



Support Frame STB

Technical Instruction Manual

Support frame



Product features

The support frame is mainly used for pouring against existing structures (walls, rock, soil, sheet piling, foundations, etc.) if only one side of the formwork can be erected. For practical reasons it is generally not possible to tie through the formwork. Hence, the total fresh-concrete pressure has to be transferred via the formwork into the support frame and then on into the foundation. The MEVA support frame consists of a welded and painted steel construction.

See the separate STB load charts for details about the loads that occur in standard applications.

Permissible anchor loads according to DIN 18216

Anchor system	Permissible loading
DW 15	90 kN per tie rod
DW 20	160 kN per tie rod
DW 26.5	250 kN per tie rod

When using the support frames, special attention must be paid to the following:

- The foundations and floor slabs, etc. must be able to withstand the tensile and compressive forces that occur. A structural verification may be required.
- The "opposite side" of the single-sided formwork, i.e. the existing structure, must also be able to resist the fresh-concrete pressure.
- The DW tie rods must not be welded, heated or deformed.
- For more complex or special cases not dealt with in this manual please contact the MEVA experts for advice.
- Deviations from the versions described in this manual always require a separate structural verification.

Attention

Check on-site to make sure that the tensile forces Z and the compressive forces V that occur can be safely transferred into the foundation or floor slab. In particular, the concrete strength and the degree of reinforcement used need to be reviewed. If the support frames are used on top of slabs – for example in underground garages – support the slab where the vertical forces V occur in order to transfer these into the foundation.

Abbreviations, measurements, figures and tables, etc.

The abbreviation STB is used for the support frame. DIN means Deutsche Industrie-Norm (German Industrial Standard). E DIN (E = Entwurf / draft) means that the DIN is in draft status and not yet approved. Any further abbreviations are explained where they are used for the first time.

TÜV means Technischer Überwachungsverein. This is the independent German organisation that tests the safety of technical installations, machinery and motor vehicles. If a product passes the test, it is permitted to carry the GS seal. GS stands for Geprüfte Sicherheit (approved safety).

Measurements: This manual uses the metric system, i.e. m (for metre), cm (for centimetre) and mm (for millimetre).

Non-defined dimensions are in cm.

The page numbers in this manual start with STB. The figures and tables are numbered per page. Depending on its product abbreviation, a cross reference in the text refers to a page, table or figure in this or in another manual. This is indicated by the product code with which the cross-reference begins.

Support frame



Please note

This Technical Instruction Manual contains information, instructions and tips that describe how to use the MEVA equipment on the construction site in a proper, quick and economic way. Most examples shown are standard applications that will occur in practice most often. For more complicated or special applications not covered in this manual, please contact the MEVA experts for advice. They will help you without delay.

When using our products, the federal, state and local occupational health and safety regulations must be observed. Please observe the assembly instructions that your local contractor or employer has created for the site on which the MEVA equipment is used. Such instructions are intended to minimise site-specific risks and must contain the following details:

- The order in which all working steps including assembly, conversion and disassembly must be carried out
- The weight of the panels and other system parts
- The type and number of ties and braces as well as the distance between them
- The location, number and dimensions of working scaffolds including the working area and fall protection equipment required
- Attachment points for panel transport by crane. With regard to panel transport, please observe this manual. Any deviation will require structural verification.

Important: Generally, only well-maintained material may be used. Damaged parts must be replaced. Use only original MEVA spare parts for replacement.

Attention: Never wax or oil assembly locks!

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Support frame

Product overview

Walls up to a pouring height of 13.50 m can be formed from one side using three support frame versions.

- STB 450 up to a height of 5.20 m, with height extensions 150 and, if required, additional accessories up to 13.50 m (Fig. 4.1 and page STB-11).
- STB 300 plus up to a height of 3.25 m, with height extensions up to a height of 4.50 m (Fig. 4.2 and page STB-7).
- STB 300 up to a height of 3.30 m (Fig. 4.3 and page STB-21).

Two support frame sizes enable stop ends for floor slabs and slab edges up to 1.50 m to be formed.

- Brace bracket 150 up to a height of 1.50 m (Fig. 4.4 and page STB-44).
- Brace bracket 80 up to a height of 0.8 m (Fig. 4.5 and page STB-46).

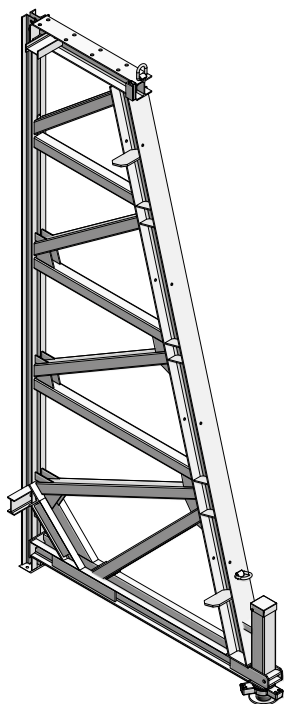


Fig. 4.1 Support frame STB 450

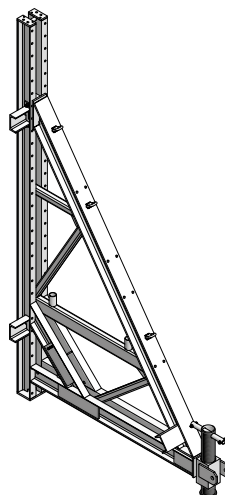


Fig. 4.2 Support frame STB 300 plus

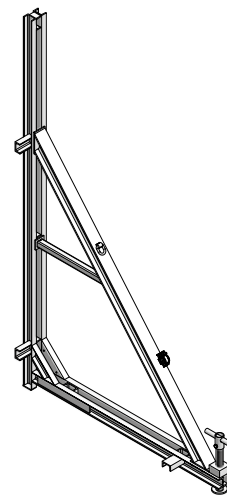


Fig. 4.3 Support frame STB 300

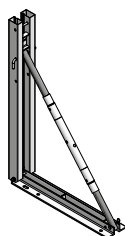


Fig. 4.4 Brace bracket SK 150



Fig. 4.5 Brace bracket 80

Support frame

Product overview

The STB support frames and the brace brackets can be combined with all MEVA wall formwork systems as well as with special designs.

From a structural and economic point of view and depending on the formwork system used, it may be more advantageous to use the support frame with vertical (Fig. 5.1) or horizontal panels (Fig. 5.2).

The support frame can be attached to the MEVA wall formwork panel from the frame side with flange screw 18 (Fig. 5.3). Alternatively, it can be attached from the facing side using fixing screw 35 and articulated flange nut 15/120 or flange nut 100 (Figures 5.4 and 5.5).

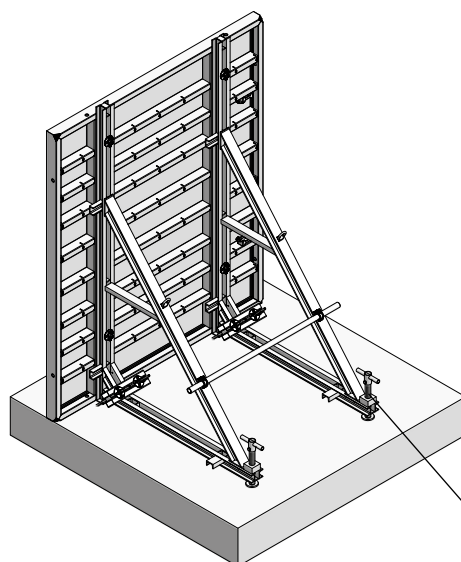


Fig. 5.1 Support frame STB 300 with vertical panels

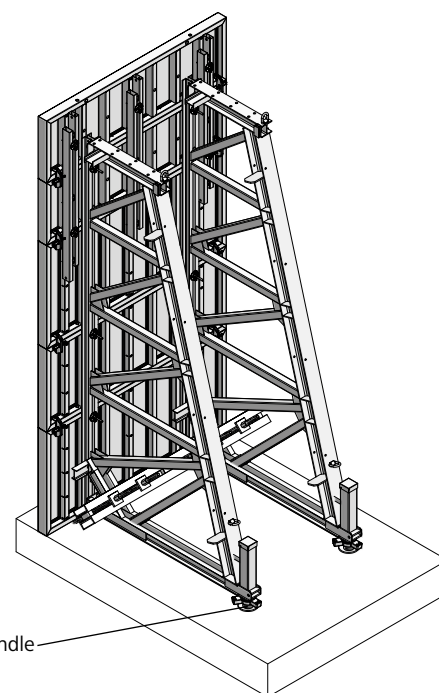


Fig. 5.2 Support frame STB 450 with horizontal panels

Attention

- When using the STB unit vertically, the spindle must be set to the middle position before mounting the STB on the formwork. This ensures that it can be perfectly adapted to suit the supporting surface.
- Refer to the product list for the spindle stroke.
- Before pouring, ensure that all STB spindles and additional braces are secure and contact the ground.

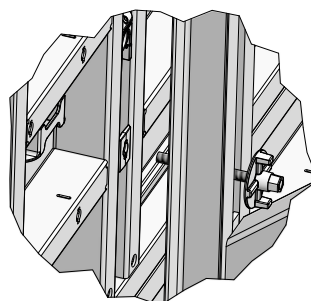


Fig. 5.3 Detail – Flange screw 18, attachment on the support frame side

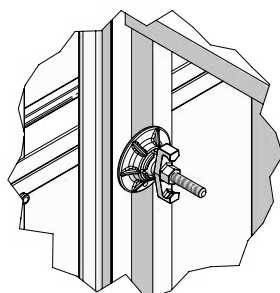


Fig. 5.4 Detail – Fixing screw on the support frame side

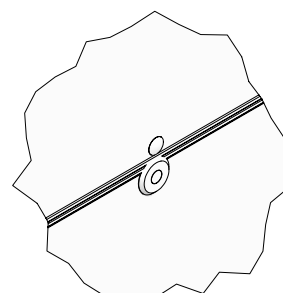


Fig. 5.5 Detail – Fixing screw on the facing side

Support frame

Support frame STB 300/300 plus

Pouring height

The STB 300 (Figures 6.1 and 6.5) is used up to a pouring height of 3.30 m.

The STB 300 plus (Fig. 6.9) is used up to a pouring height of 3.25 m and can be equipped with height extensions for a pouring height up to 4.50 m.

Horizontal panels

The support frame is attached to the multi-function profiles using flange screws 18. Alternatively, it can be attached through the tie holes of the formwork using fixing screws 35 and flange nuts 100 or articulated flange nuts 15/120 (Figures 6.1 to 6.4).

Vertical panels

When using vertical StarTec and Mammut/Mammut 350 formwork (Figures 6.5 to 6.7), the crossbeam 300 is used (Fig. 6.10). When used horizontally between the formwork panel and the support frame, the crossbeam 300 allows units to be assembled.

The support frame is attached to the multi-function profile of the formwork panel using tie rods DW and flange nuts 100 or articulated flange nuts 15/120 (Fig. 6.5).

When Mammut XT is used vertically, an additional crossbeam is not required (Fig. 6.8).

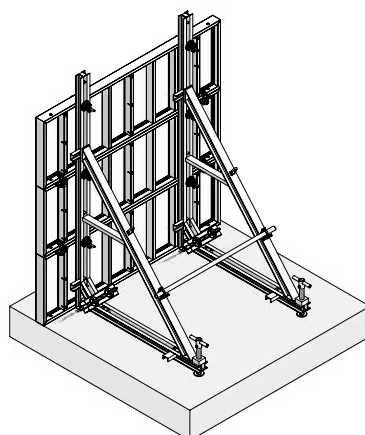


Fig. 6.1 Support frame STB 300 with horizontal panels

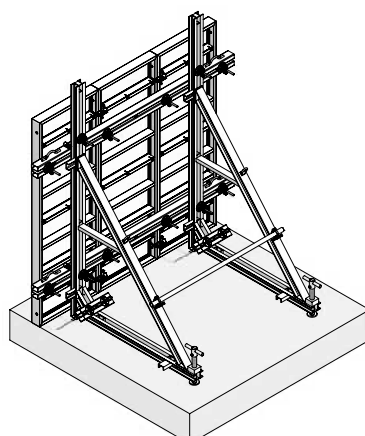


Fig. 6.5 Support frame STB 300 with vertical panels

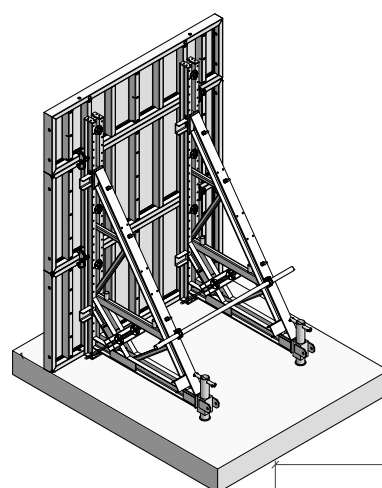


Fig. 6.9 Support frame STB 300 plus with horizontal panels

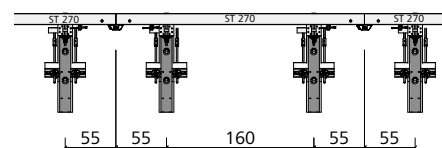


Fig. 6.2 StarTec horizontal, with fixing screw

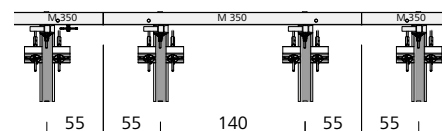


Fig. 6.3 Mammut 350 horizontal, with fixing screw

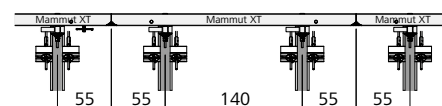


Fig. 6.4 Mammut XT horizontal, with fixing screw

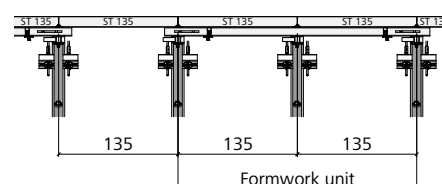


Fig. 6.6 StarTec vertical, with flange screw

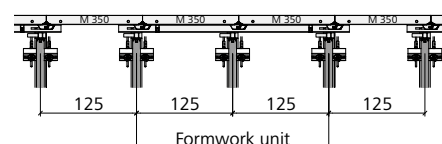


Fig. 6.7 Mammut vertical, with flange screw

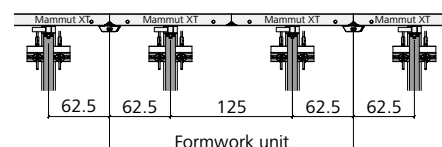


Fig. 6.8 Mammut XT vertical, with flange screw

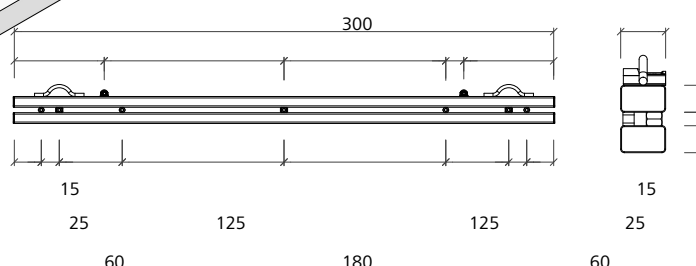


Fig. 6.10 Crossbeam 300

Description	Ref. No.
Support frame STB 300.....	29-402-62
Flange screw 18.....	29-401-10
Flange screw 28.....	29-401-12
Fixing screw 5/DW 15.....	29-401-20
Articulated flange nut 15/120.....	29-900-10
Flange nut 100.....	29-900-20
Crossbeam 300.....	29-403-05

Support frame

Support frame STB 300 plus

The STB 300 plus (Fig. 7.1) is used up to a pouring height of 3.25 m.

With a maximum of three STB height extensions 50 (Fig. 7.2), the STB 300 plus can be used up to a pouring height of 4.50 m (see page STB-9).

The STB compensation rail (Fig. 7.3) enables the support frame unit to be dowelled to the slab. It is attached to the support frame or to the STB height extension with the STB fixing screw (Fig. 7.4) (see page STB-10).

The STB panel support (Fig. 7.5) ensures that the STB formwork panel unit does not shift unintentionally when being repositioned. Furthermore, additional accessories such as a walkway bracket can be attached to the integrated multi-function nut (see page STB-8).

When height-extending the support frame using STB height extensions, additional braces are attached to the STB base extension 57 (Fig. 7.6).

The support frame 300 plus enables additional scaffold tubes to be installed at the positions provided in order to provide rigidity (Fig. 7.1).

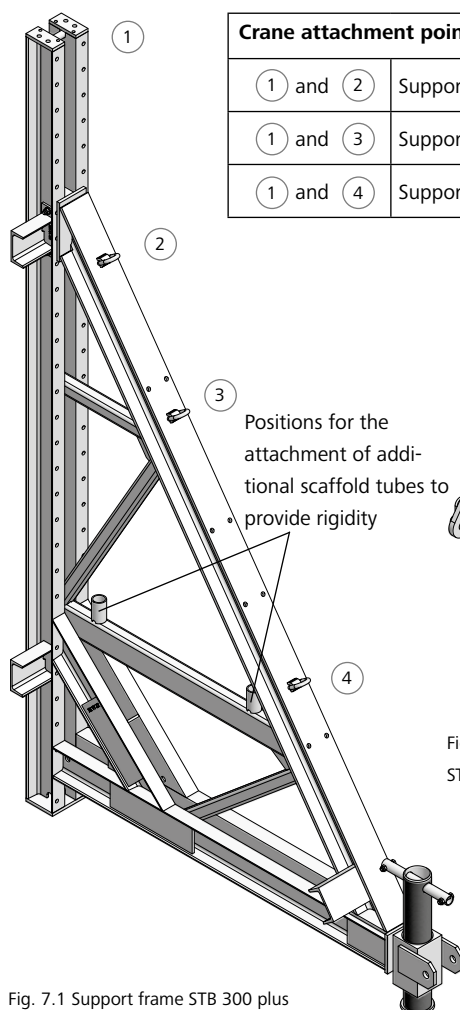


Fig. 7.1 Support frame STB 300 plus

Crane attachment points	
① and ②	Support frame with formwork
① and ③	Support frame installed vertically
① and ④	Support frame installed horizontally

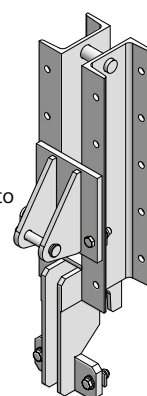


Fig. 7.2
STB height extension 50

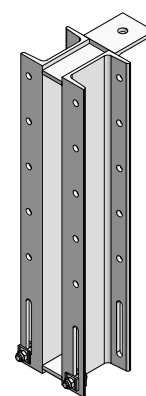


Fig. 7.3
STB compensation rail

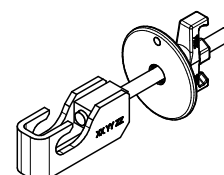


Fig. 7.4 STB fixing screw

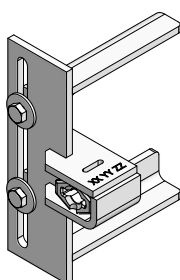


Fig. 7.5 STB panel support

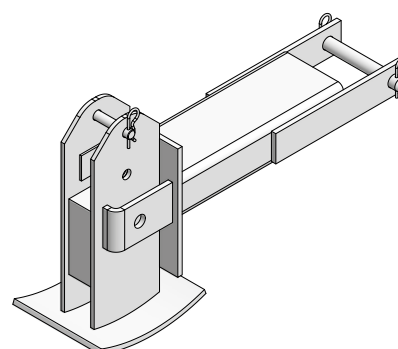


Fig. 7.6 STB base extension 57

Description	Ref. No.
Support frame STB 300 plus...	29-402-60
STB height extension 50	29-402-63
STB compensation rail.....	29-402-66
STB panel support.....	29-402-68
STB base extension 57	29-402-69
STB fixing screw.....	29-401-19

Support frame

Support frame STB 300 plus

The STB panel support (Fig. 8.2) prevents the STB formwork panel unit shifting unintentionally when being repositioned. Furthermore, additional accessories such as a walkway bracket can be attached to the integrated multi-function nut (Figures 8.1, 8.3 and 8.4).

The panel support is attached to the support frame 300 plus using the integrated screws. The position must be selected so that it is located on the formwork panel between two crossbeams or on a cross stiffener (Figures 8.3 and 8.4).

