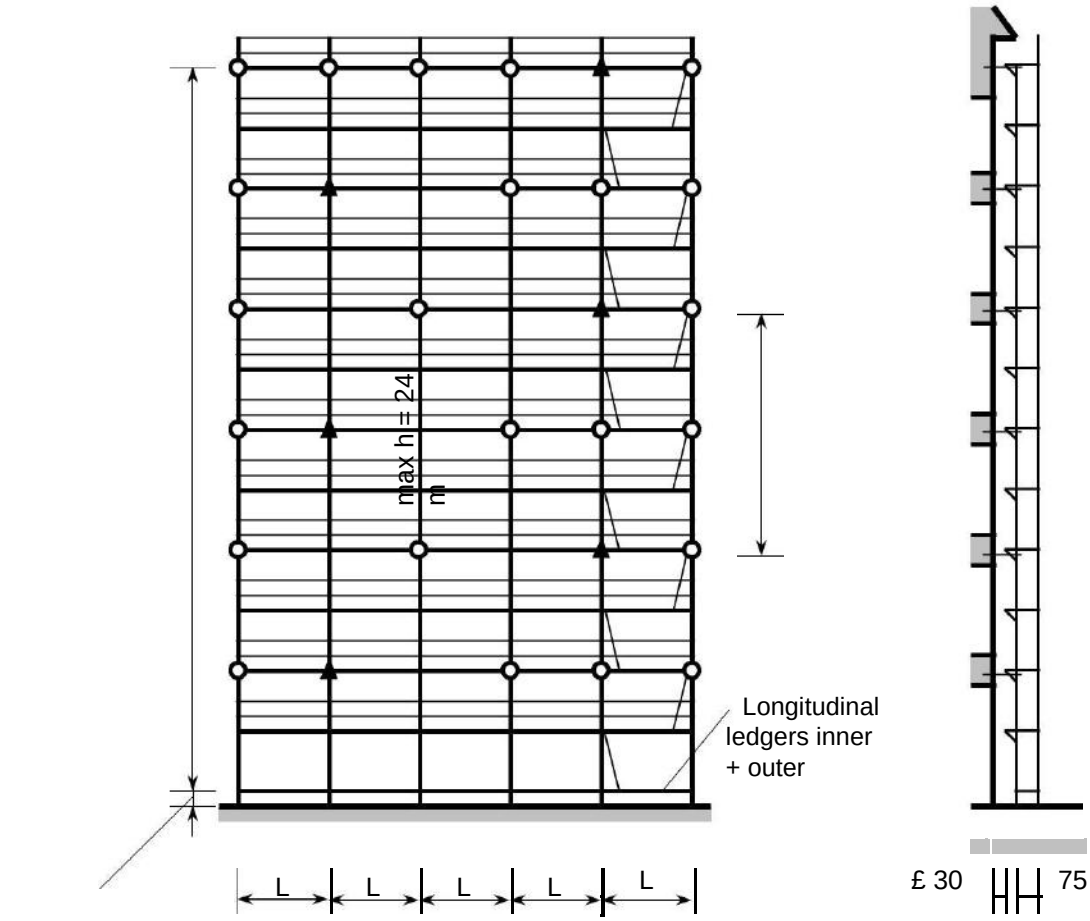


Anchorage with short fixed scaffolding brackets, only on the inner uprights (Fig. 23)

Anchorage with triangular brackets attached to the inner uprights (V holder, Fig. 25).

Façade			closed		partially open	
Tie spacing			at 8 m intervals		at 8 m intervals	
Additional tie			/		/	
max spindle extension (cm)			25		25	
force ↓	Anchor height (m)		≤ 20	= 24	≤ 20	= 24
	^ Façade		1.4	1.1	4.0	3.2
	V holder	II façade FII	5.5		5.5	
		Vertical load Fα	3.9		3.9	

Fig. 27: Basic variant (GV) and console variant (KV), L £ 3.00 m
Round pipe support



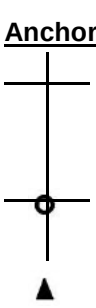
Field length:
L = 3.00 m / 2.50 m / 2.00 m / 1.50 m

Decks:
Steel covering 32

Permitted equipment:
Inner consoles 41 on each level

Use:
As exposed scaffolding in front of a partially open or closed façade.

Anchoring:

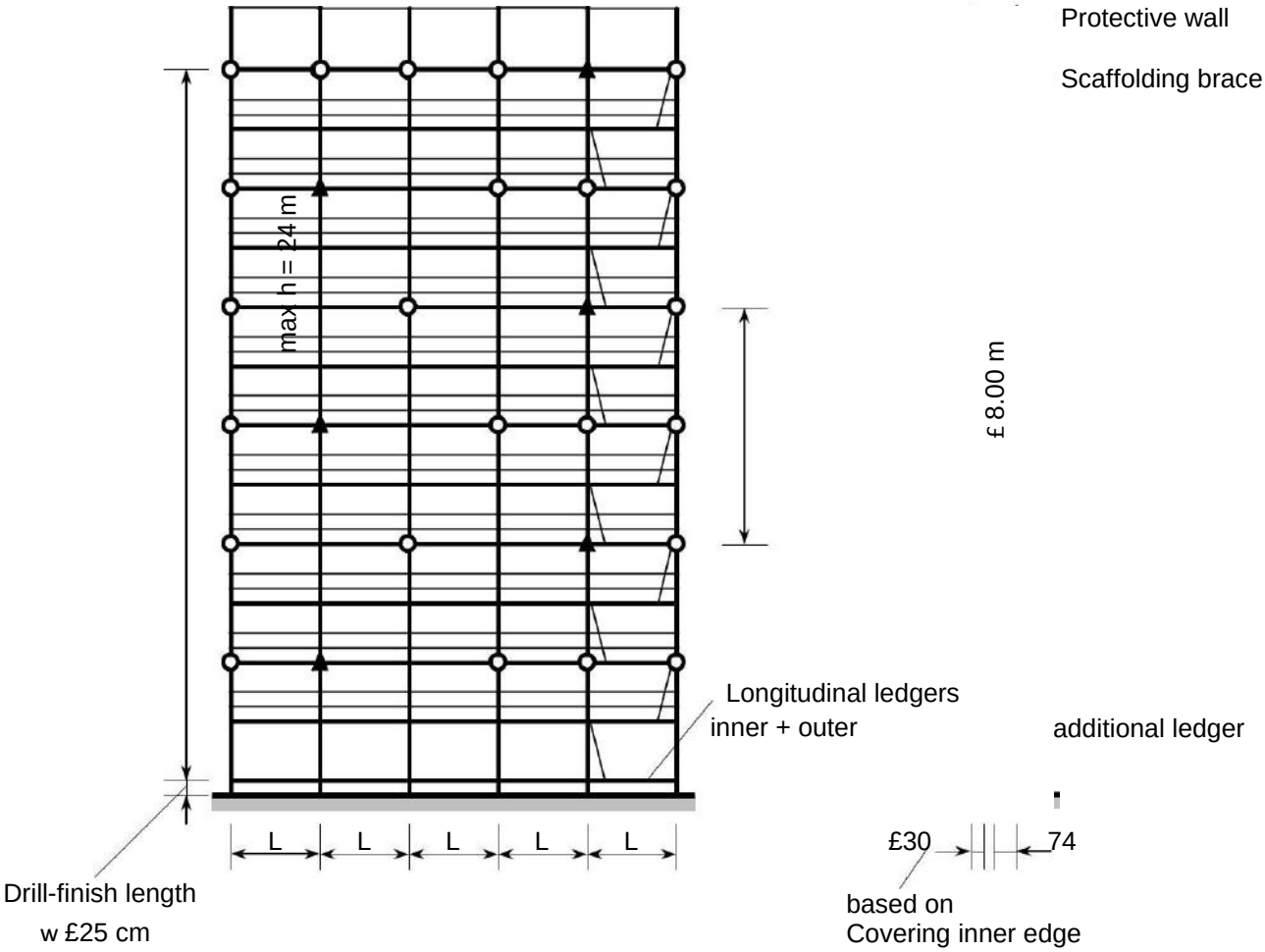


Anchorage with short fixed scaffolding brackets, only on the inner uprights (Fig. 23)

Anchorage with triangular brackets attached to the inner uprights (V holder, Fig. 25).

Façade			closed		partially open	
Tie spacing			at 8 m intervals		at 8 m intervals	
Additional tie			/			
max spindle extension (cm)			25		25	
forces (kN)	Anchor height (m)		≤ 20	= 24	≤ 20	= 24
	^ Façade		1.4	1.1	4.0	2.0
	V holder	II façade FII	5.5		5.5	
		Vertical load F α	3.9		3.9	

Fig. 28: Basic variant (GV) and console variant (KV), L £ 3.00 m with protective wall, SL support



Field length:
L = 3.00 m / 2.50 m / 2.00 m / 1.50 m

Decks:
Steel covering 32

Permitted equipment:
Inner consoles 41 on each level, protective wall in in the outer corner.

Use:
As exposed scaffolding in front of a partially open or closed façade.

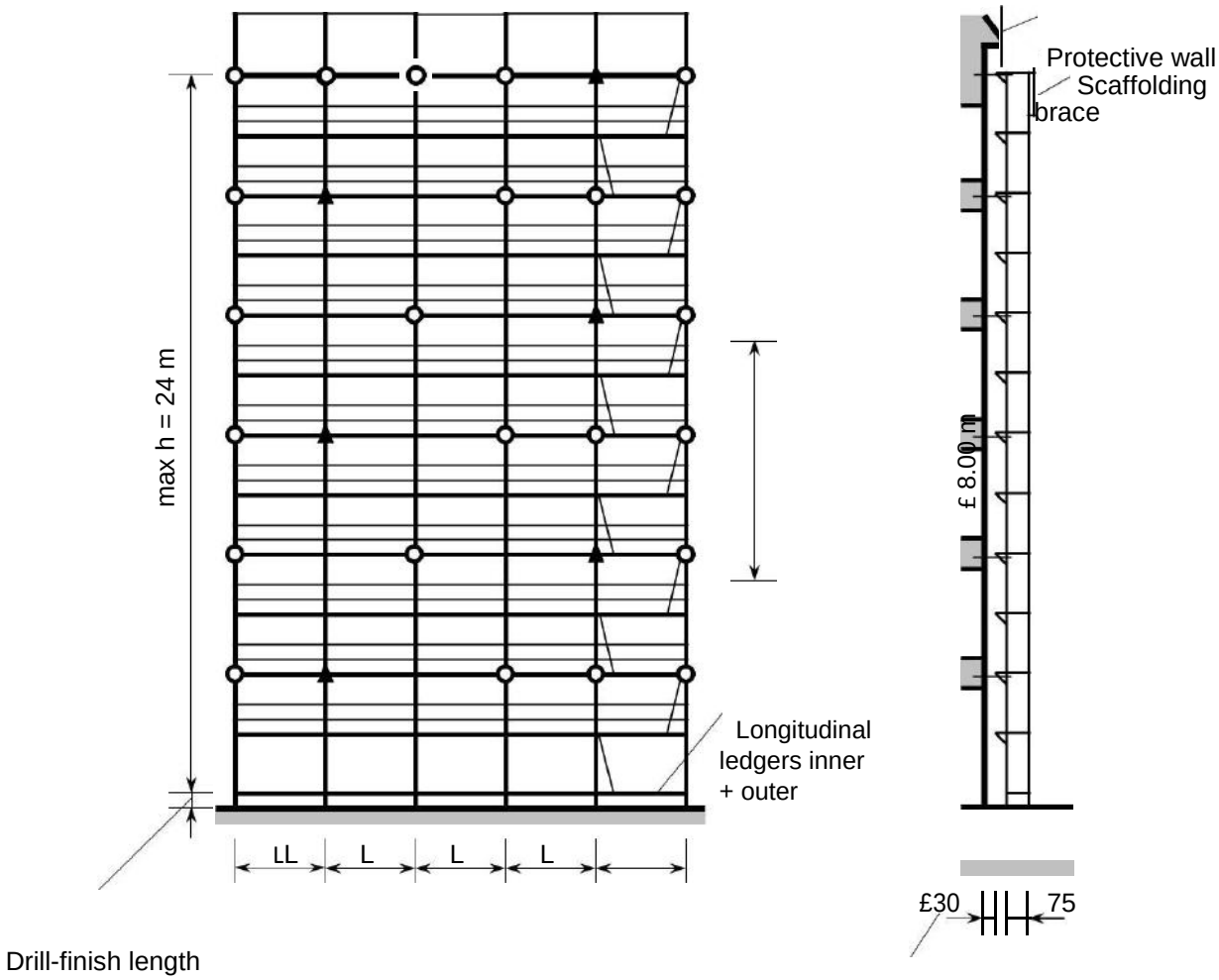
Anchoring:

Anchorage with short scaffold brackets, attached only to the inner uprights (Fig. 23)

Anchorage with triangular brackets attached to the inner uprights (V holder, Fig. 25).

Façade			closed		partially open	
Tie spacing			at 8 m intervals		at 8 m intervals	
Additional tie						
max spindle extension (cm)			25		25	
forces (kN)	Anchor height (m)		≤ 20	= 24	≤ 20	= 24
	^ Façade		1.4	2.2	4.0	3.4
	V holder	II façade FII	5.5		5.5	
		Vertical load Fα	3.9		3.9	

Fig. 29: Basic variant (GV) and console variant (KV), L £ 3.00 m with protective wall, round pipe support



Field length:
L = 3.00 m / 2.50 m / 2.00 m / 1.50 m

Decks:
Steel covering 32

Permitted equipment:
Inner consoles 41 on each level, protective wall in in the outer corner.

Use:
As exposed scaffolding in front of a partially open or closed façade.

Anchoring:

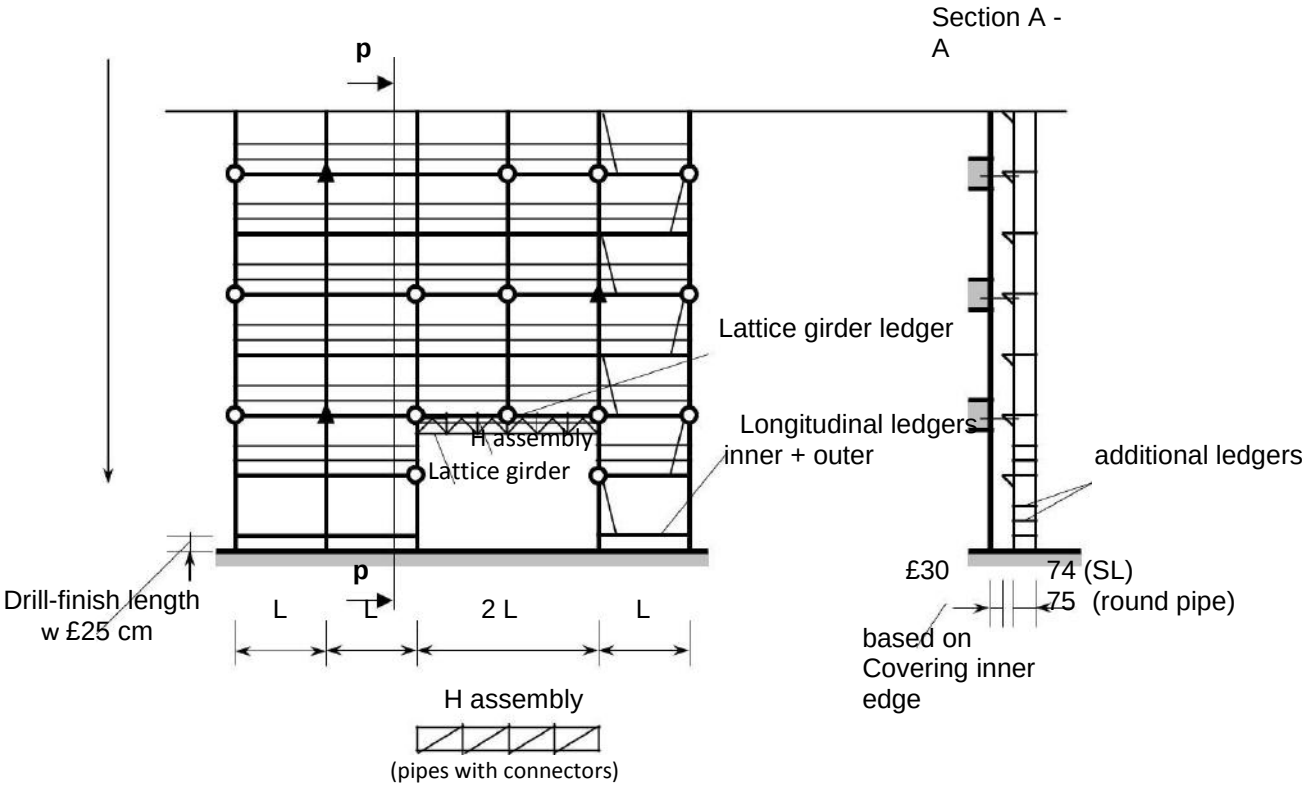
Anchorage with short scaffold brackets, attached only to the inner uprights (Fig. 23)

Anchorage with triangular brackets attached to the inner uprights (V holder, Fig. 25).

Façade			closed		partially open	
Tie spacing			at 8 m intervals		at 8 m intervals	
Additional tie						
max spindle extension (cm)			25		25	
ces (kN	Anchor height (m)		≤ 20	= 24	≤ 20	= 24
	^ Façade		1.4	2.2	4.0	3.4
	V holder	II façade FII	5.5		5.5	
		Vertical load Fα	3.9		3.9	

Fig. 30: Scaffolding with bridging beams 6.00 m
Lattice girder with 4 wedge heads (Annex B, pages 70 and 71)

SL support (lattice girder according to Annex B, page 73)
Round pipe support (lattice girder according to Annex B, page 74)

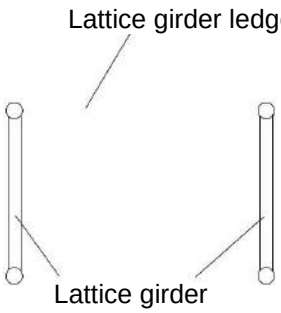


Field length:
L = 3.00 m / 2.50 m

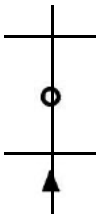
decks:
Steel covering 32

Permitted equipment:
Inner consoles 41 on each level, protective wall in in the outer corner.

