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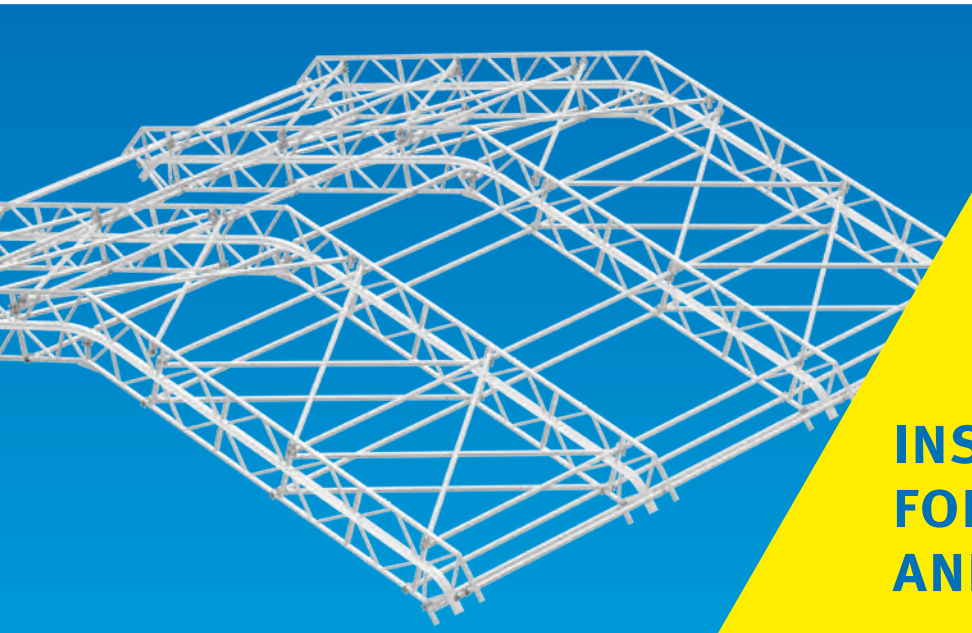

INSTRUCTIONS FOR ASSEMBLY AND USE

ALFIX VARIO WEATHER PROTECTION ROOF

ALFIX
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With the publication of these Instructions for Assembly and Use, any previous issue becomes invalid.

VARIO Weather Protection Roof Instructions for Assembly and Use by ALFIX

Edition: March 2017

1. Preface

Dear ALFIX Customer,

The *VARIO weather protection roof* you have purchased is versatile and comes equipped with components that are sure to last a long time.

Please follow instructions for assembly, use, and dismantling to ensure safe working.

Read this manual carefully before using the scaffold and always keep it with you when assembling the roof. It explains in detail all necessary steps and safety measures in the correct order.

The diagrams are here to assist you as you work through each chapter.

If you want to deviate from these instructions for assembly and use, or if you have questions regarding our roofing system, give us a call, we would be happy to help you.

Sincerely,
The ALFIX Team

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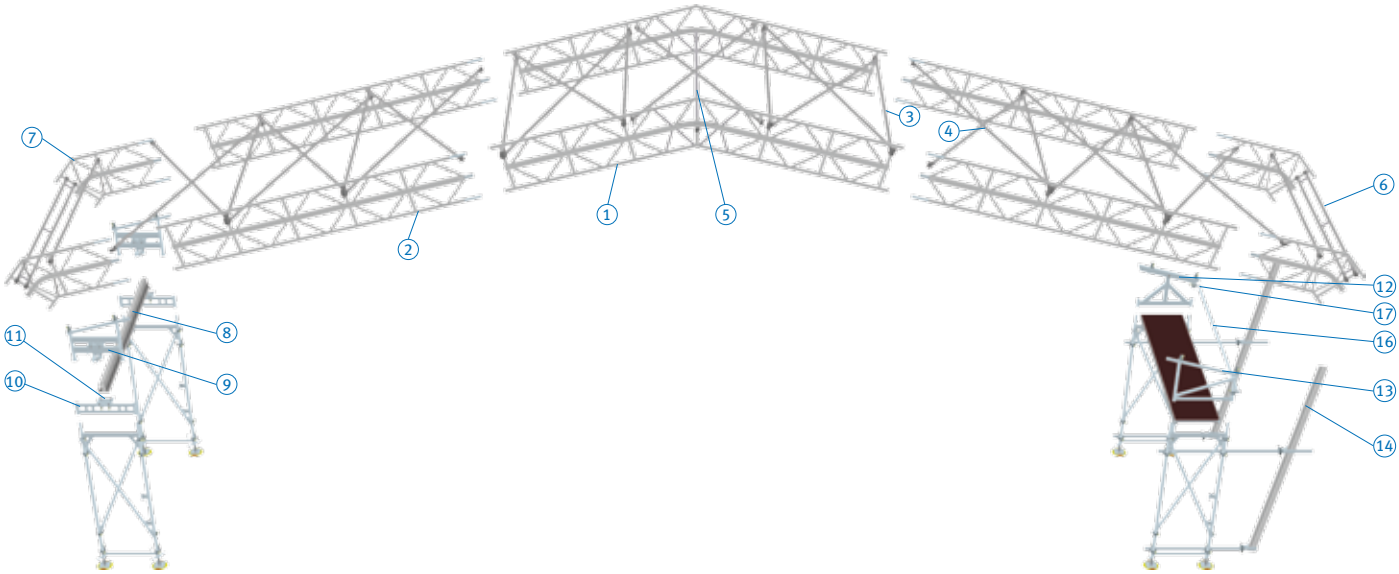
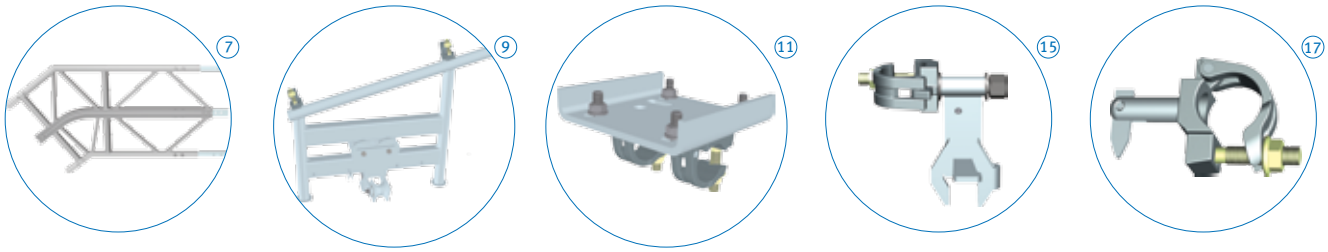
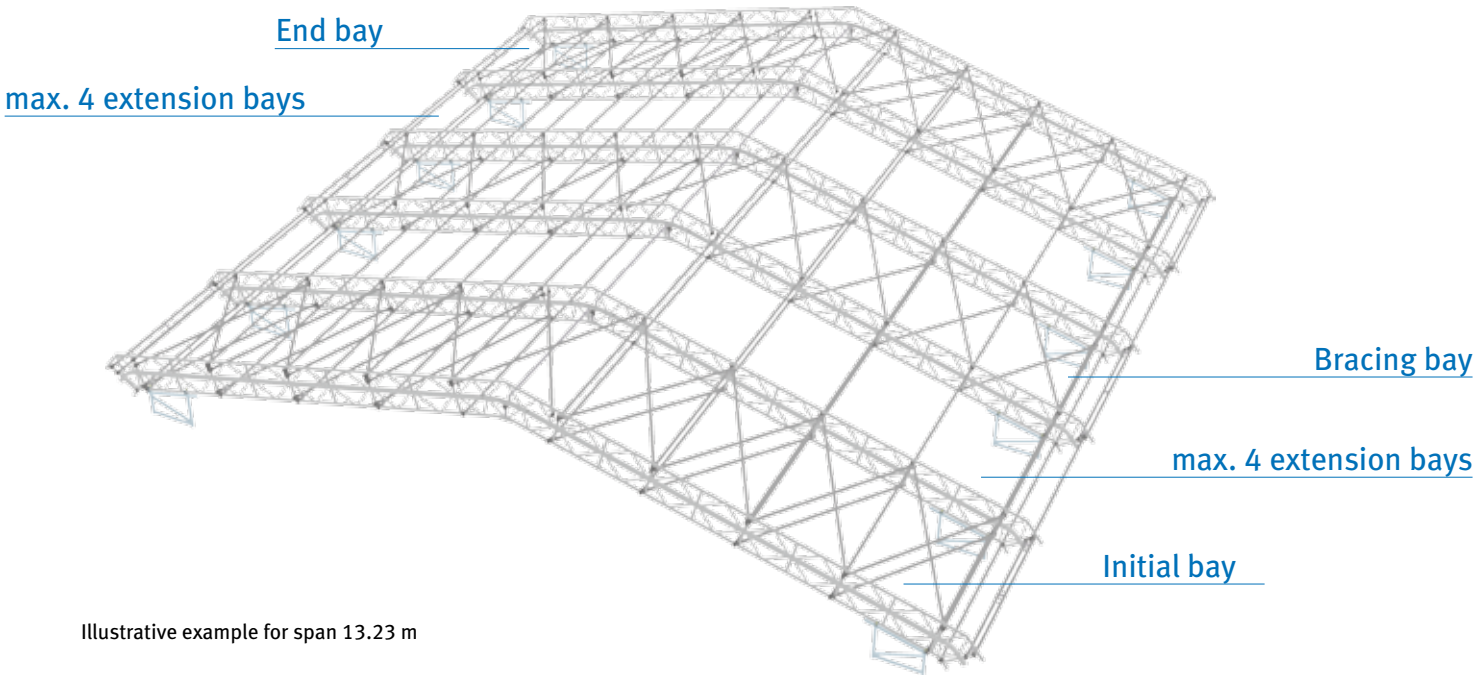
Overview
Initial bay example/illustration of top chord level





01	Ridge girder
02	Roof girder
03	Longitudinal ledger
04	Diagonal ledger
05	Ridge ledger
06	Eaves bracing
07	Roof girder corner section 37.5°
08	Rail
09	Rolling frame with girder support 15°
10	Rail adapter
11	Rail support plate
12	Girder support, pin-jointed
13	Girder support 400
14	Keder rail wall profile
15	Keder rail holder 360°, adjustable
16	Eaves ledger
17	Tilting pin coupler

Illustration of top chord and bottom chord level



Illustrative example for span 13.23 m

Arrangement of bracing elements

Initial and end bays:

Longitudinal ledger	Diagonal ledger	Eaves bracing
Every 1.5 m at top chord Every 1.5 m at bottom chord	Every 1.5 m at top chord crossed Every 1.5 m at bottom chord single At ridge crosswise	On both sides at top chord

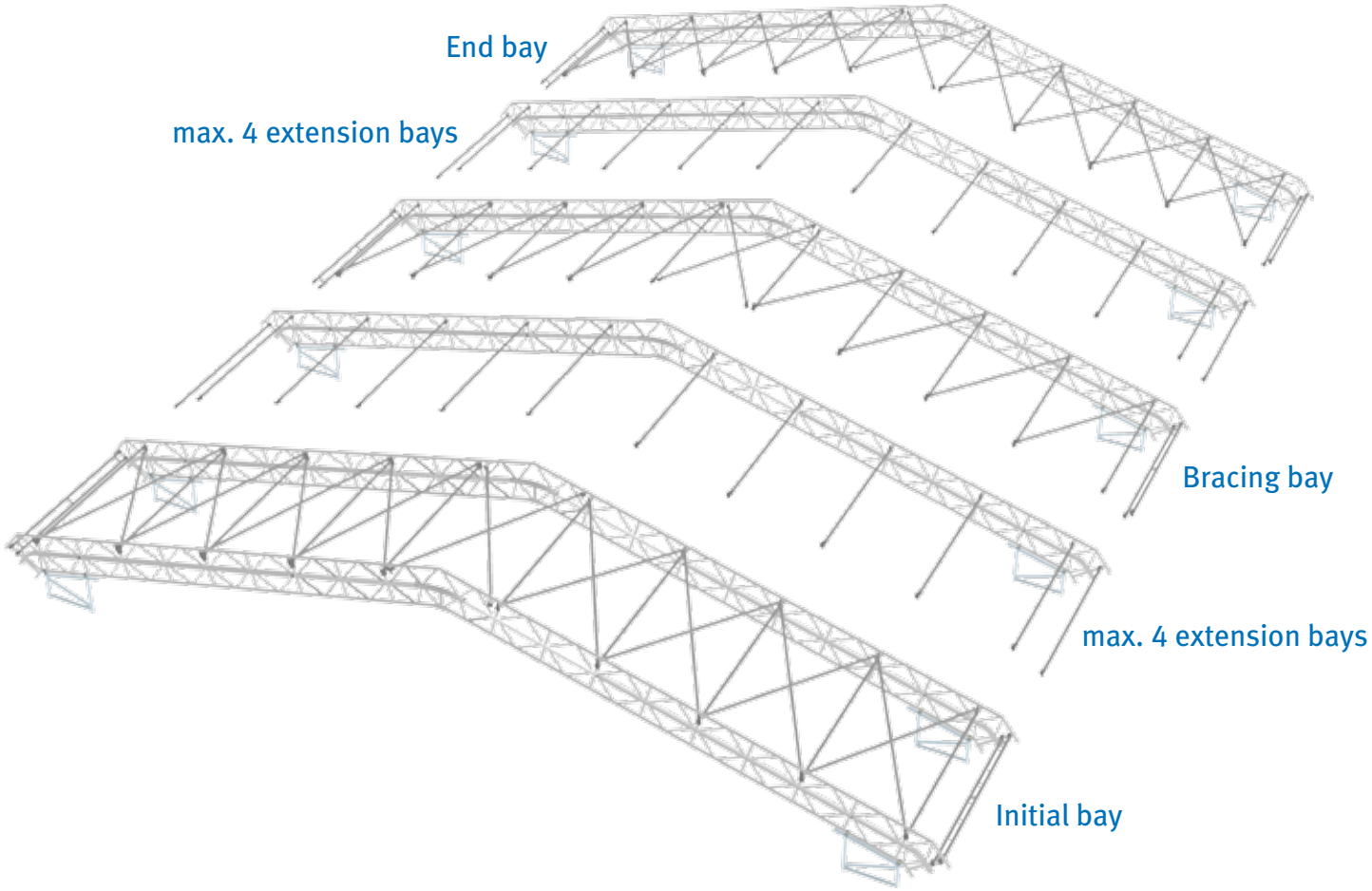
Bracing bays:

Longitudinal ledger	Diagonal ledger	Eaves bracing
Every 1.5 m at top chord Every 1.5 m at bottom chord	Every 1.5 m at top chord single Every 1.5 m at bottom chord single At ridge crosswise	On both sides at top chord

Extension bays:

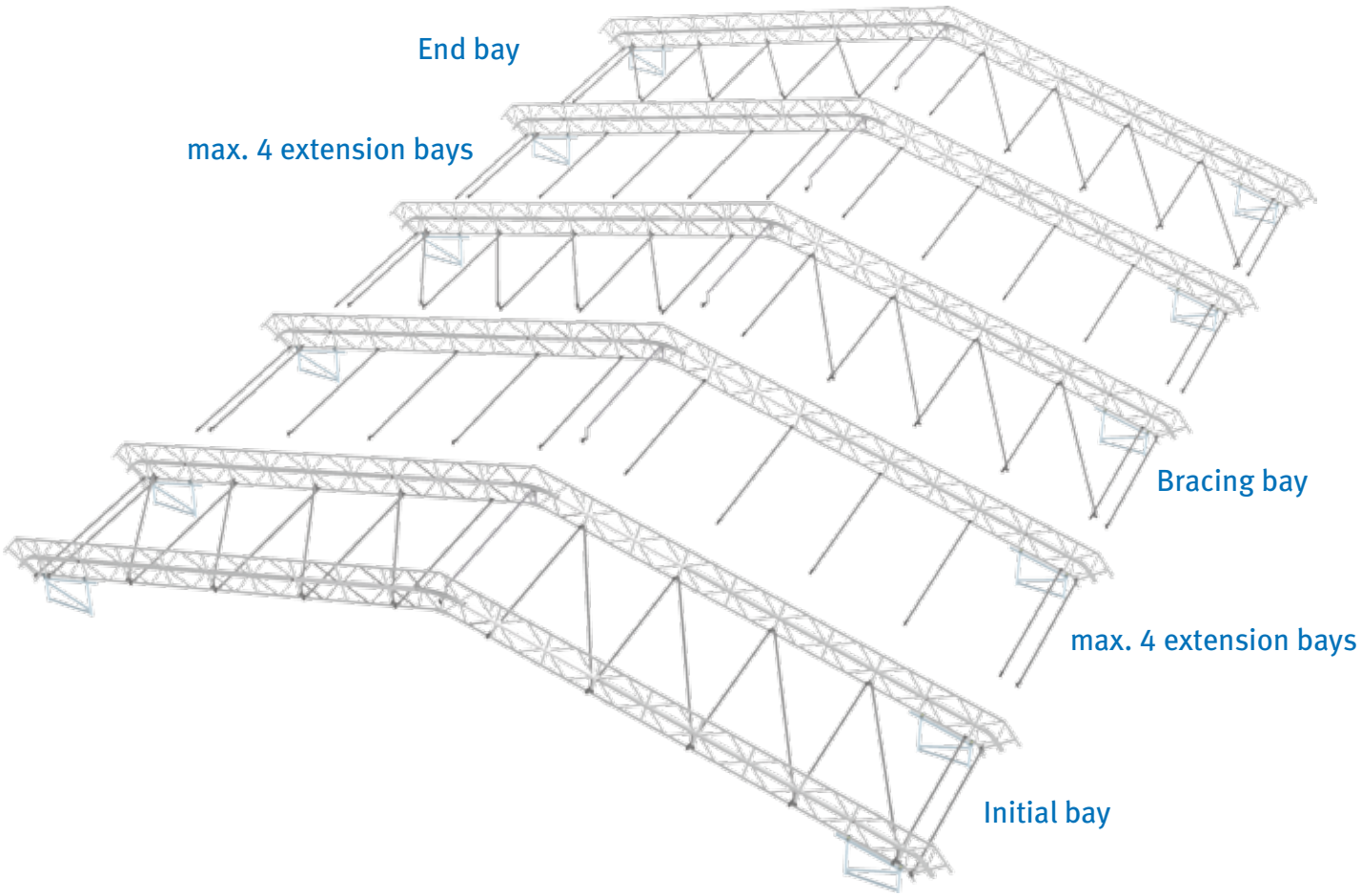
Longitudinal ledger
Every 1.5 m at top chord Every 1.5 m at bottom chord

Illustration of top chord level



Illustrative example for span 13.23 m

Illustration of bottom chord level

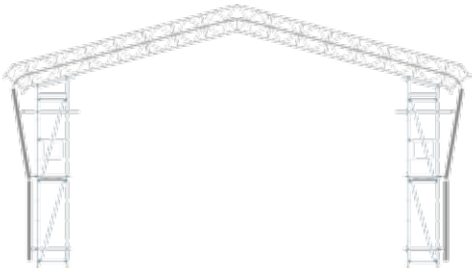


Material example for span 13.23 m

General

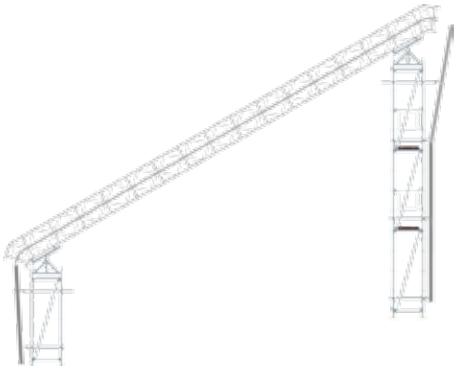
The *VARIO weather protection roof* is a modular system that can be placed upon nearly every scaffolding system. It is, thus, the ideal solution for most applications and fits optimally for both local and technical conditions.
Light-weight and easy to transport components comprised of aluminium and mostly screwless connections, provides for fast and simple handling and assembly.

The *VARIO weather protection roof* can therefore also be used in a cost-effective manner, even for short-term installation periods.



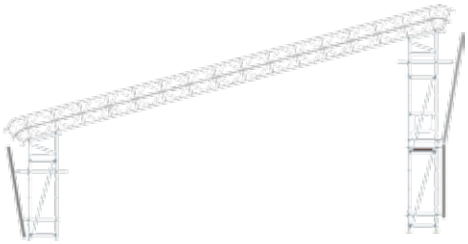
Weather protection roof on substructure, designed as double-pitch roof with 15° roof pitch

The standard design of the *VARIO weather protection roof* applies to all weather protection roofs up to a span of 27.72 m on scaffolds or substructures tightly covered with tarpaulins on all sides. It ends in the eaves area with the roof girder corner section 37.5°.

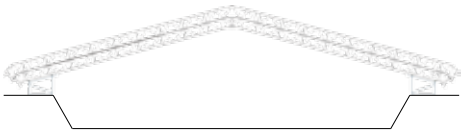


Weather protection roof on substructure, designed as mono-pitch roof with roof pitch between 15° and 40°

If local conditions require it, the weather protection roof can also be used as a mono-pitch roof with an adjustable roof pitch between 15° and 40°. The roof trusses can easily be supported by scaffolds, lattice girders or wall brackets. The maximum span (unsupported length) for mono-pitch roofs is 14.0 m.

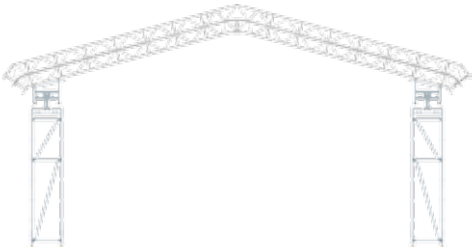


Protective roof on excavation pits, designed as double-pitch roof with 15° roof pitch



To cover excavation pits, conduits, or other ground works, the *VARIO weather protection roof* can be used without side walls.

Mobile weather protection roof on substructure with rail, designed as double-pitch roof with 15° roof pitch



A mobile roof makes it possible to shift each component section by section, depending on manufacturers' ability to equip the site with a crane. Here too, scaffolding material can be saved since roofing can take place in accordance with construction progress.

Weather protection hall mobile on triangular bracket with castor wheel, designed as double-pitch roof with 15° roof pitch

Due to the low weight of the aluminium structure (about 10 kg/m²), the *VARIO weather protection roof* is ideal for mobile halls. Shifting the structure by hand is even possible with larger halls when on level ground. The maximum span is 16 m.

CAUTION

Depending on the required snow loads, wind zones etc. spans must be examined and verified by an object-related structural analysis.

4.1. General

The *VARIO weather protection roof* shall be assembled in compliance with the accident prevention regulations UVV BGV C 22 and the instruction sheets of Bau BG 410 for safety of roof work and the relevant DIN standards (even when used by subcontractors). **Assembly shall be reserved for qualified personnel only.**

Instructions of use for the object concerned shall be issued by the contractor which defines, on the basis of a hazard analysis, and with due regard to the Industrial Safety Regulations, how to best implement the fall protection. Please consider all technical protective measures, such as personal protection equipment to protect against fall, and any special instructions.

It is recommended to assemble and pull in the tarpaulins on the ground as far as possible. The roof bays completely assembled this way (incl. tarpaulin) are lifted onto the substructure, and then the keder tarpaulin is pulled into the intermediate bays when the roof is up.

Where the roof needs to be opened, stationary weather protection roofs should be provided with platforms, serving as work areas, in the eaves area of the roof.

When wind forces reack speed higher than 13.8 m/sec, as per the Beaufort scale, the assembly of the weather protection roof, on the substructure, must be suspended. The roof should not be opened. The roof bays shall only be placed when there is no wind.

Mobile halls must be anchored before tarpaulins are provided.

4.2. Openings in weather protection roof

During pre-assembly, please consider, wheter or not, the roof bays are to be opened during construction.
To the greatest possible extent, the openings should be in the eaves area, because opening and closing is easier there.

Depending on the size of the opening required, it may be necessary to leave out bracings in the relevant roof bays.

If this is the case, the roof bays adjoining the roof bay to be opened, shall be formed as bracing bays. Depending on the type of assembly, the keder roof tarpaulins have to be provided with scaffold ropes of suitable length to ensure a safe opening and closing of the tarpaulins from the work bridge.

If it is necessary in special cases for the weather protection roof to be opened at an unplanned location or if entire truss bays must be removed, it shall be done by qualified scaffolders only.

It is absolutely necessary for workers to wear personal protection equipment (PPE) to protect against falls and to only move on the roof bay when it is closed.

At the end of the working day, take care that all openings are closed. In addition, make sure that you do not open the weather protection roof at wind forces above 13.8 m/sec, as per the Beaufort scale.

4.3. Snow loads

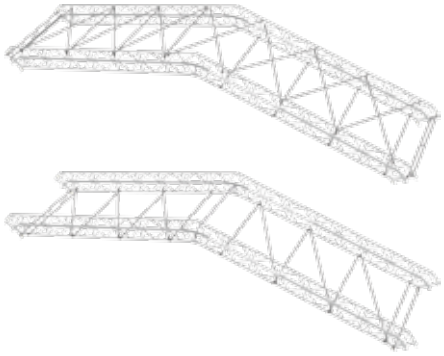
The *VARIO weather protection roof* is designed for a snow load of 0.25 kN/m^2. In special cases, and after consultation with our engineering department, the snow load can be influenced by downstand girders depending on the span.

The maximum snow load can be ensured by heating the enclosure or clearing the roof surface.

When heating is chosen, make sure that a minimum temperature of 12°C is constantly maintained under the ridge. A bracket aisle must be provided for clearing the structure (also see item 4.1.).

The bracket aisle has to be designed as a walkway for clearing the roof surface and as a fall protection should someone access the roof girder.

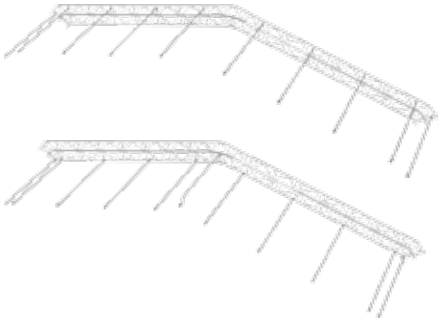
As part of the hazard analysis, the concept of clearing and the related safety measures, such as PPE, have to be defined for the executing party to be able to, if needed, clear the roof surface without delay.



5.1. Roof bays

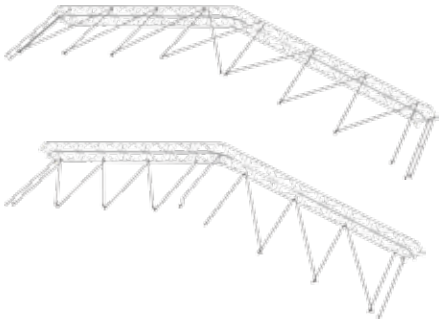
Initial bay

This is the first front-end roof bay. It requires special bracings for sustainable transfer of tension forces from the gable wall tarpaulin.



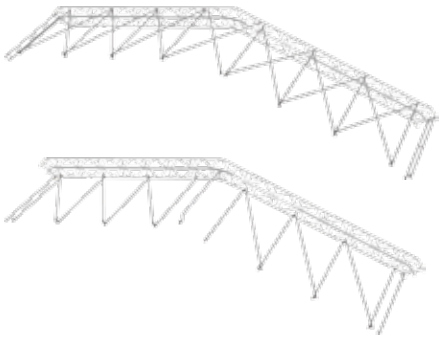
Extension bay

Extension bays are roof bays which are arranged between the braced roof bays. Up to a maximum of four extension bays can be placed between the braced roof bays.



Bracing bay

The bracing bay is used when the weather protection roof has more than four extension bays or when the initial bay, extension bays and end bay are more than six roof bays long (see illustration).



End bay

The bracing of the end bay is similar to that of the initial bay. It is located on the opposite gable end of the initial bay. In the material requirement table (ref. item 8) the end bay differs from the initial bay by a material difference, since the end bay extends the weather protection roof (as do the extension and bracing bays), unlike the initial bay, which does not constitute an independent roof bay.