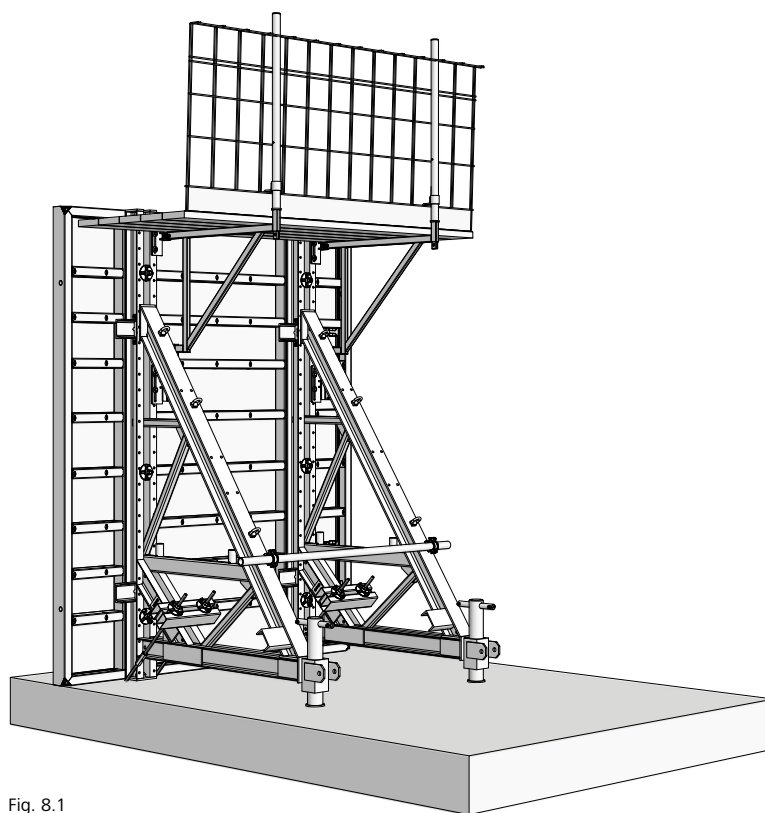


Fig. 8.1

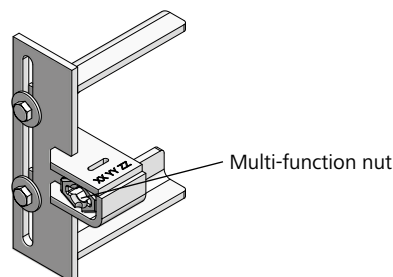


Fig. 8.2 STB panel support

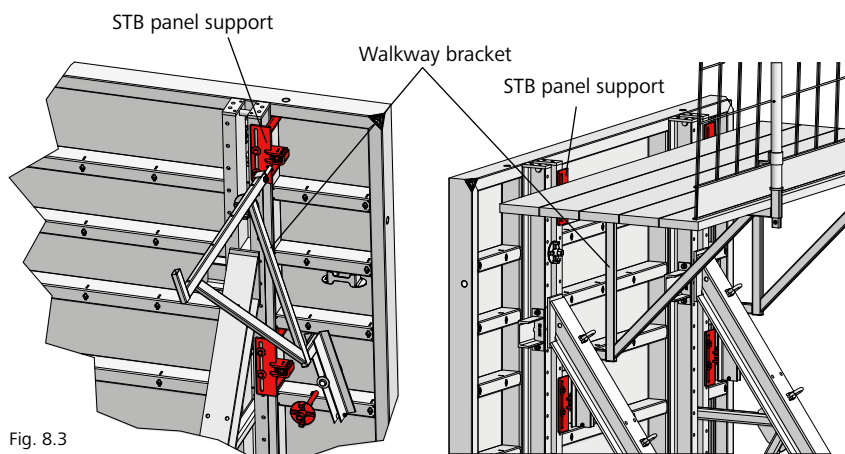


Fig. 8.3

Fig. 8.4

Description	Ref. No.
Support frame STB 300 plus...	29-402-60
STB panel support.....	29-402-68

Support frame

Support frame STB 300 plus

With a maximum of three STB height extensions 50 (Fig. 9.2), the STB 300 plus can be used up to a pouring height of 4.50 m.

The STB height extension 50 is attached to the support frame or the STB height extension 50 located below using the integrated screws (Fig. 9.2).

The braces can be attached to the STB height extension 50 and to the STB base extension 57 (Figures 9.1 and 9.2).

Refer to Table 9.4. for the configuration of the support frame unit as a function of the pouring height.

Refer to the STB load charts for information on the forces that occur and the type of bracing.

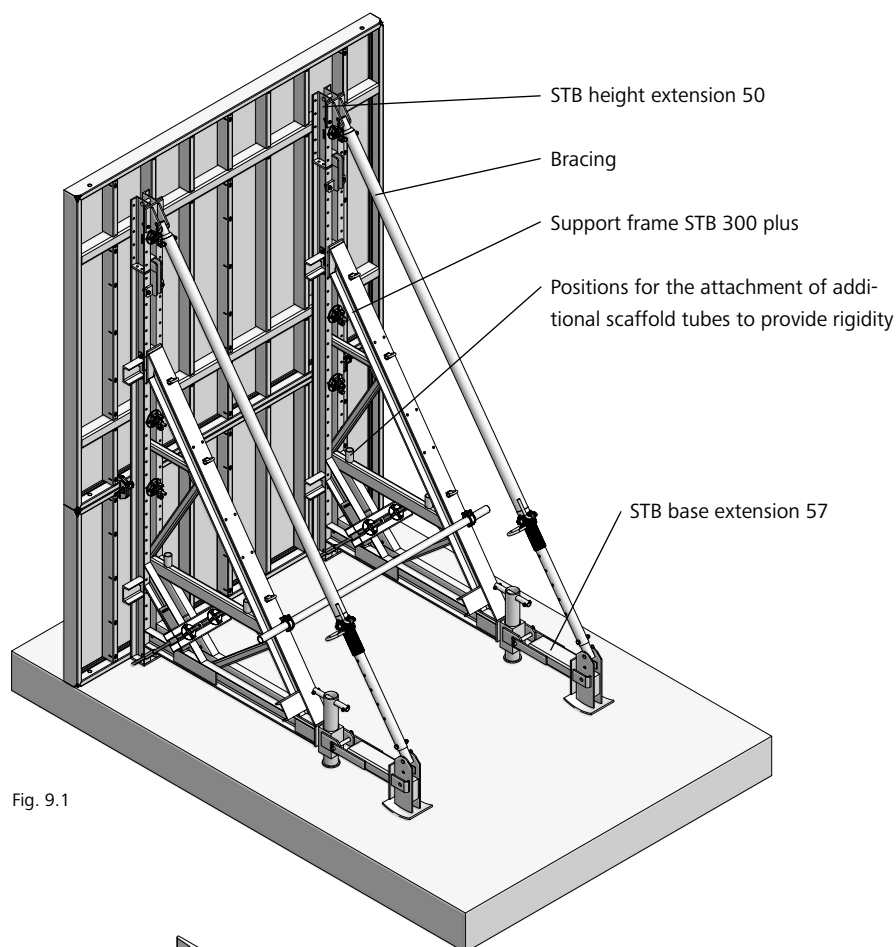
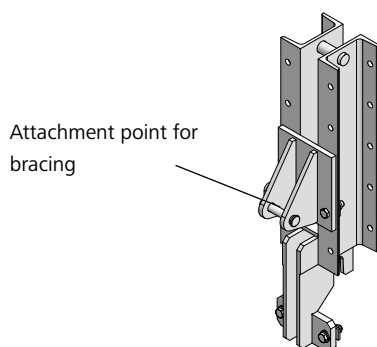


Fig. 9.1



Attachment point for bracing

Fig. 9.2 STB height extension 50

Attachment point for bracing

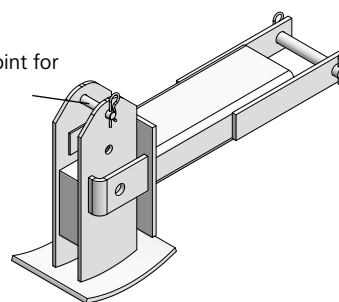


Fig. 9.3 STB base extension 57

Configuration	Pouring height (m)
STB 300 plus	2.50 to 3.25
STB 300 plus + 1 height extension	Up to 3.50
STB 300 plus + 1 height extension + 1 brace + 1 STB base extension 57	Up to 3.75
STB 300 plus + 2 height extensions + 2 braces + 2 STB base extensions 57	Up to 4.25
STB 300 plus + 3 height extensions + 3 braces + 3 STB base extensions 57	Up to 4.50

Table 9.4

Description	Ref. No.
Support frame STB 300 plus...	29-402-60
STB height extension 50	29-402-63
STB base extension 57	29-402-69

Support frame

Support frame STB 300 plus

The STB compensation rail (Fig. 10.1) enables the support frame unit to be dowelled to the slab. A job-built square timber bridges the gap to the formwork panel.

The compensation rail is attached to the support frame or the STB height extension using the STB fixing screw (Figures 10.2 and 10.3).

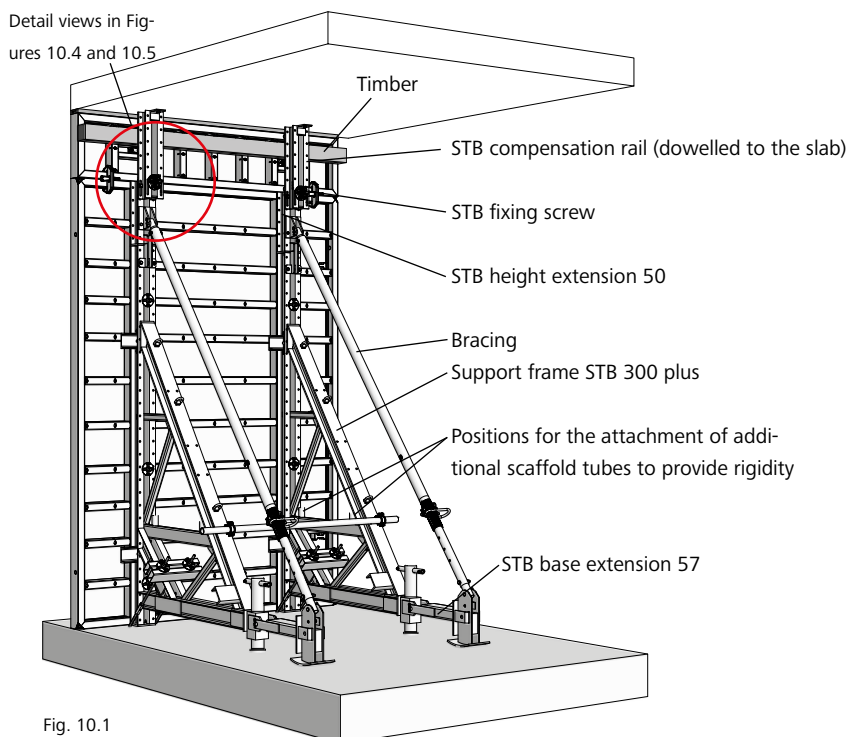


Fig. 10.1

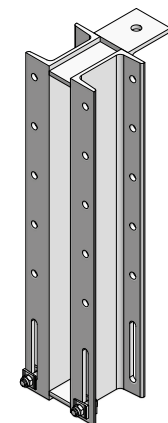


Fig. 10.2 STB compensation rail

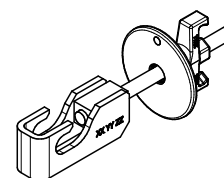


Fig. 10.3 STB fixing screw

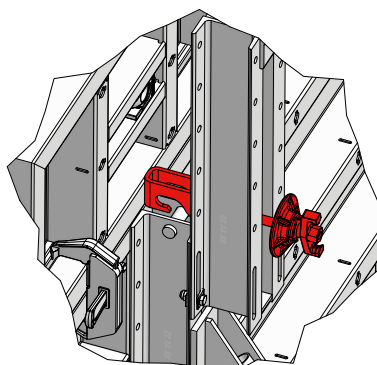


Fig. 10.4 Detail view of STB fixing screw

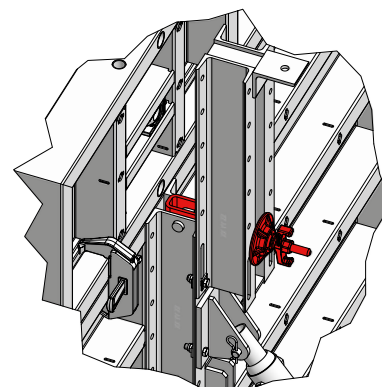


Fig. 10.5 Detail view of STB fixing screw

Description	Ref. No.
Support frame STB 300 plus...	29-402-60
STB compensation rail.....	29-402-66
STB base extension 57	29-402-69
STB fixing screw.....	29-401-19

Support frame

Support frame STB 450

Possible applications

The STB 450 is designed for single-sided formwork up to 5.20 m (Fig. 11.1). Using height extensions 150 and other accessories as required, the STB 450 allows single-sided formwork to be erected with the following heights:

- Up to 6.70 m – One height extension (Fig. 11.2)
- Up to 8.20 m – Two height extensions, base extension, Triplex SB braces
- Up to 9.40 m – Three height extensions, base extension, Triplex SB braces (Fig. 11.3)
- Up to 11.00 m – Four height extensions, base extension, Triplex SB braces (Fig. 11.4)
- Up to 12.50 m – Five height extensions, base extension, Triplex SB braces
- Depending on the construction site and using a corresponding number of height extensions and Triplex SB braces, support frame constructions for formwork heights up to 13.50 m can also be built.

Attention

- Before pouring, ensure that all STB spindles and additional braces are secure and contact the ground.

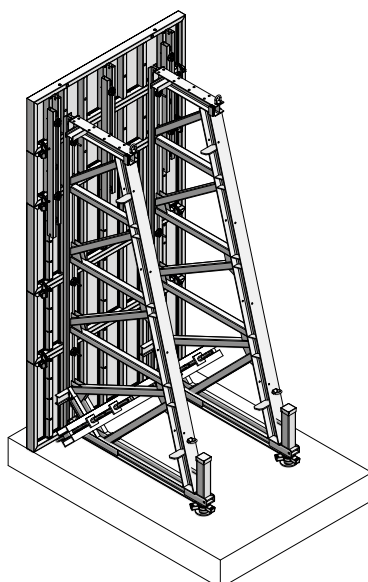


Fig. 11.1 Up to a formwork height of 5.20 m:
Three fixing screws are required for each STB

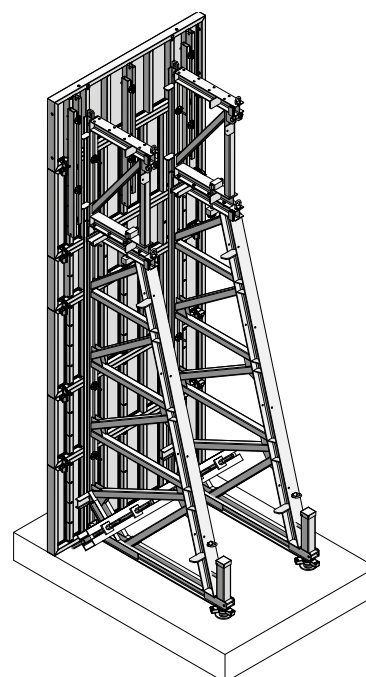


Fig. 11.2 Up to a formwork height of 6.70 m:
Four fixing screws are required for each STB

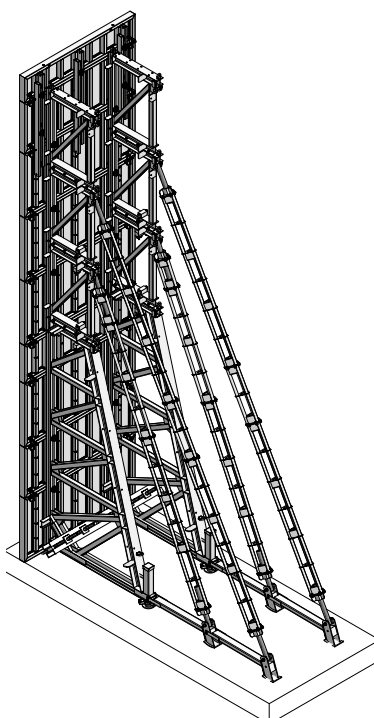


Fig. 11.3 Up to a formwork height of 9.40 m:
Six fixing screws are required for each STB

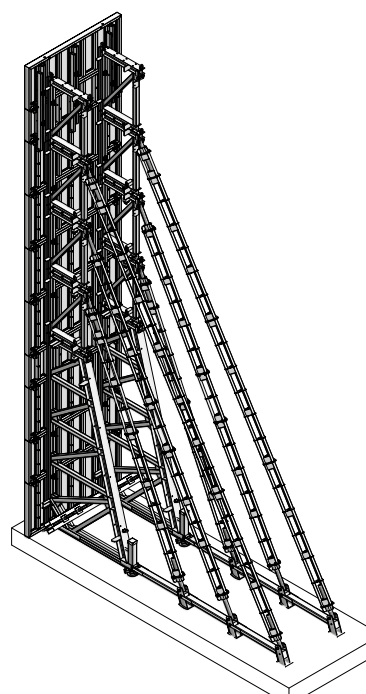


Fig. 11.4 Up to a formwork height of 11.00 m:
Seven fixing screws are required for each STB

Description	Ref. No.
Support frame STB 450.....	29-406-00
Height extension 150.....	29-406-10
Base extension.....	29-406-20
Fixing screw 35/DW 15.....	29-401-20
Articulated flange nut 15/120	29-900-10
Flange nut 100	29-900-20
Flange screw 18.....	29-401-10
Triplex SB 300 (right-hand thread)	29-407-15
(left-hand thread).....	29-407-17
Triplex intermediate piece SB 50.....	29-407-30
SB 100.....	29-407-35
SB 200.....	29-407-40
SB 300.....	29-407-45
Top unit 73 (left-hand thread) black spindle.....	29-407-25
Top unit 73 (right-hand thread) silver spindle.....	29-407-20

Support frame

Pre-assembly of support frame units

The surface on which the formwork and the support frames are pre-assembled should be clean, even and capable of supporting the total weight. The support frames are attached to the rear of the horizontal formwork panels (Fig. 12.1).

Assembly

→ The support frame is attached to the formwork's multi-function profiles using flange screw 18. Alternatively, it can be attached using the tie holes of the formwork with fixing screws 35 and articulated flange nuts 15/120 or flange nuts 100. The fixing screws must be inserted through the tie holes and secured to prevent them falling out, using the flange nut 100 for example, before the formwork panel is placed on the ground.

→ The height extensions are bolted to the support frame or height extension below using the eight (8) M20x50 screws and M20 nuts supplied.

→ The pre-assembled units should rest on square timbers (face down) on the ground before they are flown into place.

Assembly of the Triplex SB braces

Depending on the overall height, it may be necessary to attach Triplex SB braces to the height extensions 150 and the base extensions. The fastening elements required are supplied with the height and base extensions (Figures 12.2 to 12.4).

Attention

→ When using the STB unit vertically, the spindle must be set to the middle position before mounting the STB on the formwork. This ensures that it can be perfectly adapted to suit the supporting surface.

→ Before pouring, ensure that all STB spindles and additional braces are secure and contact the ground.

→ Refer to the Triplex Technical Instruction Manual (www.meva.net).