Use:
As exposed scaffolding in front of a partially open or closed façade.



Anchoring:



Anchorage with short fixed scaffolding brackets, only on the inner uprights (Fig. 23)

Anchorage with triangular brackets attached to the inner uprights (V holder, Fig. 25).

Façade			**closed**	**partially open**
Tie spacing			at 8 m intervals	at 8 m intervals
Additional tie				
max spindle extension (cm)			25	25
forces (kN)	Anchor height (m)		see corresponding Construction variant	
	^ Façade			
	V holder	II façade FII		
		Vertical load Fα		

2.5.3 Installing additional components

2.5.3.1 Extension console 41

The consoles 41 (Annex B, pages 50 and 52) should be installed on every level on the façade side in the console variants. This applies both to the SL supports (page 50) and the round pipe supports (page 52). They each hold a 32 cm-wide scaffolding platform which should be installed from the level below. If no console extension is available, there may be a risk of falling while performing this work.

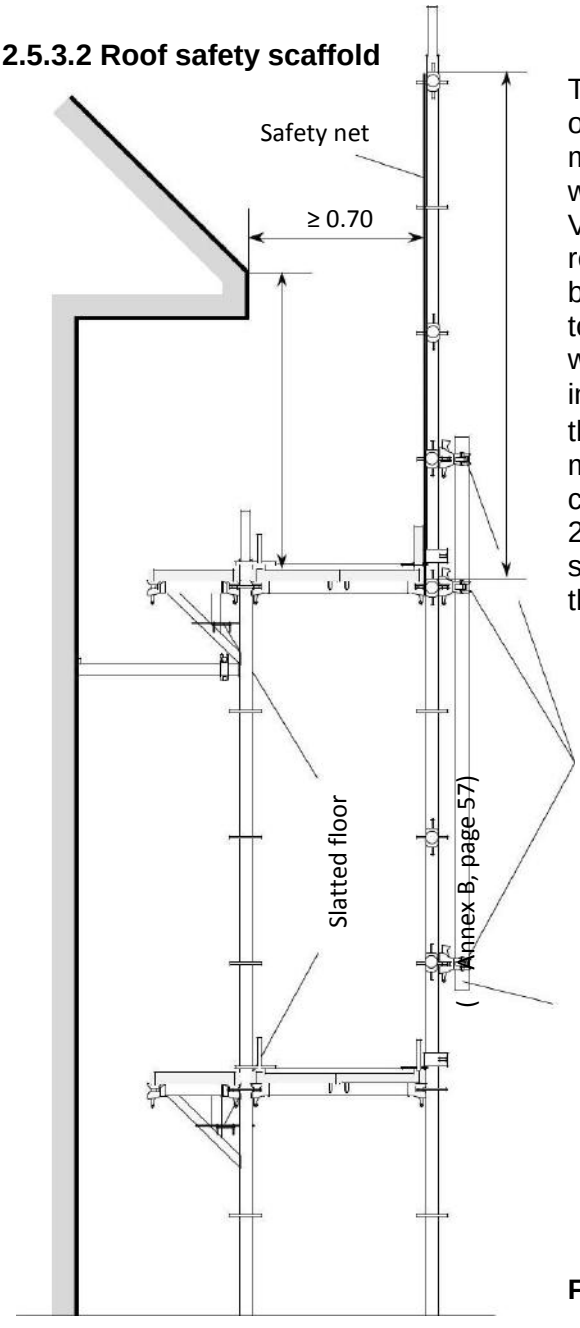
The gap between the framework and the console platform should be closed using the slatted floor or a horizontal brace (see Fig. 11, 12 and 31).

There may be a risk of falling when installing the console platforms!

Perform a risk assessment which takes the specific local situation into account!

If necessary, secure with PSA!

2.5.3.2 Roof safety scaffold

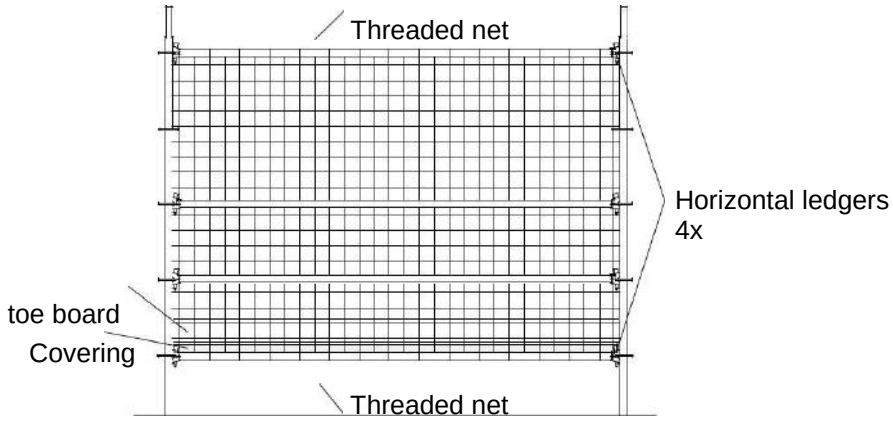


The roof safety scaffold consists of the vertical upright with a 2.00 m projection and the protective wall according to 2.5.3.3. The Vertical upright should be reinforced with a scaffolding brace, which should be attached to the perforated discs using wedge head connectors as shown in Fig. 31. The distance between the Protective wall and the eaves must be at least 0.70 m. In the case of a protective wall height of 2.00 m, the decks at the roof safety level should be no lower than 1.20 m below the eaves.

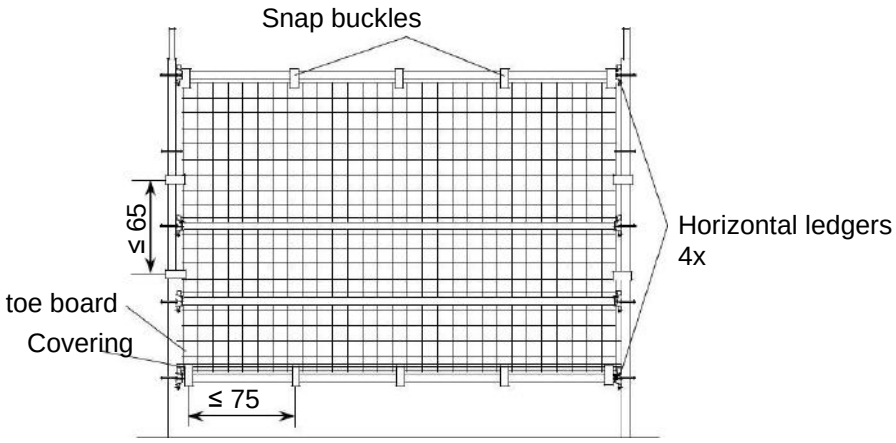
Fig. 31: Upper area of the scaffold

2.5.3.3 Protective wall

The barrier consists of nets according to DIN EN 1263-1 with a mesh size of no more than 100 mm. The nets should be either threaded onto the horizontal ledgers stitch for stitch at the platform level and at a height of + 2.00 m (version A) or attached to these ledgers using snap buckles (version B). The manufacturer must confirm that the snap buckles have sufficient carrying capacity for use on the protective wall and roof safety scaffolding.



Version B



Version B

Fig. 32: Protective wall

2.6 Dismantling the Plettac contur modular system as façade scaffolding

The steps described in sections 2.2 to 2.5 should be reversed in order to dismantle the contur scaffolding.

The anchoring should only be removed when the overlying scaffolding structure has been completely dismantled. Components with loosened connectors must be immediately dismantled.

Removed scaffolding components must not be stored on the transport route to avoid tripping hazards.

Removed scaffolding components must not be thrown off the scaffolding.

2.7 Use of the Plettac contur modular system as façade scaffolding

The contur scaffolding as façade scaffolding in accordance with approval Z-8.22-843 can be used as work and safety scaffold in accordance with load class 3 and these Guide for erection and use and following the requirements of the BetrSichV without any further documented evidence of conformity. Other configurations with different load classes are possible. The stability of the scaffolding is to be verified in each individual case on the basis of the approval notification.

The scaffolding user must determine the suitability of the selected set-up variant of the contur scaffolding for the work to be performed and ensure that it is functioning correctly. The user must ensure that the scaffolding is inspected before use for visible defects. If any defects are found during the inspection, the scaffolding must not be used until the areas with defects are repaired by the scaffold contractor. Subsequent alterations to the scaffolding are regarded as assembly, modification and disassembly work and must only be performed by professionally qualified staff. This work must be inspected and approved by the scaffolding contractor.

The inspections must be repeated after unusual events, such as a long period of inactivity, accidents and natural events which have an impact on the scaffolding.

It is recommended that the results of inspections should be recorded in the form of an inspection log (see Section 2.8) and stored for at least three months after the scaffolding is disassembled.

Inspection log
Page 1

2.8 Inspection log for work and safety scaffolding

here: Plettac contur modular system as façade scaffolding
(in accordance with Sections 10 and 11 BetrSichV)

Client: _____ Datum: _____

Scaffolding installer _____

Building project: _____

Type of scaffold:

Work scaffold

Safety scaffold

Canopy
Roof safety scaffold

		Load class	Width class
Scaffold class:	1	4	W06
	2	5	W09
	3	6	____

Clothing: Nets Plans _____

Purpose: _____

Scaffolding parts: apparently undamaged *

Stability:

Carrying capacity of contact area (Section 2.2.2 of A&V) *

Jack extension length (Section 2.2.3 of A&V) *

Offset of the upright joints (Section 2.2.4 and Fig. 16 of the A&V) *

Platform clips to prevent the decks from lifting (Section 2.2.5 of the A&V) *

Height adjustment (Section 2.3.2 of the A&V) *

Bridging girders (Fig. 30 of the A&V) *

Roof safety scaffold (Section 2.5.3.2 of the A&V) *

Anchorages (Section 2.4.4 of the A&V) *

Pinning forces see Figs. 26 to 30 of the A&V

* tick if tested and fine

Inspection log
Page 2

Decks:

System decks (according to Table 1 of the A&V)
*

Occupational and operational safety:

Side rails (Section 2.4.2.6 of the A&V) *

Wall distance ≤ 30 cm *

Scaffolding access (Section 2.4.2.4 of the A&V) *

Corner configuration (Section 2.3.3 of the A&V) *

Consoles (Section 2.5.3.1 of the A&V) *

Gap between scaffold and console platform closed *

Protective wall in roof safety scaffold (Section 2.5.3.3 of the A&V) *

Traffic safety, lighting *

Submit plan for use to the client *

* tick if tested and fine

Complete examination of contur scaffolding, the marking has been displayed as shown.

Scaffolding according to EN 12811-1 width class W06 load class 3
evenly distributed load max. 2.00 kN/m²
Date of test

Scaffolding operations John Doe
1234-123 456

Comments:

Date _____ Signature (Authorised individual) _____

Date _____ Signature (Customer) _____

Changes to the contur scaffolding must only be performed by the scaffold erector.

Check list for the Scaffold users Page 1

2.9 Check list for scaffold users to check of work and safety scaffolds

here: Plettac contur modular system as façade scaffolding

Scaffold users _____ Date: _____

Scaffolding installer _____

Building project: _____

Inspection	no defects	defects (please specify)
Use		
Suitable e.g. for stucco and plaster work, repainting?		
Is the scaffold labelled in a visible location (e.g. stairs)? Work scaffolding and / or safety scaffolding according to DIN EN 12811-1/DIN 4420-1 Load class and payload, width class Scaffolding installer		
Have the inspection and approval been documented? (e.g. in an inspection log or labelling according to paragraph 2.8)		
Stability and structural safety		
Was the stability and structural safety confirmed by the client (constructor) at the time of the start of use?		
Occupational and operational safety		
Are secure access or climbing facilities available, such as ladders inside the scaffolding or stair towers?		
Has every used scaffolding platform been completed installed? (in the case of W06 e.g. two 32 cm-wide decks or one 64 cm-wide panel) Have the decks been secured to stop them from being lifted?		
Is the gap between the scaffolding platforms and console 41 closed (slatted floor or horizontal ledgers)?		

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Check list for scaffold users
Page 2

Inspection	No Defect specify)	Defects (please
If scaffolding is on the corner of a building, does the covering follow all the way round the corner?		
Are the decks undamaged?		
Do all platforms with a fall height of more than 2.00 m have side rails on three sides? (guardrail, intermediate rail, toe board)		
Have the side rails on three sides also been installed on the ends and at openings?		
Is a maximum distance from the wall to the edge of the covering no more than 30 cm? (if not, side rails are required here)		
Requirements for safety and roof safety scaffolds		
Has the covering area been completely installed for the roof safety scaffold?		
Is the distance between the protective wall and the eaves at least 0.70 m? (covering is ≤ 1.20 m lower than the eaves).		
Is the covering of the roof safety scaffold no lower than 1.50 m under the eaves? (distance between the protective wall and eaves ≥ 1.00 m).		
Is the protective wall made out of nets or mesh?		
Does the covering area consist of at least three decks with a width of 32 cm if being used as safety scaffold?		
Are the platforms of the safety scaffold no deeper than 2.00 m below the precipitous edge?		
Other requirements		
Are live cables and / or devices switched off, covered or cordoned off in the scaffolding area?		
Are the lighting conditions available to ensure the safetyof movement by the public.		
Is a protective canopy required if the scaffolding is being used in a public area?		

Distance of decks from the wall ≤ 30 cm!

Otherwise, inner side rails are required!

Date

Signature (Authorised individual)

3. Plettac contur as interior scaffolding

3.1 General

Essentially, the information in Chapters 2.2 to 2.4.3 for façade scaffold designs also apply here. As interior scaffolding does not usually stand in front of a façade, it does not need to be secured horizontally using standard tie spacing. If there is a way to anchor the scaffolding, the forces are usually concentrated and directed into the building constructions to be scaffolded or which are nearby (usually in industrial building). Due to the fact that they are usually have a large base area, interior scaffolding can also stand completely on its own. In all cases, vertical diagonals in two intersecting directions are required to stabilise the structure (Fig. 33). Under certain circumstances, horizontal diagonals are also required. However, it is not necessary to use the version shown in Fig. 33. In this case, the deck levels constructed as a disk provides the rigidity of the scaffolding floor plan.

A verified standard set-up (see Chapter 2.1) is available for the façade scaffolding, which is shown in approval notification Z-8.22-843, Annex C, and in these Assembly and Usage Instructions, Fig. 26 to 32. However, it is not possible to define a standard set-up for interior scaffolding. It is therefore necessary to check the stability of each scaffold structure (see also Chapter 2.1, para. 4).

Simple static calculations can be performed based on the information in Chapter 6. In the case of larger and complicated scaffold constructions, the measurement values listed in the approval notification Z-8.22-843, Chapter 3 and Annex A must be adhered to.

The working levels of the Plettac contur modular system can be constructed using either system decks from the façade scaffolding SL70/100 or decks with round pipe support claws. The scaffold can also be constructed using free-form steel or wooden planks. The different versions of the associated components are described in detail in the following chapters.

The components which are not part of the standard set-up as façade scaffolding are also included in Annex B of the approval notification Z-8.22-843. Their production is therefore covered by this notification.

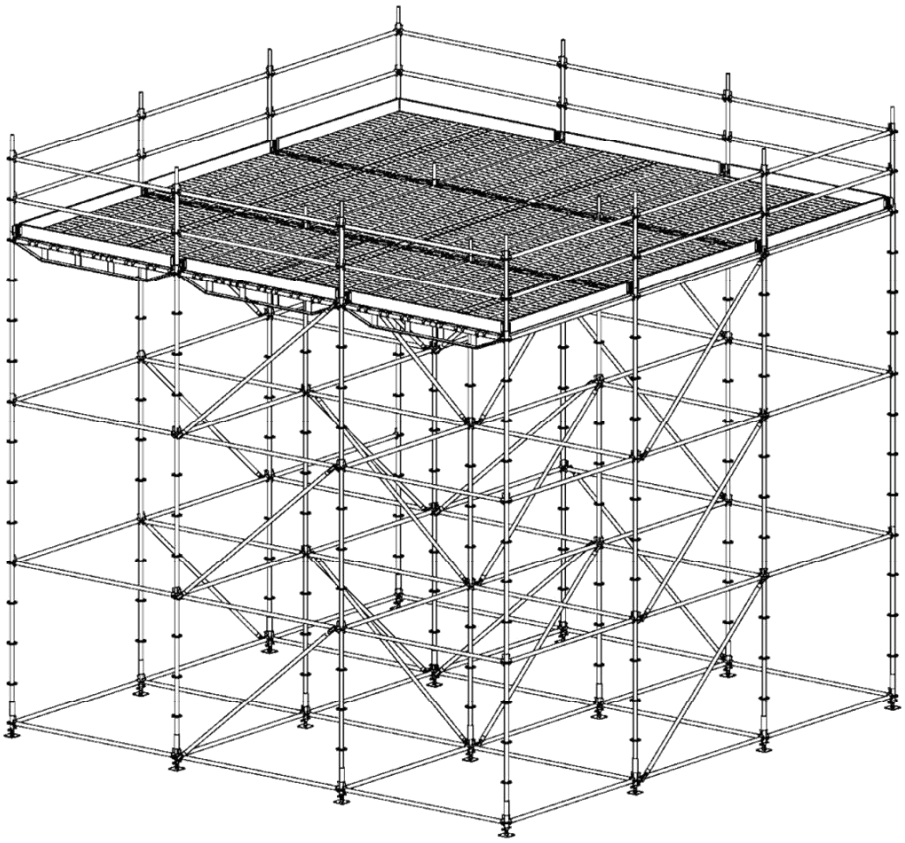


Fig. 33: Typical interior scaffolding as surface scaffolding (access not shown)

Connection of a PPE to prevent falling as shown in Fig. 21 and 22

3.2 Version with standard SL-decks

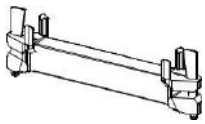
3.2.1 General

In order to use the decks if the combi-scaffolding SL70 / 100 (Annex B, page 38), the supporting beams and consoles include welded star-shaped bolts. The connection heads are flush with the profile of the ledger at the top so that the decks can be placed right up against the vertical standards. The wedge is only 4 mm thick and so short that it disappears into the end groove in the floor and does not protrude above the top deck level. The wedge heads usually have integrally cast pins (Annex B, page 9). In special cases where the holes do not match the length of the pins, wedge heads with no pins (Annex B, page 10) are used instead.