Examples of roof bay types, each with top chord and bottom chord bracing

5.2. Assembly of roof trusses

After the necessary span has been determined (ref. item 7), the roof girder elements can then be pre-assembled. To do so, place the roof and ridge girders flat on the ground. Provide the roof girders (with pre-assembled spigot fittings and keder profile connectors) with the sponge rubber gaskets supplied. Put them onto the keder profile connectors with the rectangular opening. Now, the girder elements can be telescoped.
It is recommended to place squared timber under the girders to facilitate screwing. Secure the connections between the roof girders at the top chord and bottom chords using 2 hexagon bolts M14x65 (8.8) each, and at the keder rails secure with 2 Allen screws M12x30 (8.8) each.

Connect the girders in the chord area using 4 hexagon bolts for each chord and butt, and 4 cylinder-head screws per butt in the keder area.

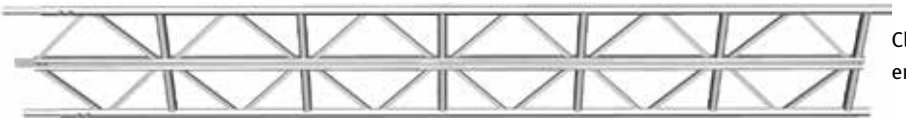
Caution! Important for assembly.

Roof girder seal (sponge rubber), self-adhesive

The figure shows a roof girder as supplied. Make sure that when you dismantle it, that you loosen only the screwed connections with cap nuts and standard nuts respectively, and that the dismantled roof girder complies with this figure.

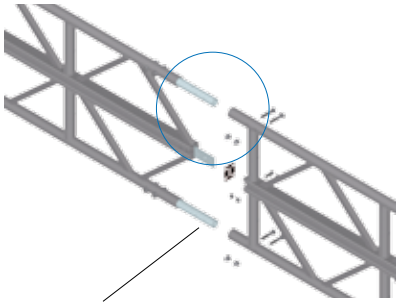
The connecting elements of steel must remain in the “open” end of the roof girder. If the girders are returned incorrectly dismantled, additional costs will be incurred.

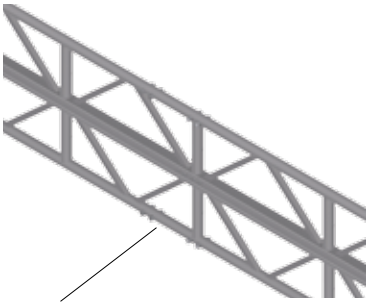
Open end

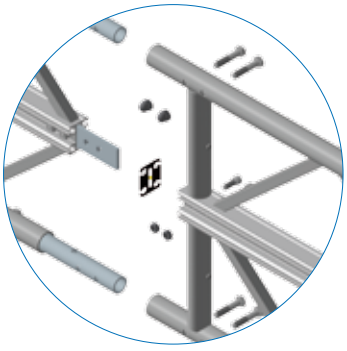


Closed end

Girder butt

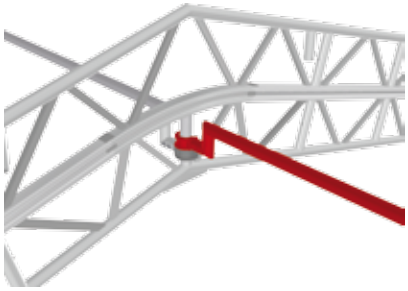






At every girder butt the roof girders have to be connected with 4 hexagon bolts M14x65 (8.8) + cap nut M14 (6) and 2 Allen screws M12x30 (8.8) + nut M121 (8).

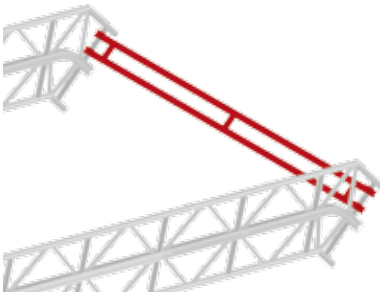
5.3. Roof bracing



5.3.1. Ridge ledger

Mount ridge ledgers in the ridge area of every roof bay to the central vertical tube in the bottom chord area. The ridge ledgers have cranked ends of different length on both sides to ensure that, despite the ridge ledgers being mounted to the same vertical tube, every ridge ledger can be mounted and aligned horizontally on the same level (ref. figure below). The ridge ledgers also prevent the formation of water pockets in the ridge area.

Ridge ledger

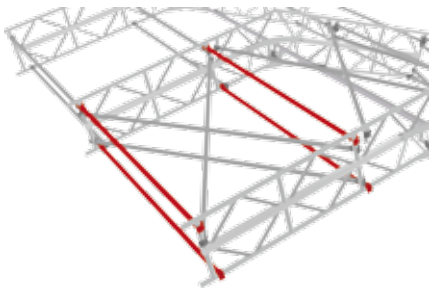


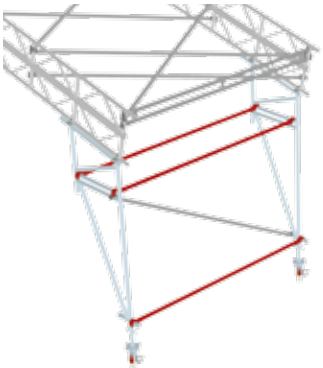
Eaves bracing assembly

5.3.2. Eaves bracing

Mount the eaves bracings onto the outermost vertical tube on the eaves side in the top chord area (in initial bay, bracing bay and end bay). Accordingly, two eaves bracings have to be installed for each braced roof bay.

When using corner sections as eaves ends, the eaves bracing has to be mounted onto the vertical tube in the top chord.





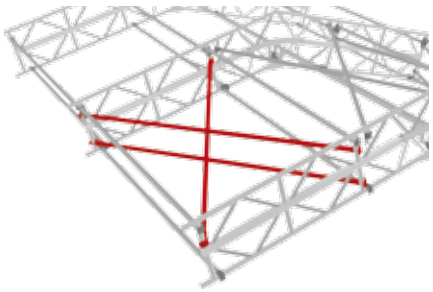
5.3.3. Longitudinal ledger

Mount the longitudinal ledgers in the top chord area (above the keder profile) onto the vertical tubes, and mount the bottom chord profile (below the keder rail) onto horizontal tubes. Make sure that all longitudinal ledgers in the bottom chord area are mounted at the location described, otherwise a sagging of the keder tarpaulin might be possible and “water pockets” may form (ref. detail).

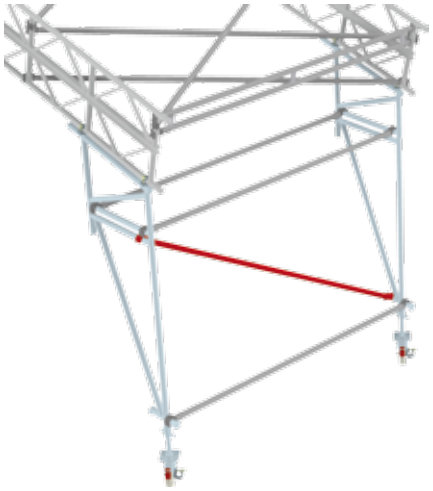
For mobile halls, longitudinal ledgers are installed, both, in the roof and the wall area at the triangular brackets.

5.3.4. Diagonal ledger

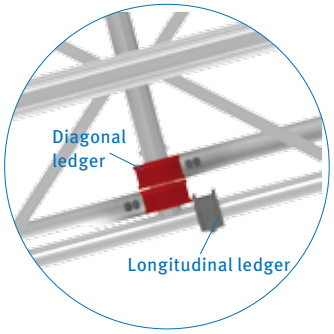
Make sure that the diagonal ledgers in the bottom chord area are mounted, as close as possible, to the bottom chord to ensure keder tarpaulins are properly fastened and are not drooping down (ref. detail).



Mount the diagonal ledgers in the top chord area (above the keder rail) onto the vertical tubes, and mount the diagomal ledgers in the bottom chord area (below the keder rail) onto the vertical tubes, in the initial bay, end bay and bracing bays. At the ridge, the diagonal ledgers are mounted crosswise in the top chord area of the vertical sockets.



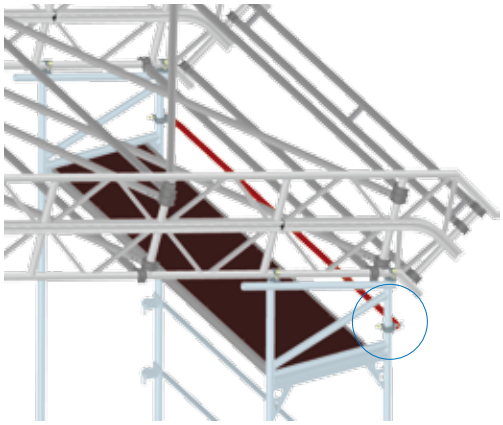
For mobile halls, diagonal ledgers are installed both in the roof and wall area at the triangular brackets.

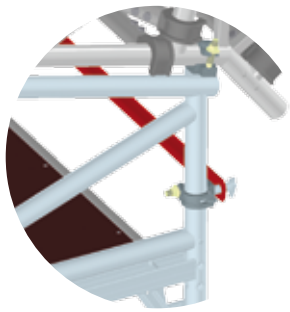


Detail: In the bottom chord area the longitudinal ledgers are not mounted onto the vertical tubes but on the bottom chord. Mount the diagonal ledgers onto the vertical tube resting on the bottom chord.

5.3.5. Eaves ledger

Eaves ledgers are used to fasten the roof tarpaulin. They are attached to the girder supports, assembly frames, or triangular brackets, by means of the tilting pin couplers or keder rails with tilting pin.





5.4. Position of roof bracings in the individual bays

Initial and end bays:

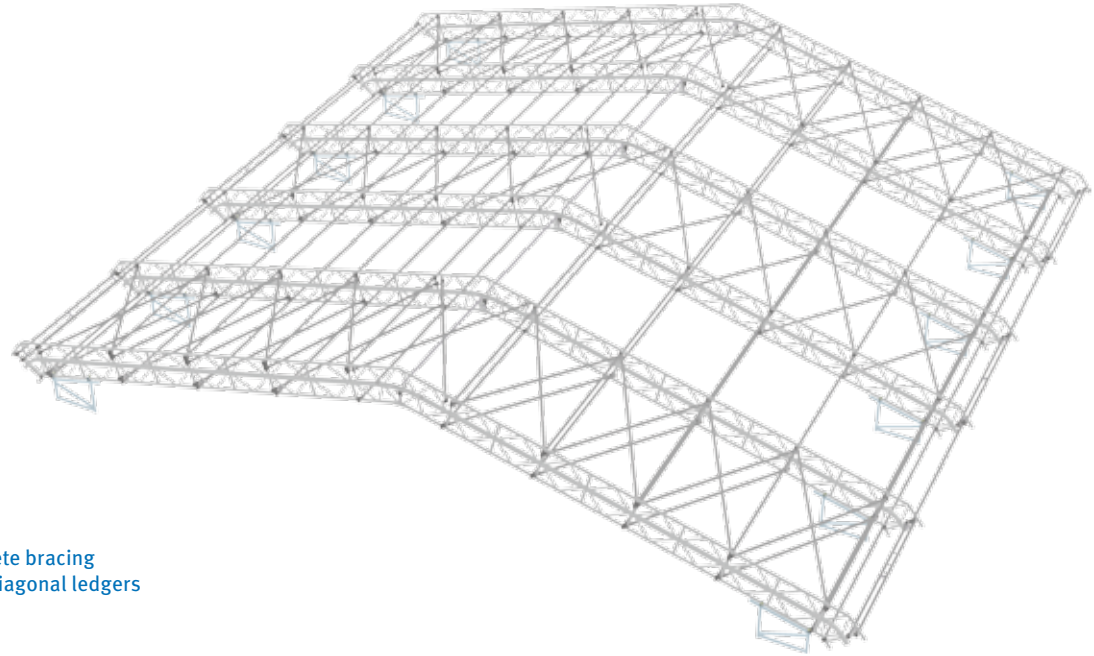
Longitudinal ledger	Diagonal ledger	Eaves bracing
Every 1.5 m at top chord Every 1.5 m at bottom chord	Every 1.5 m at top chord crosswise Every 1.5 m at bottom chord single At ridge crosswise	On both sides at top chord

Bracing bays:

Longitudinal ledger	Diagonal ledger	Eaves bracing
Every 1.5 m at top chord Every 1.5 m at bottom chord	Every 1.5 m at top chord single Every 1.5 m at bottom chord single At ridge crosswise	On both sides at top chord

Extension bays:

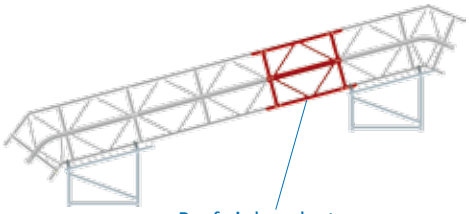
Longitudinal ledger
Every 1.5 m at top chord Every 1.5 m at bottom chord



The figure shows the complete bracing including longitudinal and diagonal ledgers

5.5. Assembly of roof girder corner section 37.5°

The corner section can be easily attached to the roof girder, and thus it is possible to pull the keder tarpaulin over the eaves. Initially, connect the roof girder corner section to the roof girder after the span has been determined. Next, put the corner section flat down on the ground and insert it into the relevant roof girder with the pre-assembled spigot fittings and keder profile connectors. Prior to assembly, it is necessary, however, to place the roof girder sealing at the keder profile. The adhesive properties of the sponge rubber provide for a proper positioning at the keder profile. Secure the connection between the roof girders at the top and bottom chords with 2 hexagon bolts M14x65 (8.8) each, and at the keder rails with 2 Allen screws M12x30 (8.8) each. It is recommended that squared timber is placed underneath during assembly.



Roof girder adapter
Article No.: 4712100

For the construction of mono-pitch roofs, the corner section must be assembled on both sides of the roof girder. Due to the offset of the keder rail at the top and bottom chord, it is necessary to insert an adapter on one side, which has to be placed between the roof girder and the corner section.

5.6. Assembly of roof panels

Usually, construction starts with the initial bay.

To this end, two pre-assembled roof trusses have to be put up (by hand with smaller spans, otherwise by crane) and placed onto a mounting frame of scaffold elements or secured by strutting. The roof trusses are put up at the distance of the grid size and are parallel to each other.

Now, the roof bracings have to be mounted as per item 5.4.