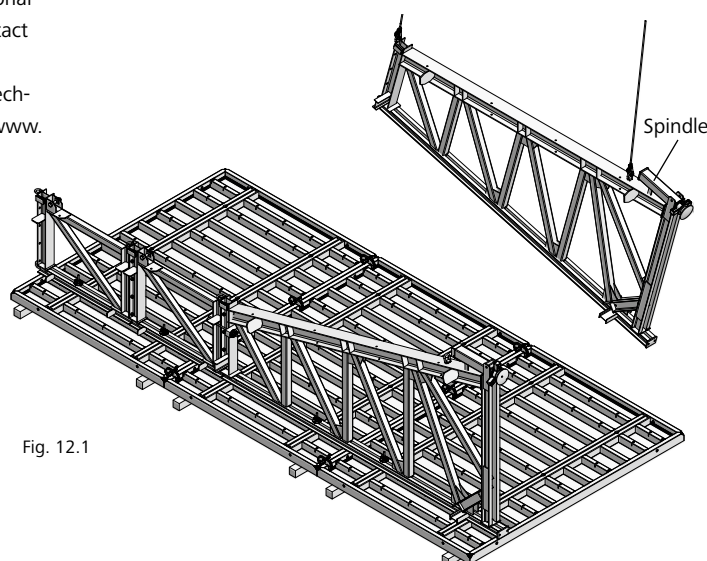


Fig. 12.1

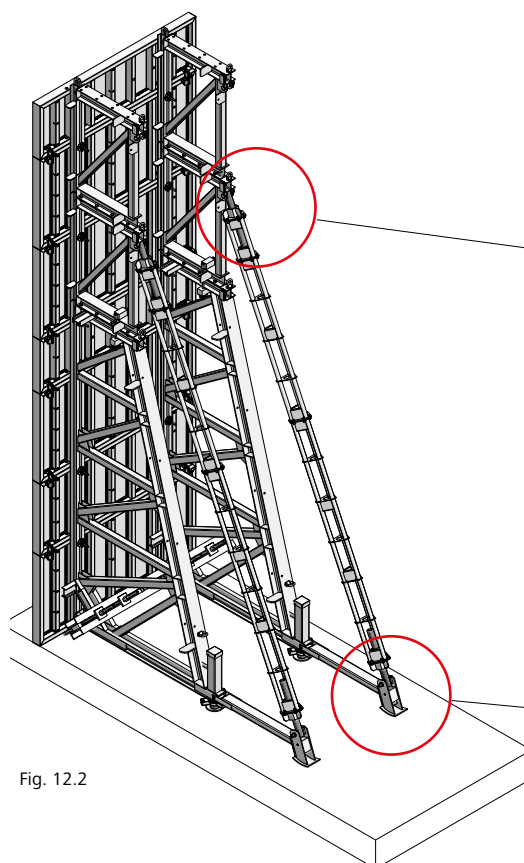


Fig. 12.2

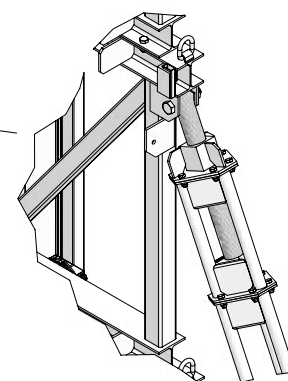


Fig. 12.3 – Detail view of the upper Triplex connection

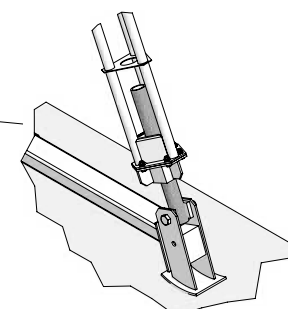


Fig. 12.4 – Detail view of the lower Triplex connection

Support frame

Diagonal bracing

Scaffold tubes with Ø 48.3 x 4.05 mm, bolt-on couplers 48/M14 and swivel-joint couplers 48/48 are needed to build the diagonal bracing required.

A horizontal tube is required for STB 300 (Fig. 13.1) and STB 300 plus (Fig. 13.2).

The STB 450 requires two horizontal and one diagonal scaffold tube (Fig. 13.3).

If height extensions are used, additional horizontal scaffold tubes must be installed from the second height extension upwards (Figures 13.4 and 13.5).

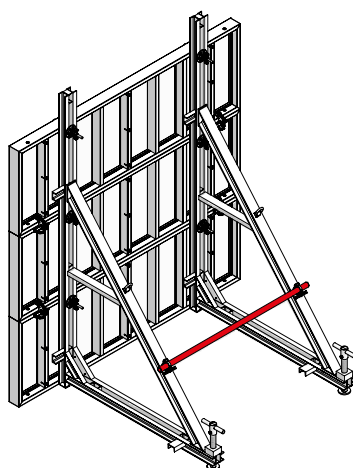


Fig. 13.1

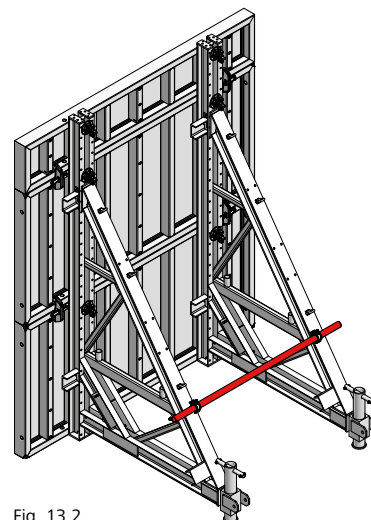


Fig. 13.2

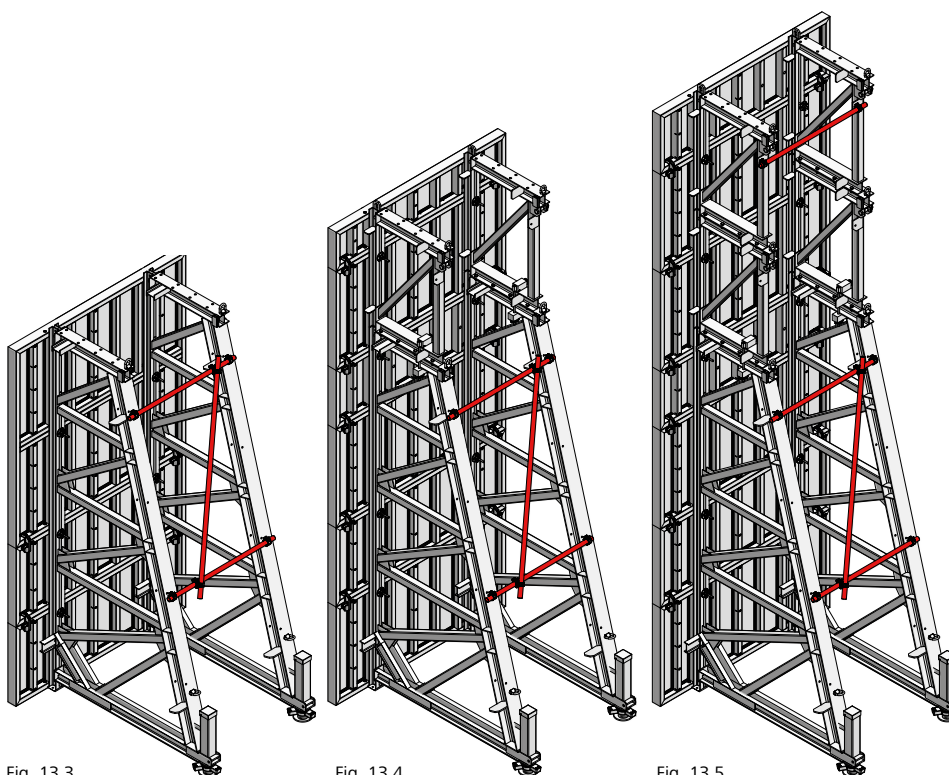


Fig. 13.3

Fig. 13.4

Fig. 13.5

Description	Ref. No.
Scaffold tube 48/200	29-412-23
Scaffold tube 48/300	29-412-26
Scaffold tube 48/400	29-412-27
Swivel-joint coupler 48/48	29-412-52
Bolt-on coupler 48/M14	40-080-70

Support frame

Workplaces

Above a height 2.00 m the risk of falling must be assessed.

SecuritBasic

The support frame STB 450 can be equipped with the safety system SecuritBasic (Fig. 14.1) for safe and efficient work at all heights. This prevents falling accidents and at the same time increases work efficiency.

Conventional

If a scaffold is erected conventionally (Fig. 14.2) or with walkway brackets (see page STB-16), DIN EN 12811-1 and DIN 4420-1 must be observed. Minimum cross section of handrail and midrail: for a post spacing up to 2.00 m: 15 x 3 cm. For a post spacing of up to 3.00 m: 20 x 4 cm.

We recommend the use of safety meshes. They are quick and safe method to provide fall protection.

Attention

→ When using our products, the federal, state and local codes and regulations must be observed.

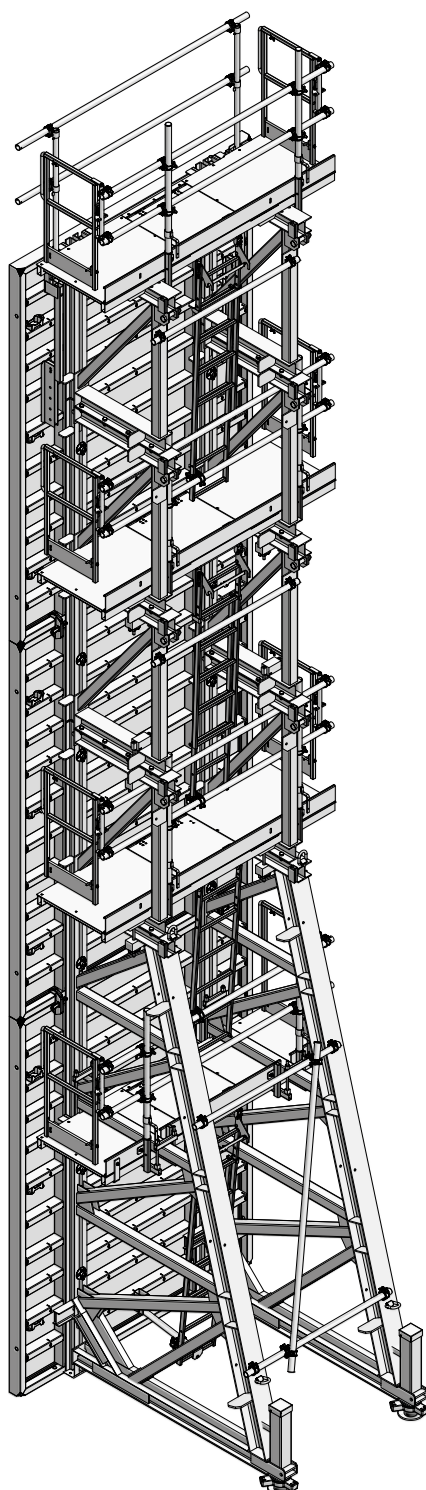


Fig. 14.1

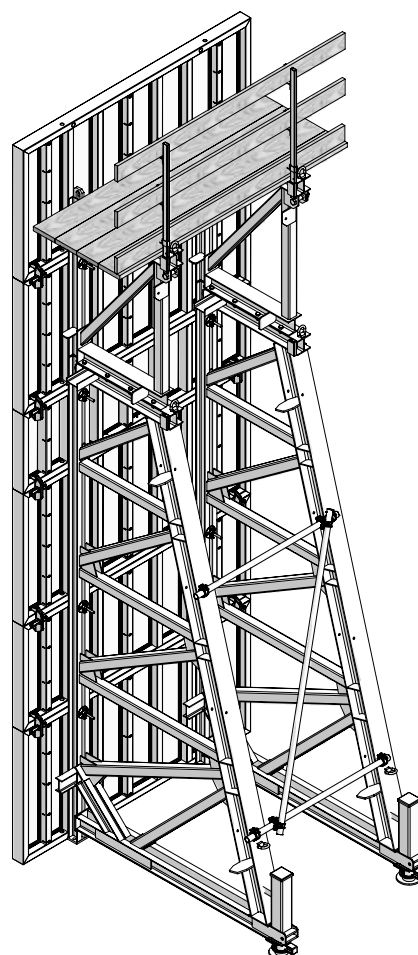


Fig. 14.2

Support frame

Workplaces – SecuritBasic

The support frame 450 as well as the height extension 150 can be equipped with the SecuritBasic platform 2470 with integrated access ladder (Fig. 15.1) on the 2.50 m wide Mammut panel.

Refer to Tables 15.2 to 15.4. for the type and quantity of the parts required for the complete unit as depicted in Fig. 15.1 or for individual platforms.

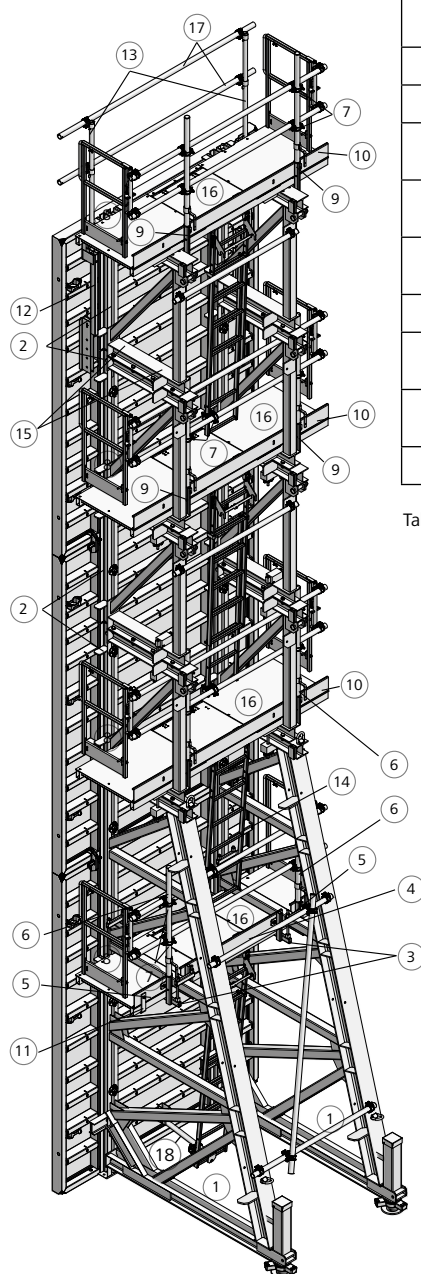


Fig. 15.1

Bill of material (complete unit as in Fig. 15.1)			
Position	Quantity	Ref. no.	Description
1	2	29-406-00	Support frame STB 450
2	8	29-406-10	STB height extension 150
3	2	29-406-25	Horizontal girder STB 450 SB
4	1	29-406-66	Toe board STB 1290 SB
5	2	29-406-64	Toe board STB 480 SB
6	8	29-106-80	Guardrailing post 48/120 UK
7	19	29-412-50	Rigid coupler 48x48
8	8	29-601-78	Side railing hinged SB tube coupler
9	6	29-406-27	Horizontal girder ST extension 150 SB
10	3	29-406-68	Toe board STB 2470 SB
11	2	29-406-62	Toe board holder STB SB
12	2	29-601-92	Support for guardrailing post IC SB
13	2	29-406-29	Front railing post retractable STB 450
14	4	29-603-45	Telescopic ladder 1700-3180 SB
15	8	29-406-87	STB special connector
16	4	29-600-15	Alu platform M 2470 SB with hatch
17	10	29-603-55	Scaffold tube 48.3/2470 SB
18	1	29-603-80	Ladder fixture panel SB

Table 15.2

Bill of material (individual platform on STB 450)			
Position	Quantity	Ref. no.	Description
3	2	29-406-25	Horizontal girder STB 450 SB
4	1	29-406-66	Toe board STB 1290 SB
5	2	29-406-64	Toe board STB 480 SB
6	2	29-106-80	Guardrailing post 48/120 UK
7	5	29-412-50	Rigid coupler 48x48
8	2	29-601-78	Side railing hinged SB tube coupler
11	2	29-406-62	Toe board holder STB SB
14	1	29-603-45	Telescopic ladder 1700-3180 SB
16	1	29-600-15	Alu platform M 2470 SB with hatch
17	2	29-603-55	Scaffold tube 48.3/2470 SB
18	1	29-603-80	Ladder fixture panel SB

Table 15.3

Bill of material (individual platform on height extension 150)			
Position	Quantity	Ref. no.	Description
6	2	29-106-80	Guardrailing post 48/120 UK
7	5	29-412-50	Rigid coupler 48x48
8	2	29-601-78	Side railing hinged SB tube coupler
9	2	29-406-27	Horizontal girder ST extension 150 SB
10	1	29-406-68	Toe board STB 2470 SB
14	1	29-603-45	Telescopic ladder 1700-3180 SB
15	2	29-406-87	STB special connector (also refer to the STB load charts)
16	1	29-600-15	Alu platform M 2470 SB with hatch
17	2	29-603-55	Scaffold tube 48.3/2470 SB
Additional parts on the uppermost height extension			
12	2	29-601-92	Support for guardrailing post IC SB
13	2	29-406-29	Front railing post retractable STB 450
17	2	29-603-55	Scaffold tube 48.3/2470 SB

Table 15.4

Support frame

Workplaces – Walkway bracket

Working platforms are built using walkway brackets 90 (Fig. 16.1) together with guardrailing posts. The procedure is as for two-sided wall formwork. For details see the Technical Instruction Manual of the formwork you are using. For safe access to the platform we recommend using the MEVA Stair Tower.

Permissible load:

1.5 kN/m², load class 2 according to DIN 12811-1. Maximum influence width: walkway bracket 90 = 1.80 m
Planking classification S10.

Platform layout

The STB units can be set up flexibly and combined with different formwork systems and heights. When planning, take the platform layout and the fall height into account.

STB 450

The planks and boards can be attached to the support frame or the height extension (Figures 16.3 and 16.4). The guardrailing posts are inserted directly into the support for guardrailing post of the STB 450 or the height extension.

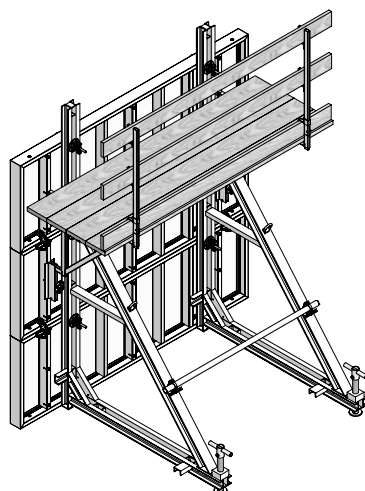


Fig. 16.1 STB 300 with walkway bracket 90

Attachment of boards to the walkway bracket with screws (Ø 10 mm and a minimum length of 110 mm)

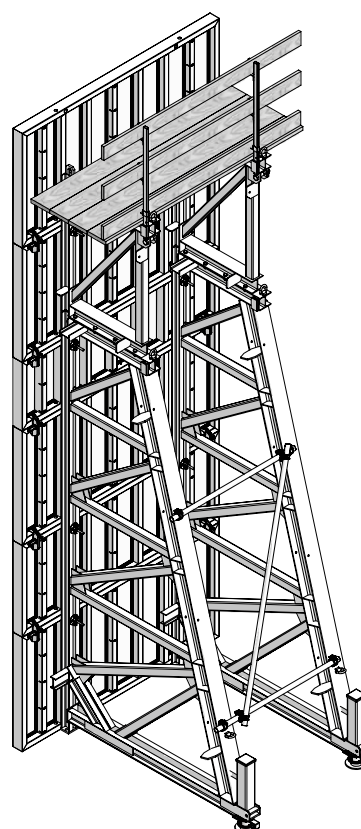


Fig. 16.2 STB 450 with conventional scaffold on STB height extension

Attachment of boards to the STB or height extensions with screws (e.g. M20x75). The guardrailing posts are easily and safely inserted into the guardrailing post supports of the support frame or height extension.

Description	Ref. No.
Walkway bracket 90	29-106-00
Guardrailing post 100	29-106-75
Guardrailing post 140	29-106-85
Guardrailing post 48/120	29-106-80
Side railing 90/100	29-108-20

Support frame

Access ladder

An access ladder with safety cage is required if the support frame 450 is used. The distance from the ground to the safety cage must not exceed 3 m. The ladders are attached to the wall formwork panels using the ladder fixture 33/45, regardless of whether a crossbeam or alignment rails are used (Figures 17.1 to 17.4). The ladder fixture is bolted to the multi-function profiles of the wall formwork panels using flange screws 18. Three ladder fixtures 33/45 are required for formwork heights between 350 cm and 450 cm. For heights above 450 cm please contact MEVA.

Note

- Alternatively, a MEVA Stair Tower can be employed to access the working level.
- A MEVA Stair Tower is required above a height of 5.00 m if there are no intermediate working levels.