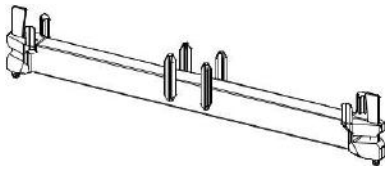
3.2.2 Symmetrical supporting beams

The 1- to 4-plank supporting beams are symmetrical (Annex B, pages 25 and 26). The length is adapted to the geometrical conditions of the vertical frames of the Plettac façade scaffolding SL70 / 100.

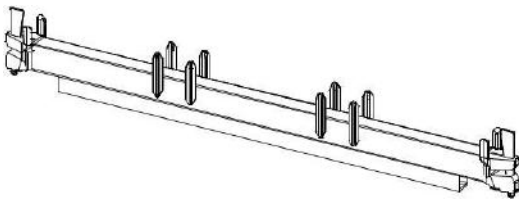
Axial dimension 1-plank = 41 cm compatible with the SL40 frame



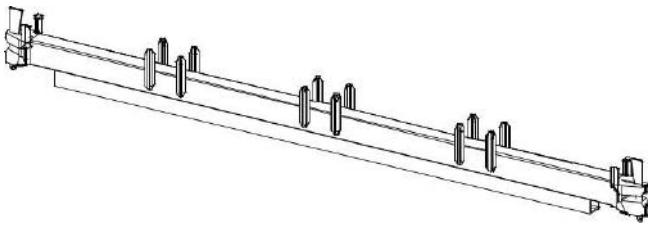
Axial dimension 2-plank = 74 cm compatible with the SL70 frame



Axial dimension 3-plank = 106 cm compatible with the SL100 frame



Axial dimension 4-plank = 139 cm edge distances like the 1-plank to 3-plank



3.2.3 Double-covering ledgers

The double-covering ledgers (Annex B, page 81) are designed asymmetrically. A connecting head with pins is installed on the side shown on the left in Fig. 5 to 38 so that the floors can be positioned in the same way as with the symmetrical transoms. From this point onwards, as many standard decks as possible are used across to the other side and the final gap is closed using filler decks (Fig. 34) is closed. There is a connecting head with no pin on this side. This has a star-shaped bolt welded between the top flange and the inclined portion of the lower flange. When installing the ledgers in a field series, this must always be located on the same side.

The purpose of this arrangement is so that different ledger lengths can be used in a field. This is required when dealing with an inclined or curved wall during the installation of a surface scaffold (Fig. 39). If the start-shaped bolts are all at the same distance for all of the ledgers on the "symmetrical" side, the decks can be positioned up to the end of the shorter ledgers as required.

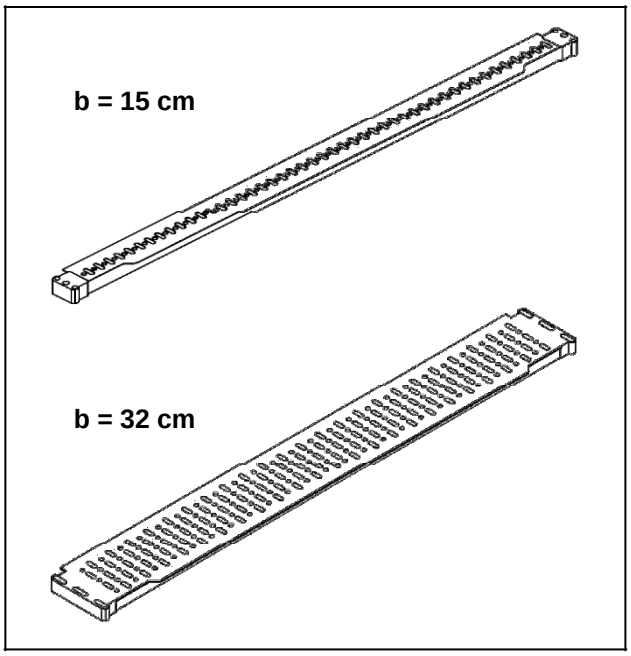


Fig. 34: Filler decks made of steel

The filler decks have head fittings for various functions. Only one of the three holes in the 15 cm-wide deck (Annex B, page 40) is mounted over a bolt. As a rule, the outer hole is located over the last welded-on star-shaped bolt.

The 32 cm wide deck (Annex B, page 39) has slots in the head fittings so that it can be attached anywhere on any of the covering ledgers. It is primarily intended for the "asymmetrical" side of the double covering ledger 2.00 m.

The 15 cm-wide filler decks can be used anywhere as "half" decks. In doing so, one of the outer holes should always be pushed over the star-shaped bolt. The 32 cm-wide decks can also be used in place of a standard deck. The lateral recesses at the ends are used to create vertical diagonals (only for assembly on the "symmetrical" side of the ledger.

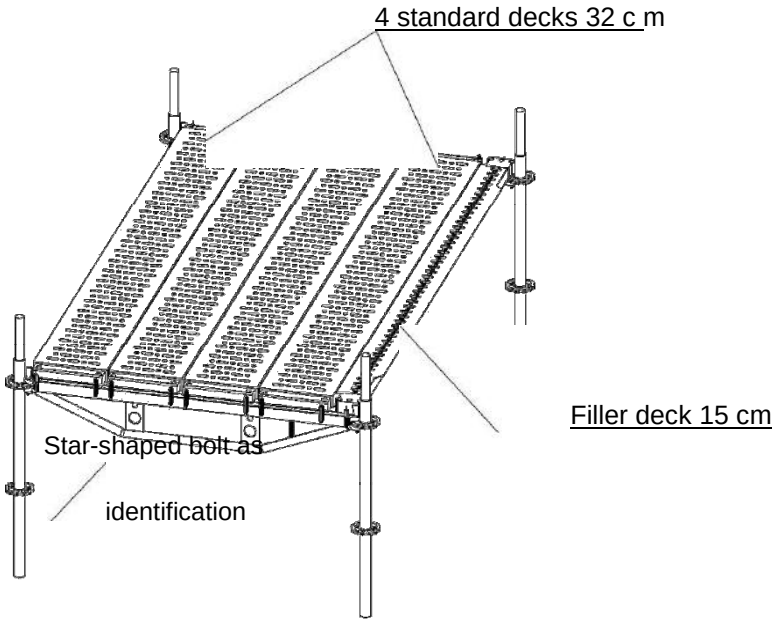


Fig. 35: The 1.50 m-wide field

In the case of fields with double-covering ledgers it must be ensured that the welded labelling star-shaped bolts are on the same side for all ledgers.

The 1.50 m-wide field consists of 4 standard ledgers and one 15 cm-wide filler deck. This is placed against the last standard deck.

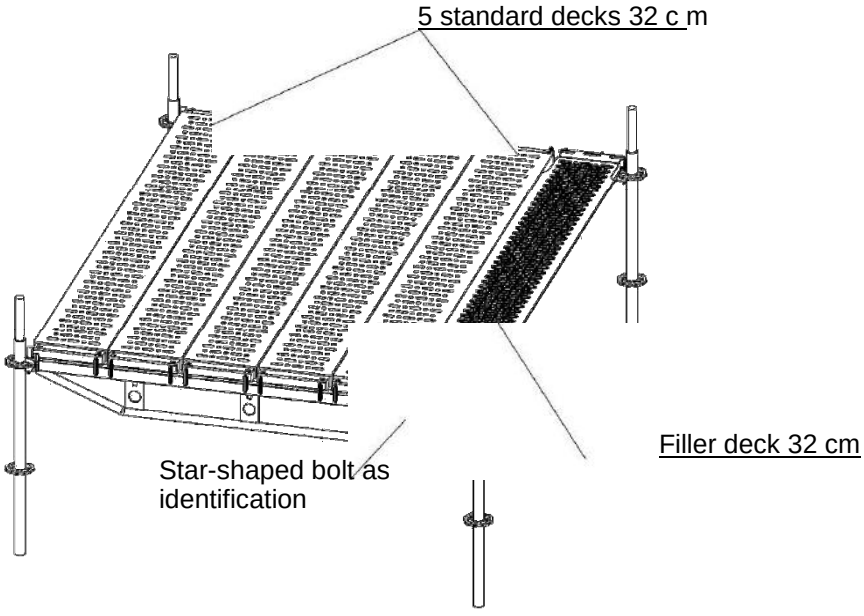


Fig. 36: The 2.00 m-wide field

The 2.00 m-wide field consists of 5 standard ledgers and one 32 cm-wide filler deck. Alternatively, two filler decks with a width of 15 cm can also be installed.

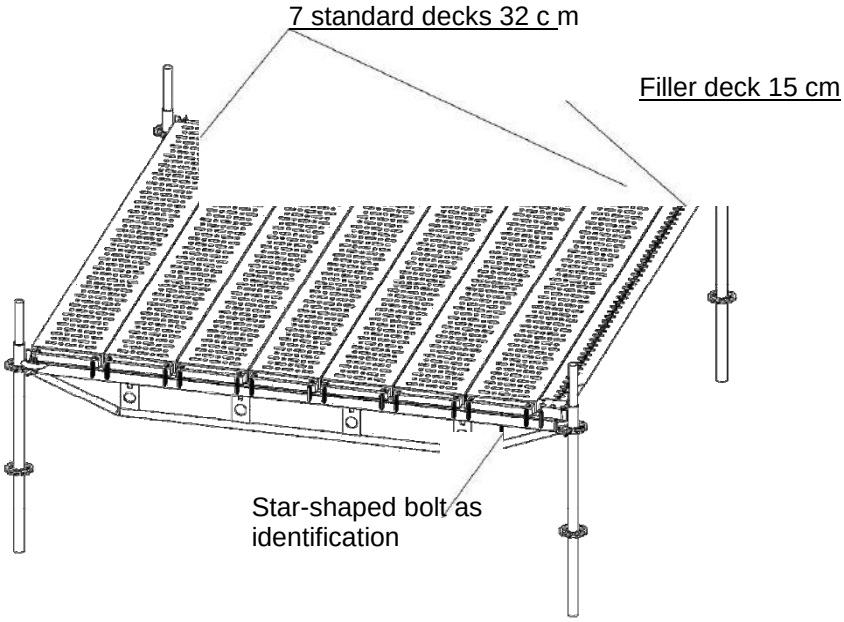


Fig. 37: The 2.50 m-wide field

The 2.50 m-wide field consists of 7 standard ledgers and one 15 cm-wide filler deck. This includes a joint width of 25 mm to the standard deck.

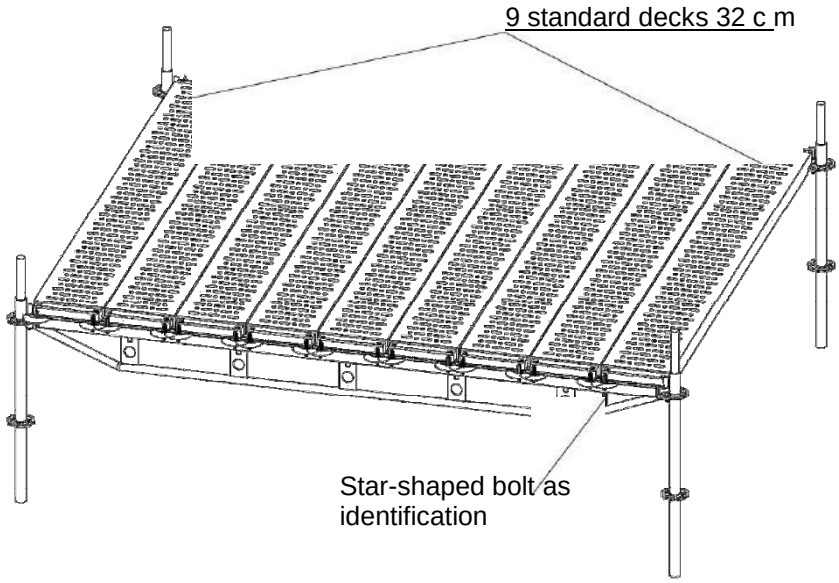


Fig. 38: The 3.00 m-wide field

The 3.00 m-wide field consists of 9 standard decks. On the "asymmetrical" side, the last deck is positioned against the vertical standard.

If the field widths 1.50 m to 3:00 m are placed together on the left, this results in the arrangement shown in Fig. 39. In the picture from left to right, the arrangement of the star-shaped bolts is the same for all double-covering ledgers. On the right-hand end, there is enough space left for a filler deck (see description of Fig. 35 to 38).

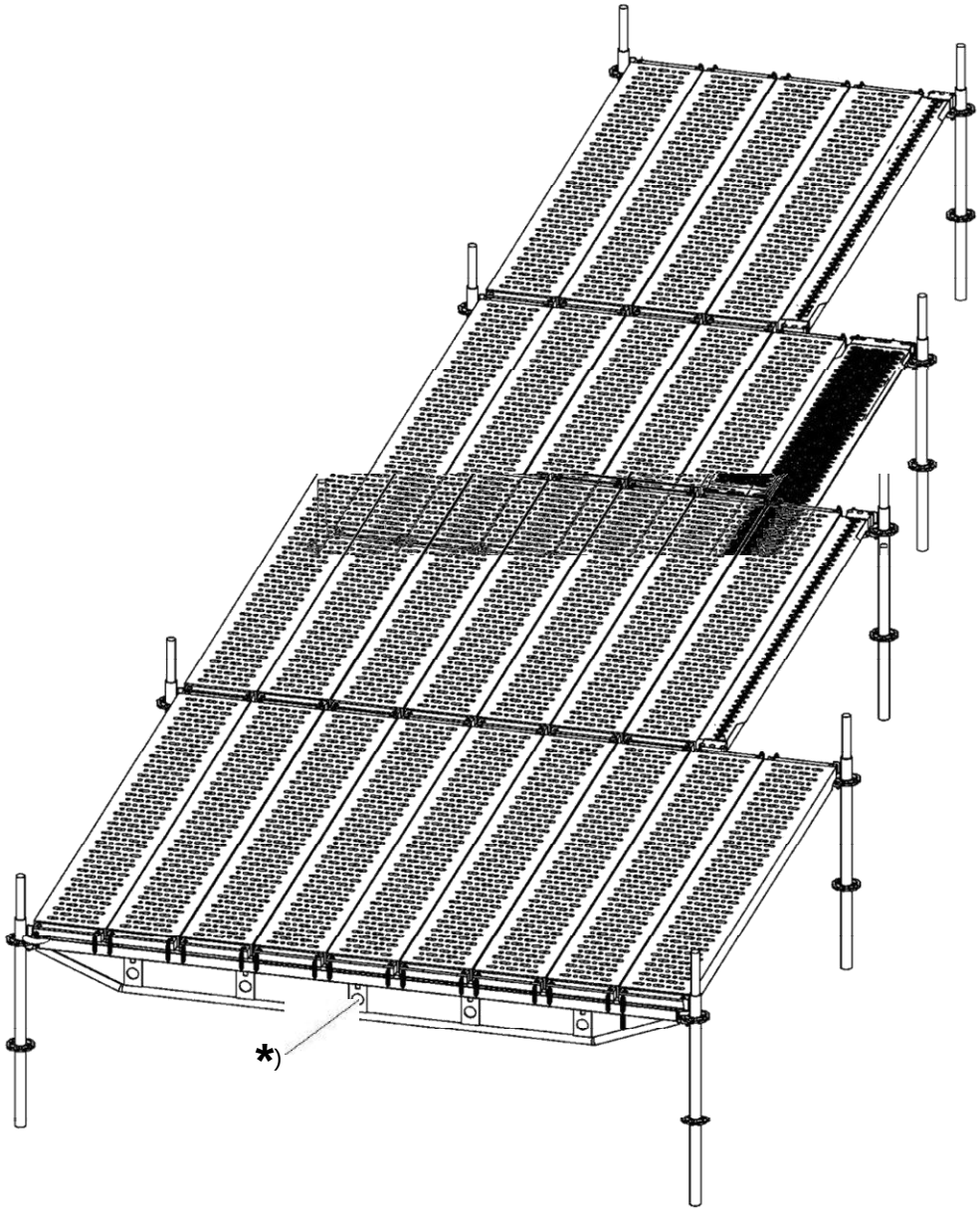


Fig. 39: Fig. 39: Graduated bolt lengths (photos 35 to 38)

*) Scaffolding braces 48 can be inserted into the round holes, e.g. as a bolt for attaching loads.

3.2.4 Lattice girder with 4 wedge heads

The lattice girder with 4 wedge heads (Annex B, pages 79 and 80) has a strap distance of 50 cm. This means that both straps can be connected to the perforated discs. The upper strap has welded star-shaped bolts and connecting heads with or without pegs. The lower strap consists of a circular tube Æ 48.3 mm with accompanying wedge heads. The double connection on either side of the vertical standards makes the scaffold construction so stable on the lattice girder level that no further stabilisation measures are usually necessary.