Make sure that the roof bracings are always mounted starting with the eaves upwards to the ridge, and from the ridge downwards to the eaves. Thus, avoiding twisting and distorting.

If the standing height exceeds 2.0 m, when assembled on ground, the work has to be carried out from a mobile scaffold tower.
If several roof bays are to be lifted at the same time, up to three roof bays can be pre-assembled in the same manner.

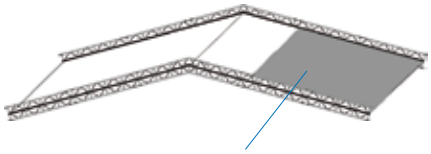
5.7. Assembling the roof tarpaulins

The keder tarpaulins can be inserted through the two keder grooves on each side in the centre chord of the roof girder. With the VARIO weather protection roof keder roof tarpaulins can be assembled in three different ways.

5.7.1. Keder roof tarpaulin from eaves to eaves (1 tarpaulin per roof bay)

This version is used for small spans, because it needs a large tarpaulin length.

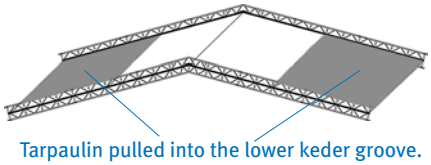
5.7.2. One keder roof tarpaulin on each roof side, overlapping at the ridge (2 tarpaulins per roof bay)



Tarpaulin pulled into lower keder groove.

Two keder grooves allow an overlapping of the keder roof tarpaulins. This method is used for medium spans up to 19 m.

5.7.3. One keder roof tarpaulin on each roof side, one keder roof tarpaulin at the ridge overlapping the two roof-side tarpaulins (3 tarpaulins per roof bay)



Tarpaulin pulled into the lower keder groove.

This method is used for large spans. The outer tarpaulins are pulled into the lower ones, the ridge tarpaulin into the upper keder groove. Keder roof tarpaulins for all intended purposes can be gathered from the material requirements table on pages 38 to 41.

5.8. Fastening the roof tarpaulins

According to the three possibilities described in 5.7., the keder roof tarpaulins are laid out on the eaves side of the completed roof bay and inserted into the relevant keder groove. A scaffold rope is then fastened to the front-end eyelets and is used to pull the keder roof tarpaulin to the position needed. Since, in most cases, the standing height exceeds 2.0 m, the tarpaulins shall be placed from a mobile scaffold tower.

Fasten the keder roof tarpaulins as follows:

5.8.1. Keder roof tarpaulin from eaves to eaves (1 tarpaulin per roof bay)

After the roof bay has been mounted onto the substructure, fasten the keder roof tarpaulin to the assembled eaves ledgers using cam buckle straps (ref. eaves ledger page 15). Prior to the assembly on the substructure, loosely fasten the keder roof tarpaulin to the roof girders.

5.8.2. Keder roof tarpaulin from eaves to eaves, overlapping at the ridge (2 tarpaulins per roof bay)

The keder roof tarpaulins must overlap in the ridge area by min. 2.00 m. In the ridge area, the keder roof tarpaulin must be secured to the vertical tubes of the roof girders by the scaffold ropes used for pulling, with the tarpaulin in the lower keder groove to be fastened at the vertical tube, and the tarpaulin in the upper keder groove at the vertical tubes in the top chord area.

In the eaves area, the tarpaulin has to be fastened, after roof bay assembly on the substructure, to the assembled eaves ledgers using cam buckle straps (ref. eaves ledger item 5.3.5.).

Prior to the assembly on the substructure, loosely fasten the keder roof tarpaulin to the roof girders.

5.8.3. One keder roof tarpaulin on each eaves side, one keder roof tarpaulin, at the ridge overlapping over both eaves-side tarpaulins (3 tarpaulins per roof bay)

In the roof area the keder roof tarpaulins on the roof sides are fastened to the vertical tubes in the bottom chord area by means of the scaffold ropes, in the eaves area to the assembled eaves ledgers (ref. eaves ledger item 5.3.5.).

Prior to the assembly on the substructure, loosely fasten the keder roof tarpaulin to the roof girders. Fasten the tarpaulin at the ridge to the vertical tubes in the top chord area using the scaffold ropes needed for pulling on both sides of the ridge.

5.9. Crane lifting of roof bays

Prior to the assembly of roof trusses as roof bays, note that no more than 3 roof bays can be moved on one crane lift.

For every crane lift there must be at least one braced roof bay.

If there is no braced roof bay for a planned crane lift due to unfavourable segmentation, an extension bay must be braced like a bracing bay.

Should it be necessary to lift a single roof girder, it must additionally be made bend-proof along the girder using a lattice girder or steel tubes and couplers, because otherwise the roof girder may kink.

To provide an attachment point for the crane gear, lattice girders are mounted along the highest point of the middle third (ref. item 7, pages 36/37) of each roof side at the top chord of the roof girder.

5.10. Placing the pre-assembled roof bays onto the substructure

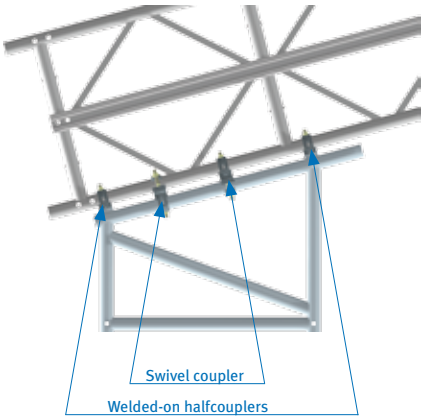
Upon completion of pre-assembly, the roof bays can be placed onto the substructure. The substructure requirements must have been met (ref. requirements of substructure, item 6) and the girder support must be attached to the assembly frame and properly secured by locking clips to prevent lift-off.

Attach the roof bays as described in item 5.8. and lift them to the place of destination. Use a guide rope for this purpose.

After the roof bays have been placed onto the girder supports, couple the roof trusses with two welded-on halfcouplers and two pre-assembled swivel couplers. Make sure that the roof overhang is positioned the same at all roof trusses and on each side.

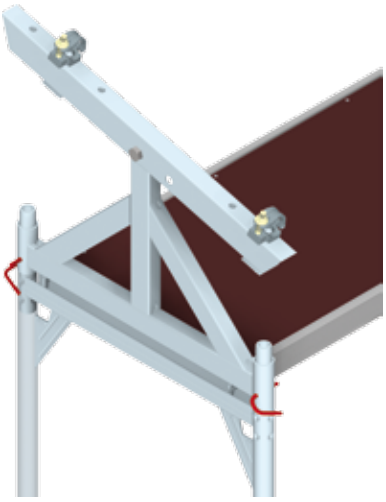
After the roof bays have been firmly installed, fasten the keder roof tarpaulins on the eaves side to the mounted eaves ledgers using cam buckle straps (ref. item 5.9.).

When all roof bays have been installed by crane, all possible gaps must be closed.



5.10.1. Assembling keder roof tarpaulins from a working platform

In such case, no longitudinal ledgers are needed in the empty bays. Fasten the keder roof tarpaulin to the scaffold ropes laid out beforehand on the neighbouring bays and pull it to the required position from the opposite side of the roof using an idler pulley arranged in the ridge area and fix it. In the eaves area the tarpaulins are fastened to the eaves ledgers by means of cam buckle straps.



5.11. Assembling pin-jointed girder support

The pin-jointed girder support is suitable for the construction of double-pitch or mono-pitch roofs, adjustable to any roof pitch up to 40°. Select the support according to the centre-to-centre distance and place it onto the existing substructure. After that secure the support additionally with a locking clip. When positioning the roof bay, tilt up the couplers, depending on the static requirements up to four couplers, so that the braced roof bay can be mounted properly.

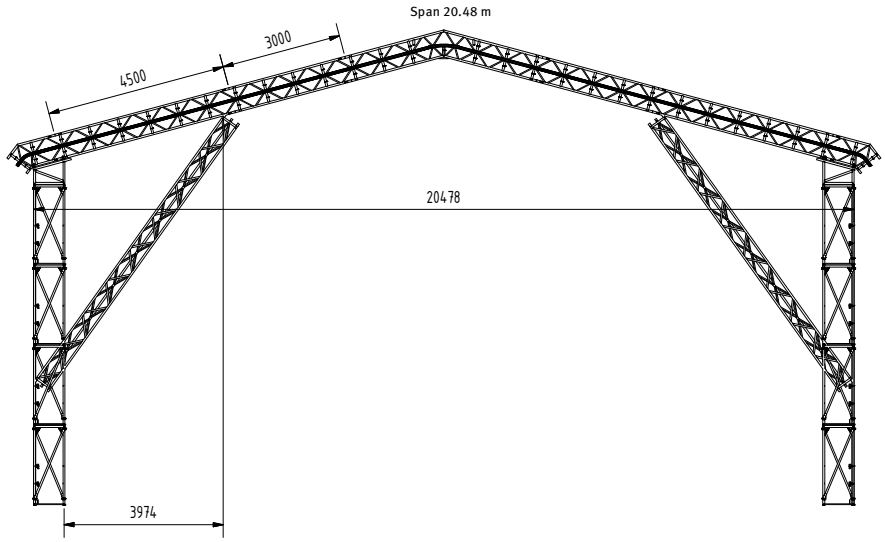
CAUTION

Spans and the number of couplers at the girder support have to be examined and verified depending on the required snow loads, wind zones etc. by an object-related structural analysis.

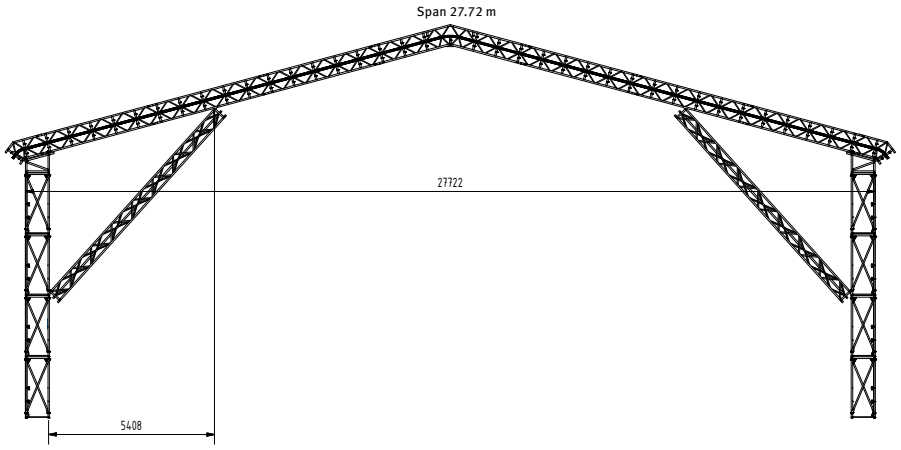
5.12. Assembling the head struts

If head struts have to be installed in the weather protection roof due to static requirements (ref. material requirement tables, pages 38 – 41), then they have to be mounted onto the roof trusses shortly before being placed onto the scaffold. To this end, the roof bay to be placed is lifted by the crane and secured, then a chord of the head strut (three-chord lattice girder) is connected with the roof truss from a mobile scaffold tower. A swivel coupler is to be used for the connection that is coupled in front of a vertical tube and secured by a second upstream coupler resp. The distance of the head strut from the internal strut of the substructure can be gathered from the diagram below. A rope should be attached to the head strut so that it can be easily pulled and mounted after the roof bay has been placed.

Attach the head struts to the substructure with both cross beams. If there is a lack of space or design requires so, and depending on the stress analysis result, provide tension belts in combination with head struts or tension belts only. In most cases, it requires solutions that are tailored to the individual site.



This version applies to weather protection roofs of spans from 20.48 m to 23.38 m.



This version applies to weather protection roofs of spans from 24.83 m.

5.13. Keder rails for wall covering


(1)

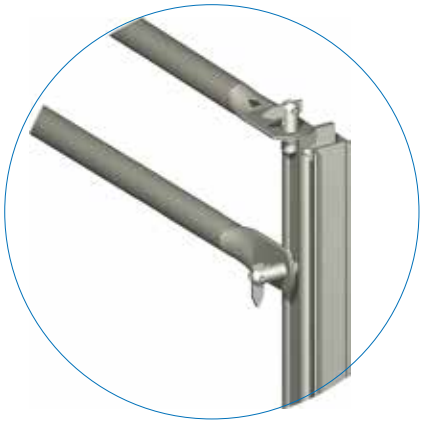

(2)

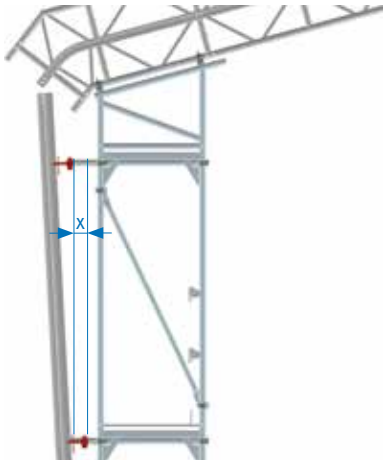

(3)


(4)

The keder rail is installed by means of a keder rail holder. The latter is fixed to the scaffold every 2 m only. The keder rail is positioned through lateral insertion (1) into the fixed part of the keder rail holder (2). By clicking the keder rail into the end position, the movable part of the holder closes automatically and embraces the keder rail (3). Keder rail and holder are secured non-positively and positively by a hammer blow onto the wedge (4).
Due to the continuous arrangement of the keder rail at the scaffold, regardless of the position and number of keder rail holders, an installation is possible at any time.

A keder rail with tilting pin is used to fasten the eaves ledgers so that the roof tarpaulin can also be fastened when keder rails are used in the eaves area. When an eaves ledger connection is inserted into the upper opening of the keder rail, the wall tarpaulin can be fastened through the use of another eaves ledger.