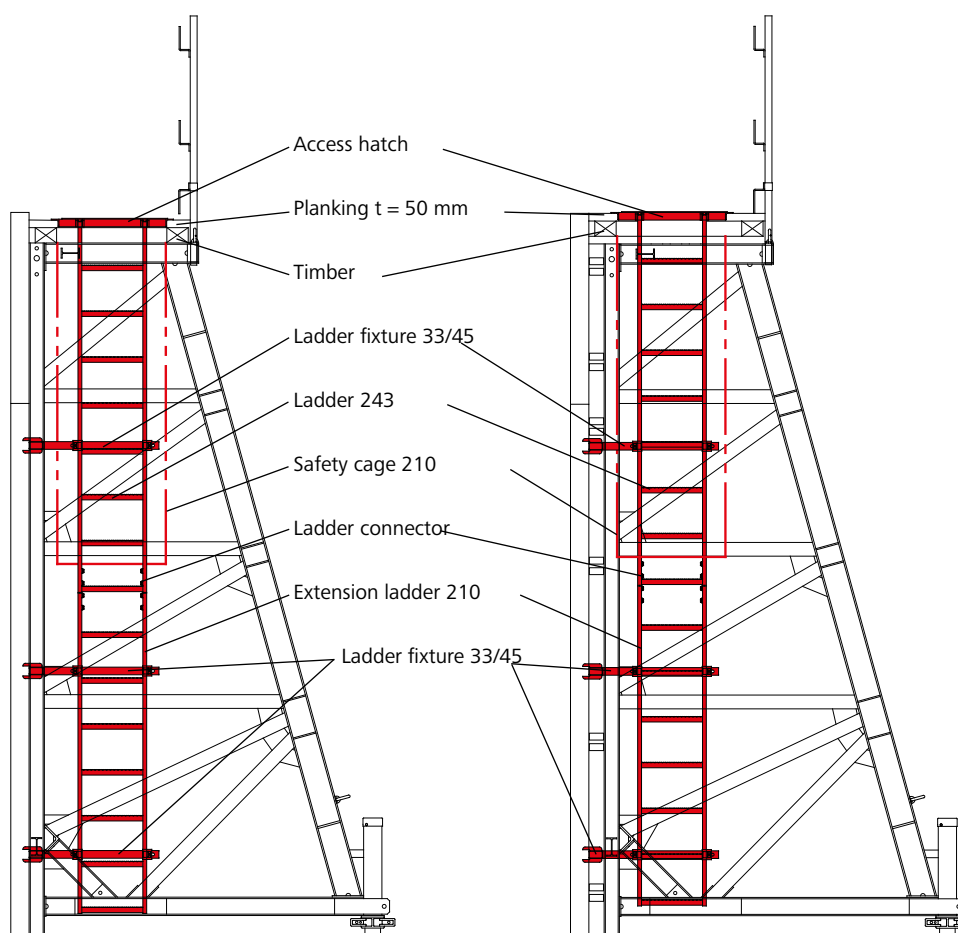


Fig. 17.1 STB 450 with ladder access; STB attached directly to the formwork.

Fig. 17.2 STB 450 with ladder access; crossbeam or alignment rail between STB and formwork.

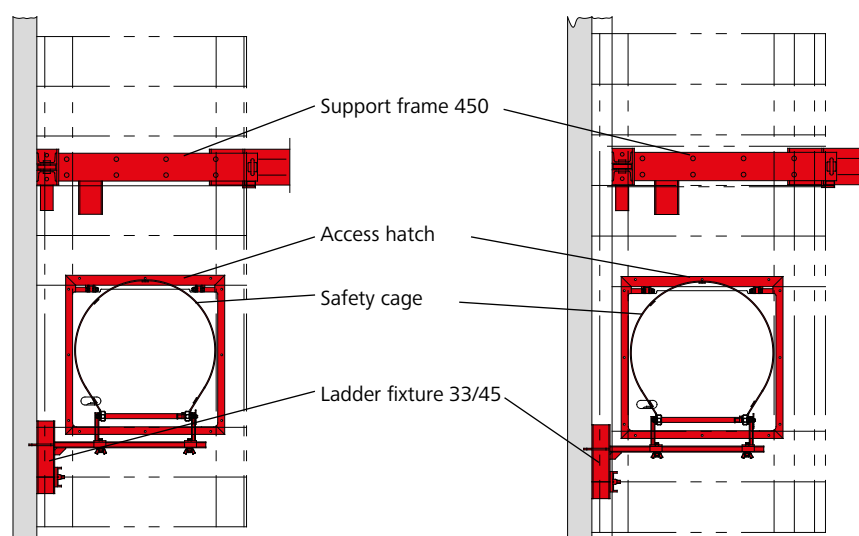


Fig. 17.3 Ladder access with access hatch without crossbeam

Fig. 17.4 Ladder access with access hatch and crossbeam

Description	Ref. No.
Ladder fixture 33/45	29-404-35
Ladder 243	29-416-50
Extension ladder 210	29-414-60
Extension ladder 90	29-416-60
Extension ladder 60	29-416-62
Safety cage 210	29-414-85
Safety cage 85	29-414-90
Safety cage 40	29-416-90
Ladder connector	29-414-70
Access hatch KLK	29-416-05

Anchoring details – General

Anchors for support frame 450 (Fig. 18.1), support frame 300 plus (Fig. 18.2) and support frame 300 can be made for different floor slab thicknesses using anchor loops or DW tie rods, coupling nuts and anchoring auxiliaries.

All parts are designed for the use of DW 15, DW 20 and DW 26.5 tie rods.

The anchoring auxiliaries can be attached either to the upper (Fig. 18.3) or to the lower rebar layer (Fig. 18.4) depending on the slab thickness or the number and density of rebars. The angle of installation of the tie rods is automatically correct due to the shape of the anchoring auxiliaries (45°).

Depending on the version it may be possible to recover and reuse the tie rods (see page STB-21).

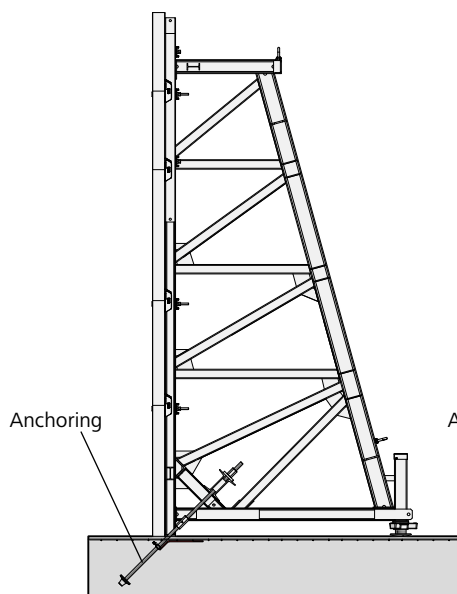


Fig. 18.1 Support frame STB 450

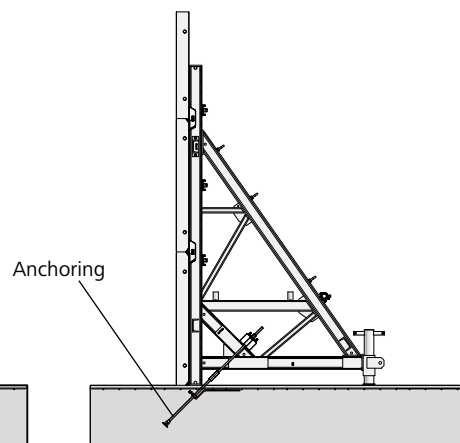


Fig. 18.2 Support frame STB 300 plus

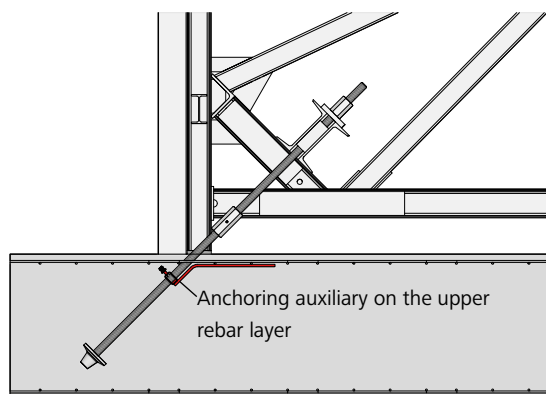


Fig. 18.3

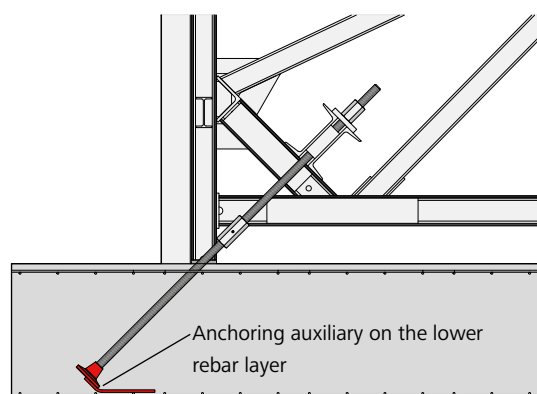


Fig. 18.4

Support frame

Anchoring details – General

Decisive for the choice of tie rod are the forces that occur at the anchor point of the support frame. Anchoring can be performed as follows:

- With tie rod DW 15 (Fig. 19.1) and M cross stiffener 44.
- With tie rod DW 20 or DW 26.5 and twin channel 80/22 or 245/22 (Fig. 19.5).
- With anchor loop 15 (Fig. 19.2) or 20 and twin channel (Figures 19.3 and 19.4) or with anchor loop 15 or 20 turned through 180° (Fig. 19.4). Contact the structural engineer if additional rebars are required.

Maximum anchoring loads:

Tie rod DW

DW 15 = 90 kN per tie rod

DW 20 = 160 kN per tie rod

DW 26.5 = 250 kN per tie rod

Anchor loop

DW 15 = 180 kN

DW 20 = 320 kN

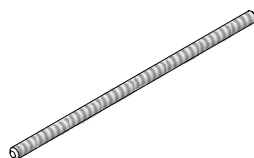


Fig. 19.1 Tie rod DW

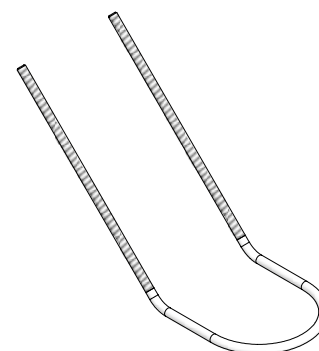


Fig. 19.2 Anchor loop

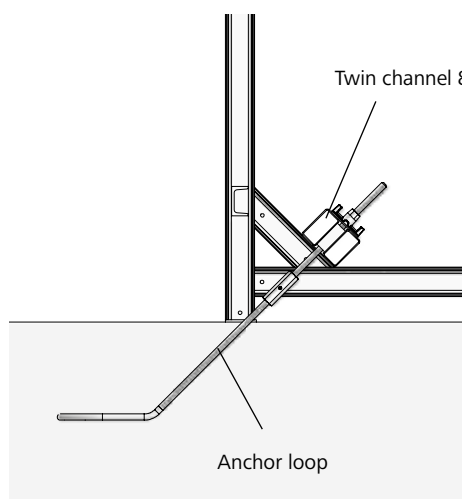


Fig. 19.3

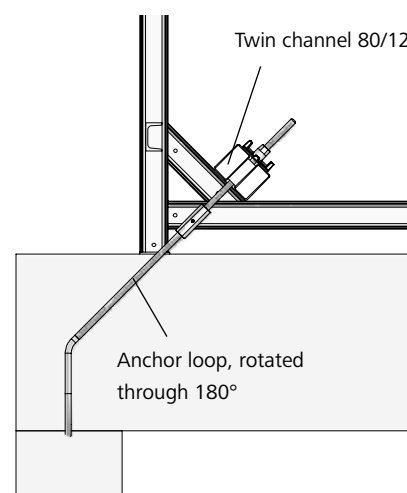


Fig. 19.4

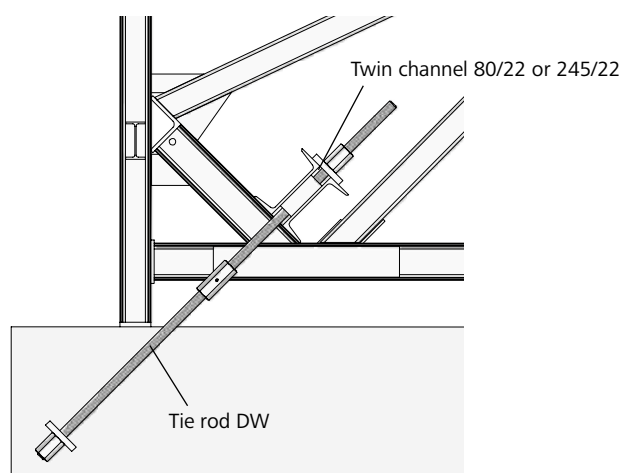


Fig. 19.5

Description	Ref. No.
Tie rod DW 15/90	29-900-80
Tie rod DW 20/120	29-900-97
Tie rod DW 26.5/80	29-900-75
Anchor loop 15	29-001-20
Anchor loop 20	29-001-25
M cross stiffener 44	29-401-02
Twin channel 245/22	29-406-30
Twin channel 80/22	29-406-35
Twin channel 80/12	29-406-38

Support frame

Anchoring details – General

Anchoring auxiliaries – Individual parts

→ Anchor holder

DW 15 – DW 26.5 (Fig. 20.1), attachment to the upper rebar layer. The use of the anchor holder DW is recommended for slab thicknesses greater than approx. 40 cm or for slabs with a large number and density of rebars.

It is bent to 45° and can be used with DW 15, DW 20 and DW 26.5 tie rods. If the anchor holder DW with anchor sleeve is used, it can be used with tie rods DW 15.

→ Single/double anchor DW, attachment to the lower rebar layer.

For slab thicknesses up to approx. 40 cm we recommend the use of single anchors (Fig. 20.2) or double anchors (Fig. 20.3).

Maximum loading:

Single anchor DW

DW 15 = 90 kN per tie rod

DW 20 = 160 kN per tie rod

DW 26.5 = 250 kN per tie rod

Double anchor DW

DW 15 = 180 kN

DW 20 = 320 kN

The single/double anchor is bent to 45°.

→ The planing cap (Fig. 20.4) with a 45° end face for use with tie rods DW 15 and DW 20 (planing cap DW 26.5 for tie rod DW 26.5) is made of rigid foam and is inserted over the tie rod or the anchor sleeve before pouring, allowing a smooth, level floor slab surface to be achieved. Once the concrete has been poured and the planing cap removed, a coupling nut DW can now be screwed onto the tie rod and a second tie rod can be installed to secure the support frame.

→ Coupling nut (Fig. 20.5), to enable the tie rods encased in the floor slab to be extended.

The nut has a DW thread. Permissible load in kN and widths across flats (WAF) in mm:

Ø 15: 90 kN, WAF 30

Ø 20: 160 kN, WAF 36

Ø 26.5: 250 kN, WAF 46

→ Fixed anchors DW 15, DW 20 and DW 26.5 (Fig. 20.6), to anchor the tie rods inserted through the anchor holder DW.

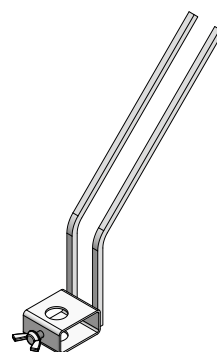


Fig. 20.1 Anchor holder DW 15 – DW 26.5

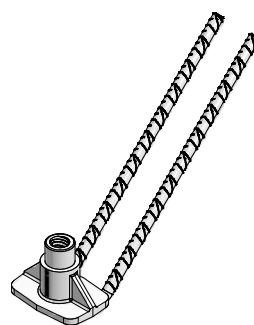


Fig. 20.2 Single anchor DW

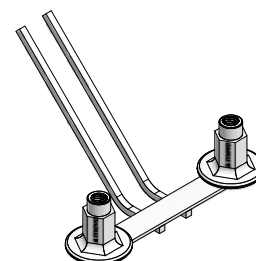


Fig. 20.3 Double anchor DW

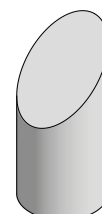


Fig. 20.4 Planing cap

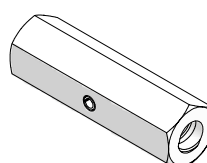


Fig. 20.5 Coupling nut

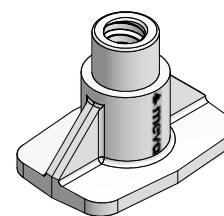


Fig. 20.6 Fixed anchor DW

Description	Ref. No.
Anchor holder	
DW 15 – DW 26,5	29-925-80
Single anchor DW 15	29-925-40
Single anchor DW 20	29-925-45
Single anchor DW 26.5	29-925-50
Double anchor DW 15	29-925-60
Double anchor DW 20	29-925-65
Planing cap	29-917-75
Planing cap DW 26.5	29-917-85
Coupling nut 15	29-900-55
Coupling nut 20	29-900-50
Coupling nut 26.5	29-900-56
Fixed anchor DW 15	29-926-60
Fixed anchor DW 20	29-926-65
Fixed anchor DW 26.5	29-926-70

Anchoring details – General

The tie rod can be installed with a planing cap (Figures 21.1 and 21.2) to ensure a smooth, level floor slab surface, or without a planing cap (Fig. 21.3). The installation without a planing cap can be performed either without (Fig. 21.3) or with an anchor sleeve. In this case, the anchor sleeve is to be wrapped in tape to protect it against contamination.

Depending on the version, it may be possible to recover tie rods.

→ Non-recoverable tie rod, e.g. for use with impermeable concrete without an anchor sleeve (Fig. 21.1).

→ Recoverable tie rod with anchor sleeve (Fig. 21.2).

When a tie rod can be recovered and which anchor sleeve is required to allow this is shown in Table 21.4.

Note

→ The anchor loops DW 15 and DW 20 cannot be recovered.

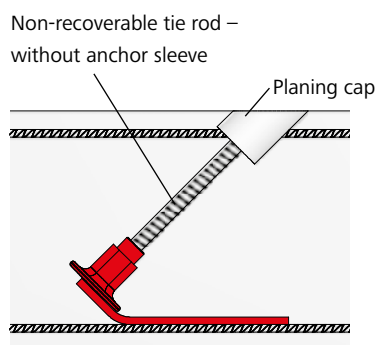


Fig. 21.1

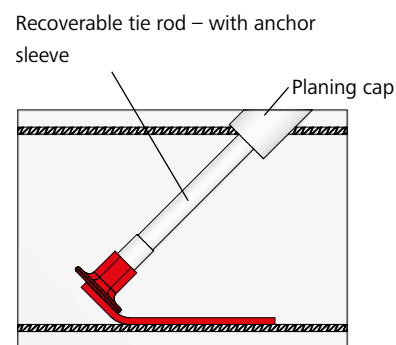


Fig. 21.2

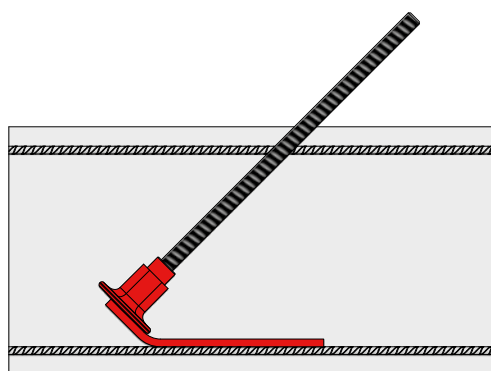


Fig. 21.3

Description	Recoverable tie rod		
	DW 15	DW 20	DW 26.5
	Anchor sleeve	Anchor sleeve	Anchor sleeve
Anchor holder DW 15 – DW 26.5	D 22	–	–
Single anchor DW 15 / fixed anchor DW 15	D 26	–	–
Single anchor DW 20 / fixed anchor DW 20	–	D 32	–
Single anchor DW 26.5 / fixed anchor DW 26.5	–	–	–
Double anchor DW 15	D 26	–	–
Double anchor DW 20	–	D 32	–

Table 21.4

Description	Ref. No.
Anchor holder	
DW 15 – DW 26,5	29-925-80
Single anchor DW 15	29-925-40
Single anchor DW 20	29-925-45
Single anchor DW 26.5	29-925-50
Double anchor DW 15	29-925-60
Double anchor DW 20	29-925-65
Fixed anchor DW 15	29-926-60
Fixed anchor DW 20	29-926-65
Fixed anchor DW 26.5	29-926-70
Plastic tube D22/200	29-902-30
Plastic tube D26/200	29-902-29
Plastic tube D32/200	29-902-28

Anchoring – versions

The anchoring auxiliary must be selected according to the tying method used (tie rod DW, anchor loop DW) (Table 22.1).

→ Tie rods DW 15, 20 and 26.5 can be used with anchor holders DW 15 – DW 26,5 (Fig. 22.2), single anchors DW 15, 20 and 26,5 or with double anchors DW 15 and 20 (Fig. 22.3).

→ Anchor loops 15 and 20 can only be used with anchor holders DW 15 – DW 26.5 (Fig. 22.3).