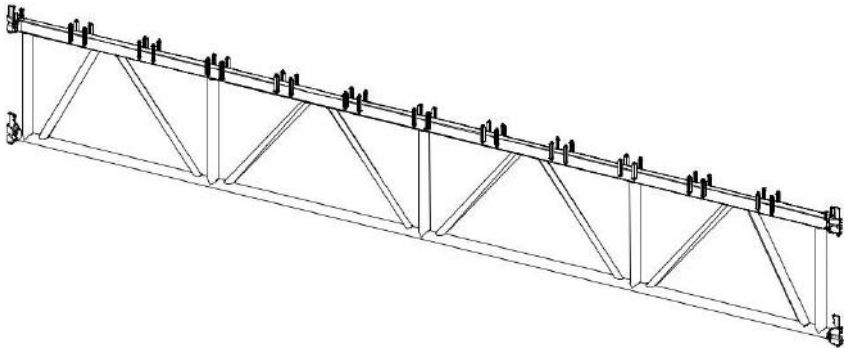


Fig. 40: Lattice girder for SL decks

The classification of the star-shaped bolts is selected so that groups of at least two decks can usually be laid at regular intervals (joint width = 6 mm). The joint width is slightly larger between these groups. The purpose of the "groups" is to allow even 64 cm-wide covering panels to be installed.

The lattice girders with lengths of 2.50 m and 3.00 m are placed in the same way as the corresponding double covering ledgers (Fig. 37 and 38). The 4.00 m, 5.00 m and 6.00 m lattice girders are symmetric. They have connecting heads with pins on both sides so that the decks are positioned in the same way as with the symmetrical transoms (Section 3.2.2). A 15 cm-wide filler deck is required for the lengths 4.50 m and 7.50 m. This is installed in the same way as the double covering ledger 2.50 m.

The "asymmetrical" lattice girder end with lengths 2.50 m, 3.00 m, 4.50 m and 7.50 m has a connection head without pins. There must always be positioned the same side during installation. The "symmetrical" lengths 4.00 m, 5.00 m and 6.00 m can be incorporated as desired.

For the lattice girders in lengths 2.50 m, 3.00 m, 4.50 m and 7.50 m, the connection heads without pins must always be on the same side.

3.2.5 Consoles

Consoles in the SL version are available for one or two decks. The holding fixtures for the decks are identical to the corresponding transoms (Section 3.2.2). The consoles are designed so that they can be mounted on a stand in a ground view under 90 ° (corner solution). In the case of a 2-plank console, the pressure pad is directly over the disc 50 cm below and is secured with an arbour protruding into the hole to prevent sideways movement (Fig. 41).

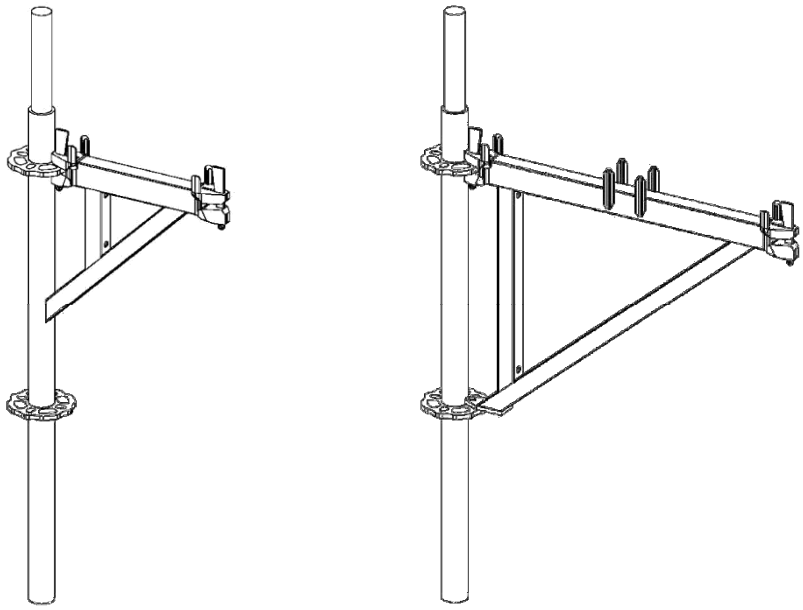


Fig. 41: Consoles for SL decks

At the top, both consoles have a connecting head. When required, a vertical upright can be connected, e.g. a railing post. The base standard 116 (Annex B, page 13) is recommended for this purpose.

If the 2-plank console needs to be scaffolded further upwards, the top of the console can be additionally supported by one or two vertical diagonals. The diagonal should be used 74/75 * 200 in accordance with Annex B, page 34.

3.2.6 Deck retainers and toe boards

Whenever wind forces lifting upwards may occur or scaffolding needs to be stabilised by the built-in decks, deck retainer need to be installed. These are braced between the two vertical standards.

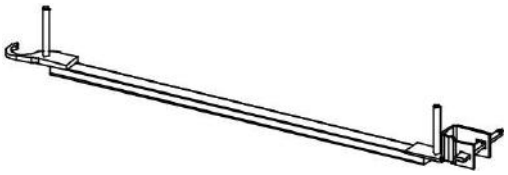


Fig. 42: Deck retainers

They are clamped using a wedge head on one side and a hook as a counter bearing on the other side. In the case of continuous installation, ensure that hooks are used to clamp one side and a wedge head on the other side for each vertical standard.

The deck retainer (Annex B, page 29) has two toe board pins. These are used to hold both the longitudinal toe boards as well as the cross-toe boards. The series components from the SL70 / 100 program are used as longitudinal toe boards (Annex B, page 45). The cross-toe boards (Annex B, page 46) are plugged onto both uprights so that they are right on the deck retainer. They have a lower height than the longitudinal toe boards (125 mm). Another distinguishing feature is the inscription "cross" (Fig. 43).

If the installation of the deck retainer is not required, the basic deck plank holders (Annex B, page 47) can be used to fix the toe boards.

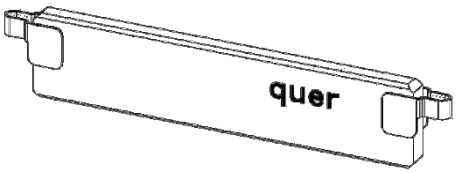


Fig. 43: Cross-toe boards

3.3 Version with decks for round pipe support

3.3.1 decks

The decks have forged support claws, which are staggered. This enables continuous installation without lateral displacement. An integrated anti-lift latch prevents the claws from lifting and becoming airborne in the case of winds blowing upwards. It is constructed so that the locking sleeve automatically falls into the closed position after installation of the deck. For safety reasons, however, this is always to be checked. It is easy to see whether the anti-lifting latch has closed or if it is still open by checking the position of the upper bracket.

The anti-lifting latches are designed so that the locking sleeve hold-downs are designed so that the backup level automatically falls into the closed position after installation of the deck.

However, it is always necessary to check whether the anti-lifting latches have closed.

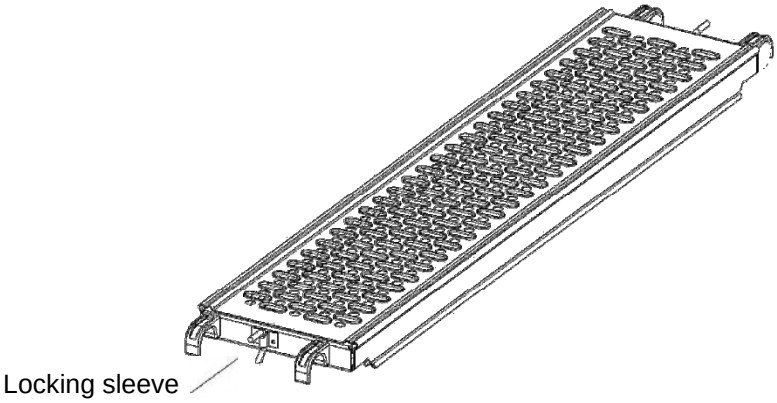


Fig. 44: Steel deck with anti-lifting latches

3.3.2 Transoms

The round pipe ledgers (Annex B, page 24) can also be appropriately fitted as a supporting beam up to a length of 1.50 m. The permissible loads are listed in Chapter 6.

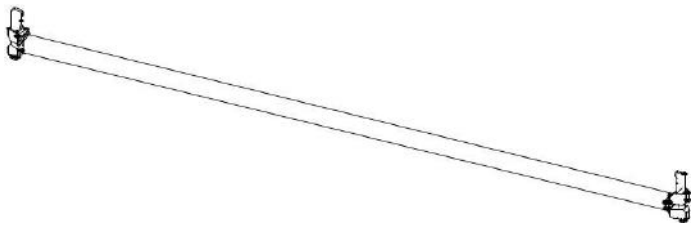


Fig. 45: Round pipe ledgers

To accommodate higher loads, the 1.50 m-long ledger is also produced with a reinforcement underneath, which consists of a T-profile (Annex B, page 30). The does not prevent the anti-lifting latches on the decks from locking. The construction height of only 88 mm provides the maximum possible headroom.

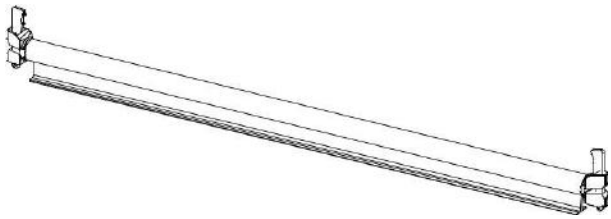


Fig. 46: Supporting beam 150, reinforced

The lengths 1.50m, 2.00 m, 2.50m and 3.00 m are designed as a double ledger (Annex B, page 72). The construction is adapted to the higher load requirements (see Chapter 6).

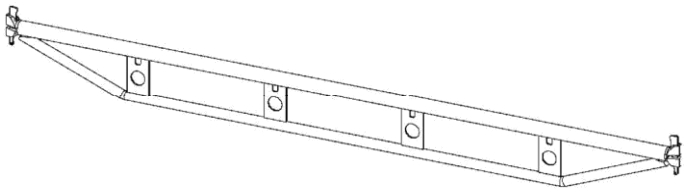
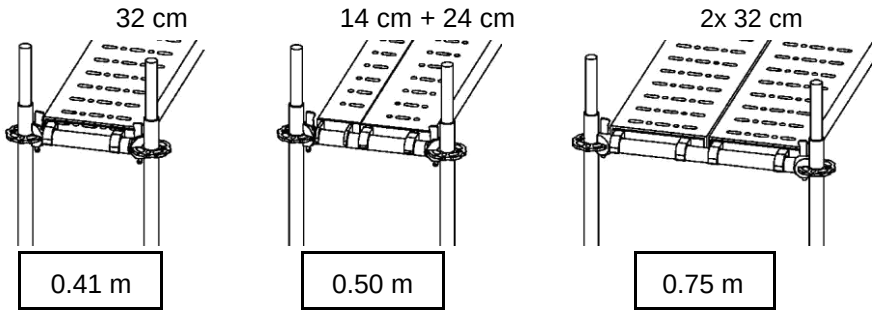


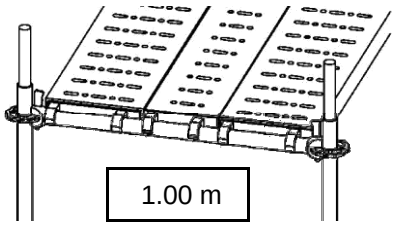
Fig. 47: Cross-ledgers for pipe support

3.3.3 Classification of the decks

The standard deck width is 32 cm. The 14 cm-wide deck is provided in order to balance and optimise the allocation of the decks using the various ledger lengths. A 24 cm wide deck is provided for special cases. The following recommended layout for the decks can be used for the different ledger lengths) the anti-lifting latches are not shown to improve clarity):

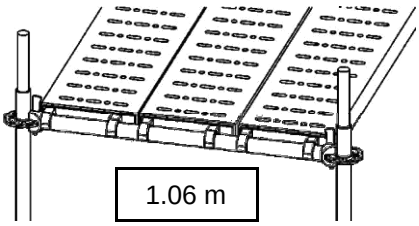


2 x 32 cm + 24 cm



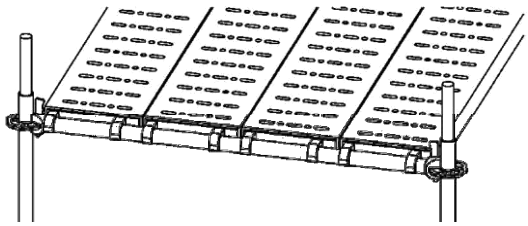
1.00 m

3 x 32 cm



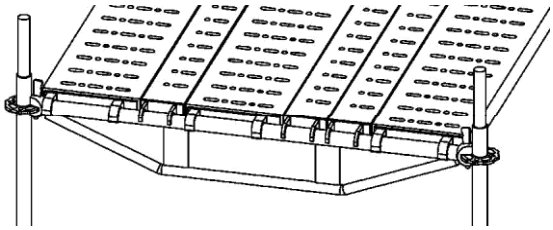
1.06 m

4 x 32 cm



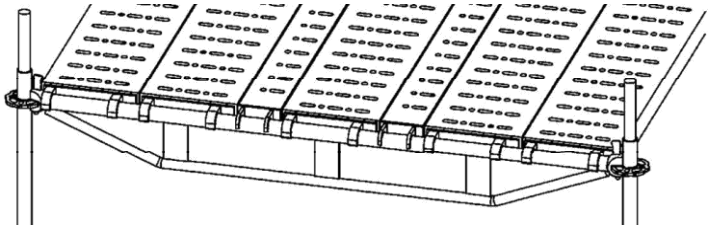
1.39 m

3 x 32 cm + 3 x 14 cm



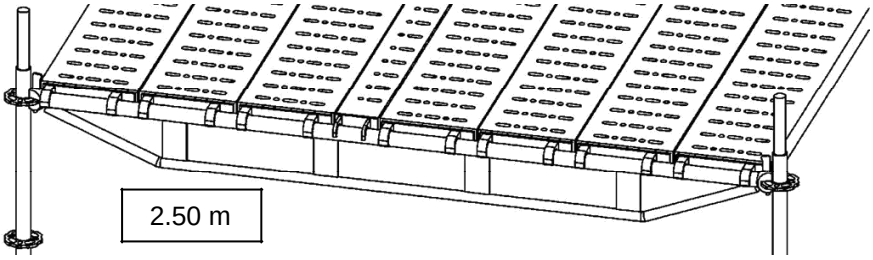
1.50 m

5 x 32 cm + 2 x 14 cm



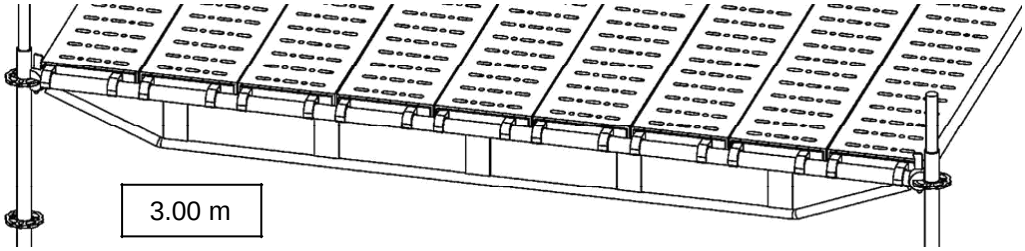
2.00 m

7 x 32 cm + 1 x 14 cm



2.50 m

9 x 32 cm



3.00 m

3.3.4 Lattice girder

The lattice girders for the pipe support have a system height of 50 cm and are connected to the discs of the vertical standards using upper and lower straps. This makes the scaffold structure very stable at the level of the lattice girder. Further stabilisation measures are not usually required.

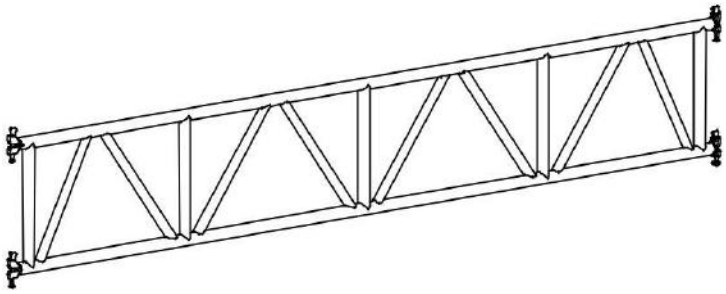


Fig. 48: Lattice girder for pipe support

Lengths of 3.00 m to 8.00 m are manufactured in gradations of 1.00 m (Annex B, pages 70 and 71). Three 32-decks can be installed per linear meter.

The fact that the covering for round pipe support can be installed on the lower strap also means that it is possible to create a work platform at graduated heights (e.g. to scaffold sprung arches). The decks are placed on the upper strap on one side and on the lower strap on the other side (Fig. 49). However, 14-decks must be used on the lower strap in the area of the intersection. The difference in height between the platform sections corresponds to the distance between the discs, which is 50 cm.

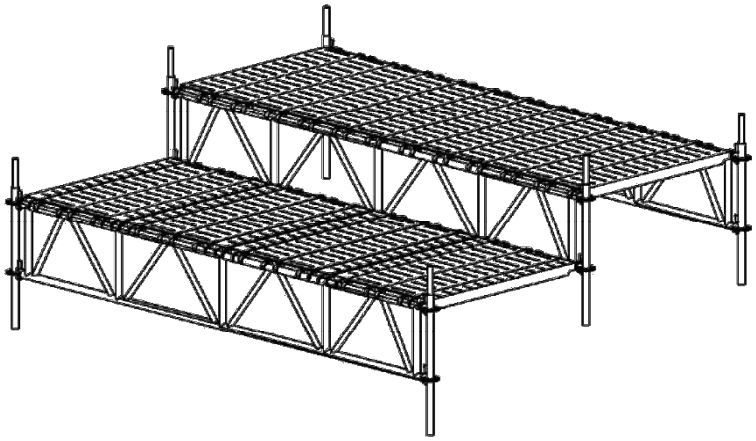


Fig. 49: Graduated platform

3.3.5 Consoles

Consoles for round pipe support (Annex B, pages 52 to 54) are available in the system widths 0.41 m, 0.50 m and 0.75 m (Fig. 50). The decks can be arranged as shown in Chapter 3.3.3. The console ledger can be used without support (Fig. 51) for subordinate purposes (Page 55 Annex B). This is available in two lengths, for 24 cm and 32 cm-wide decks.