5.14. Keder rail wall profiles for flexible wall covering

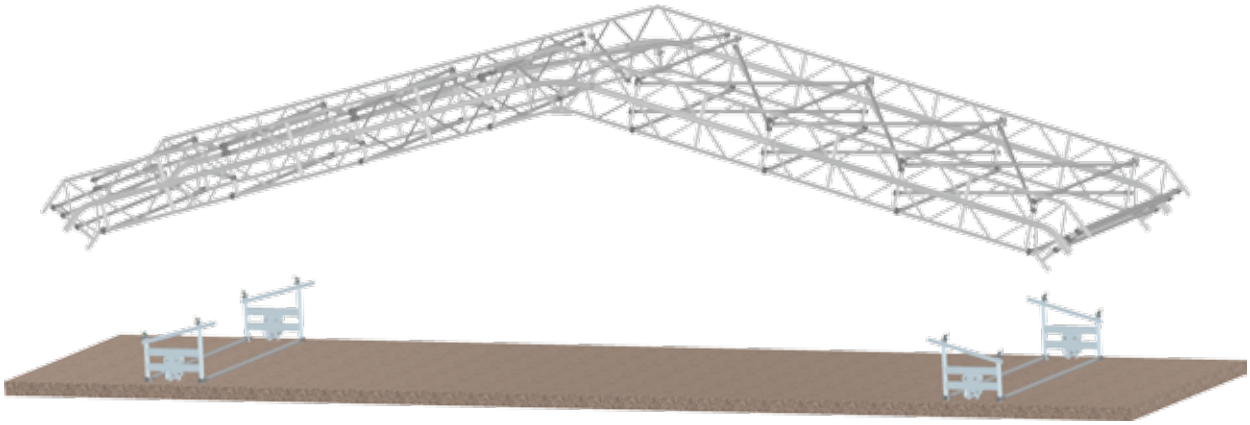
To adjust the inclination of the keder rail to the tarpaulin run, the adjustable keder rail holder is needed. The seat of the keder rail wall profile is movable by 360°. Unlike the standard keder rail holder, the adjustable keder rail holder is not fasted to the scaffold but through scaffold tubing coupled with the assembly frame at the internal and external strut. The inclination is set through the offset (X) of the keder rail holders to each other. The keder rail is installed as described in item 5.13., however. For this either a keder rail (single keder groove) or a keder rail wall profile (keder groove on both sides) can be used (ref. figure on the left)

5.15. Assembling a mobile double-pitch roof on substructure

The rolling frame with girder support 15° and a few additional components make the ALFIX weather protection roof mobile. Low deadweight and the rail system make it easy to shift by hand.

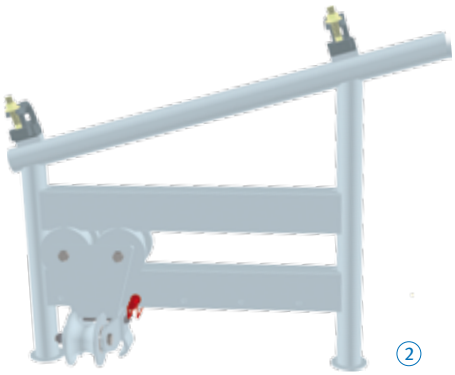
Assembling the rolling frame with girder support 15°

For assembly, we recommend lifting the braced roof bay by crane and assembling the rolling frame from below. The welded disks on the left and right vertical tube of the rolling frame make it possible to put up the rolling frame horizontally on the ground and position it accordingly (Fig. 1). Then, the rolling frames have to be braced to each other. To this end, a longitudinal ledger is attached to the rolling frame on the left and the right side. Before placing, the couplers should be opened. After placing, connect the rolling frame with the roof bay using the couplers.



1

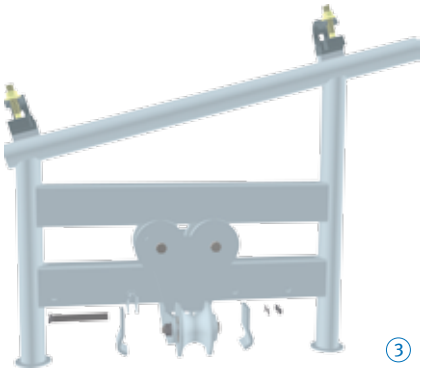
During assembly it is vital to pay attention that the locking pin of the rolling frame is in transport position (Fig. 2). **Important! Failing to do so may cause injuries due to accidental shifting in transverse direction.**



2

CAUTION

Observe transport position!

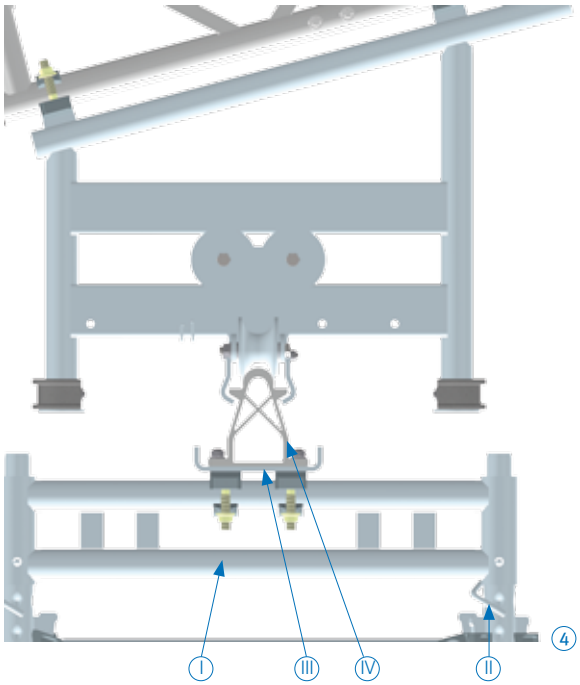


③

Then, the roof bay and the rolling frame can be placed on the rail by means of a crane (attachment points ref. pages 36/37). Prior to that, remove the lift-off preventer at the rolling frame (Fig. 3). Loosen the screws and remove the sheet plate. After positioning, attach the lift-off preventer at the rolling frame again (Fig. 4).

If the removal of the lift-off preventer is to be avoided, the rolling frame can also be 'threaded' from the end of the rail (Fig. 4). Immediately after threading, the rolling frames have to be braced with longitudinal ledgers. Then, the roof bay can be put down on the rolling frame and mounted.

Slight inaccuracies when placing it on the rail can be equalized by the rolling frame in transverse direction.

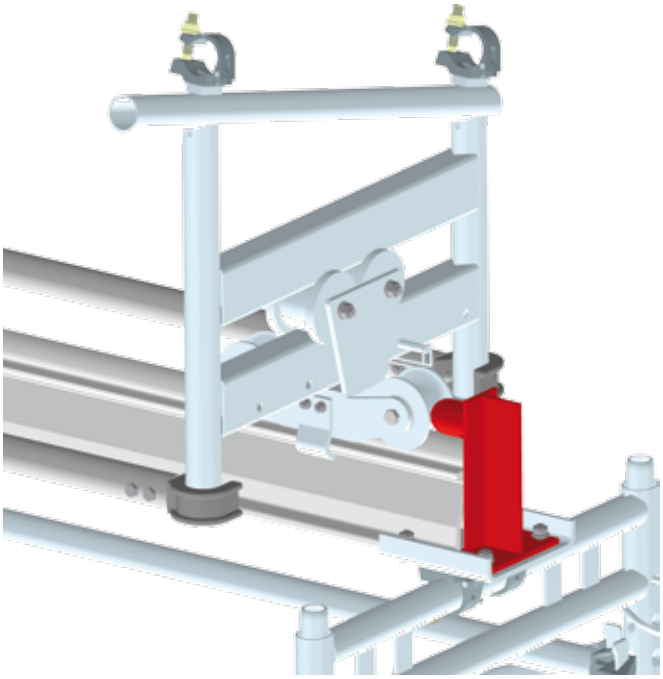


④

Assembly is also possible with a gable-end scaffolding. The gable-end scaffolding must be put up in accordance with the relevant instructions for assembly and use. Such scaffolding should be in line with the length of the roof bay (3.07 m x 2.57 m/3.00 m x 2.50 m). To compensate for the roof pitch, it is recommended to put up the scaffold in steps of 0.5 m up to the ridge. After the rail has been installed the rolling frame is placed on it and protected against lift-off. To stabilize the rolling frames it is necessary to brace them to each other by longitudinal ledgers (Fig. 1). Once done, the pre-assembled roof truss can be placed onto the rolling frame from the gable-end scaffolding. It is screwed together with the rolling frame and provisionally secured against tilting. In the same manner, secure the second roof truss. When both roof trusses have been assembled and secured, the bay is braced (ref. pages 14/15). The braced roof bay can be pushed on to the rail and the next bay is connected.

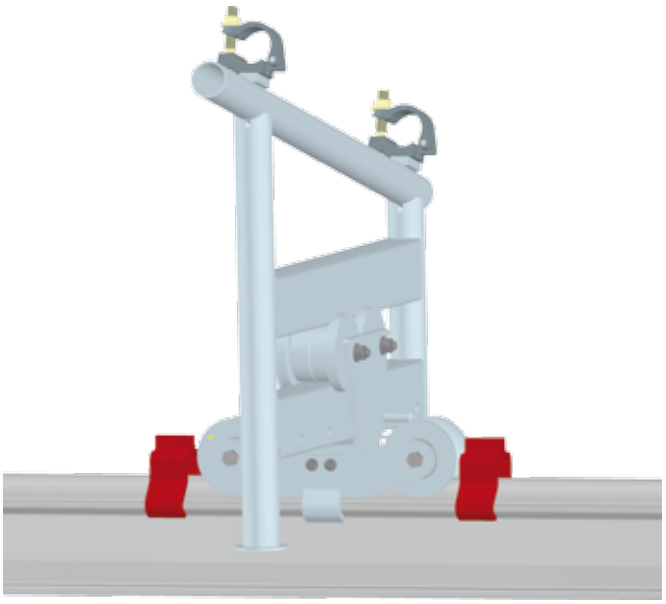
Assembling the rail

Select the rail (Fig. 4, IV) according to the bay width of the scaffold. When used in façade scaffoldings an adapter will be required. Place the adapter (Fig. 4, I) on to the assembly frame and secure it with a locking clip (Fig. 4, II). Attach the support plate to the upper tube of the adapter (Fig. 4, III). Connect it with the adapter by means of the integrated halfcouplers. Centrally align the support plate on the adapter, level in transverse direction to the adapter using a water level and tighten the halfcouplers. Tip: For support plate aligning on the adapter in longitudinal direction, the rails (prior to leveling by water level) can be briefly put down. Then, the rails of aluminium can be assembled.
The rails must be laterally aligned to each other to prevent any offset. Then, firmly connect the rail with the support plate using 4 M12x35 screws. Provide a support plate under every rail joint.



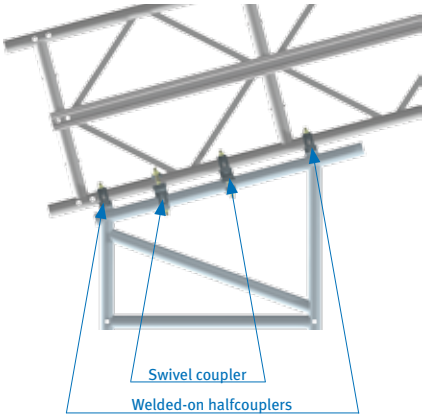
⑤

Provide stoppers on the rail to prevent displacement (Fig. 6). The stopper holds the rail like a claw and has to be screwed on after positioning. When the roof needs to be shifted the stoppers have to be released again. Once released it is recommended to install a bumper on each side of the rail as a stop. Place the bumper at the open end of the support plate and screw it in (Fig. 5).
In transverse direction the rolling frame must be secured against displacement by means of a locking pin. The pin should be used to reduce the freedom of movement to a minimum. The hole spacing provides for an independent protection in transverse direction.



⑥

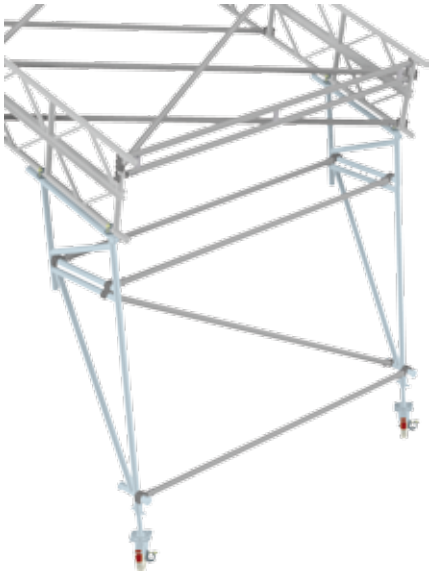
5.16. Assembling the roof bays for mobile weather protection halls



Girder supports are mounted onto the necessary roof trusses. Make sure that both girder supports are fastened to the same location on the corresponding roof truss side.

Couple the girder supports using two welded halfcouplers and two pre-assembled swivel couplers. Then, insert the triangular brackets into the girder supports and secure them with locking clips against lift-off.

After the castor wheels have been pushed into the triangular brackets, the first two pre-assembled roof trusses can be raised (by crane usually) and placed onto a mounting rack of scaffold components or secured by strutting. The roof trusses are arranged in parallel at the distance of the grid size.



Now, mount the wall bracing at the triangular brackets. To this end connect the lower tube connections with the upper horizontal tube with two longitudinal ledgers and one diagonal ledger each. Now, the wall bracings have to be positioned according to item 5.4. Since the standing height exceeds 2.0 m, the work has to be carried out from a mobile scaffold tower. Make sure that roof bracings are always mounted beginning at the eaves up to the ridge, and from the ridge down to the eaves. Twisting and distortion of the roof girder are thus avoided. After all roof bays have been pre-assembled this way, the castor wheels (with pre-assembled halfcouplers) should be connected with each other with steel tubes to ensure the track stability of the structure.

5.17. Anchorage of a mobile hall

Before the tarpaulins are pulled into mobile halls, they have to be anchored. Mobile halls must always be anchored from every strut on the ground. If this is not feasible, the spacing between the points of anchorage can be changed by providing an auxiliary structure.

To this end, triangular brackets with lattice girders are connected in longitudinal direction and anchors are placed at the lattice girders. It must be taken into account that every strut has to be secured against lift-off and horizontal displacement. The ballast, to be considered, depends on the size and type of roofing (object-related structural analysis).

Due to the low deadweight of the structure, mobile weather protection halls can only be shifted when there is almost no wind. As soon as the required position has been reached, the hall has to be anchored again immediately.