Type of anchoring auxiliary	Anchoring versions				
	Tie rod DW			Anchor loop	
	15	20	26.5	15	20
Anchor holder DW 15 – DW 26.5	■	■	■	■	■
Single anchor DW 15 / fixed anchor DW 15	■	–	–	–	–
Single anchor DW 20 / fixed anchor DW 20	–	■	–	–	–
Single anchor DW 26.5 / fixed anchor DW 26.5	–	–	■	–	–
Double anchor DW 15	■	–	–	–	–
Double anchor DW 20	–	■	–	–	–

Table 22.1

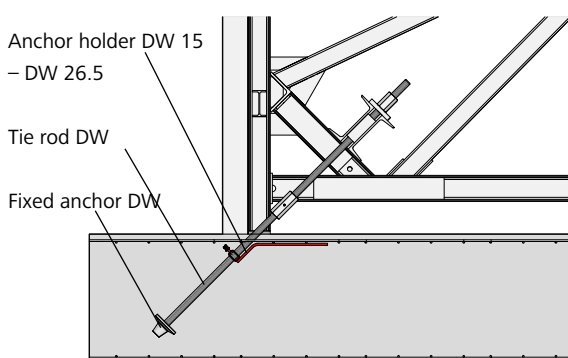


Fig. 22.2 Anchor holder DW 15 – DW 26.5 with tie rod DW

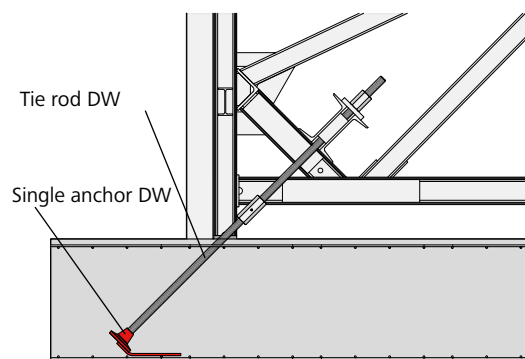


Fig. 22.3 Single/double anchor with tie rod DW

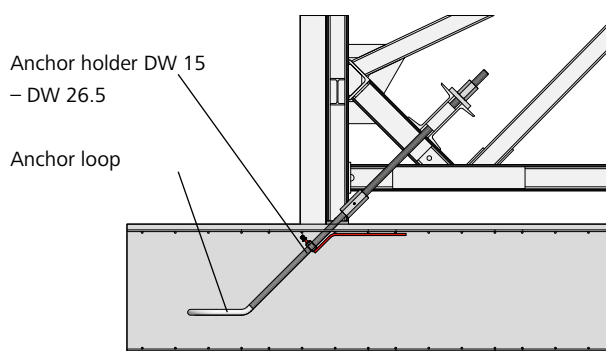


Fig. 22.4 Anchor holder DW 15 – DW 26.5 with anchor loop

Support frame

Anchoring details for STB 300

Figures 23.1 and 23.2 show the STB 300 being used with horizontal panels.

In this case the installation dimension of the anchor or the anchor loop is 15 cm (front face of the formwork panel to the exit point of the tie rod axis).

Figures 23.3 and 23.4 show the STB 300 used with vertical panels and an alignment rail between the formwork and the support frame, e.g. for compensation and corner solutions. We recommend using anchor loop 15.

In this case the installation dimension of the anchor or the anchor loop is 25 cm (front face of the formwork panel to the exit point of the tie rod axis).

When using the STB cross brace, use single tie rods DW 15 in the corner area.

This guideline refers to the use of a formwork panel with a frame depth of 12 cm.

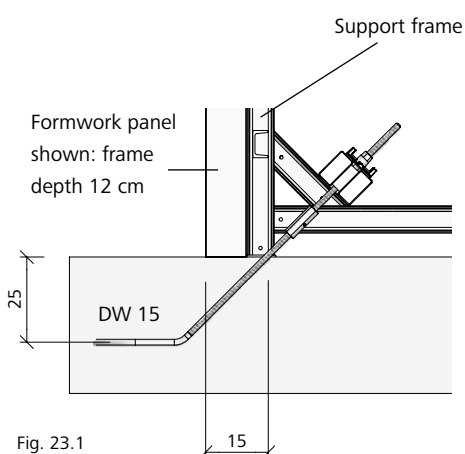


Fig. 23.1

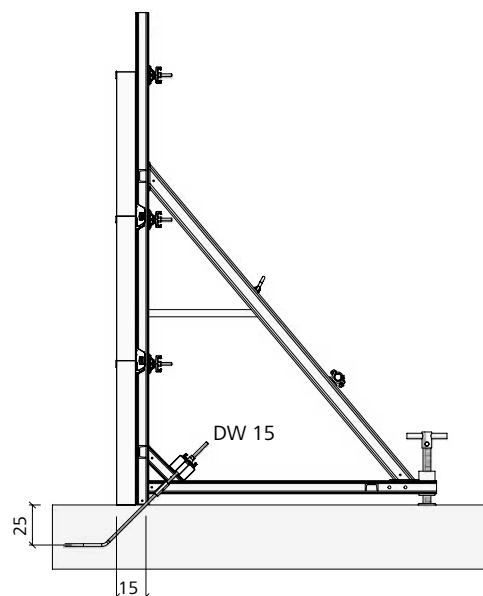


Fig. 23.2

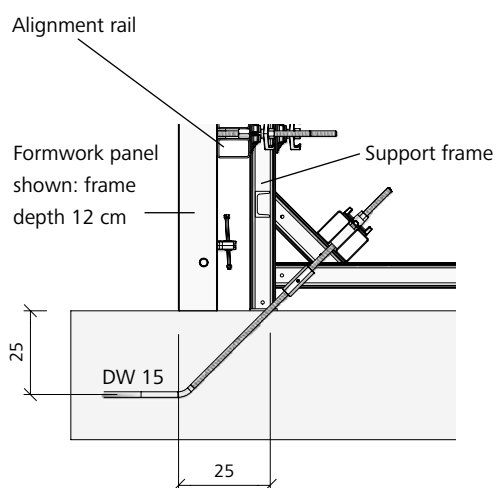


Fig. 23.3

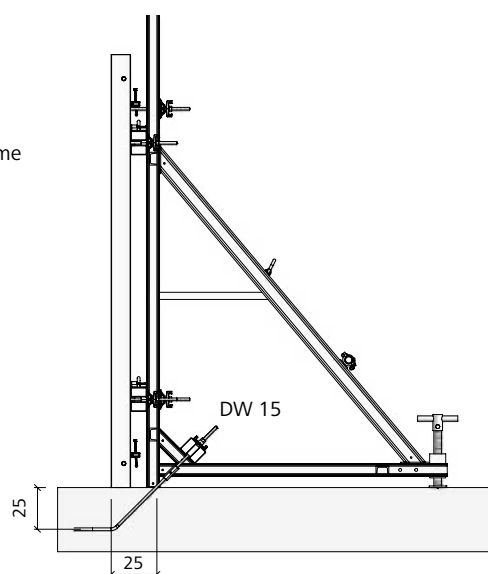


Fig. 23.4

Description	Ref. No.
Anchor loop 15	29-001-20
Anchor loop 20	29-001-25
Coupling nut	
15 (WAF 30)	29-900-55
20 (WAF 36)	29-900-50
Tie rod DW 15/90	29-900-80
Tie rod DW 20/120	29-900-97
Flange nut 100	29-900-20
Articulated flange nut	
15/120	29-900-10
Articulated flange nut	
20/140	29-900-05
M cross stiffener 44	29-401-02

Support frame

Anchoring details for STB 300 plus

Figures 24.1 and 24.2 show the STB 300 plus being used with horizontal panels.

In this case the installation dimension of the anchor or the anchor loop is 15 cm (front face of the formwork panel to the exit point of the tie rod axis).

Figures 24.3 and 24.4 show the STB 300 plus used with vertical StarTec or Mammut formwork and an alignment rail between the formwork and the support frame, e.g. for compensation and corner solutions. We recommend using anchor loop 15 or 20.

In this case the installation dimension of the anchor or the anchor loop is 25 cm (front face of the formwork panel to the exit point of the tie rod axis).

When using the STB cross brace, use single tie rods DW 15 in the corner area.

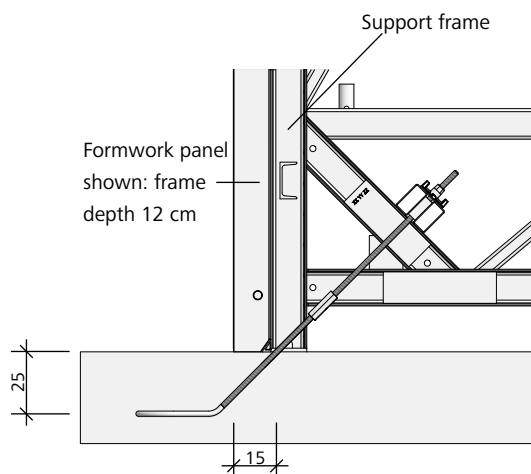


Fig. 24.1

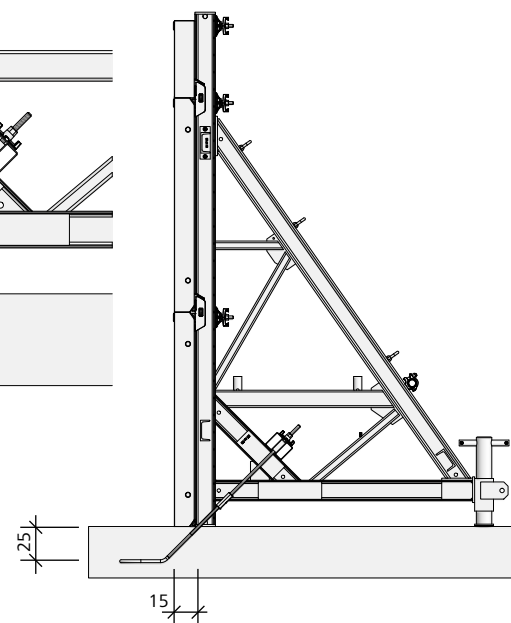


Fig. 24.2

This guideline refers to the use of a formwork panel with a frame depth of 12 cm and set-up of the support frame on the floor slab.

The dimension changes for raised support frames.

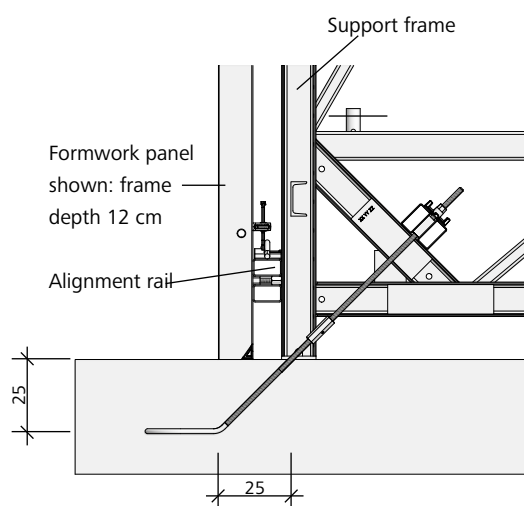


Fig. 24.3

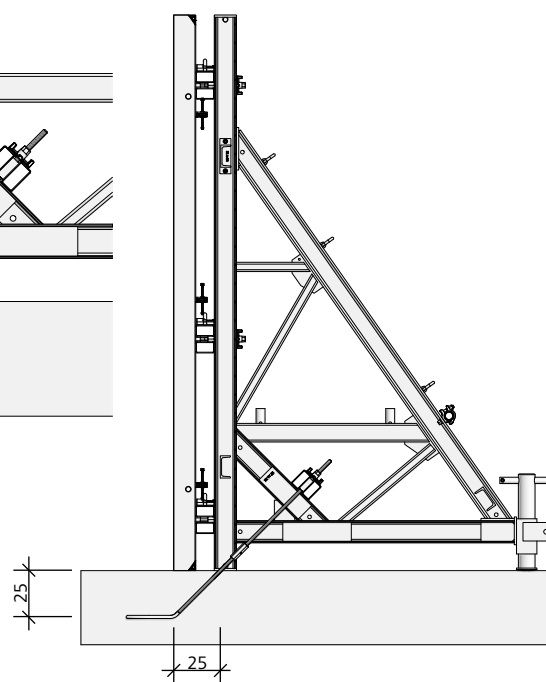


Fig. 24.4

Description	Ref. No.
Anchor loop 15	29-001-20
Anchor loop 20	29-001-25
Coupling nut	
15 (WAF 30)	29-900-55
20 (WAF 36)	29-900-50
Tie rod DW 15/90	29-900-80
Tie rod DW 20/120	29-900-97
Flange nut 100	29-900-20
Articulated flange nut 15/120	29-900-10
Articulated flange nut 20/140	29-900-05
M cross stiffener 44	29-401-02

Support frame

Anchoring details for STB 450

Figures 25.1 and 25.2 show the STB 450 being used with horizontal panels.

In this case the installation dimension of the anchor is 20 cm (front face of the formwork panel to the exit point of the tie rod axis).

Figures 25.3 and 25.4 show the STB 450 used with vertical panels and an alignment rail between the formwork and the support frame, e.g. for compensation and corner solutions.

In this case the installation dimension of the anchor is 30 cm (front face of the formwork panel to the exit point of the tie rod axis).

Refer to the separate STB load charts for the number of tie rods DW 15, DW 20 and DW 26.5 required.

When using the STB cross brace, use single tie rods DW 15 in the corner area.

This guideline refers to the use of a formwork panel with a frame depth of 12 cm and set-up of the support frame on the floor slab. The dimension changes for raised support frames.

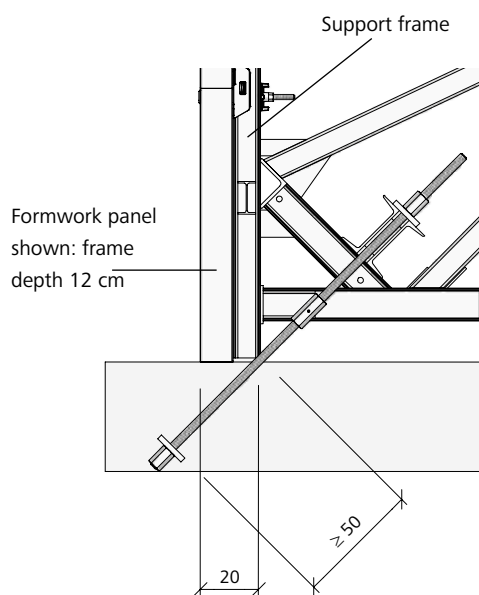


Fig. 25.1

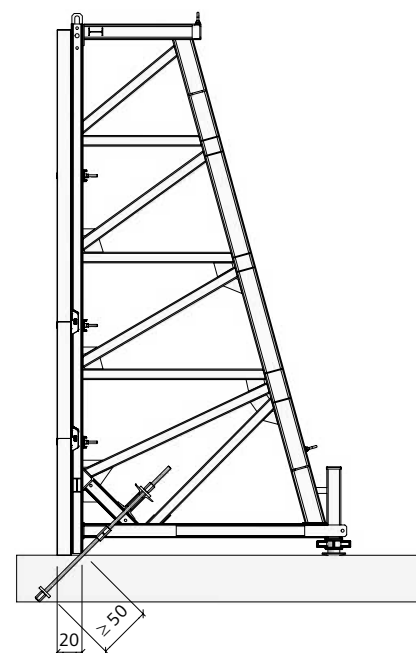


Fig. 25.2

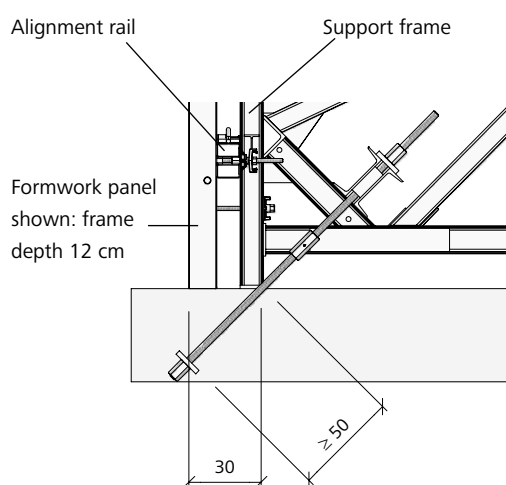


Fig. 25.3

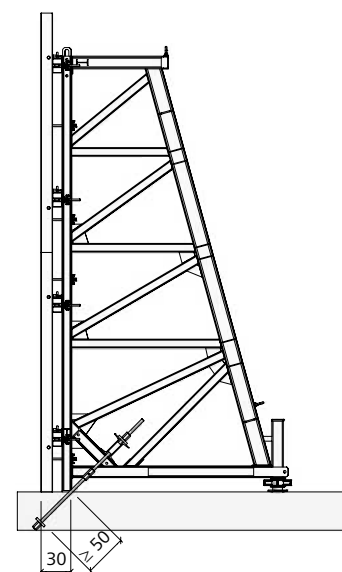


Fig. 25.4

Description	Ref. No.
Hexagonal nut	
20 (WAF 36)	29-900-61
26.5 (WAF 46)	29-900-58
Counter plate	
120x120x20/25	29-900-35
120x120x20x38	29-900-30
Tie rod DW 26.5/80	29-900-75
Coupling nut 26.5	29-900-56
Twin channel 245/22	29-406-30
Twin channel 80/22	29-406-35
Twin channel 80/12	29-406-38

Anchoring – Installing anchor holders DW 15 – DW 26.5

The use of the anchor holder DW is recommended for slab thicknesses greater than approx. 40 cm or for slabs with a large number and density of rebars. It is attached to the bottom of the upper rebar layer, for example with binding wire (Fig. 26.1).

Refer to pages STB-23 to STB-25 for the installation dimension of the anchor holder DW (Figures 26.2 and 26.3).

Depending on the installation method used:

→ the tie rod DW is inserted through the anchor holder DW, screwed into the fixed anchor DW and secured with the adjusting screw.

→ the anchor loop is inserted through the anchor holder DW and secured with the adjusting screw.

Having installed the planing cap on the tie rod DW 15 or DW 20 or on the anchor sleeve, the slab can be poured.

The planing cap must sit completely on the tie rod so that the coupling nut can be screwed down to the centre stop.

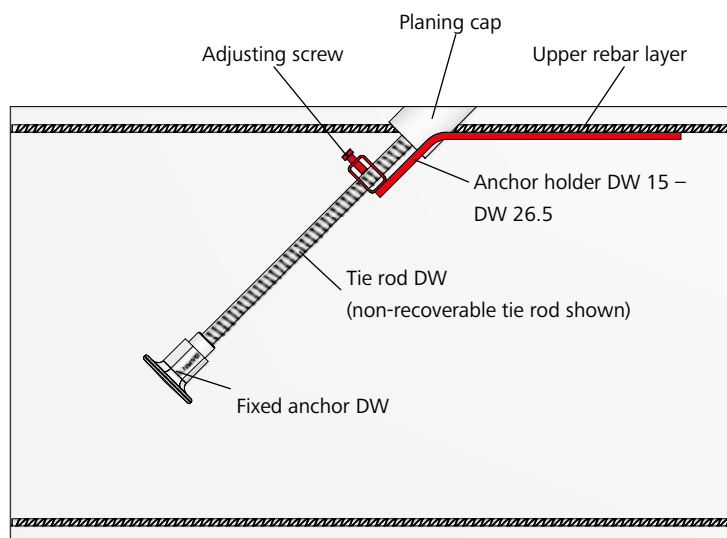


Fig. 26.1

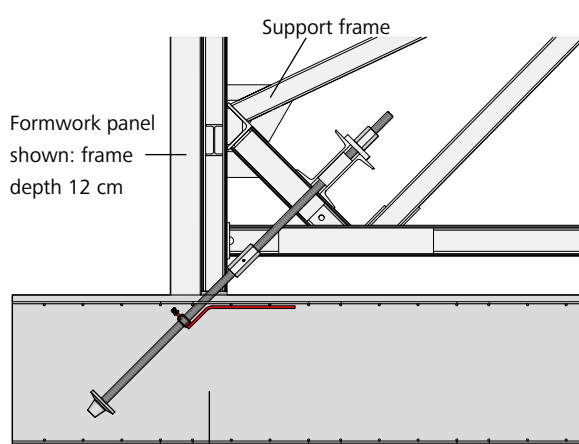


Fig. 26.2

The dimension in brackets applies to use with support frame STB 300/300 plus.