The consoles are designed so that they can be mounted on a stand in a ground view under 90 ° (corner solution). The 75 cm wide console connects to the disc located 50 cm below with its pressure piece and is secured with a spike protruding into the hole to prevent sideways movement (see Fig. 41).

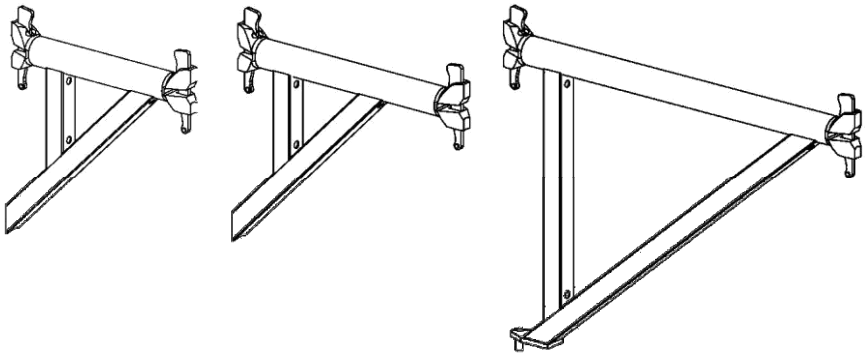


Fig. 50: Consoles for pipe support

At the top, these consoles have a connecting head. When required, a vertical upright can be connected, e.g. a railing post. The base standard 116 is recommended for this purpose (Annex B, page 13).

If the 75 cm-wide console needs to be scaffolded further upwards, the top of the console can be additionally supported by one or two vertical diagonals. The diagonal 74/75 * 200 should be used in accordance with Annex B, page 34.

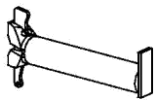


Fig. 51:

3.3.6 toe boards

The toe boards for pipe support (Annex B, page 4 8) have slotted and cranked hinges. These are pushed behind the wedges of the transom in such a way that the toe boards are on the decks (Detail 1). The slots are pushed into one another at the corners. One end of the slot should be positioned open at the top and the other transversely with the slot open at the bottom (or vice versa) (Detail 2).

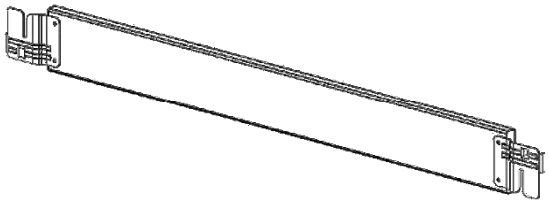


Fig. 52: Toe board for pipe support (seen from the outside)

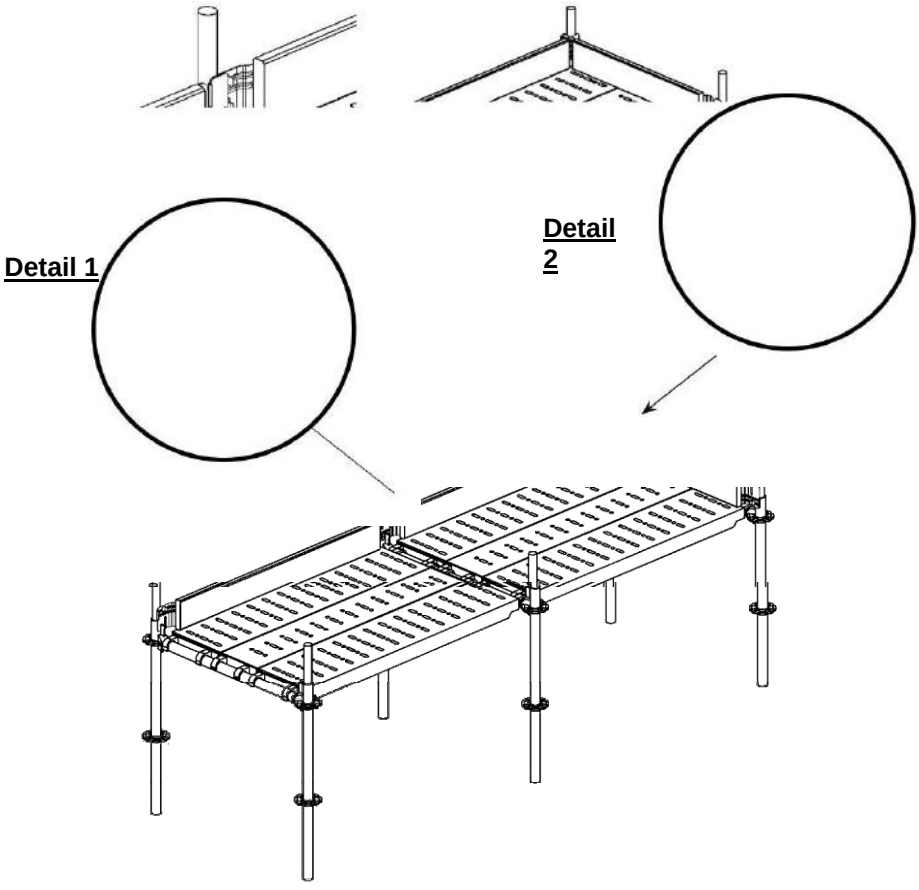


Fig. 53: Installation of toe boards (seen from the inside)

4. Plettac contur as circular scaffolding

4.1 General

Essentially, the information in Chapters 2.2 to 2.4.3 for façade scaffold designs also apply here. Round areas can easily be scaffolded due to the 8 possible connections to the discs using the large and small holes. A basic distinction is made between the "small" and "large" diameters.

Bridge piers or chimneys, for example, may have "small" diameter (≤ 3:00 m). Rectangular scaffolding is the most useful type to use in this case (see section 4.2).

Oil tanks, for example, have a "large" diameter. In this case, the scaffolding should follow the curvature in the ground view (see Chapter 4.3).

4.2 Objects with a small diameter

(As an example: Scaffolding a round bridge pier)

The connecting decks must be secured to prevent lifting and moving!

The round structure is surrounded by a square lattice in such a way that the main decks are ≤30 cm from the outer surface (Fig. 54). The ledgers are connected to the small holes to create a right angle (see connection detail).

The open inner corners are covered with free steel decks (Annex B, page 58). These should be secured to prevent them from lifting or moving. If no fire protection is required, corresponding wood braces can also be used.

All four levels should be reinforced with vertical diagonals.

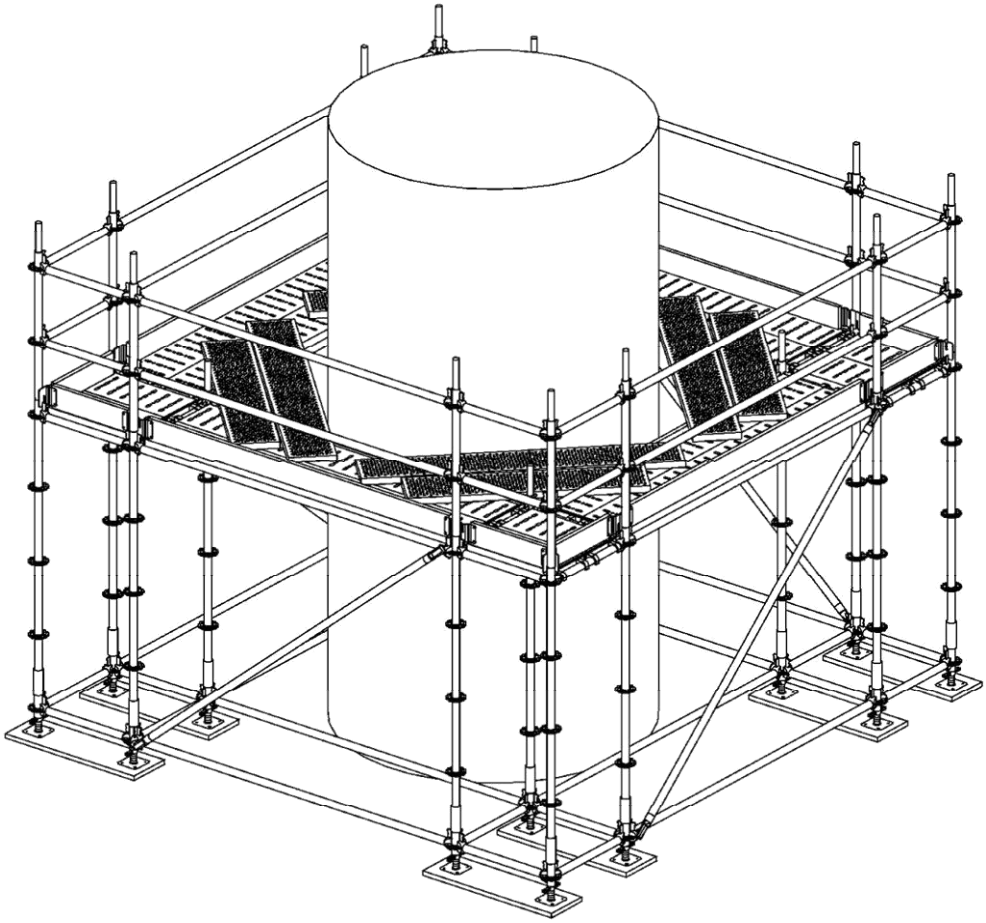
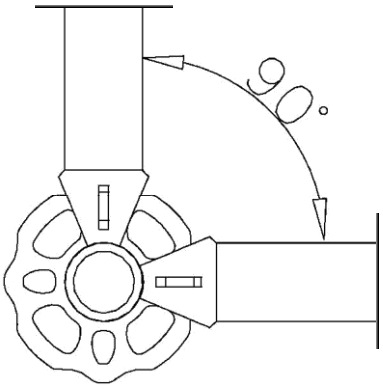


Fig. 54: Scaffolding a round bridge pier

Connection to the small holes!



Connection detail

**When connecting the ledgers to the small holes,
the scaffold section automatic aligned, angle.**

4.3 Objects with a large diameter

(As an example: scaffolding an oil tank)

If the building has larger dimensions, the scaffolding should follow the curve. Rectangular cells are constructed for this purpose and arranged at distances which allow the outer layers to be connected to standard horizontal ledgers (Fig. 55). As the connector ledgers do not form a right angle with the scaffold sections,
the uprights should be turned so that all ledgers are connected to the large holes. This allows an angle of up to 30° to be created between the scaffold section and connector ledgers (see connection detail).

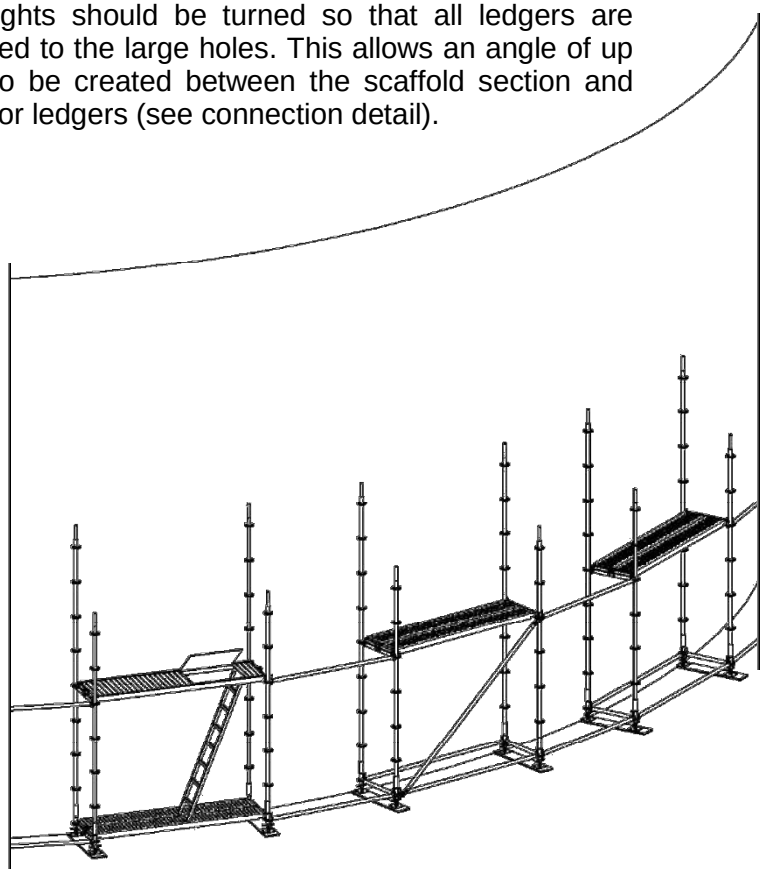
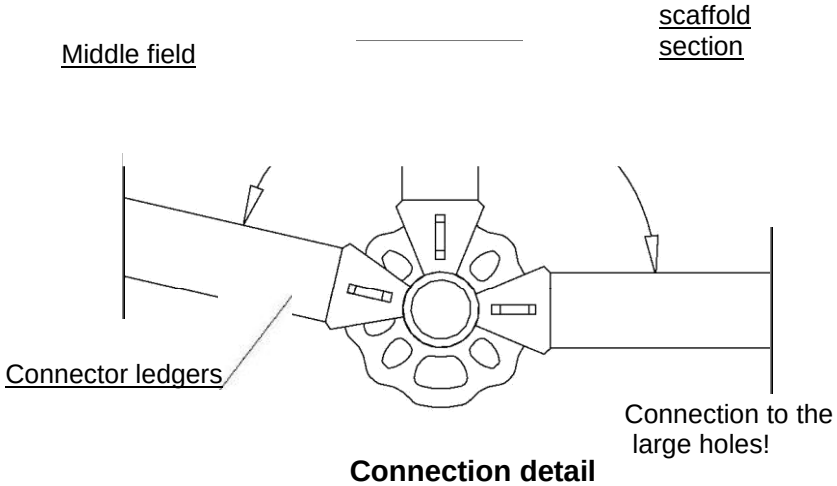


Fig. 55: Lower scaffold levels

When connecting the ledgers to the large holes, angles deviating from 90° can also be created between the ledgers milestones. As the scaffolding sections are no longer automatic aligned,

the rectangularity needs to be ensured using alternative measures,

e.g. by aligning the diagonal dimensions.



Connection detail

At least every second rectangular scaffold section (see. text for Fig. 55) should be reinforced using vertical diagonals. The spaces should be covered with system-free steel decks (Annex B, page 5 8) or optionally with wooden planks (to prevent them from lifting and moving).

The description of the façade scaffold design (Chapter 2) should be followed during construction. Anchorings should be installed consecutively as shown in Fig. 23 and 25. Ensure that the minimum scaffold height of 0.95 m is complied with in all areas. If the level falls below this height, a third horizontal ledger is required +1.50 m above the support ledger level.

The connecting decks must be secured to prevent lifting and moving!

The railing must not be lower than the minimum height of 0.95 m!

If so, a third guardrail is required!

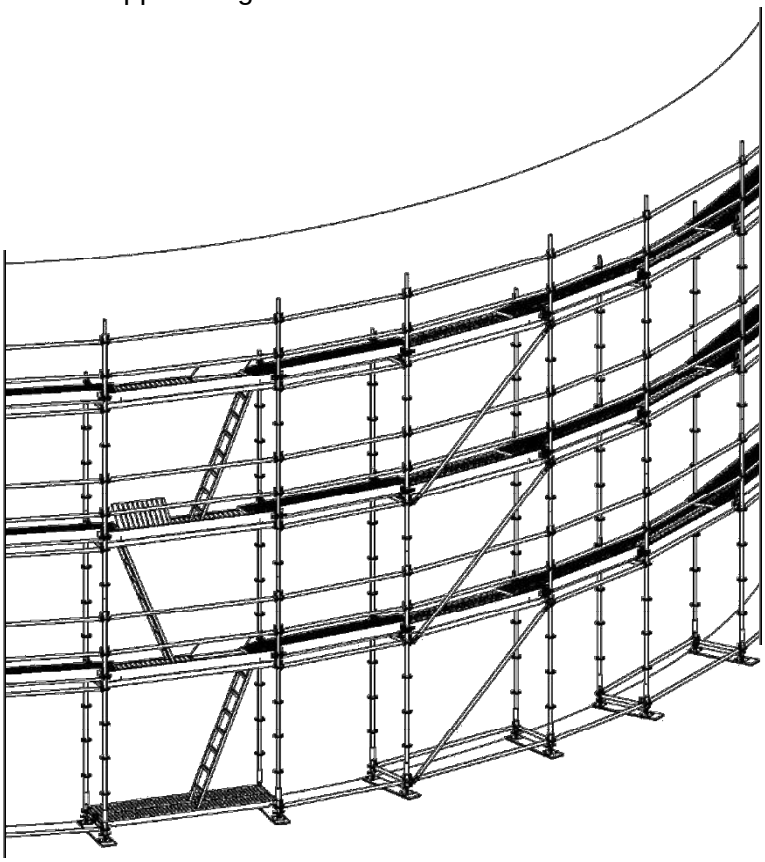


Fig. 56: Finished scaffolding

5. Recesses on the working level

5.1 General

In specific cases where, for example, supports or pipes protrude into the working level vertically, sufficiently large recesses need to be created. With the Plettac contur modular system, this is achieved using Intermediate transverse ledgers. These are positioned in front of and behind the protruding object on the traversing decks or horizontal ledgers and are used to mount correspondingly shorter decks.