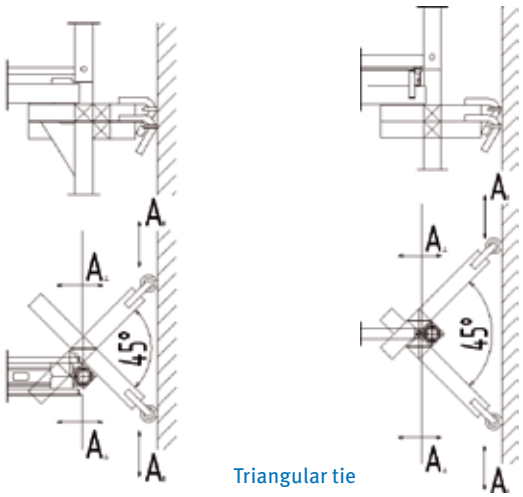
6.1. General technical details of scaffold bracing for VARIO weather protection roof

1 Assembly frame, steel
2 Diagonal cross braces
3 Triangular tie or double anchor
4 Scaffold tube (steel) with swivel coupler
5 Girder support (secured by locking clips)
6 Roof girder corner section 37.5°
7 Roof girder, aluminium
8 Lattice girder, steel, for scaffold bracing
9 Scaffold tube, above and below decks for girder bracing
10 Keder tarpaulins with ropes or belt ties
11 Lower anchorage (cantilever end)

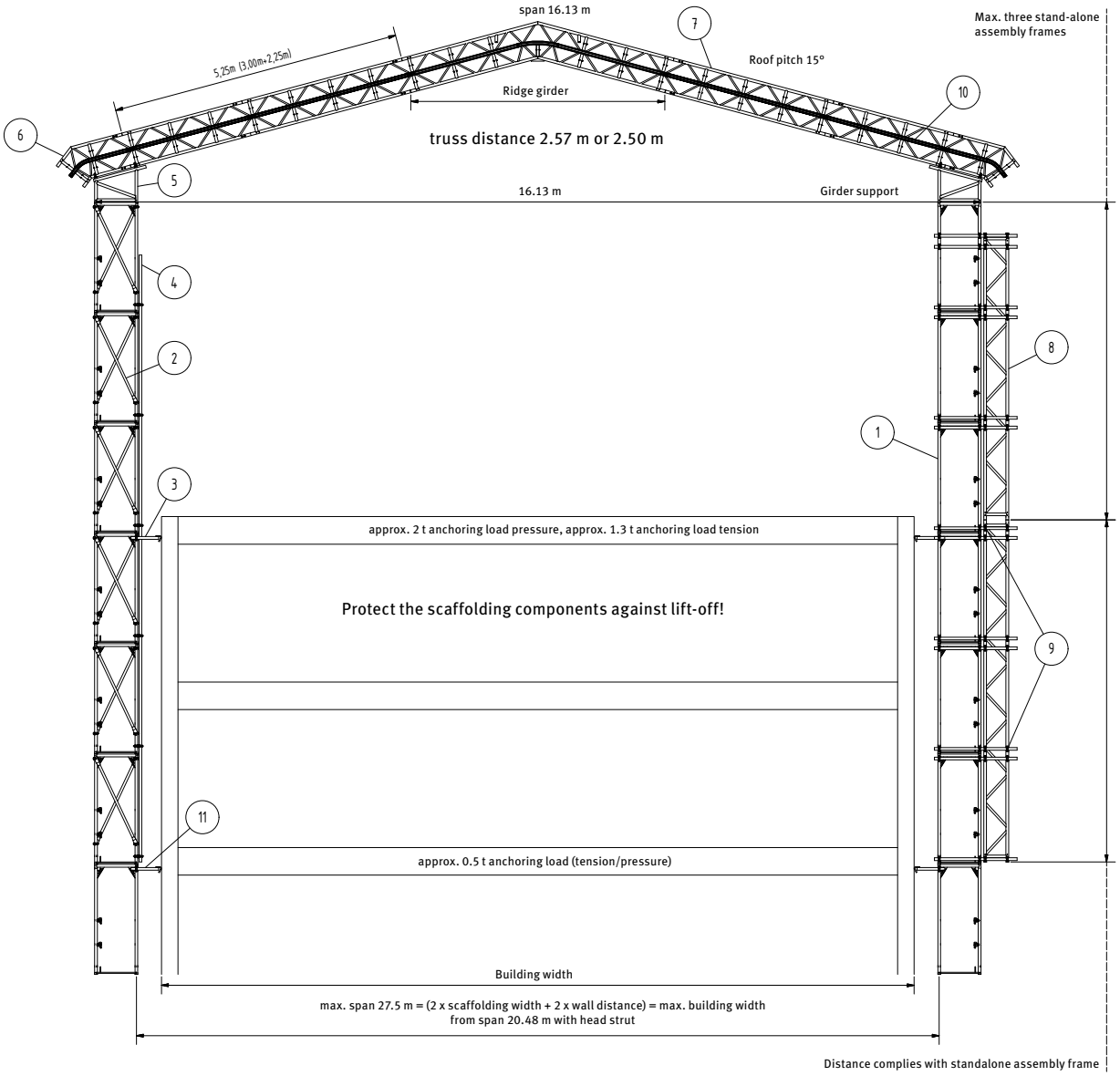
Scaffold bracing in longitudinal direction with diagonals at internal strut and external strut, arrangement of bracing bays as in the roof.

In addition to the heavy-duty anchors (3) and (11), the scaffolding has to be anchored according to the standard version.

Max. permissible snow load: 0.25 kN/m²; scaffolding to be covered with tarpaulins from all sides; standard construction height up to 20 m above ground; all roof openings must be closed daily at the end of work.



Triangular tie



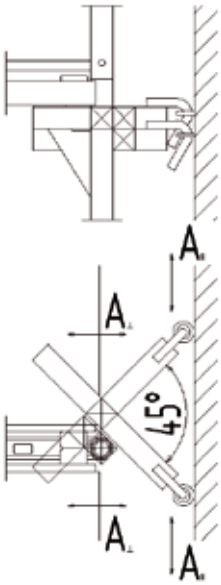
CAUTION

Before the tarpaulins are applied, keep in mind that every roof truss has to be anchored. Every roof truss should be anchored to the ground. The ballast to be considered depends on the size and type of roofing (object-related structural analysis).

Depending on the snow loads, wind zones etc. spans have to be examined and verified by object-related structural analysis.

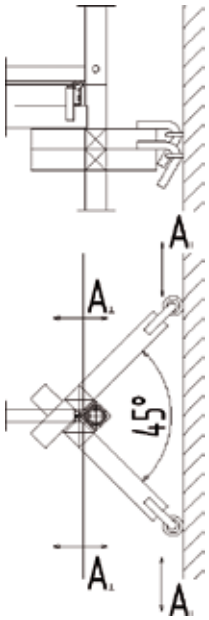
6.2. Explanation

The *VARIO weather protection roof* can be mounted both on scaffoldings of 2.50 m spacing and 2.57 m spacing. It is suitable for assembly frame widths of 0.732 m and 0.739 m resp. and 1.065 m and 1.088 m resp. According to the stress calculation the weather protection roof can be placed on maximum three scaffolding levels projecting over the last anchor (ref. General technical details of scaffold bracing). A working platform of scaffolding brackets or keder brackets has to be positioned at the uppermost assembly frame to decks height.



6.3. Anchoring of longitudinal wall

The space between the roof support point and the topmost anchor must be the same as that between the topmost anchoring point to the next lower one. At a projection of four meters, for example, the lower anchor must be provided four meters below the topmost anchor (ref. diagram, item 6.1). Every single strut must be anchored. The uppermost anchor is a triangular tie because of the high forces. The respective lower anchor is fixed by means of a single anchor point. The anchoring described above only refers to a façade scaffolding in combination with a weather protection roof.
Regardless of the instructions above, a façade scaffolding must be anchored according to the respective technical approval.



6.4. Anchoring the gable wall

The gable walls are anchored at the same height. Here too, the upper anchor comes as a triangular tie. The lower one is a standard type.

6.5. Scaffold bracing of longitudinal wall

Reinforce the internal struts of the scaffolding frame using an additional tube 48.3 mm according to DIN EN 39. Connect the tube to the quarter points of the scaffolding frame. Brace the assembly frames in the cantilever area (lower anchor to roof support) in a crosswise manner using two diagonal cross braces. Brace the assembly frames in the area below the head strut connection in a crosswise manner using four diagonal cross braces. Brace the scaffold in longitudinal direction using one scaffold diagonal at the internal strut and one at the external strut. The bracing bays are arranged in the same way as those of the roof. If the described bracing of the assembly frames is not possible due to construction work in this area, vertically connect lattice girders to the external struts of the assembly frame along the cantilever. Make sure that steel lattice girders are used. The girder chord has to be braced every 2.0 m in transverse direction or connected to the assembly frame (both struts) by a scaffold tube above or below the scaffold decks.

6.6. Scaffold bracing of gable wall

Reinforce the internal struts of the scaffolding frame using an additional tube of 48.3 x 3.2 St. 235. Connect the tube to the quarter points of the scaffolding frames. Brace the assembly frames in the cantilever area (lower anchor to roof support) in a crosswise manner using two diagonal cross braces. If the described bracing of the assembly frames is not possible due to construction work in this area, vertically connect lattice girders to the external struts of the assembly frame along the cantilever. Make sure that steel lattice girders are used. The girder chord has to be braced every 2.0 m in transverse direction.

7.1. Determining the span of a fixed weather protection roof on scaffolds

To determine the necessary spans, observe the following:

- Projection of the building (bays, eave projections)
- Scaffolding used (0.73 m/0.74 m or 1.09 m/1.10 m)
- Type of wall sheeting (standard or keder technology)

The required span consists of:

④ Type of wall sheeting

③ Scaffold width

② Wall spacing

① Building width

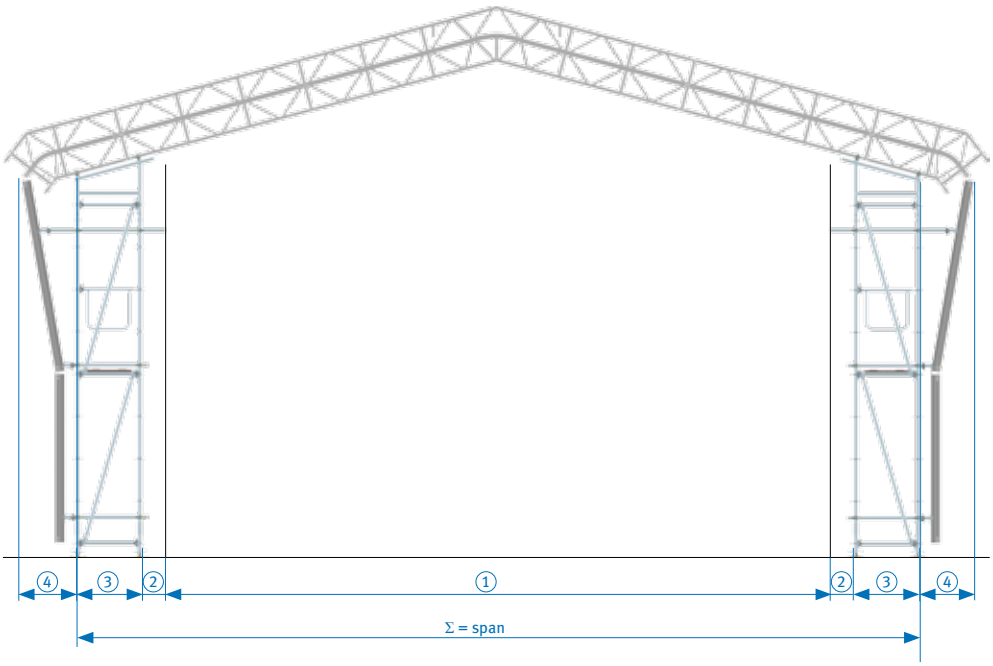
② Wall spacing

③ Scaffold width

④ Type of wall sheeting (for keder rails about 20 cm)

CAUTION

Depending on the required snow loads, wind zones etc. spans must be examined and verified by a object-related structural analysis



7.2. Determining the span of a mobile hall

To determine the necessary spans, observe the following:

- Required clear width
- Required clear internal height (eaves side)
- Type of wall sheeting (standard or keder technology)

The required span consists of:

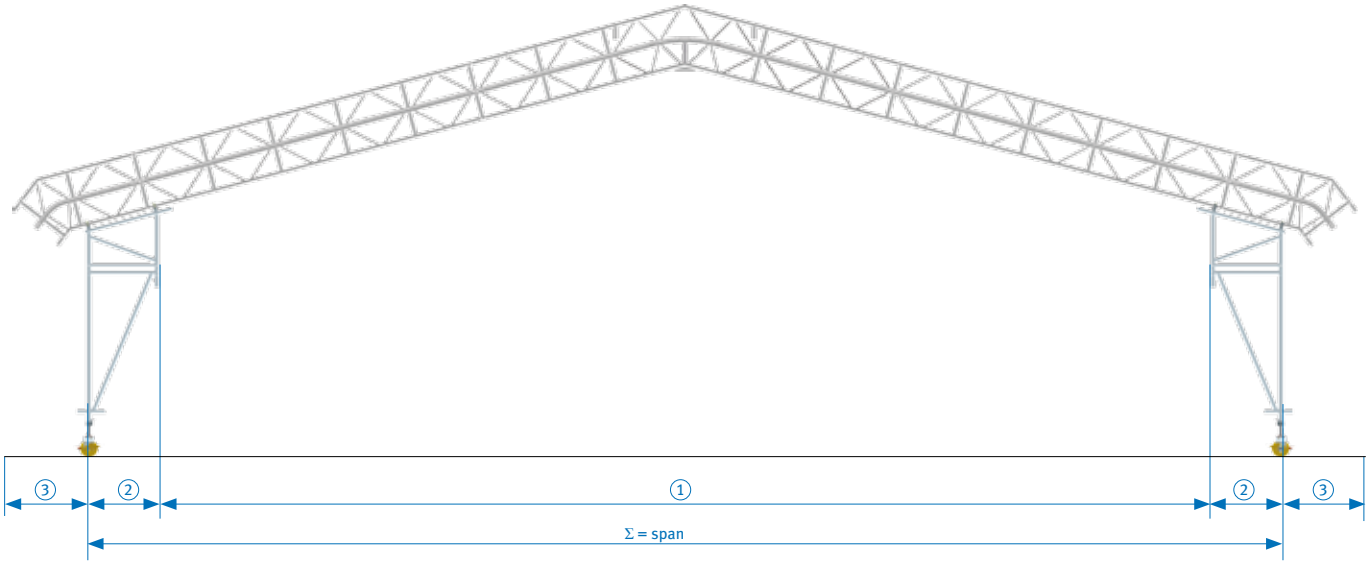
③ Type of wall sheeting (for keder rails approx. 20 cm)

② Triangular bracket

① Required clear width

② Triangular bracket

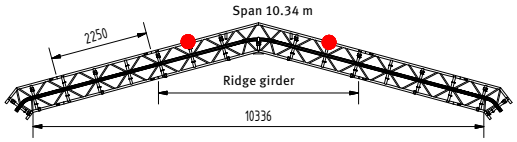
③ Type of wall sheeting

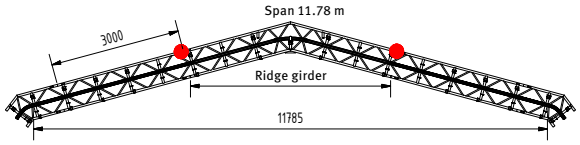


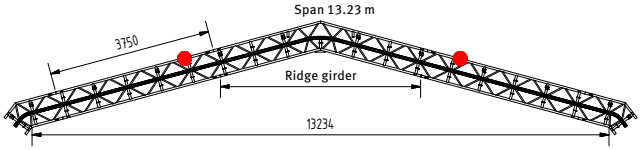
The *VARIO weather protection roof* can be mounted onto the triangular bracket as needed by means of the girder support so that variable roof overhangs are possible. For subsequent adjustments, the eaves overhang can be compensated by keder profile extensions.