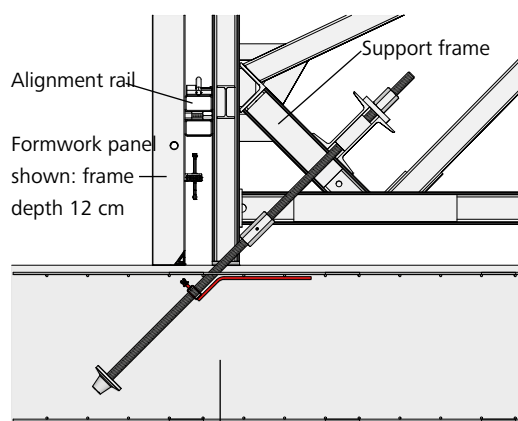


Fig. 26.3

The dimension in brackets applies to use with support frame STB 300/300 plus.

Description	Ref. No.
Anchor holder DW 15 – DW 26,5	29-925-80
Fixed anchor DW 15	29-926-60
Fixed anchor DW 20	29-926-65
Fixed anchor DW 26.5	29-926-70
Planing cap	29-917-75
Planing cap DW 26.5	29-917-85

Anchoring – Installing anchor holders DW 15 – DW 26.5

The maximum length of the tie rods DW when using the anchor holder DW depends on the floor slab thickness d_{Bt} (Fig. 27.1) and is calculated using the formula on the right. For the maximum length of the tie rods DW in the different slab thicknesses refer to Table 27.2. For other structural specifications the installation depth of the tie rod can be varied and set using the integrated adjusting screw.

Depending on the slab thickness, the maximum installation depth of the anchors and any additional rebaring measures required are to be clarified with the structural engineer taking corrosion protection requirements into consideration.

Note

- The tie rod lengths specified in Table 27.2 apply when the planing cap is installed.
- Longer tie rods are required if planing caps are not installed.

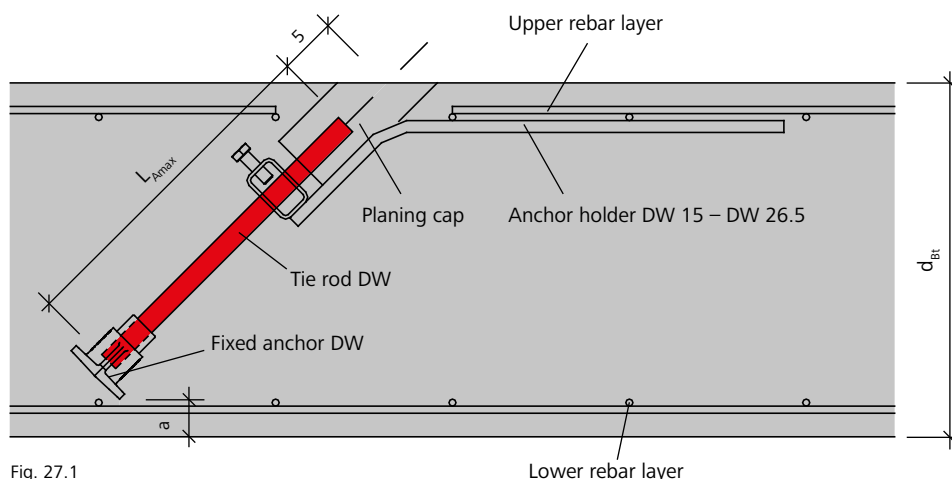


Fig. 27.1

Maximum length of the tie rod when using anchor holders DW 15 – DW 26.5:

$$L_{Amax} = \sqrt{2} \times (d_{Bt} - a - 5.5)$$

L_{Amax} = maximum length of the tie rod

d_{Bt} = thickness of component/slab

a = distance between lower edge of component to lower edge of slab

Anchor holder DW 15 – DW 26.5	Thickness of component/slab in cm						
	35	40	45	50	55	60	65
Maximum length of tie rod L_{Amax} (for a concrete thickness of at least 20 mm and use of a planing cap)	37	44	51	58	66	74	82

Table 27.2 Maximum length of the tie rod

The minimum length of the tie rod is 50 cm when anchoring the STB 450 (see page STB-25). The part/slab must thus have a thickness of at least 45 cm.

Anchoring – Installing single/double anchors

We recommend the use of the single and double anchor (Fig. 28.1) for slab thicknesses up to approx. 40 cm. It is welded to the top of the lower rebar layer or attached with binding wire.

Refer to pages STB-23 to STB-25 for the installation dimension of the single/double anchor (Figures 28.2 and 28.3).

The tie rod DW is screwed into the single/double anchor.

Having installed the planing cap / planing cap DW 26.5 on the tie rod DW or on the anchor sleeve, the slab can be poured.

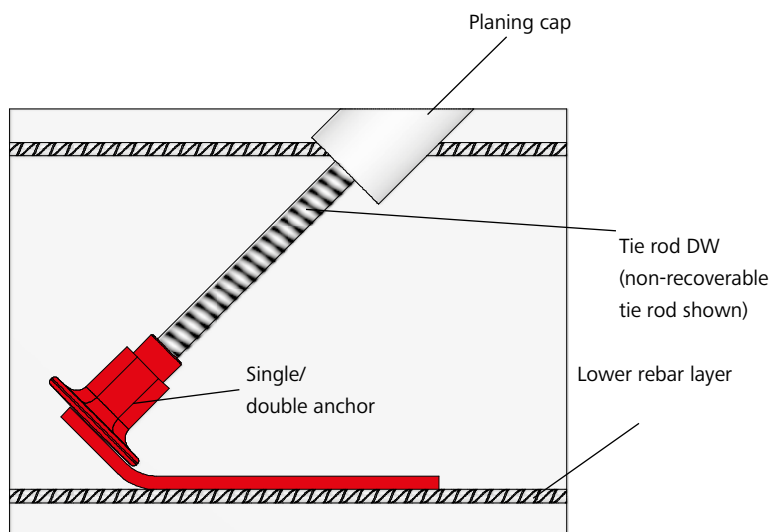


Fig. 28.1

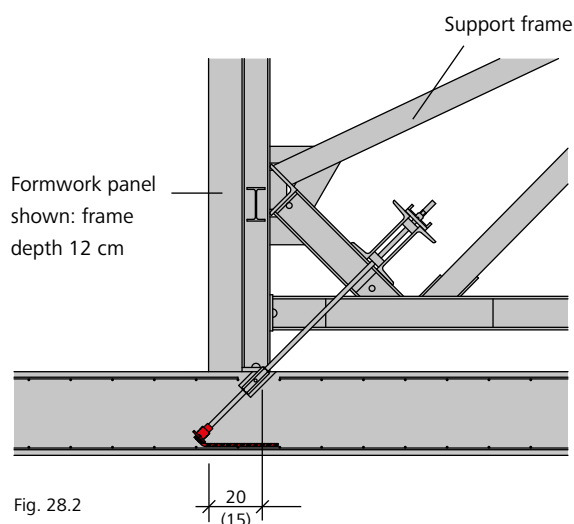


Fig. 28.2

The dimension in brackets applies to use with support frame STB 300.

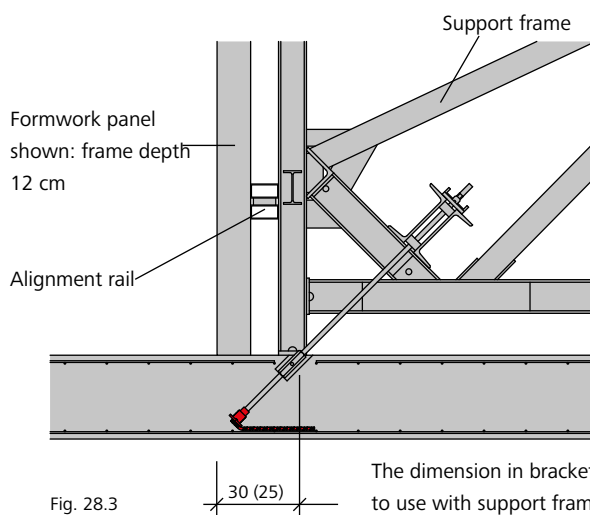


Fig. 28.3

The dimension in brackets applies to use with support frame STB 300.

Description	Ref. No.
Single anchor DW 15	29-925-40
Single anchor DW 20	29-925-45
Single anchor DW 26.5	29-925-50
Double anchor DW 15	29-925-60
Double anchor DW 20	29-925-65
Planing cap	29-917-75
Planing cap DW 26.5	29-917-85

Anchoring – Installing single/double anchors

The exact length of the tie rods DW when using single/double anchors depends on the floor slab thickness d_{Bt} (Fig. 29.1) and is calculated using the formula on the right. For the exact length of the tie rods DW in the different slab thicknesses refer to Table 29.2.

Depending on the slab thickness, the maximum installation depth of the anchors and any additional rebaring measures required are to be clarified with the structural engineer taking corrosion protection requirements into consideration.

Note

→ The tie rod lengths specified in Table 29.2 apply when the planing cap is installed. If planing cap DW 26.5 is used, the tie rod must be 1 cm longer.

→ Longer tie rods are required if planing caps are not installed.

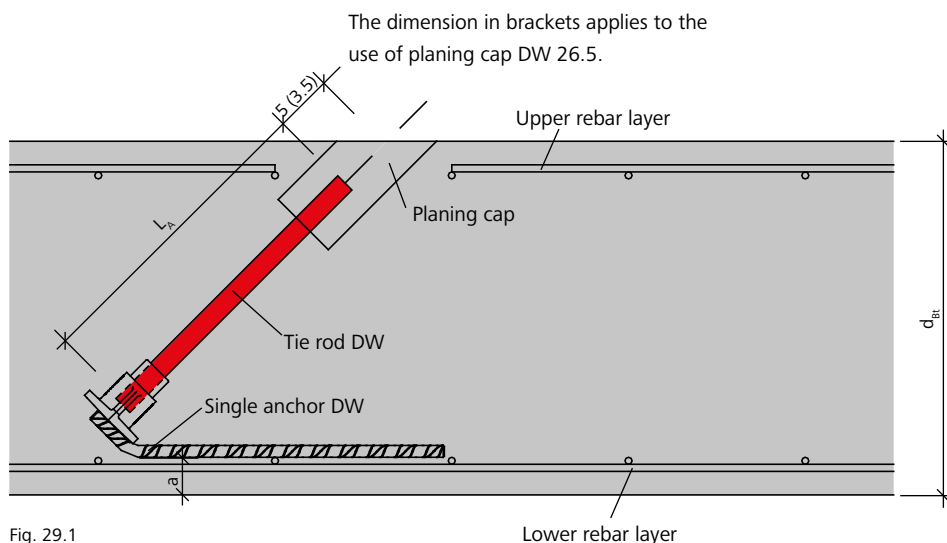


Fig. 29.1

Length of the tie rod when using the single/double anchor:

$$L_A = \sqrt{2} \times (d_{\text{Bt}} - a - 6.5)$$

L_A = length of tie rod

d_{Bt} = thickness of component/slab

a = distance between lower edge of component to lower edge of slab

Single/double anchor	Thickness of component/slab in cm						
	35	40	45	50	55	60	65
Length of tie rod L_A (for a concrete thickness of at least 20 mm and use of a planing cap)	35	42	49	56	65	72	79

Table 29.2 Length of tie rod

The minimum length of the tie rod is 50 cm when anchoring the STB 450 (see page STB-25). The part/slab must thus have a thickness of at least 50 cm.

Use of the planing cap DW 26.5 = length of tie rod L_A + 1 cm.

Support frame

Anchoring – installation of the anchor extension

Step 1: After pouring, remove the planing cap (Fig. 30.1).

Step 2: The coupling nut can now be screwed fully onto the tie rod (Fig. 30.2)

Step 3: The extension tie rod DW is screwed into the coupling nut and can thus be used to anchor the support frame (Figures 30.3 to 30.4). Refer to Table 30.6 for the minimum length of the extension tie rod DW.

Step 4: When the support frame is no longer in use, the extension tie rod and the coupling nut are screwed out. Depending on the installation version, the recoverable tie rod can now be removed. We recommend using an adjustable spanner to screw out the tie rod.

Step 5: The opening in the steel-reinforced concrete slab is then plugged, taking corrosion protection requirements into account. (Fig. 30.5).

If a planing cap is not used when anchoring, only steps 2 to 4 are performed (see also page STB-21).

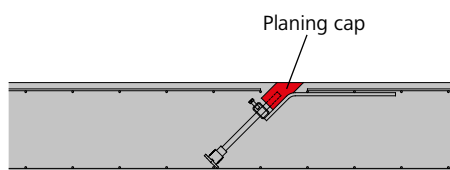


Fig. 30.1

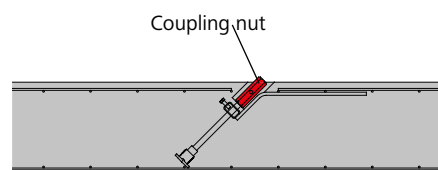


Fig. 30.2

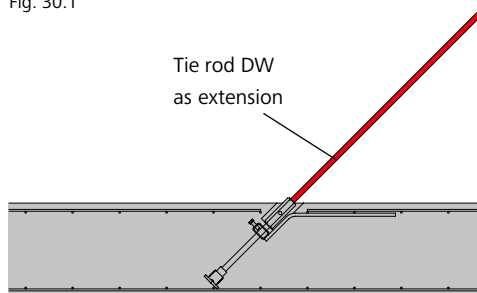


Fig. 30.3

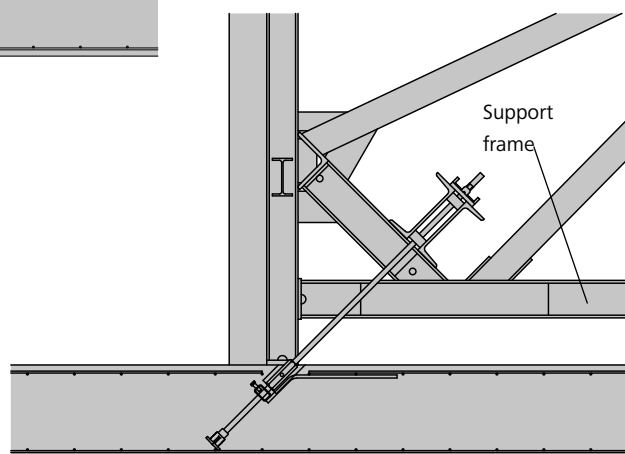


Fig. 30.4

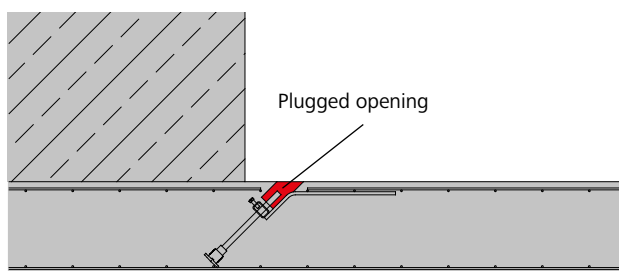


Fig. 30.5

Minimum length of extension tie rod (in cm)	M cross stiffener 44	Twin channel 80/12	Twin channel 80/22 and 245/22
STB 300	57	59	-
STB 300 plus	88	90	100
STB 450	-	88	98

Table 30.6

Description	Ref. No.
Coupling nut 15.....	29-900-55
Coupling nut 20.....	29-900-50
Coupling nut 26.5.....	29-900-56
Tie rod DW 15/90.....	29-900-80
Tie rod DW 20/..	
per linear metre.....	29-900-98
Tie rod DW 26.5/80.....	29-900-75
Tie rod DW 26,5/..	
per linear metre.....	29-900-73
Adjustable spanner.....	29-926-95

Support frame

Anchoring – Upright bracket

Facing can be bolted directly to the upstand bracket (Fig. 31.1) or a wall formwork panel can be placed up against it.

It has an adjustment range of 10 cm.

The height of the upstand formwork must not be greater than 15 cm.

The maximum distance between the upstand brackets for MEVA panels is 240 cm.

Installing the upstand bracket

To install the upstand bracket, press a spiral anchor DW 15 or the quick anchor into the fresh concrete (Fig. 31.2).

When the concrete has set and the polystyrene core (spiral anchor DW 15) has been removed, the upstand bracket can be anchored to the ground with a tie rod DW 15 and a flange nut 100 (Fig. 31.3).

The facing or the wall formwork panel are now placed up against the upstand bracket (Fig. 31.4).

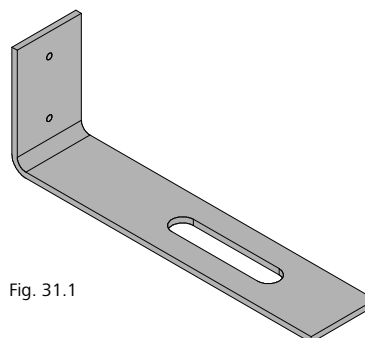


Fig. 31.1

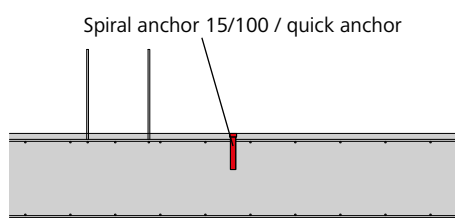


Fig. 31.2

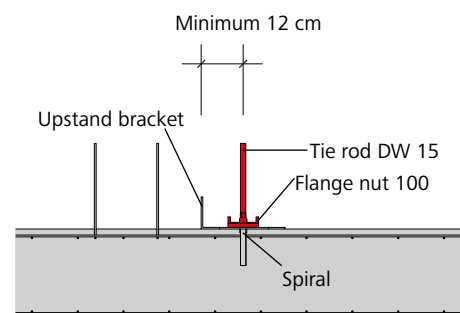


Fig. 31.3

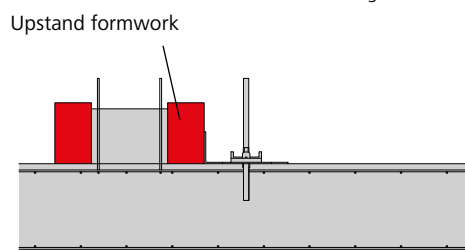


Fig. 31.4

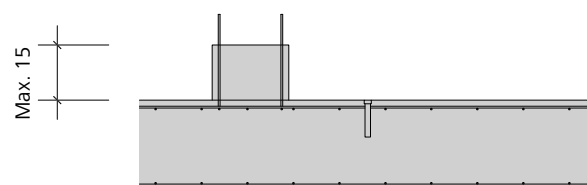


Fig. 31.5

Description	Ref. No.
Upstand bracket	29-925-10
Spiral anchor DW15/100.....	29-921-10
Quick anchor	29-922-70
Quick anchor DW 15	
anchor plate	29-922-73
Quick anchor fixture	29-922-75
Tie rod DW 15/45	29-900-76
Flange nut 100	29-900-20
Adjustable spanner	29-926-95

Support frame

Stop ends

The stop end bracket SB 110 can be used for wall thicknesses up to 90 cm. It has a sliding part that is slid up against the existing component at the stop end (Fig. 32.1 and 32.2). The stop end bracket is mounted by sliding it horizontally between the support frames (Fig. 32.4) and by attaching a tie rod DW 15/45 and an flange nut 100 or an articulated flange nut 15/120 to the nuts of the multi-function profiles of the panels (StarTec XT, StarTec, Mammut XT, Mammut 350 or Mammut). The support frame is then located between the panel and the stop end bracket.

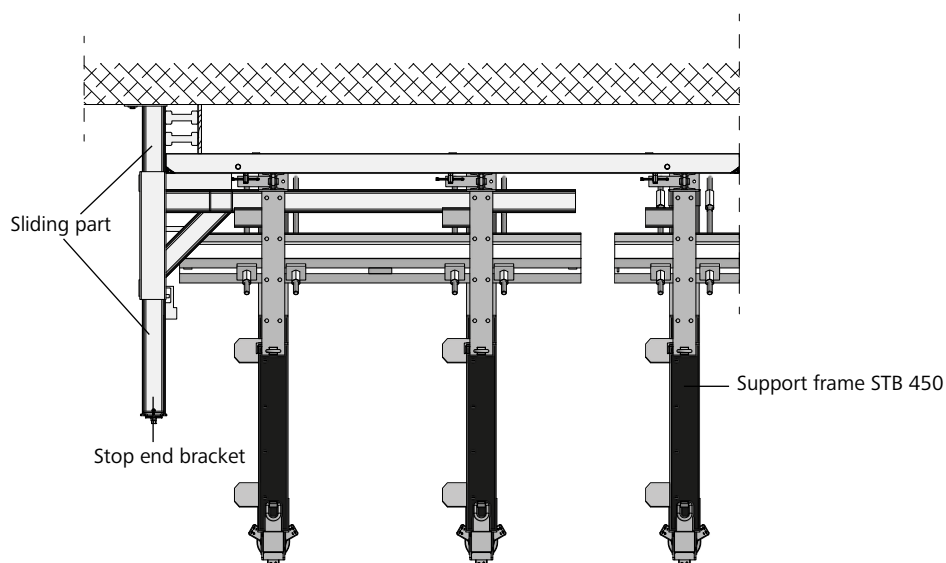


Fig. 32.1 Stop end bracket SB 110 on a horizontal Mammut XT panel

When installing the stop end bracket, please observe the following:

- Mammut: When attaching the stop end bracket to a horizontal panel, make sure the bottom of the panel faces the side to which the sliding part of the stop end bracket is attached to form the stop end.
- Mammut and StarTec: The clamping device for the stop end bracket SB 110 must be used to attach the stop end bracket (Fig. 32.2).