The intermediate transverse ledger is available for both SL ledgers and those with round pipe supports. Two different types of construction are used, namely the "middle version" for double-sided support on continuous decking and the "edge design", which is supported by both a deck and a longitudinal ledger.

All intermediate transverse ledgers have a width of 32 cm for mounting 1, 2 or 3 decks. In the following sketches, the respective 2-plank versions are shown as an example.

The fields with recesses must not be subjected to more than the maximum load according to load class 3. The use of higher loads must be backed up with detailed documented evidence of conformity.

5.2 Representation of the different versions

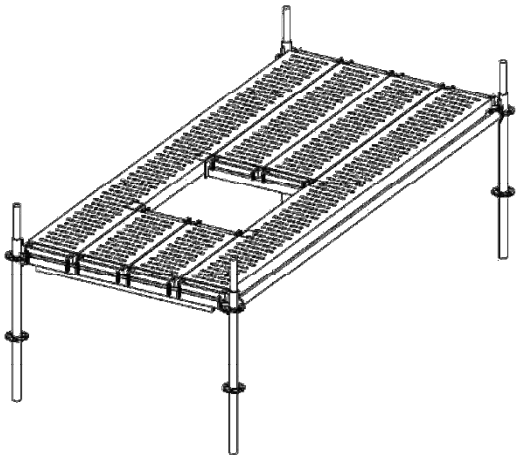


Fig. 57: Intermediate transverse ledger SL support, middle version
(see Annex B, page 27)

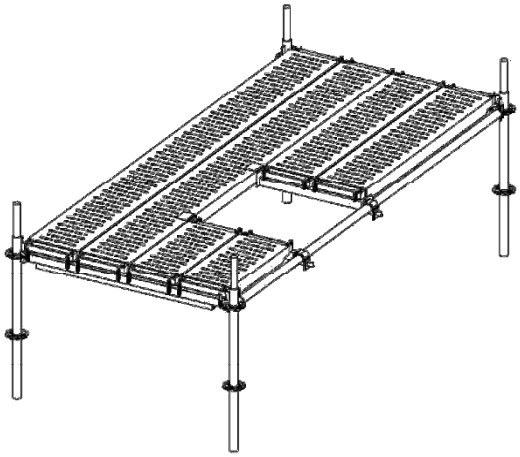


Fig. 58: Intermediate transverse ledger SL support, edge version

(see Annex B, page 28)

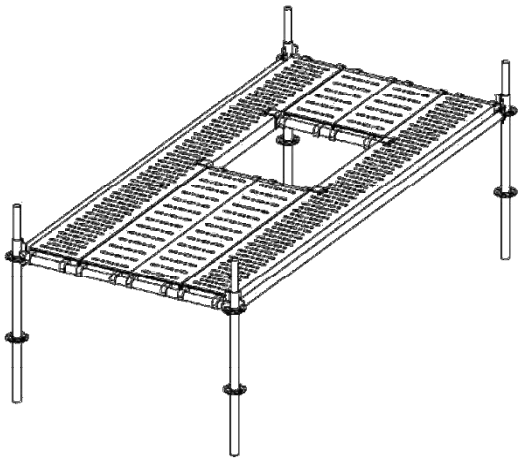


Fig. 59: Intermediate transverse ledger pipe support, middle version

(see Annex B, page 31)

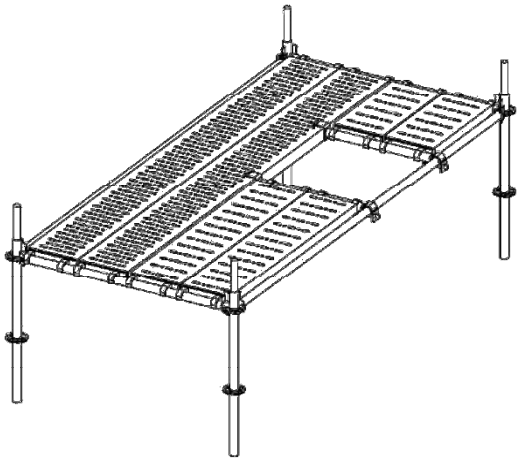


Fig. 60: Intermediate transverse ledger pipe support, edge version

(see Annex B, page 32)

6. Carrying capacity of the components

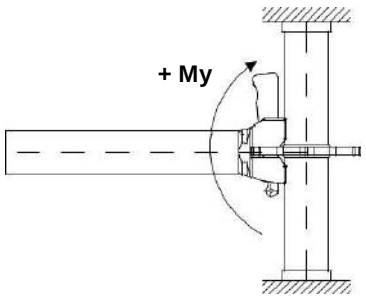
6.1 General

The load values specified in this section for the modular connection and load carrying capacity of various components relate to the "working load level", i.e. these loads can actually be used. They inform the scaffolders and users about the carrying capacity of the finished scaffold in specific areas. These comply with the legally required safety standards.

Under no circumstances should these modular values be used for the static calculation of the scaffold system. The measurement values (index "d") are required for this purpose. The corresponding capacity to withstand stresses and the turning and spring solidity of the modular connection are listed in the approval notification Z-8.22-843, Chapter 3 and Annex A.

6.2 Bolt connection

The main connecting values are depicted below. They must only be used for the assessment of ledgers which are formed either as a cantilever (console ledger) or in if the wedge head on the other end is has a subordinate load due to the specified cut loads.



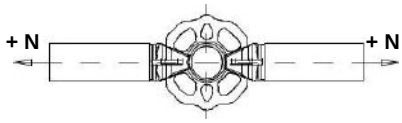
The bending moment My is the cantilever moment (load * level arm).

Pipe ledger:
permissible My = ± 63.0 kNcm

Transoms:
permissible My = + 32.1 kNcm
- 55.2 kNcm

Caution!

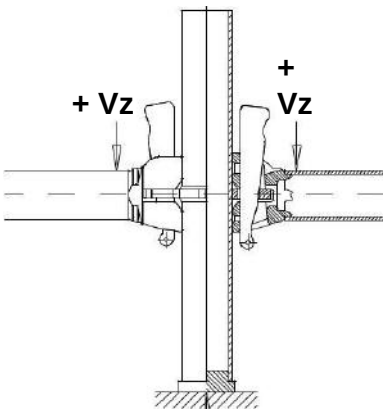
The listed values are working loads!



The longitudinal force N is a tensile or compressive force on the ledgers.

Pipe ledger:
permissible N = ± 20.2 kN

Transoms:
permissible N = ± 14.6 kN



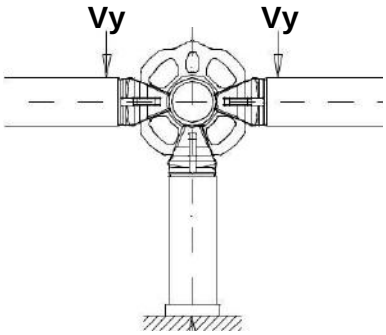
The vertical shear force Vz represents the reaction force of the deck ledger. It can also be applied as a single load behind the wedge head.

Pipe ledger and transoms:

permissible Vz = ± <u>17.3 kN</u>

The perforated disc can carry the following maximum load from several ledgers:

permissible SVz = ± <u>48.8 kN</u>



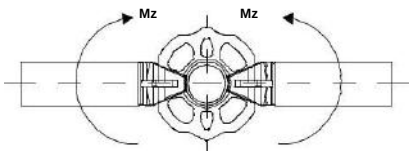
The horizontal shear force Vy consists of reaction forces caused by the wind or other horizontal loads.

Only pipe ledger:

permissible Vy = ± <u>6.2 kN</u>

<u>Caution!</u>

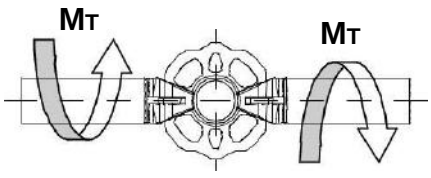
The listed values are working loads!



The bending moment Mz is the horizontal cantilever moment (load * level arm).

Only pipe ledger:

permissible Mz = ± <u>14.5 kNcm</u>

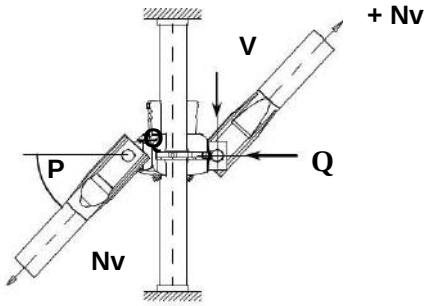


Torsional moments M_T turn the bolt around its longitudinal axis.

Only pipe ledger:

permissible $_{MT}$ = ± <u>38.7 kNcm</u>

6.3 Vertical diagonals



The vertical diagonals reinforce the scaffolding and determine to be used to a significant extent. Please refer to Table 6 of the approval notification. The maximum safe carrying capacity at the connection is:
permissible Nv= ± **16.3 kN**

This value can be applied to all diagonals as a tensile force. However, if Nv is a compressive force, the buckling strength of the diagonal tubes will flow under. Including the flattened end portions in the calculation of the capacities to withstand stress.

The carrying capacities in both the diagonal direction (Nv) and the horizontal (Q) and vertical (V) are components are specified in Table 4.

The values listed in Table 6 of the approval notification for pressure are based on the calculation for the "assco futuro" module system. The field lengths in this system are 7.2 cm longer than those in the "Plettac contur" system and therefore have a slightly lower carrying capacities. The carrying capacities shown in Table 4 are derived from the calculation of carrying capacities for metric field lengths and can be used for "Plettac contur". The diagonal dimensions missing in the approval notification have been added.

It should be noted that if several diagonals are added to one level, the individual carrying capacities can only be added together in the case of diagonals of the same dimensions and direction of inclination (tensile or compressive). In the case of different field lengths and opposite inclination directions (tensile or compressive), the individual load components must be determined on the basis of the rigidity (®⇒ Engineering office). Corresponding technical information can be requested from ALTRAD Plettac assco.

Table 4: Carrying capacity of vertical diagonals **working loads** ()

Field length (m)	a (°)	**permissible tension** (kN)	**tension Q** (kN)	**tension V** (kN)	**permissible pressure** (kN)	**tension Q** (kN)	**tension V** (kN)
	Field height H = 2.00 m						
3.00	35.1	16.30	13.3	9.4	5.12	4.2	2.9
2.50	40.5		12.4	10.6	6.17	4.7	4.0
2.00	47.3		11.1	12.0	7.62	5.2	5.6
1.50	56.1		9.1	13.5	9.59	5.4	8.0
1.39	58.3		8.6	13.9	10.13	5.3	8.6
1.06	65.5		6.8	14.8	11.93	5.0	10.9
1.00	67.1		6.3	15.0	12.32	4.8	11.4
0.74/0.75	73.6		4.6	15.6	13.81	3.9	13.2
0.50	80.2		2.8	16.1	15.10	2.6	14.9

Table 4 (continued) (**Service loads**)

Field length (m)	a (°)	**permissible tension** (kN)	**tension Q** (kN)	**tension V** (kN)	**permissible pressure** (kN)	**tension Q** (kN)	**tension V** (kN)
	Field height	H = 1.50 m					
3.00	27.8	16.30	14.4	7.6	5.41	4.8	2.5
2.50	32.6		13.7	8.8	6.50	5.5	3.5
2.00	39.1		12.7	10.3	8.08	6.3	5.1
1.50	48.1		10.9	12.1	10.41	7.0	7.8
1.06	58.8		8.4	13.9	13.56	7.0	11.6
1.00	60.6		8.0	14.2	14.15	6.9	12.3
0.74/0.75	68.5		6.0	15.2	16.30	6.0	15.2
0.50	77.0		3.7	15.9	16.30	3.7	15.9
	Field height	H = 1.00 m					
3.00	19.4	16.30	15.4	5.4	5.51	5.2	1.8
2.50	23.1		15.0	6.4	6.63	6.1	2.6
2.00	28.5		14.3	7.8	7.69	6.8	3.7
1.50	36.6		13.1	9.7	8.92	7.2	5.3
1.25	42.4		12.0	11.0	10.07	7.4	6.8
1.06	47.7		11.0	8.1	11.44	7.7	8.5
1.00	49.8		10.5	12.5	12.06	7.8	9.2
0.74/0.75	59.5		8.3	14.0	15.99	8.1	13.8
0.50	71.0		5.3	15.4	16.30	5.3	15.4
	Field height	H = 0.50 m					
3.00	10.0	16.30	16.1	2.8	5.59	5.5	1.0
2.50	12.0		15.9	3.4	6.42	6.3	1.3
2.00	15.2		15.7	4.3	6.67	6.4	1.8
1.50	20.4		15.3	5.7	7.11	6.7	2.5
1.00	30.6		14.0	8.3	8.21	7.1	4.2

6.4 Horizontal diagonal and diagonal scaffolding

The weld connection bent at right angles in the basic configuration according to Annex B, page 35 is standard for the **horizontal diagonals**. The rigidity and carrying capacities are shown in Table 7 of the approval notification. The following applies for all lengths up to 3.00 x 2.00:

permissible N = ± 7.33 kN

Only the greatest length at 3:00 x 2.50 m has a lower carrying capability:

permissible N = ± 6.33 kN

The **diagonal ledgers** according to Annex B, page 36 are intended for square fields. They are therefore like formed horizontal ledges. Their carrying capacity depends on the buckling load, limited by the load capacity of the modular connection. The permissible diagonal forces are specified in Table 5.

Table 5: Carrying capacity of the diagonal ledgers

Field size (m * m)	**Length** (m)	**permissible tension** (kN)	**permissible pressure** (kN)
0.75 * 0.75	1.061	20.2	20.2
1.00 * 1.00	1.414	20.2	20.2
1.50 * 1.50	2.121	20.2	20.2
2.00 * 2.00	2.828	20.2	13.5
2.50 * 2.50	3.535	20.2	9.0
3.00 * 3.00	4.243	20.2	6.4

The old horizontal diagonals according to Annex B, page 37 have a traction/compression carrying capacity of:

permissible N = ± 2.71 kN

6.5 Vertical Standards

The following details of the permissible standard loads are to be used exclusively for the pre-calculation of a scaffold-supporting structure. They apply to a max. drill-finish length of 10 cm. For larger spindle trails and ledger intervals of H = 1.0 m and H = 1.5 m, the base points should be used as the basis, whereby their carrying capacity cannot be stated as an overall value. These must always be verified with a static calculation of the overall system.

"Buckling load" applies to horizontal rigid brackets of the ledger levels

"Dia 1/1, 1/2, 1/3" applies to rigidity created by diagonals in each field, in every second field or every third field.

Table 6: Carrying capacity of vertical standards

Systems width (cm)	**middle uprights**				**Edge uprights**			
	"Buckling load" (kN)	**Dia 1/1** (kN)	**Dia 1/2** (kN)	**Dia 1/3** (kN)	**"Buckling load"** (kN)	**Dia 1/1** (kN)	**Dia 1/2** (kN)	**Dia 1/3** (kN)
H = 2.00 m								
74	50.0	47.5	42.3	37.2	38.5	38.1	36.1	34.7
100	49.5	48.3	45.8	42.7	38.3	38.3	37.5	36.6
110	49.4	48.2	46.1	43.1	38.3	38.3	37.6	37.6
150	48.3	47.5	46.2	46.2	38.2	38.2	37.8	37.2
200	47.0	46.6	45.9	44.8	37.8	37.8	37.8	37.1
250	46.0	45.7	45.1	44.6	37.3	37.3	37.2	36.7
300	44.5	44.5	44.1	43.8	36.7	36.7	36.7	36.3
H = 1.50 m								
74	65.5	61.4	56.6	50.0	55.1	54.0	50.8	47.2
100	64.6	63.1	60.5	55.4	54.8	54.6	53.2	53.2
110	64.4	63.0	60.9	56.2	54.7	54.7	53.4	53.4
150	63.1	62.3	61.1	58.9	54.1	54.1	53.6	53.6
200	61.7	61.2	60.5	58.6	53.7	53.6	53.2	52.9
250	60.6	60.2	59.7	58.1	52.9	52.8	52.6	52.4
300	59.2	57.6	57.0	56.0	52.2	51.2	50.6	49.8
H = 1.00 m								
74	74.8	70.1	68.5	66.8	70.9	70.1	68.5	66.8
100	75.1	71.1	69.1	66.9	70.6	70.3	69.1	66.9
110	75.0	72.5	70.6	67.4	70.5	70.3	69.7	67.4
150	74.1	73.3	71.8	69.4	70.1	69.8	69.2	68.5
200	73.3	72.7	72.0	70.5	69.7	69.3	68.8	68.2
250	72.7	72.1	71.4	69.3	69.3	68.8	68.3	67.8
300	72.0	71.5	70.8	69.2	68.8	68.4	67.9	67.2

6.6 Decks

The load classes for the decks according to DIN EN 12811-1 are specified in **Table 7** Furthermore, the associated area load and the concentrated single load are also provided. The relevant single load can be distributed over an area of 50 x 50 cm. For narrower floors, it is reduced according to the width, but must not fall below 1.5 kN.