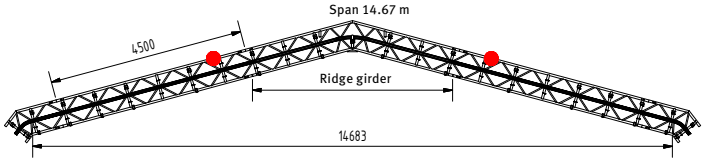
The bracing between triangular brackets is by longitudinal and diagonal ledgers of the roof system. The diagonal bracings of the side walls are made at the positions of the braced bays in the weather protection roof (min. every 5th bay)

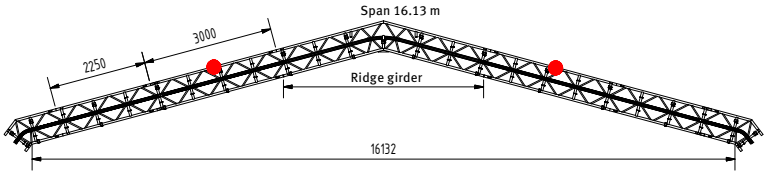
7. Illustration of spans

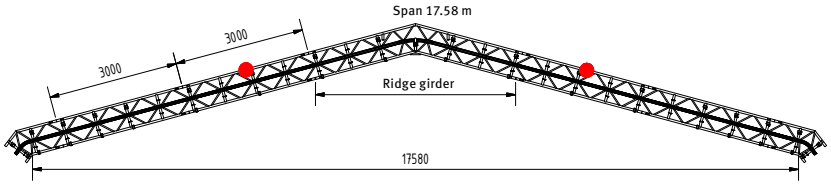


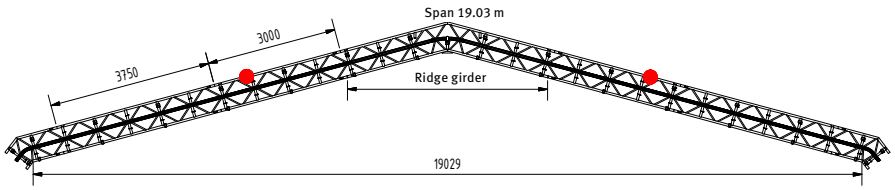










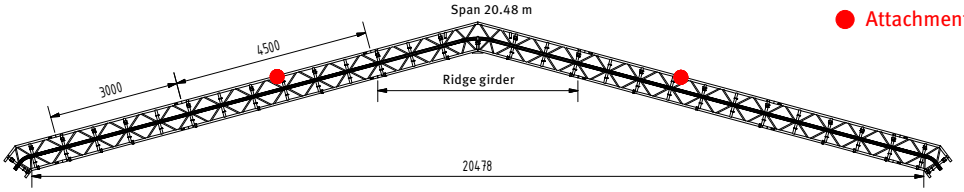


Possible spans of the *VARIO weather protection roof* can be gathered from the material requirements table and the illustration. The roof span should be minimum 20 cm larger than the span determined from the above formula. Since the VARIO weather protection roof can be mounted onto the substructure as needed, variable roof overhangs are possible.

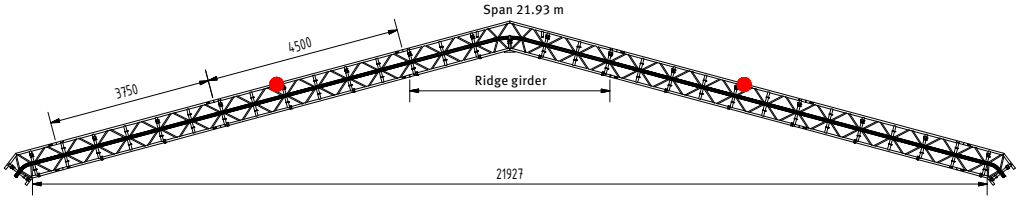
● Attachment point for crane

Attachment point for crane

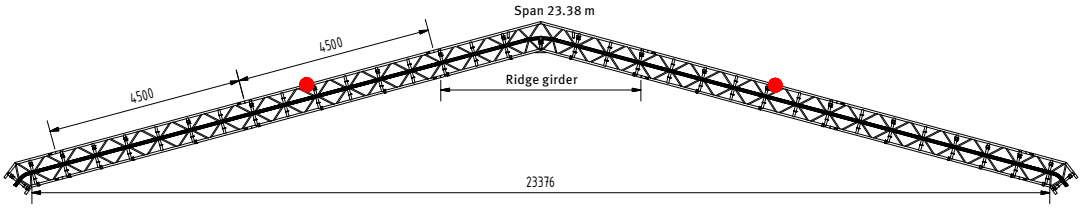
Span 20.48 m



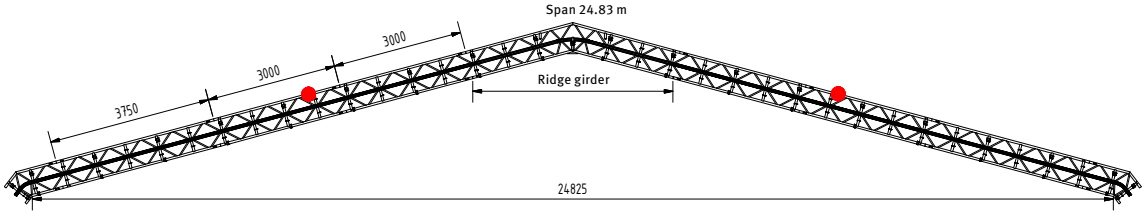
Span 21.93 m



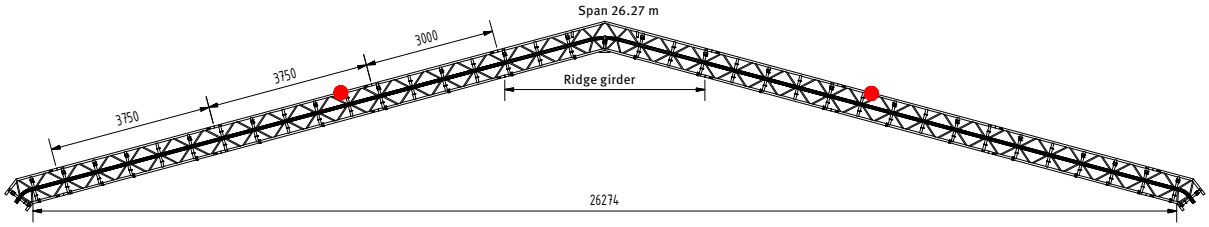
Span 23.38 m



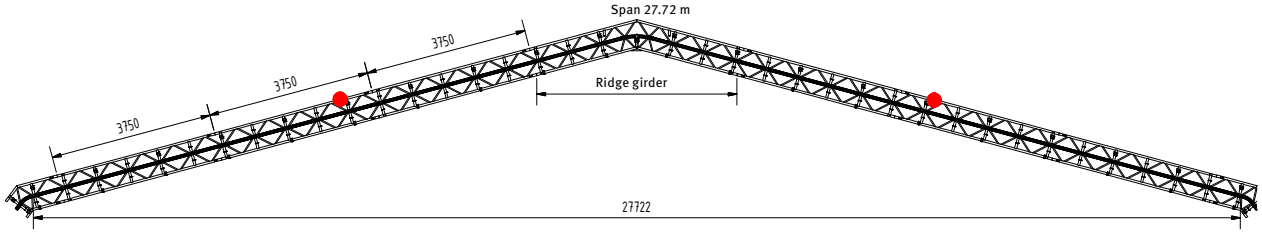
Span 24.83 m



Span 26.27 m



Span 27.72 m



8. Material requirement table

Initial bay (bay length: 2.57 m)

Span [m]		10.34	11.78	13.23	14.68	16.13	17.58	19.03	20.48	21.93	23.38	24.83	26.27	27.72
	[kg]													
Ridge girder 4.60 m	44.1	2	2	2	2	2	2	2	2	2	2	2	2	2
Roof girder 2.25 m	24.0	4				4								
Roof girder 3.00 m	30.8		4			4	8	4	4			8	4	
Roof girder 3.75 m	37.5			4				4		4		4	8	12
Roof girder 4.50 m	44.2				4				4	4	8			
Roof girder corner section 37.5°	16.3	4	4	4	4	4	4	4	4	4	4	4	4	4
Longitudinal ledger	4.7	18	26	22	30	26	34	30	38	34	42	38	46	42
Diagonal ledger	5.4	20	26	26	32	32	38	38	44	44	50	50	56	56
Ridge ledger	5.1	1	1	1	1	1	1	1	1	1	1	1	1	1
Eaves bracing	9.5	2	2	2	2	2	2	2	2	2	2	2	2	2
Tilting pin	0.8	4	4	4	4	4	4	4	4	4	4	4	4	4
Eaves ledger	4.7	2	2	2	2	2	2	2	2	2	2	2	2	2
Girder support 0.73 m	14.0	4	4	4	4	4	4	4	4	4	4	4	4	4
Head strut 8.20 m	56.7								4	4	4	4	4	4
Swivel coupler	1.2								12	12	12	12	12	12
Sponge rubber Roof girder sealing		8	8	8	8	12	12	12	12	12	12	16	16	16
Keder tarpaulin 8.00 x 2.53 m	12.0		2	2					1	1				
Keder tarpaulin 10.00 x 2.53 m	15.0				2	2			2	2	3	3	1	1
Keder tarpaulin 12.00 x 2.53 m	17.0	1					2	2					2	2
Scaffold rope 2.50 m			4	4	4	4	4	4	8	8	8	8	8	8
Cam buckle strap		14	14	14	14	14	14	14	14	14	14	14	14	14
Locking clip		8	8	8	8	8	8	8	8	8	8	8	8	8
Weight approx. [kg]		551.7	655.9	663.9	766.7	790.3	891.5	899.5	1245.5	1253.5	1353.3	1377.3	1478.1	1486.1

Initial bay (bay length: 2.50 m)

Keder tarpaulin 8.00 x 2.46 m	12.0		2	2					1	1				
Keder tarpaulin 10.00 x 2.46 m	15.0				2	2			2	2	3	3	1	1
Keder tarpaulin 12.00 x 2.46 m	17.0	1					2	2					2	2
Weight approx. [kg]		546.4	649.2	657.6	759.0	783.0	882.8	891.2	1235.8	1244.2	1342.6	1367.0	1466.4	1474.8

Extension bay (bay length: 2.57 m)

Span [m]		10.34	11.78	13.23	14.68	16.13	17.58	19.03	20.48	21.93	23.38	24.83	26.27	27.72
	[kg]													
Ridge girder 4.60 m	44.1	1	1	1	1	1	1	1	1	1	1	1	1	1
Roof girder 2.25 m	24.0	2				2								
Roof girder 3.00 m	30.8		2			2	4	2	2			4	2	
Roof girder 3.75 m	37.5			2				2		2			4	6
Roof girder 4.50 m	44.2				2				2	2	4	2		
Roof girder corner section 37.5°	16.3	2	2	2	2	2	2	2	2	2	2	2	2	2
Longitudinal ledger	4.7	20	28	24	32	28	36	32	40	36	44	40	48	44
Diagonal ledger	5.4													
Ridge ledger	5.1	1	1	1	1	1	1	1	1	1	1	1	1	1
Eaves bracing	9.5													
Tilting pin coupler	0.8	2	2	2	2	2	2	2	2	2	2	2	2	2
Eaves ledger	4.7	2	2	2	2	2	2	2	2	2	2	2	2	2
Girder support 0.73 m	14.0	2	2	2	2	2	2	2	2	2	2	2	2	2
Head strut 8.20 m	56.7								2	2	2	2	2	2
Swivel coupler	1.2								6	6	6	6	6	6
Sponge rubber Roof girder sealing		4	4	4	4	6	6	6	6	6	6	8	8	8
Keder tarpaulin 8.00 x 2.53 m	12.0		2	2					1	1				
Keder tarpaulin 10.00 x 2.53 m	15.0				2	2			2	2	3	3	1	1
Keder tarpaulin 12.00 x 2.53 m	17.0	1					2	2					2	2
Scaffold rope 2.50 m			4	4	4	4	4	4	8	8	8	8	8	8
Cam buckle strap		14	14	14	14	14	14	14	14	14	14	14	14	14
Locking clip		4	4	4	4	4	4	4	4	4	4	4	4	4
Weight approx. [kg]		279.8	338.0	332.6	389.6	392.0	447.2	441.8	621.4	616.0	670.0	686.0	727.6	722.2