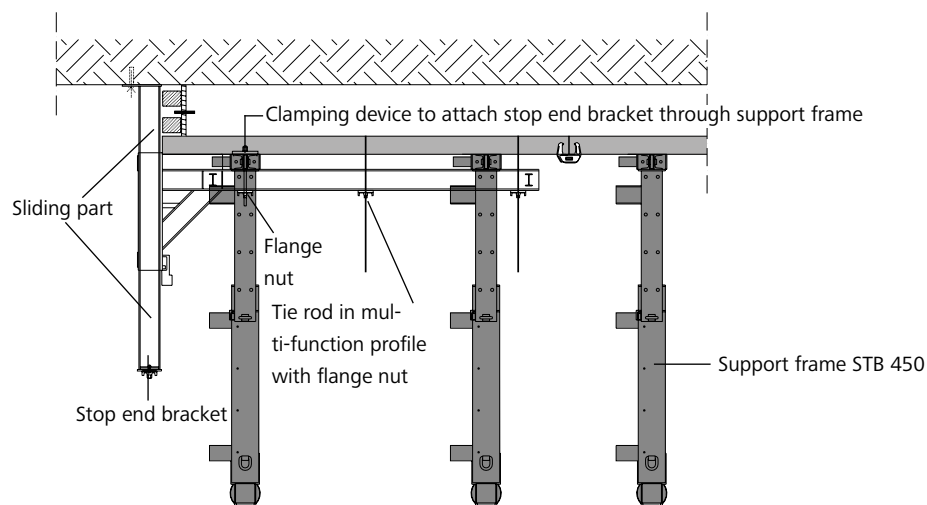


Fig. 32.2 Stop end bracket SB 110 on a horizontal Mammut/StarTec panel with a clamping device for the stop end bracket

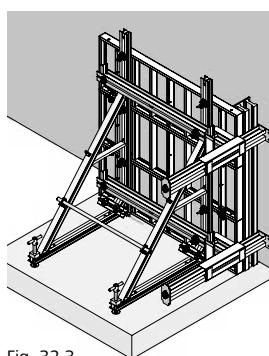


Fig. 32.3

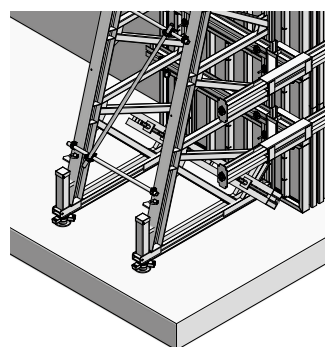


Fig. 32.4

Description	Ref. No.
Stop end bracket SB 110.....	29-406-40
Clamping device for stop end bracket SB 110	29-406-60
Flange nut 100	29-900-20
Articulated flange nut 15/120	29-900-10
Tie rod DW 15/45	29-900-76

Support frame

Stop ends

Figures 33.1 to 33.4 show wall formwork and support frames with different heights and the number of stop end brackets required. Please note that an STB 450 with three height extensions requires six stop end brackets and an STB 450 with 4 height extensions requires 7 stop end brackets.

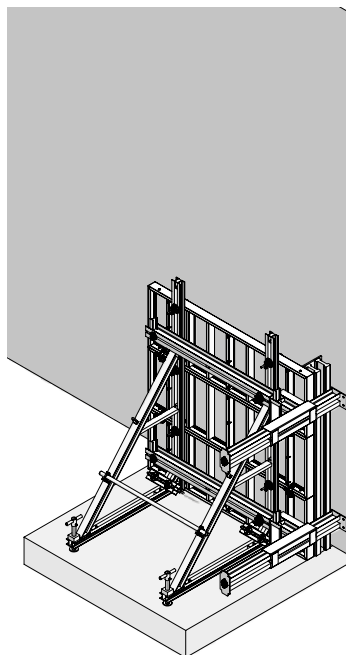


Fig. 33.1
Two stop end brackets for an STB 300

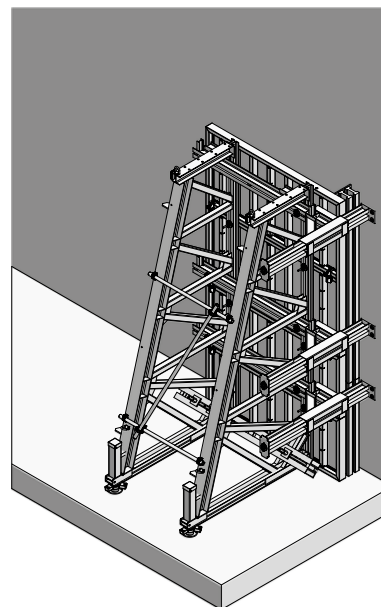


Fig. 33.2
Three stop end brackets for an STB 450

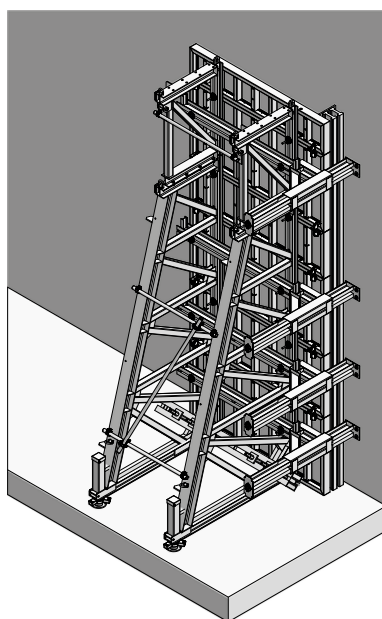


Fig. 33.3
Four stop end brackets for an STB 450 with one height extension

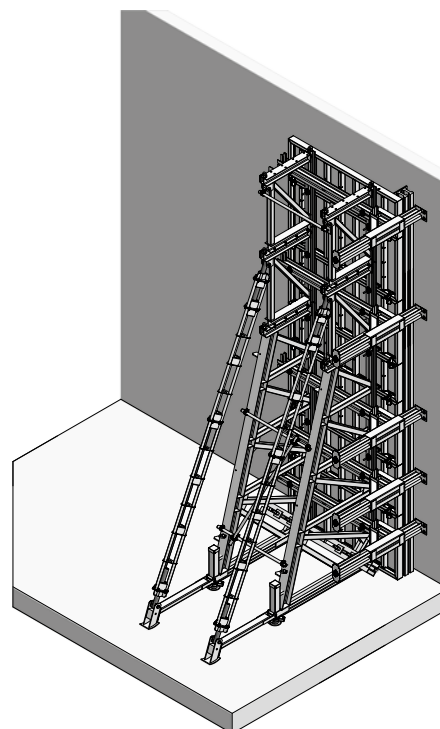


Fig. 33.4
Five stop end brackets for an STB 450 with two height extensions

Support frame

Inside corner with cross brace STB and STB 300/300 plus

Single-sided walls with corners can be formed using the cross brace STB. The cross brace must be attached to the multi-function profiles of the wall formwork using flange screws 18. Two support frames are required for each corner. For detailed dimensions of the anchor positions see Figures 34.1 and 34.2. For the anchoring of support frames see pages STB-18 to STB-30.

A maximum formwork height of 3.30 m is possible when using the STB cross brace with the STB 300. The STB 300 plus is used up to a pouring height of 3.25 m and can be equipped with height extensions for a pouring height up to 4.50 m.

For details of the use of the cross brace in conjunction with StarTec and Mammut formwork refer to the next pages.

Attention

- The dimensions for the anchor positions must be observed.
- Refer the separate STB load charts for the permissible loads as a function of pouring height and fresh-concrete pressure.

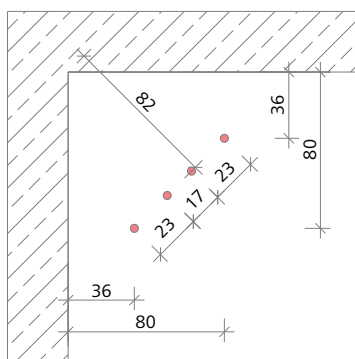


Fig. 34.1

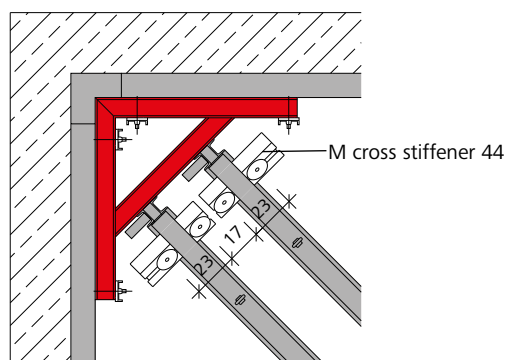


Fig. 34.2

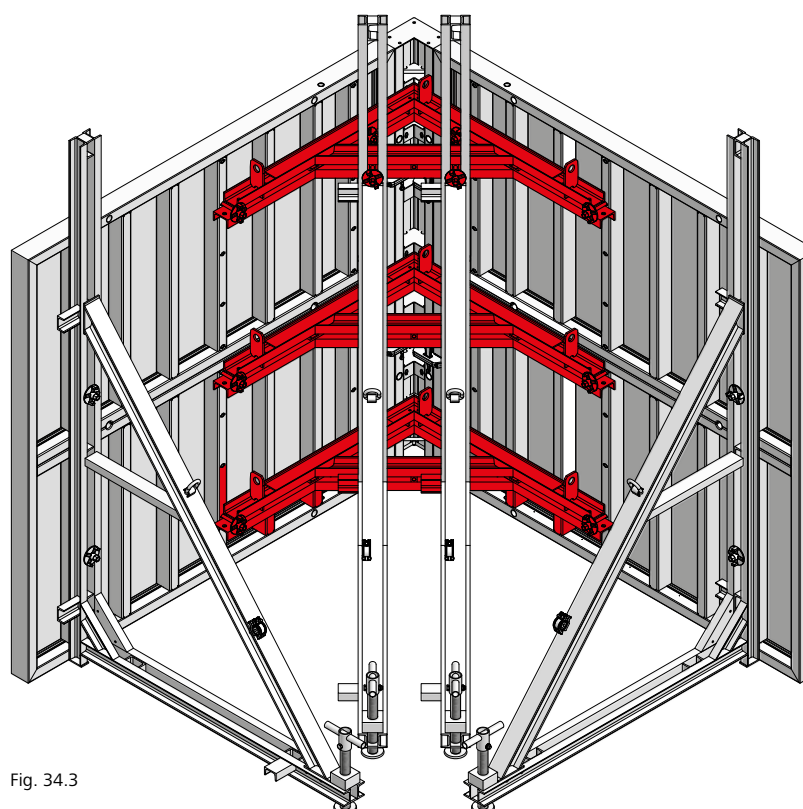


Fig. 34.3

Description	Ref. No.
Cross brace STB	29-406-70
Flange screw 18	29-401-10
M cross stiffener 44	29-401-02
Twin channel 80/12	29-406-38

Support frame

Inside corner with cross brace STB and STB 300/300 plus

There are various options available when using the cross brace STB:

Figures 35.1 to 35.3 show the use of the cross brace in conjunction with Mammut formwork. The Mammut panels can be used horizontally (Figures 35.1 and 35.3) or vertically (Fig. 35.2). If the Mammut panel is used horizontally, it is also possible to attach the STB 300 either to the multi-function profile with the flange screw 18 (Fig. 35.1) or using the tie hole with the fixing screw 35. If the Mammut panel is used vertically, the STB can be attached to the multi-function profile with the flange screw 18 (Fig. 35.2).

Due to their greater stiffness, we recommend using large-size panels in the lower area.

It is sometimes necessary to install a vertical panel next to the inside corner to avoid interference with the support frames (Fig. 35.3).

Fig. 35.4 shows the application with horizontal StarTec formwork with the STB 300 attached to the multi-function profile.

Attention

→ Refer the separate STB load charts for the permissible loads as a function of pouring height and fresh-concrete pressure.

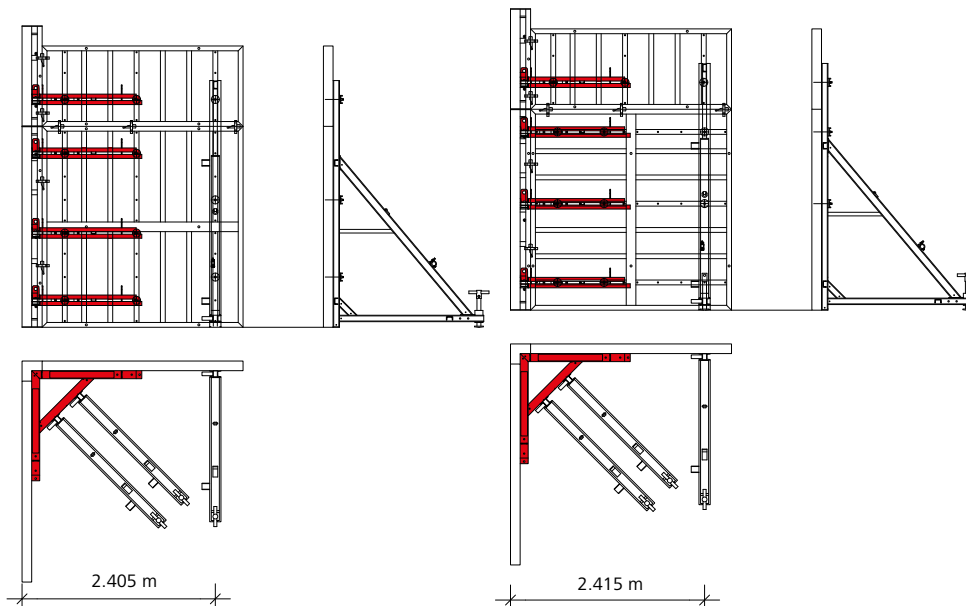


Fig. 35.1

STB 300 with horizontal Mammut formwork; attachment of the STB cross brace and the STB to the multi-function profile using flange screw 18

Fig. 35.2

STB 300 with vertical Mammut formwork; attachment of the STB cross brace and the STB to the multi-function profile using flange screw 18

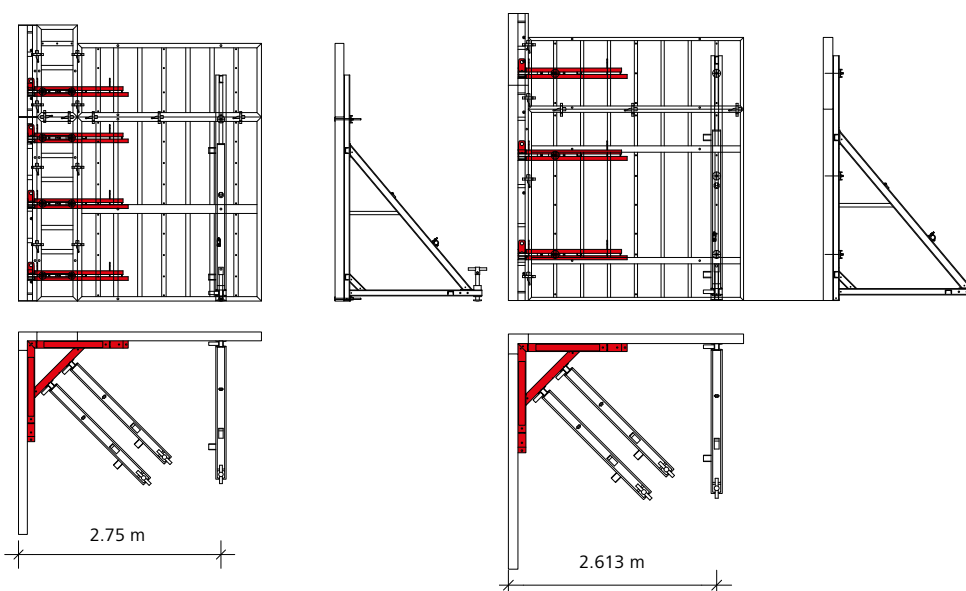


Fig. 35.3

STB 300 with horizontal Mammut formwork and vertical "corner" panel; attachment of the STB cross brace to the multi-function profile using flange screw 18 and of the STB through the tie hole using fixing screw 35

Fig. 35.4

STB 300 with vertical StarTec formwork; attachment of the STB cross brace and the STB to the multi-function profile using flange screw 18

Description	Ref. No.
Cross brace STB	29-406-70
Flange screw 18	29-401-10
Fixing screw 35/DW15	29-401-20
M cross stiffener 44	29-401-02
Twin channel 80/12	29-406-38

Support frame

Inside corner with cross brace STB and STB 300/300 plus

Figures 36.1 to 36.3 show the cross brace used with vertical StarTec formwork. Figures 36.1 and 36.2 both show a vertical element installed next to the inside corner; in each case the STB 300 is attached to the multi-function profile of the vertical large-size panel or the height-extension panel with a flange screw 18.

Fig. 36.3 shows the attachment of cross brace STB to the multi-function profile of the vertical large-size panel or the height-extension panel using flange screw 18 and of the STB through the tie hole using fixing screws 35.

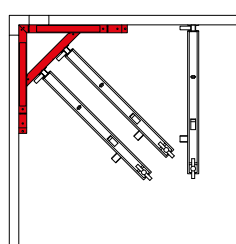
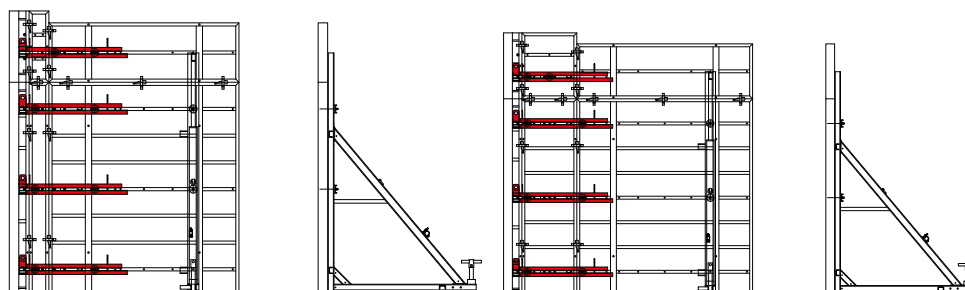
Fig. 36.4 shows the attachment of cross brace STB to the multi-function profile of the horizontal large-size panel or the height-extension panel using flange screw 18 and of the STB through the tie hole using fixing screws 35.

Due to their greater stiffness, we recommend using large-size panels in the lower area.

Attention

→ The distance between the inside corner and the attachment of the STB 300 should not be greater than 2.85 m!

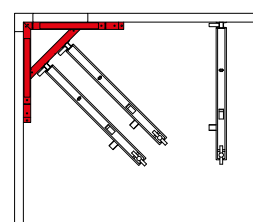
→ Refer the separate STB load charts for the permissible loads as a function of pouring height and fresh-concrete pressure.