Table 7: Carrying capacity of the decks

Covering	**(Annex B Page** Approval Z-8.22-843)	**Length** (m)	**Load Great**	**Authoritative Area load** (kN / m²)	**Authoritative Single load** (kN)
Steel deck 32 SL support Steel deck 32 Pipe support	38 41	3.00	**4**	5.0	1.92
Aluminium floor 32 SL support	/	2.50	**5**	7.5	1.92
Aluminium floor 32 Pipe support	/	≤ 2.00	**6**	10.0	1.92
Steel toeboard 32 SL support	39	3.00	**3**	3.0	1.50
		2.50	**3**	4.0	1.92
		≤ 2.00	**4**	5.0	1.92
Steel toeboard 15 SL support	40	3.00	**4**	5.0	1.50
		2.50	**5**	7.5	1.50
		≤ 2.00	**6**	10.0	1.50
Steel deck 24 Pipe support Steel deck 14 Pipe support	42 43	3.00	**4**	5.0	1.50
		2.50	**5**	7.5	1.50
		≤ 2.00	**6**	10.0	1.50
Aluminium access platform Plywood flooring, SL support	59	3.00	**3**	2.0	1.50
		2.50	**3**	2.0	1.50
Aluminium access platform Aluminium lining, SL support Aluminium lining, pipe support	63 65	3.00	**3**	2.0	1.50
		2.50	**4**	3.0	3.00
Aluminium stairs SL support Aluminium stair pipe support	83, 84 85, 86	3.00	**3**	2.0	1.50
		2.50	**3**	2.0	1.50
Solid wood flooring 32, SL support (all current versions)	/	3.00	**3**	2.0	1.50
		2.50	**4**	5.0	1.92
		2.00	**5**	7.5	1.92
		1.50	**6**	10.0	1.92
Aluminium floor plus, SL support (Width = 64 cm)	/	3.00	**4**	3.0	3.00
		2.50	**5**	4.5	3.00
		≤ 2.00	**6**	6.0	3.00

6.7 Transoms

The following tables show the carrying capacities of the various supporting beams. The values are valid for the current status of the component construction at the time at which this guide for erection and use. It distinguishes between the following groups of ledgers:

Table 8: Reinforced ledger and double ledger for SL support

Table 9: Round pipe ledgers

Table 10: Reinforced ledgers and double ledgers for pipe support

Table 11: Intermediate transverse ledger

When determining the carrying capacities, the elastic joint restraint of the connections was taken into account (apart from in the case of the intermediate transverse ledger). The dead weight of the decks has already been deducted from the permissible payloads (steel decks at 0:23 kN / m²). The individual columns of the tables indicate the following:

permissible q: permissible uniformly distributed load of the ledger

Ledger length: field length to be supported by the ledger

permissible p: permissible payload on the scaffold surface to be supported by the **ledger.** If the values are greater than the figures specified in Table 7 (authoritative area load), this can only be achieved by strengthening the decks.

Load class: Classification according to the partial area loads (authoritative surface load for steel decks according to Table 7)
1. Space for middle ledger, second space for edge ledger I ***)**

permissible P: 1 x P = permissible concentrated load on the middle ledger 2 x P = permissible loads a third of the way along the ledger

.

***)** In a tessellated arrangement of the ledgers, each transom can be regarded as an edge ledger

Table 8: Carrying capacity of reinforced ledgers and double ledgers SL support

Ledger length (m)	**permissible q** (kN / m)	**Covering length** (m)	**permissible p*)** Centre ledger (kN / m²)	**permissible p*)** Edge ledger (kN / m²)	**Load Great**		**permissible P** (kN)
0.74 (2-plank)	21.1	3.00	6.8	13.8	**4**	**4**	1 x 7.0
		2.50	8.2	16.7	**5**	**5**	
		2.00	10.3	20.9	**6**	**6**	
		1.50	13.8	27.9	**6**	**6**	
1.10 (3-plank)	17.3	3.00	5.5	11.3	**4**	**4**	1 x 8.5
		2.50	6.7	13.6	**5**	**5**	
		2.00	8.4	17.1	**6**	**6**	
		1.50	11.3	22.8	**6**	**6**	
1.25	12.5	3.00	3.9	8.1	**4**	**4**	1 x 7.3
		2.50	4.8	9.8	**4**	**5**	
		2.00	6.0	12.3	**5**	**6**	
		1.50	8.1	16.4	**6**	**6**	
1.39 (4-plank)	10.2	3.00	3.2	6.6	**3**	**4**	1 x 6.6
		2.50	3.9	7.9	**4**	**5**	
		2.00	4.9	10.0	**5**	**6**	
		1.50	6.6	13.4	**5**	**6**	
1.50	13.9	3.00	4.4	9.0	**4**	**4**	1 x 10.0 2 x 14.3
		2.50	5.3	10.9	**5**	**5**	
		2.00	6.7	13.7	**5**	**6**	
		1.50	9.0	18.3	**6**	**6**	
2.00	10.0	3.00	3.1	6.4	**3**	**4**	1 x 9.2 2 x 7.3
		2.50	3.8	7.8	**4**	**5**	
		2.00	4.8	9.8	**5**	**6**	
		1.50	6.4	13.1	**5**	**6**	
2.50	6.2	3.00	1.8	3.9	**2**	**4**	1 x 6.2 2 x 5.0
		2.50	2.3	4.7	**3**	**4**	
		2.00	2.9	6.0	**3**	**5**	
		1.50	3.9	8.0	**4**	**5**	
3.00	4.1	3.00	1.1	2.5	**1**	**3**	1 x 6.0 2 x 3.7
		2.50	1.4	3.1	**1**	**3**	
		2.00	1.8	3.9	**2**	**4**	
		1.50	2.5	5.2	**3**	**4**	

*) with regard to the columns "permissible p", see commentary on page 73

Table 9: Carrying capacity of the round pipe ledgers

Ledger length (m)	**permissible q** (kN / m)	**Covering length** (m)	**permissible p*)** Centre ledger (kN / m²)	**permissible p*)** Edge ledger (kN / m²)	**Load Great**		**permissible P** (kN)
0.75	21.4	3.00	6.9	14.0	**4**	**4**	7.0
		2.50	8.3	16.9	**5**	**5**	
		2.00	10.5	21.2	**6**	**6**	
		1.50	14.0	28.3	**6**	**6**	
1.00	13.5	3.00	4.3	8.8	**4**	**4**	6.1
		2.50	5.2	10.6	**5**	**5**	
		2.00	6.5	13.3	**5**	**6**	
		1.50	8.8	17.8	**6**	**6**	
1.10	12.0	3.00	3.8	7.8	**4**	**4**	5.7
		2.50	4.6	9.4	**4**	**5**	
		2.00	5.8	11.8	**5**	**6**	
		1.50	7.8	15.8	**6**	**6**	
1.25	8.9	3.00	2.7	5.7	**3**	**4**	5.0
		2.50	3.3	6.9	**3**	**5**	
		2.00	4.2	8.7	**3**	**6**	
		1.50	5.7	11.6	**4**	**6**	
1.39	7.2	3.00	2.2	4.6	**3**	**4**	4.5
		2.50	2.7	5.5	**3**	**4**	
		2.00	3.4	7.0	**4**	**5**	
		1.50	4.6	9.4	**4**	**6**	
1.50	5.6	3.00	1.6	3.5	**2**	**3**	3.8
		2.50	2.0	4.3	**3**	**4**	
		2.00	2.6	5.4	**3**	**4**	
		1.50	3.5	7.2	**4**	**5**	
2.00	3.3	3.00	0.9	2.0	**1**	**3**	2.9
		2.50	1.1	2.4	**1**	**3**	
		2.00	1.4	3.1	**1**	**3**	
		1.50	2.0	4.2	**3**	**4**	
2.50	2.1	3.00	0.5	1.2	/	**1**	2.4
		2.50	0.6	1.5	/	**1**	
		2.00	0.8	1.9	**1**	**2**	
		1.50	1.2	2.6	**1**	**3**	
3.00	1.5	3.00	0.3	0.8	/	**1**	2.0
		2.50	0.4	1.0	/	**1**	
		2.00	0.5	1.3	/	**1**	
		1.50	0.8	1.8	**1**	**2**	

*) with regard to the columns "permissible p", see commentary on page 73

Table 10: Carrying capacity of reinforced ledgers and double ledgers, pipe support

Ledger length (m)	**permissible q** (kN / m)	**Covering length** (m)	**permissible p*)** Centre ledger (kN / m²)	**permissible p*)** Edge ledger (kN / m²)	**Load Great**		**permissible P** (kN)
1.39 (reinforced)	14.9	3.00	4.7	9.7	**4**	**4**	1 x 9.9
		2.50	5.7	11.7	**5**	**5**	
		2.00	7.2	14.7	**5**	**6**	
		1.50	9.7	19.6	**6**	**6**	
1.50 (reinforced)	12.8	3.00	4.0	8.3	**4**	**4**	1 x 9.2
		2.50	4.9	10.0	**5**	**5**	
		2.00	6.2	12.6	**5**	**6**	
		1.50	8.3	16.8	**6**	**6**	
1.50	24.7	3.00	8.0	16.2	**4**	**4**	1 x 15.3 2 x 15.1
		2.50	9.7	19.5	**5**	**5**	
		2.00	12.1	24.5	**6**	**6**	
		1.50	16.2	32.7	**6**	**6**	
2.00	14.0	3.00	4.4	9.1	**4**	**4**	1 x 11.3 2 x 8.7
		2.50	5.4	11.0	**5**	**5**	
		2.00	6.8	13.8	**5**	**6**	
		1.50	9.1	18.4	**6**	**6**	
2.50	8.4	3.00	2.6	5.4	**3**	**4**	1 x 8.1 2 x 6.6
		2.50	3.1	6.5	**3**	**5**	
		2.00	4.0	8.2	**4**	**5**	
		1.50	5.4	11.0	**5**	**6**	
3.00	4.6	3.00	1.3	2.9	**1**	**3**	1 x 7.2 2 x 5.4
		2.50	1.6	3.5	**2**	**3**	
		2.00	2.1	4.4	**3**	**4**	
		1.50	2.9	5.9	**3**	**5**	

*) with regard to the columns "permissible p", see commentary on page 73

When using system-free ledgers made of wood, Intermediatetransverse ledgers are required in order to comply with the permissible width between supports according to Table 12. See also DIN 4420, Part 3, Section 6.4.3 and the "Regulations for scaffolding" (FRG 1) of the Federal Guild for Scaffolders, paragraph 1 0.2.2.

Table 11: Carrying capacity of the intermediate transverse ledger

Ledger length (m)	**permissible q** (kN / m)	**permissible P** (kN)
0.74	18,5	6,8
0.75	17,9	6,7
1.00	10,1	5,0
1.10	8,9	4,7
1.25	6,4	4,0
1.39	5,2	3,6
1.50	4,5	3,3
2.00	2,5	2,5
2.50	1,6	2,0
3.00	1,1	1,6

Table 12: Table 12: Permissible width between supports for scaffolding platforms made from wooden planks

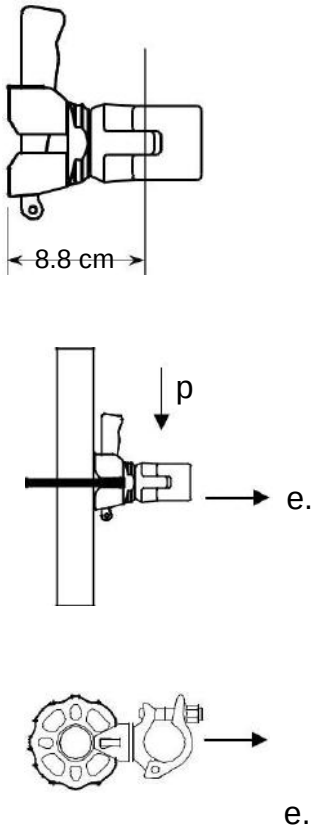
Load class	**Brace width** (cm)	**Brace thickness** (cm)				
		3.0	3.5	4.0	4.5	5.0
1, 2, 3	20	1.25	1.50	1.75	2.25	2.50
	24 and 28	1.25	1.75	2.25	2.50	2.75
4	20	1.25	1.50	1.75	2.25	2.50
	24 and 28	1.25	1.75	2.00	2.25	2.50
5	20, 24, 28	1.25	1.25	1.50	1.75	2.00
6	20, 24, 28	1.00	1.25	1.25	1.50	1.75

Table 12 applies to the sorting class S 10 or MS 10 according to DIN 4074-1

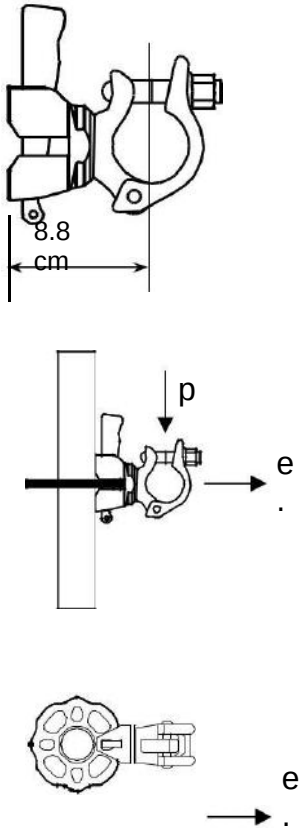
6.8 Wedge head couplers

The carrying capacities of the rigid wedge head couplers according to Annex B, page 77 are regulated in the approval notification Z-8.22-843 under 3.2.6 (Table 10). The values are valid for both set-ups ("parallel" and "perpendicular"). The allowable working loads are indicated in the sketches below. The rigidities to be applied and further conditions for static calculations are specified in the approval notification.

"Parallel" set-up



"Perpendicular" set-up



permissible V = **5.1 kN**	permissible Z = **18.2 kN**

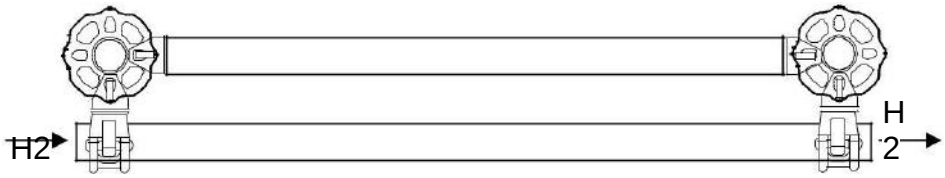
The carrying capacity values listed above also apply to rotatable wedge head couplings according to Annex B, page 78. However, they are not regulated in the approval notice for this purpose. The data are based on the evaluation of confirmation tests. The rigidity values according to Annex A, Fig. 7 also do not apply. The rigidity of the rotatable wedge head coupling is significantly lower.

The horizontal load capacity of the wedge head couplers be determined on the basis of the values Vy = ± 6.2 kN and Mz = ± 14.5 kNcm (see paragraph 6.2).

The following applies to the individual wedge couplers:

permissible H1 = 14.5 / 8.8 = **1.7 kN**

If at least two wedge head couplers are connected using a pipe, the full shear force Vy can be applied.



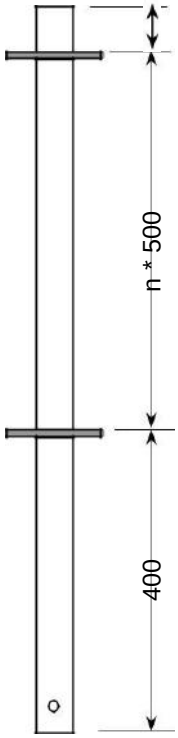
The following applies to each wedge head coupler:

permissible H2 = **6.2 kN**

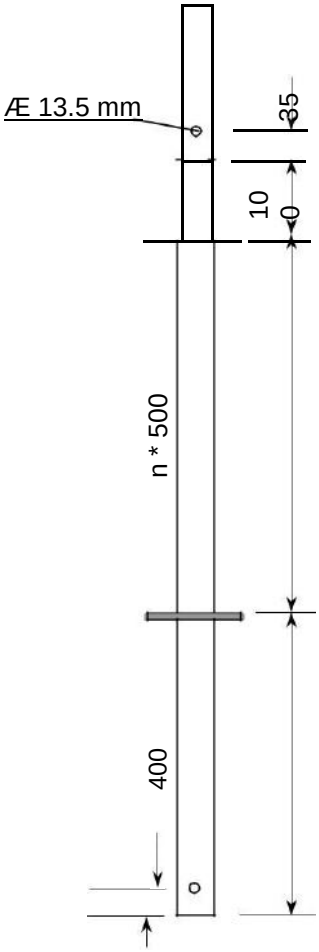
7. Constructive details

7.1 Pillars

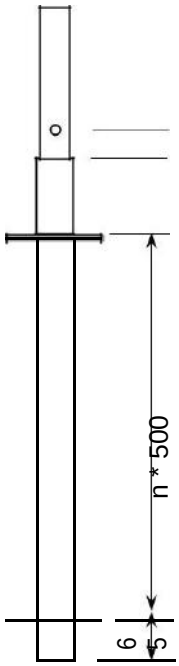
Surface scaffolding upright



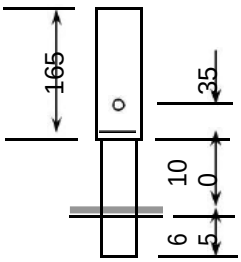
Vertical upright



Starting collar



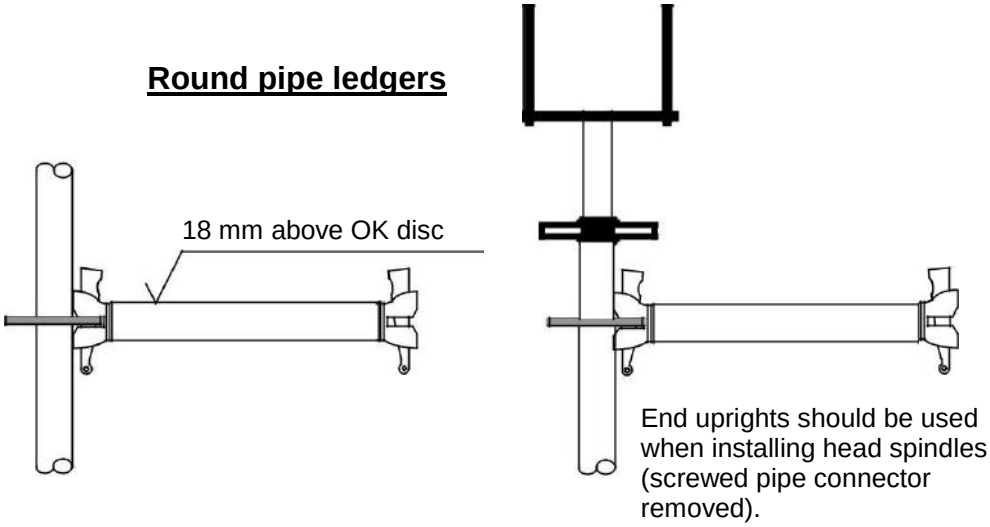
Starting collar



7.2 Ledgers and decks

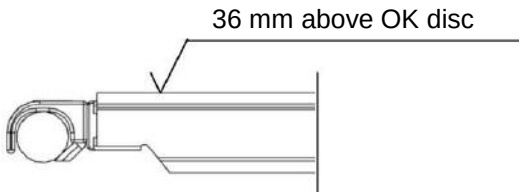
The height position relating to the discs is specified.