Extension bay (bay length: 2.50 m)

Keder tarpaulin 8.00 x 2.46 m	12.0		2	2					1	1				
Keder tarpaulin 10.00 x 2.46 m	15.0				2	2			2	2	3	3	1	1
Keder tarpaulin 12.00 x 2.46 m	17.0	1					2	2					2	2
Weight approx. [kg]		276.7	334.1	329.1	385.3	388.1	442.5	437.5	616.3	611.3	664.5	680.9	721.7	716.7

Bracing bay (bay length: 2.57 m)

Span [m]		10.34	11.78	13.23	14.68	16.13	17.58	19.03	20.48	21.93	23.38	24.83	26.27	27.72
	[kg]													
Ridge girder 4.60 m	44.1	1	1	1	1	1	1	1	1	1	1	1	1	1
Roof girder 2.25 m	24.0	2				2								
Roof girder 3.00 m	30.8		2			2	4	2	2			4	2	
Roof girder 3.75 m	37.5			2				2		2		2	4	6
Roof girder 4.50 m	44.2				2				2	2	4			
Roof girder corner section 37.5°	16.3	2	2	2	2	2	2	2	2	2	2	2	2	2
Longitudinal ledger	4.7	18	26	22	30	26	34	30	38	34	42	38	46	42
Diagonal ledger	5.4	14	18	18	22	22	26	26	30	30	34	34	38	38
Ridge ledger	5.1	1	1	1	1	1	1	1	1	1	1	1	1	1
Eaves bracing	9.5	2	2	2	2	2	2	2	2	2	2	2	2	2
Tilting pin coupler	0.8	2	2	2	2	2	2	2	2	2	2	2	2	2
Eaves ledger	4.7	2	2	2	2	2	2	2	2	2	2	2	2	2
Girder support 0.73 m	14.0	2	2	2	2	2	2	2	2	2	2	2	2	2
Head strut 8.20 m	56.7								2	2	2	2	2	2
Swivel coupler	1.2								6	6	6	6	6	6
Sponge rubber Roof girder sealing		4	4	4	4	6	6	6	6	6	6	8	8	8
Keder tarpaulin 8.00 x 2.53 m	12.0		2	2					1	1				
Keder tarpaulin 10.00 x 2.53 m	15.0				2	2			2	2	3	3	1	1
Keder tarpaulin 12.00 x 2.53 m	17.0	1					2	2					2	2
Scaffold rope 2.50 m			4	4	4	4	4	4	8	8	8	8	8	8
Cam buckle strap		14	14	14	14	14	14	14	14	14	14	14	14	14
Locking clip		4	4	4	4	4	4	4	4	4	4	4	4	4
Weight approx. [kg]		365.0	444.8	439.4	518.0	520.4	597.2	591.8	793.0	787.6	863.2	865.8	942.4	937.0

Bracing bay (bay length: 2.50 m)

Keder tarpaulin 8.00 x 2.46 m	12.0		2	2					1	1				
Keder tarpaulin 10.00 x 2.46 m	15.0				2	2			2	2	3	3	1	1
Keder tarpaulin 12.00 x 2.46 m	17.0	1					2	2					2	2
Weight approx. [kg]		360.3	438.9	433.9	511.3	514.1	589.7	584.7	784.7	779.7	854.1	857.1	932.5	927.5

End bay (bay length: 2.57 m)

Nominal width [m]		10.34	11.78	13.23	14.68	16.13	17.58	19.03	20.48	21.93	23.38	24.83	26.27	27.72
	[kg]													
Ridge girder 4.60 m	44.1	1	1	1	1	1	1	1	1	1	1	1	1	1
Roof girder 2.25 m	24.0	2				2								
Roof girder 3.00 m	30.8		2			2	4	2	2			4	2	
Roof girder 3.75 m	37.5			2				2		2		2	4	6
Roof girder 4.50 m	44.2				2				2	2	4			
Roof girder corner section 37.5°	16.3	2	2	2	2	2	2	2	2	2	2	2	2	2
Longitudinal ledger	4.7	18	26	22	30	26	34	30	38	34	42	38	46	42
Diagonal ledger	5.4	20	26	26	32	32	38	38	44	44	50	50	56	56
Ridge ledger	5.1	1	1	1	1	1	1	1	1	1	1	1	1	1
Eaves bracing	9.5	2	2	2	2	2	2	2	2	2	2	2	2	2
Tilting pin coupler	0.8	2	2	2	2	2	2	2	2	2	2	2	2	2
Eaves ledger	4.7	2	2	2	2	2	2	2	2	2	2	2	2	2
Girder support 0.73 m	14.0	2	2	2	2	2	2	2	2	2	2	2	2	2
Head strut 8.20 m	56.7								2	2	2	2	2	2
Swivel coupler	1.2								6	6	6	6	6	6
Sponge rubber Roof girder sealing		4	4	4	4	6	6	6	6	6	6	8	8	8
Keder tarpaulin 8.00 x 2.53 m	12.0		2	2					1	1				
Keder tarpaulin 10.00 x 2.53 m	15.0				2	2			2	2	3	3	1	1
Keder tarpaulin 12.00 x 2.53 m	17.0	1					2	2					2	2
Scaffold rope 2.50 m			4	4	4	4	4	4	8	8	8	8	8	8
Cam buckle strap		14	14	14	14	14	14	14	14	14	14	14	14	14
Locking clip		4	4	4	4	4	4	4	4	4	4	4	4	4
Weight approx. [kg]		397.4	488.0	482.6	572.0	574.4	662.0	656.6	868.6	863.2	949.6	952.2	1039.6	1034.2

End bay (bay length: 2.50 m)

Keder tarpaulin 8.00 x 2.46 m	12.0		2	2					1	1				
Keder tarpaulin 10.00 x 2.46 m	15.0				2	2			2	2	3	3	1	1
Keder tarpaulin 12.00 x 2.46 m	17.0	1					2	2					2	2
Weight approx. [kg]		392.1	481.3	476.3	564.3	567.1	653.3	648.3	858.9	853.9	938.9	941.9	1027.9	1022.9

9. Components overview

Ridge girder, aluminium
Article No. 47 00 460

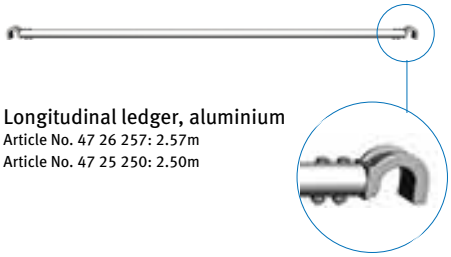
Roof girder, aluminium
Article No. 47 10 075: 0.75m
Article No. 47 10 150: 1.50m
Article No. 47 10 225: 2.25m
Article No. 47 10 300: 3.00m
Article No. 47 10 375: 3.75m
Article No. 47 10 450: 4.50m

Head strut, aluminium
Article No. 47 20 620: 6.20m
Article No. 47 20 820: 8.20m

Roof girder end piece, aluminium
Article No. 47 10 032

Roof girder adapter, aluminium
Article No. 47 12 100

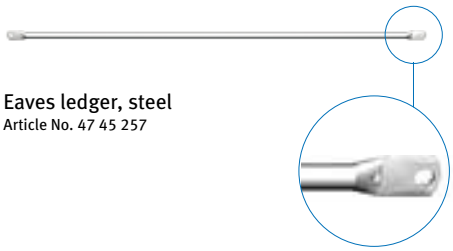
Roof girder corner section 37.5°, aluminium
Article No. 47 11 115



Longitudinal ledger, aluminium
Article No. 47 26 257: 2.57m
Article No. 47 25 250: 2.50m

Eaves bracing, aluminium
Article No. 47 50 257: 2.57m
Article No. 47 51 250: 2.50m

Diagonal ledger, aluminium
Article No. 47 30 001: 2.57m
Article No. 47 30 002: 2.50m



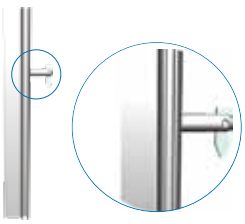
Eaves ledger, steel
Article No. 47 45 257

UNIFIX rear guardrail, steel
Article No. 20 60 250

Ridge ledger, aluminium
Article No. 47 40 257: 2.57m
Article No. 47 40 250: 2.50m

Rail adapter, steel
Article No. 47 62 500: 0.73m/0.74m

Rail adapter, steel
Article No. 47 62 501: 1.09m
Article No. 47 62 601: 1.10m



Keder rail with tilting pin 0.50 m
Article No. 47 75 050

Rail, aluminium
Article No. 47 63 200: 2.00m
Article No. 47 63 207: 2.07m
Article No. 47 63 250: 2.50m
Article No. 47 63 257: 2.57m
Article No. 47 63 300: 3.00m
Article No. 47 63 307: 3.07m

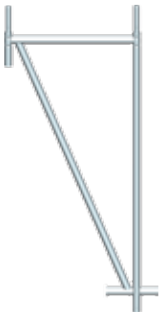
Keder rail, aluminium
Article No. 47 75 180: 1.80m
Article No. 47 75 200: 2.00m
Article No. 47 75 230; 2.30m
Article No. 47 75 300: 3.00m
Article No. 47 75 400: 4.00m
Article No. 47 75 500: 5.00m
Article No. 47 75 600: 6.00m

Keder rail wall profile, aluminium
Article No. 47 76 180: 1.80m
Article No. 47 76 200: 2.00m
Article No. 47 76 250: 2.50m
Article No. 47 76 300: 3.00m
Article No. 47 76 450: 4.50m

Girder support 400, steel
Article No. 47 60 400: 0.73m
Article No. 47 61 400: 0.74m
Article No. 47 60 401: 1.09m
Article No. 47 61 401: 1.10m

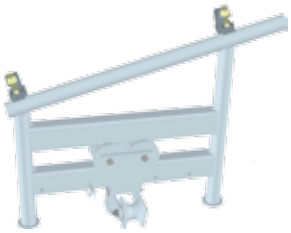
Girder support 200, steel
Article No. 47 60 100: 0.73m
Article No. 47 61 100: 0.74m

Girder support, pin-jointed
Article No. 47 60 500: 0.73m
Article No. 47 61 500: 0.74m
Article No. 47 60 501: 1.09m
Article No. 47 61 501: 1.10m



Triangular bracket, steel
Article No. 47 70 180: 1.80 x 0.73m
Article No. 47 70 180: 1.80 x 0.74m

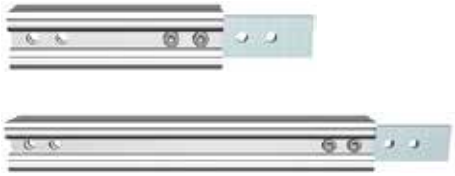
Castor wheel, track-guided
Article No. 47 99 001



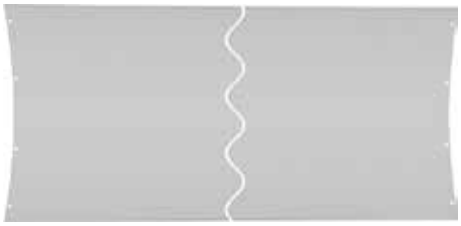
Rolling frame 0.60 m, steel, with girder support 15°
Article No. 47 62 061

Bumper, steel
Article No. 47 62 001

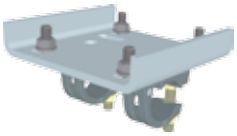
Stopper for rail, steel
Article No. 47 62 002



Groove profile extension
Article No. 47 99 008: 0.25m
Article No. 47 99 009: 0.50m

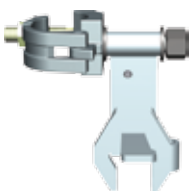


Keder tarpaulin
Article No. 47 90 080: 8.00m x 2.46m
Article No. 47 90 100: 10.00m x 2.46m
Article No. 47 90 120: 12.00m x 2.46m
Article No. 47 91 080: 8.00m x 2.53m
Article No. 47 91 100: 10.00m x 2.53m
Article No. 47 91 120: 12.00m x 2.53m



Rail support plate 0.15 x 0.18 m, steel, incl. standard parts
Article No. 47 62 000

Keder rail holder
Article No. 47 99 000: wrench size 19
Article No. 47 99 015: wrench size 22



Keder rail holder 360°, adjustable
Article No. 47 99 019

Roof girder seal (sponge rubber)
Article No. 47 99 020

Keder rail seal (sponge rubber)
Article No. 47 99 005

10.1. Supporting structure

Static system:	Two-joint framework
Roof pitch:	15° for double-pitch roof, variable up to 40° for mono-pitch roof
Truss distance:	2.57 m or 2.50 m
Roof girder:	Telescopic three-chord lattice girder of aluminium; Nominal height 600 m; length grid 750 mm, top and bottom chord and vertical rods; scaffold tubing Ø 48.3 x 4 mm; centre chord made of keder profile with two longitunidal slots on each side.
Roof and wall bracing:	Longitudinal and diagonal ledgers of aluminium with self-locking aluminium claws
Standard construction height for stationary weather protection halls:	Up to 20 m above ground, tightly covered with tarpaulins from all sides
Standard construction height for mobile weather protection halls:	Up to 8 m above ground
Span of stationary weather protection halls:	Up to 27.72 m (outer edge of girder support)
Span of mobile weather protection halls:	Up to 16.13 m (outer edge of girder support)
Span of mono-pitch roofs:	max. 14 m
Permitted snow loads:	Up to 0.25 kN/m²

10.2. Sheeting

Material:	PES HAT 1100 dtex “CR”
Weight:	approx. 590 g/m²
Tearing strength:	approx. 280 kp/5 cm
Tear growth resistance:	approx. 28 kp
Heat resistance:	- 30 °C to + 70 °C
Flammability:	NFP 92.503,42 DIN 4102B1, low-inflammability UNE 23727-90 M2 California State Fire Marshal NFPA 701BS7837 SP Full Scale Test – Method 2205
Roof and wall tarpaulin:	- On the long side with ready-made rubber keders - On the front side with welded edge reinforcement and riveted metal eyelets every 50 cm
Gable wall tarpaulin:	- Two-piece customized special makes - Ready-made rubber keders on the beveled side - With metal eyelets on the eaves side - With zip on the joint side

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