Round pipe ledgers

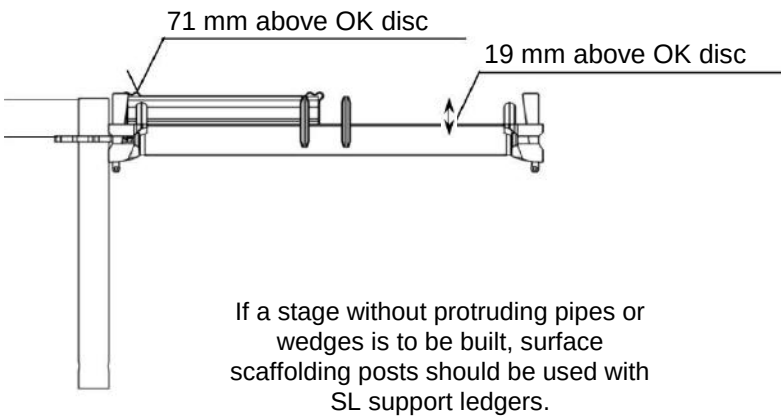


End uprights should be used when installing head spindles (screwed pipe connector removed).

Steel decks pipe support

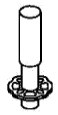


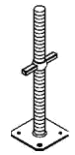
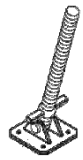
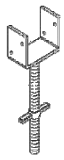
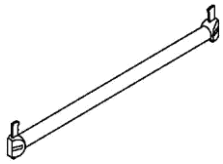
Reinforced ledger SL

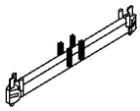
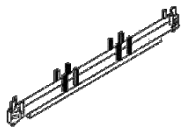
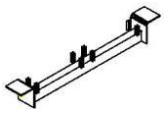
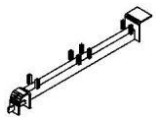
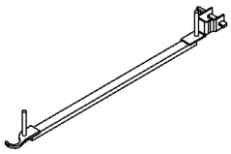
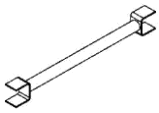
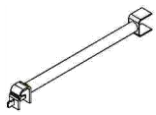
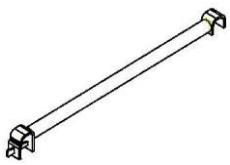


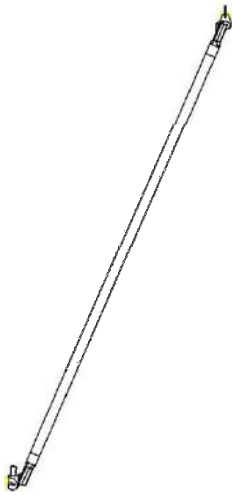
If a stage without protruding pipes or wedges is to be built, surface scaffolding posts should be used with SL support ledgers.

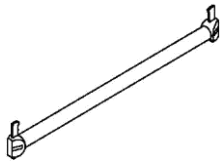
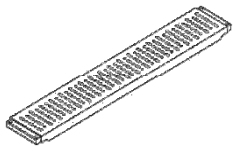
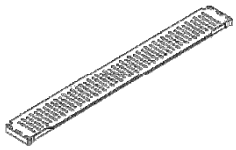
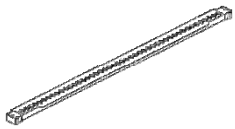
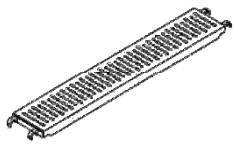
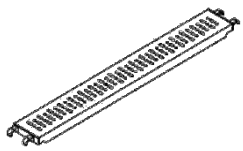
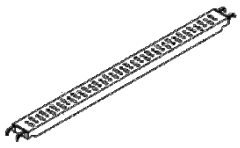
8. Component configuration

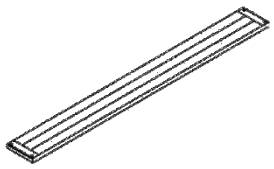
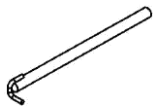
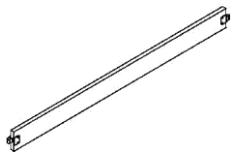
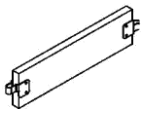
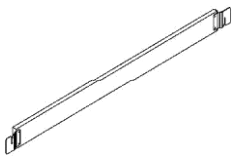
(Annex B **Page** (the approval Z-8.22-843)	**Description**	**G** (kg)	**Component of Standard version**	**illustration**
12	Vertical uprights L = 0.50 m L = 1.00 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m L = 3.50 m L = 4.00 m	 3.2 5.4 7.7 9.9 12.1 14.4 16.6 18.8	Yes	
13	Starting collars L = 0.66 m L = 1.16 m L = 2.16 m L = 3.16 m L = 4.16 m	 4.2 6.5 11.0 15.4 19.9	Yes	
14, 15	Vertical uprights with screwed pipe connector L = 0.50 m L = 1.00 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m L = 4.00 m	 3.8 6.5 8.7 11.0 13.2 15.4 19.9	Yes	
16	Surface scaffolding posts L = 0.46 m L = 0.96 m L = 1.96 m L = 2.96 m L = 3.96 m	 2.0 4.1 8.4 12.6 16.9	no	
17	Starting collar L = 0.33 m	2.1	Yes	

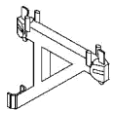
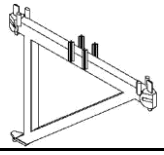
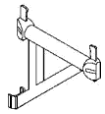
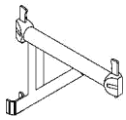
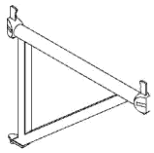
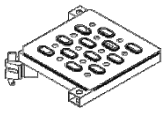
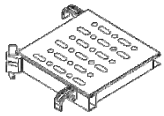
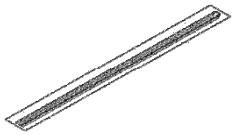
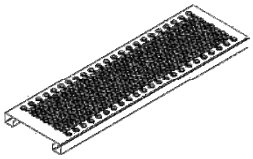
(Annex B **Page** (the approval Z-8.22-843)	**Description**	**G** (kg)	**Component of Standard version**	**illustration**
18	scaffold uprights, rigid L = 0.40 m L = 0.60 m L = 0.80 m	 2.9 3.6 4.3	Yes	
19	Scaffold uprights, swivelling L = 0.78 m	5.7	no	
20	Spindle connector L = 0.50 m	2.6	no	
21	Head spindle L = 0.50 m	6.7	no	
22	Screw jack foot clip	3.1	no	
23	Cradle connector	3.0	no	
24	Horizontal braces L = 0.41 m L = 0.50 m L = 0.74 m L = 0.75 m L = 1.00 m L = 1.06 m L = 1.25 m L = 1.39 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	 2.0 2.2 3.0 3.0 4.0 4.2 4.9 5.4 5.4 7.0 8.5 10.1	Yes	

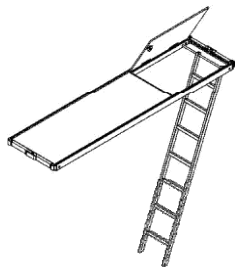
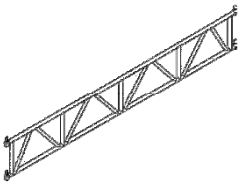
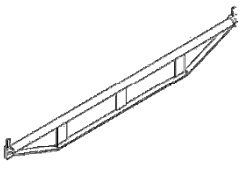
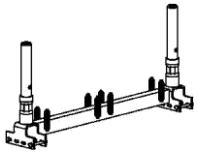
Annex B **Page** (the approval Z-8.22-843)	**Description**	**G** (kg)	**Component of Standard version**	**Illustration**
25	Transoms SL support L = 0.41 m L = 0.74 m	 2.1 3.2	Yes	
26	Transoms, SL support, reinforced L = 1.06 m L = 1.39 m	 5.7 7.2	no	
27	Intermediate transverse ledger SL support Centre design 1-plank 2-plank 3-plank	 2.3 3.4 4.5	no	
28	Intermediate transverse ledger SL support Edge design 1-plank 2-plank 3-plank	 2.7 3.8 4.9	no	
29	deck retainer for SL support L = 0.74 m L = 1.06 m L = 1.39 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	 2.7 3.3 3.9 4.1 5.0 5.9 6.8	Yes no no	
30	transoms, pipe support, reinforced L = 1.39 m L = 1.50 m	 9.1 10.0	no	
31	Intermediate transverse ledger pipe support Centre design 1-plank 2-plank 3-plank	 2.3 3.3 4.4	no	
32	Intermediate transverse ledger pipe support Edge design 1-plank 2-plank 3-plank	 2.7 3.8 4.9	no	
33	Intermediate transverse ledger L = 0.74 m Pipe support L = 0.75 m L = 1.00 m L = 1.06 m L = 1.39 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	3.7 3.9 4.8 5.0 6.2 6.6 8.3 10.1 11.9	no	

Annex B **Page** (the approval Z-8.22-843)	**Description**	**G** (kg)	**Component of Standard version**	**illustration**
34	Vertical diagonals (L * H)			
	0.74/0.75 * 2.00 m	8.2		
	1.00 * 2.00 m	8.4		
	1.06 * 2.00 m	8.5		
	1.50 * 2.00 m	9.2		
	2.00 * 2.00 m	10.1		
	2.50 * 2.00 m	11.2		
	3.00 * 2.00 m	12.4		
	0.74/0.75 * 1.50 m	6.7		
	1.00 * 1.50 m	7.0		
	1.06 * 1.50 m	7.1		
	1.50 * 1.50 m	7.9		
	2.00 * 1.50 m	9.1		
	2.50 * 1.50 m	10.3	no	
	3.00 * 1.50 m	11.6		
	0.74/0.75 * 1.00 m	5.3		
	1.00 * 1.00 m	5.8		
	1.06 * 1.00 m	5.9		
	1.50 * 1.00 m	6.9		
	2.00 * 1.00 m	8.2		
	2.50 * 1.00 m	9.6		
	3.00 * 1.00 m	11.0		
	1.00 * 0.50 m	4.8		
	1.50 * 0.50 m	6.2		
	2.00 * 0.50 m	7.6		
	2.50 * 0.50 m	9.1		
	3.00 * 0.50 m	10.6		
35	Horizontal diagonals (B * L)			
	0.74/0.75 * 2.50 m	9.0		
	0.74/0.75 * 3.00 m	10.6		
	1.00 * 2.00 m	7.8		
	1.00 * 2.50 m	9.2		
	1.00 * 3.00 m	10.8		
	1.06 * 2.50 m	9.3		
	1.06 * 3.00 m	10.9	no	
	1.39 * 2.50 m	9.8		
	1.39 * 3.00 m	11.2		
	1.50 * 2.00 m	8.6		
	1.50 * 2.50 m	9.9		
	1.50 * 3.00 m	11.4		
	2.00 * 2.50 m	10.9		
	2.00 * 3.00 m	12.2		
	2.50 * 3.00 m	13.1		

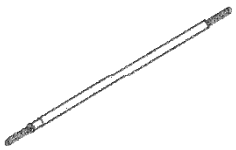
Annex B **Page** (the approval Z-8.22-843)	**Description**		**G** (kg)	**Component of Standard version**	**Illustration**
36	Diagonal ledgers	(B * L) 0.75 * 0.75 m 1.00 * 1.00 m 1.50 * 1.50 m 2.00 * 2.00 m 2.50 * 2.50 m 3.00 * 3.00 m	 4.0 5.2 7.4 9.7 11.9 14.2	no	
37	Horizontal diagonals (old version)			no	
38	Steel deck 32 SL support	L = 0.74 m L = 1.06 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	6.1 8.1 11.2 14.3 17.4 20.9	Yes	
39	Steel toeboard 32 SL support	L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	12.5 16.4 20.4 24.3	no	
40	Steel toeboard 15 SL support	L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	9.4 12.5 15.6 18.7	no	
41	Steel deck 32 Pipe support	L = 0.75 m L = 1.00 m L = 1.06 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	7.2 8.7 9.1 12.2 15.3 18.4 21.4	Yes	
42	Steel deck 24 Pipe support	L = 0.75 m L = 1.00 m L = 1.06 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	7.0 8.2 8.9 12.1 15.1 18.4 22.3	no	
43	Steel deck 14 Pipe support	L = 0.75 m L = 1.00 m L = 1.06 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	4.6 5.9 6.2 8.0 10.0 12.0 14.0	no	

Annex B **Page** (the approval Z-8.22-843)	**Description**		**G** (kg)	**Component of Standard version**	**Illustration**
/	Solid wood flooring 32 d = 48 mm, SL support	L = 0.74 m L = 1.06 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	5.7 8.2 11.5 15.4 19.2 23.0	no	
44	Scaffold brackets	L = 0.30 m L = 0.40 m L = 0.50 m L = 1.10 m L = 1.30 m L = 1.50 m L = 1.90 m	1.3 1.7 2.0 3.9 4.5 5.2 6.5	Yes	
45	Longitudinal toe board, SL design	L = 0.74 m L = 1.06 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	1.8 2.5 3.3 4.2 5.1 6.0	Yes	
46	Cross-toe board, SL design	L = 0.74 m L = 1.06 m L = 1.39 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	1.5 1.9 2.4 2.5 3.2 4.0 4.8	Yes no ↕ no	
47	Toe board holder, SL design		1.1	Yes	
47	Toe board holder connector, SL design		1.2	Yes	
48	Toe board for pipe support	L = 0.75 m L = 1.00 m L = 1.06 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	1.9 2.3 2.4 3.2 4.2 5.1 6.0	Yes	

Annex B **Page** (the approval Z-8.22-843)	**Description**	**G** (kg)	**Component of Standard version**	**Illustration**
50	Console 41, SL support	3.3	Yes	
51	Console 74, SL support	5.9	no	
52	Console 41, pipe support	3.5	Yes	
53	Console 50, pipe support	3.8	no	
54	Console 75, pipe support	6.0	no	
55	Console ledger, pipe support L = 0.23 m L = 0.30 m	 1.5 1.8	no	
/	Corner decks, SL support 1-plank 2-plank	 5.8 12.3	 Yes no	
56	Corner decks, pipe support 1-plank 2-plank	 5.4 11.9	 Yes no	
57	Slatted floor L = 0.74 m L = 1.00 m L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	 3.2 4.8 7.4 10.2 13.0 15.8	Yes	
58	System-free steel floor L = 1.00 m L = 1.50 m L = 2.00 m L = 2.50 m	 6.4 9.5 12.5 15.5	no	

Annex B **Page** (the approval Z-8.22-843)	**Description**	**G** (kg)	**Component of Standard version**	**Illustration**
59	Aluminium access platform with plywood flooring SL support L = 2.50 m L = 3.00 m	 23.0 28.5	Yes	
63	Aluminium access platform with aluminium lining SL support L = 2.50 m L = 3.00 m	 23.8 27.4	Yes	
65	Aluminium access platform with aluminium lining Pipe support L = 2.50 m L = 3.00 m	 25.2 28.8	Yes	
70, 71	Lattice girder with 4 wedge heads Pipe support L = 3.00 m L = 4.00 m L = 5.00 m L = 6.00 m L = 7.00 m L = 8.00 m	 34.5 45.5 55.8 66.5 77.1 88.5	 Yes Yes Yes Yes no no	
72	Double ledger, pipe support L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	 9.5 12.6 15.7 18.5	 no	
73	Lattice girder ledger, SL support	6.4	Yes	
74	Lattice girder ledger, pipe support	6.7	Yes	

Annex B **Page** (the approval Z-8.22-843)	**Description**	**G** (kg)	**Component of Standard version**	**Illustration**
75	Pipe connector with U-shaped profile (wedgeable)	2.2	no	
75	Pipe connector with semi-connector	1.8	no	
76	Pipe connector with U-shaped profile (threaded)	2.2	no	
77	Wedge head coupler, rigid	1.1	Yes	
78	Wedge head connector, rotatable	1.2	no	
79, 80	Lattice girder with 4 wedge heads, SL support L = 2.50 m L = 3.00 m L = 4.00 m L = 4.50 m L = 5.00 m L = 6.00 m L = 7.50 m	 29.9 34.3 44.8 50.3 55.4 66.2 83.3	no	
81	Double ledger, SL support L = 1.50 m L = 2.00 m L = 2.50 m L = 3.00 m	 9.4 12.5 15.5 18.5	no	
82	Covering ledger for aluminium stairs, SL support	7.9	no	
83, 84	Aluminium stairs, SL support L = 2.50 m L = 3.00 m	 27.5 32.5	no	
85, 86	Aluminium stairs, pipe support L = 2.50 m L = 3.00 m	 28.5 33.5	no	

Annex B **Page** (the approval Z-8.22-843)	**Description**	**G** (kg)	**Component of Standard version**	**Illustration**
89	Aluminium stairs, outer railings L = 2.50 m L = 3.00 m	 10.7 13.0	no	
90	Aluminium stairs, inner railings	14.8	no	
91	Aluminium stairs, exit railings	17.3	no	
92	Coupler	0.1	Yes	
/	installation guard railings lockable posts	5.8	no	
/	Installation guard railings telescoping strut L = 1.50 m to 2.07 m L = 2.07 m to 3.07 m	 2.5 3.0	no	

Notes

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