2.322 m

Fig. 36.1

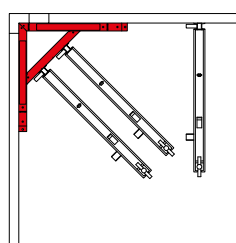
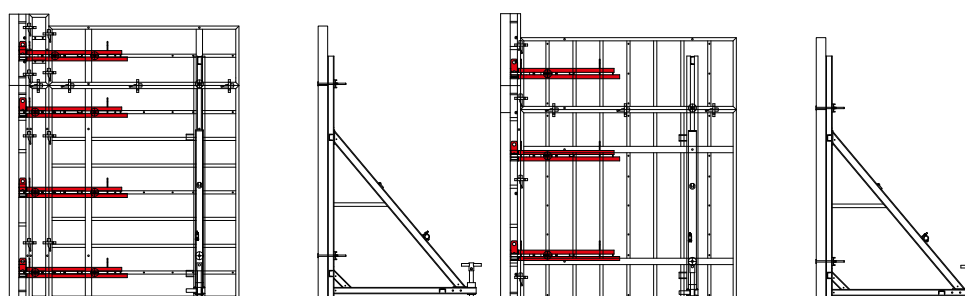
STB 300 with vertical StarTec formwork; attachment of the STB to the multi-function profile using flange screw 18



2.822 m

Fig. 36.2

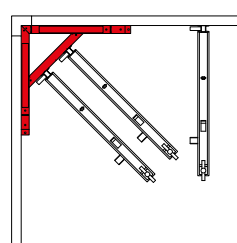
STB 300 with vertical StarTec formwork; attachment of the STB to the multi-function profile using flange screw 18



2.40 m

Fig. 36.3

STB 300 with vertical StarTec formwork; attachment of the STB cross brace to the multi-function profile using flange screw 18 and of the STB through the tie hole using fixing screw 35



2.40 m

Fig. 36.4

STB 300 with horizontal StarTec formwork; attachment of the STB cross brace to the multi-function profile using flange screw 18 and of the STB through the tie hole using fixing screw 35

Description	Ref. No.
Cross brace STB	29-406-70
Flange screw 18	29-401-10
Fixing screw 35/DW 15	29-401-20
M cross stiffener 44	29-401-02
Twin channel 80/12	29-406-38

Support frame

Inside corner with cross brace STB and STB 450

Single-sided walls with corners can be formed using the cross brace STB. The cross brace must be attached to the multi-function profiles of the wall formwork using flange screws 18. Two support frames are required for each corner. For detailed dimensions of the anchor positions see Figures 37.1 and 37.2. For the anchoring of support frames see pages STB-18 to STB-30.

A maximum formwork height of 6.00 m is possible when using the cross brace STB with the STB 450.

For details of the use of the cross brace in conjunction with StarTec and Mammut formwork refer to the next pages.

Attention

- The dimensions for the anchor positions must be observed. During assembly, the inside corner and the "corner" panel must be absolutely flush.
- Refer the separate STB load charts for the permissible loads as a function of pouring height and fresh-concrete pressure.

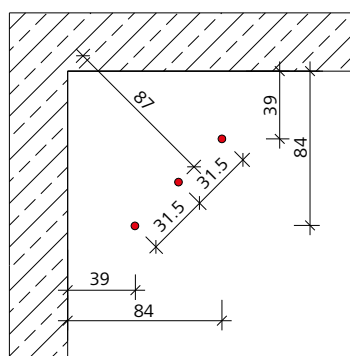


Fig. 37.1

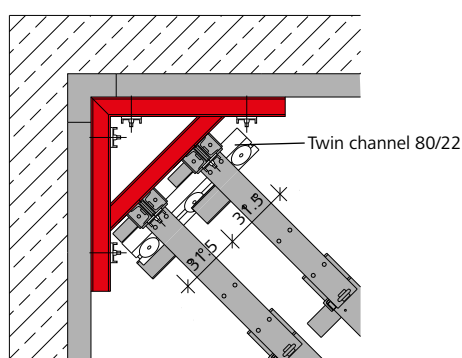


Fig. 37.2

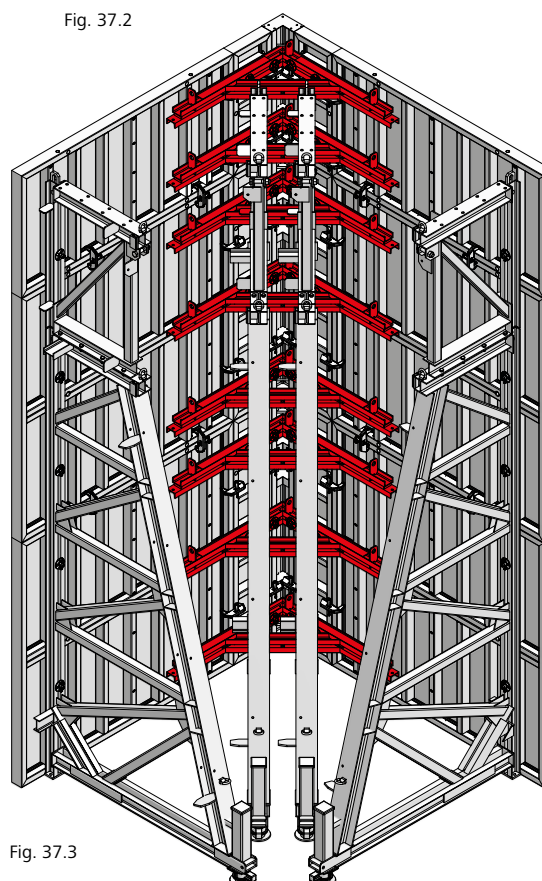


Fig. 37.3

Description	Ref. No.
Cross brace STB	29-406-70
Flange screw 18	29-401-10
Twin channel 80/22	29-406-35

Support frame

Inside corner with cross brace STB and STB 450

There are various options available when using the cross brace STB:

Figures 38.1 to 38.3 show the use of the cross brace in conjunction with Mammut formwork. The Mammut panels can be used horizontally (Figures 38.1 and 38.3) or vertically (Fig. 38.2). If the Mammut panel is used horizontally, it is also possible to attach the STB 450 either to the multi-function profile with the flange screw 18 (Fig. 38.1) or using the tie hole with the fixing screw 35. If the Mammut panel is used vertically, the STB can be attached to the multi-function profile with the flange screw 18 (Fig. 38.2).

Due to their greater stiffness, we recommend using large-size panels in the lower area.

Due to the size of the STB 450, it is always necessary to install a vertical panel next to the inside corner to avoid interference with the support frames.

Attention

→ Refer the separate STB load charts for the permissible loads as a function of pouring height and fresh-concrete pressure.

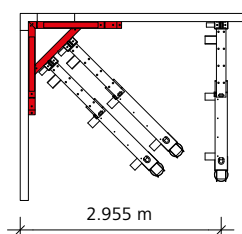
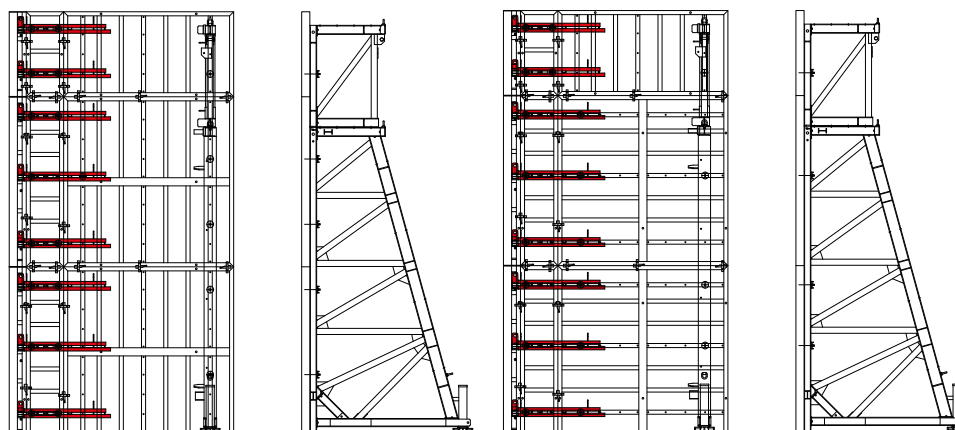


Fig. 38.1

STB 450 with horizontal Mammut formwork; attachment of the STB to the multi-function profile with flange screw 18

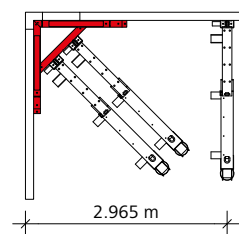


Fig. 38.2

STB 450 with vertical Mammut formwork; attachment of the STB to the multi-function profile using flange screw 18

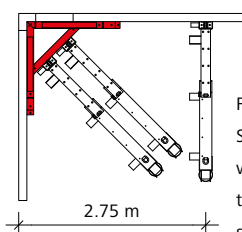
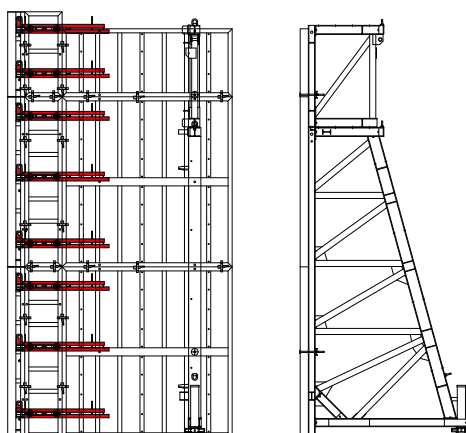


Fig. 38.3

STB 450 with horizontal Mammut formwork; attachment of the STB cross brace to the multi-function profile using flange screw 18 and of the STB through the tie hole using fixing screw 35

Attention

The distance between the inside corner and the attachment of the STB 450 to the Mammut formwork should not be greater than 2.97 m!

Description	Ref. No.
Cross brace STB	29-406-70
Flange screw 18	29-401-10
Fixing screw 35/DW15	29-401-20
Twin channel 80/22	29-406-35

Support frame

Inside corner with cross brace STB and STB 450

Figures 39.1 and 39.3 show the cross brace being used with horizontal StarTec formwork. In Fig. 39.1 the STB 450 is attached to the multi-function profiles of the horizontal large-size panel and the height-extension panel using flange screw 18.

Fig. 39.3 shows the attachment of the STB to the StarTec panels using fixing screw 35.

Figures 39.2 and 39.4 show the attachment of the STB 450 to a vertical large-size StarTec panel and a height-extension panel.

Fig. 39.2 shows the attachment to the multi-function profile using flange screw 18, and Fig. 39.4 shows the attachment using the tie hole with fixing screw 35.

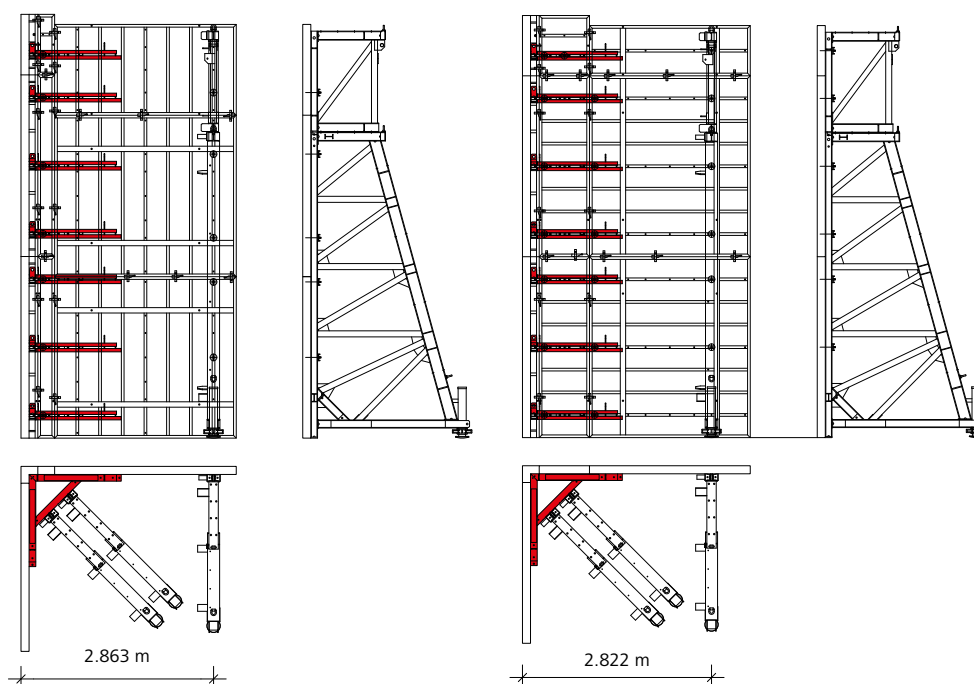


Fig. 39.1

STB 450 with horizontal StarTec formwork; attachment of the STB cross brace and the support frame to the multi-function profile using flange screw 18

Fig. 39.2

STB 450 with vertical StarTec formwork; attachment of the STB cross brace and the STB to the multi-function profile using flange screw 18

Due to their greater stiffness, we recommend using large-size panels in the lower area.

Due to the size of the STB 450, it is always necessary to install a vertical panel next to the inside corner to avoid interference with the support frames.

Attention

The distance between the inside corner and the attachment of the STB 450 should not be greater than 2.90 m!

Attention

→ Refer the separate STB load charts for the permissible loads as a function of pouring height and fresh-concrete pressure.

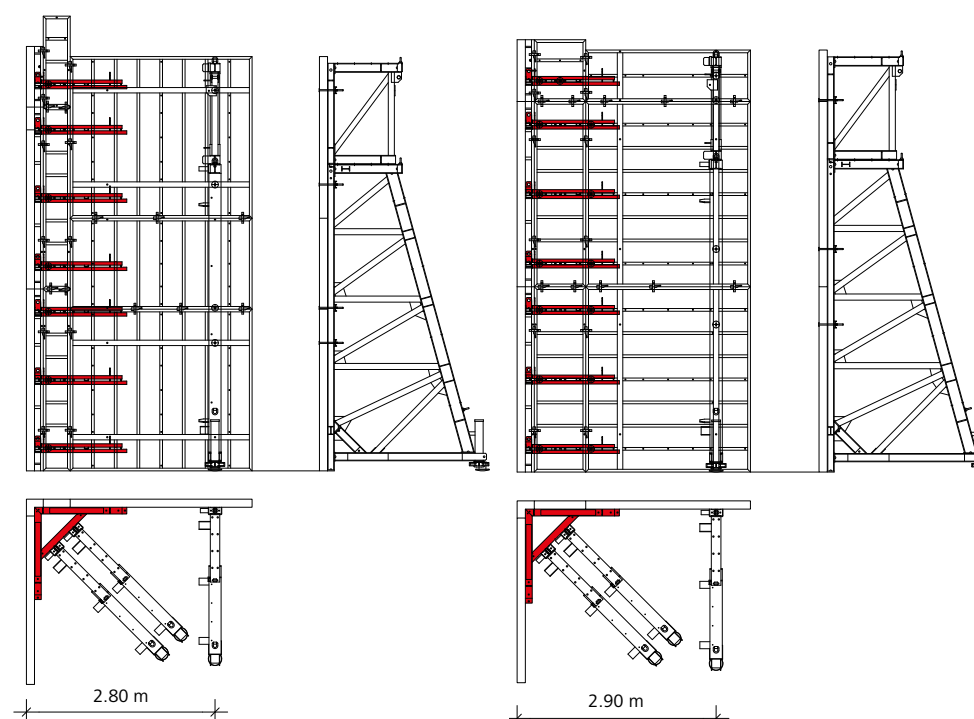


Fig. 39.3

STB 450 with horizontal StarTec formwork; attachment of the STB cross brace to the multi-function profile using flange screw 18 and of the STB through the tie hole using fixing screw 35

Fig. 39.4

STB 450 with vertical StarTec formwork; attachment of the STB cross brace to the multi-function profile using flange screw 18 and of the support frame through the tie hole using fixing screw 35

Description	Ref. No.
Cross brace STB	29-406-70
Flange screw 18	29-401-10
Fixing screw 35/DW15	29-401-20
Twin channel 80/22	29-406-35

Support frame

Crane ganging

For crane ganging, each panel must be attached to the support frame STB 300/300 plus or STB 450.

STB 300/300 plus units

STB 300/300 plus units with a width up to 3.50 m are moved by attaching the crane hook to the formwork (Figures 40.1 and 40.2). Always use two crane hooks with sufficient capacity!

STB 450 units

The STB 450 and the height extension 150 are equipped with crane eyes. When transporting STB 450 units with height extensions above the ground, attach the 4-rope crane sling to the crane eyes of the top height extension (Figures 40.3 and 40.4). Every crane eye has a capacity of 3.2 tons (this applies to both the STB 450 and the height extension 150).

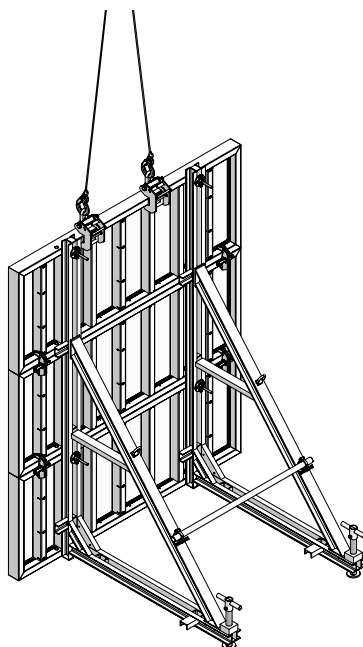


Fig. 40.1 Mammut and STB 300

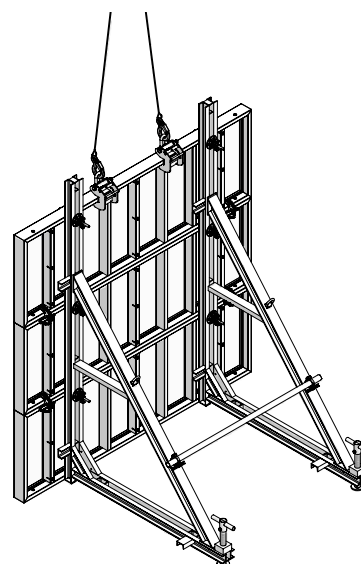


Fig. 40.2 StarTec and STB 300

Attention

- Do not break the STB units free from the concrete using the crane!
- When setting STB units on the ground, always ensure they do not tip over, using ballast if necessary. Even when setting the unit down temporarily, ensure that it is secured to prevent it tipping over, for example due to wind gusts. This can be achieved using additional supports on the facing side or setting down the units so that they rest against each other.

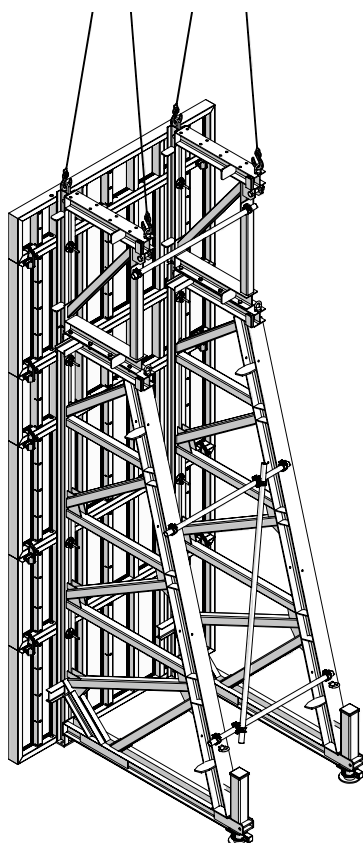


Fig. 40.3 Mammut and STB 450

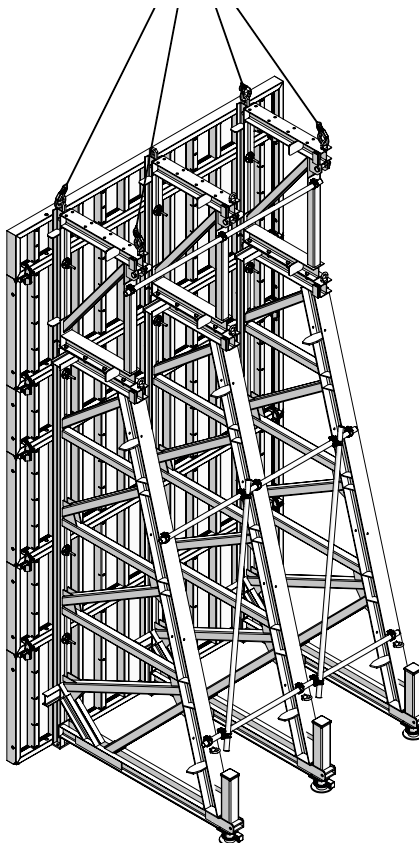


Fig. 40.4 Mammut 350 and STB 450

Support frame

Moving STB units on a trolley

STB units can be moved quickly with the STB trolley if a crane cannot be used, e.g. in tunnels. The trolley can be installed on the STB 450 (Fig. 41.3) and the STB 300/300 plus (Figures 41.1 and 41.2).

Installing the trolley waler

The trolley waler is bolted to the support frames (counter plates and nuts are already attached to the waler). When moving the unit, a counterweight is required to prevent tilting (the weight depends on the formwork height and support frame used). Each unit requires two trolley walers, four wheel adapters and four trolley spindles 48/70. Depending on the weight, four swivel-type castors for 2 or 6 tons are required. The wheels are mounted to the waler by raising the unit with the spindle.

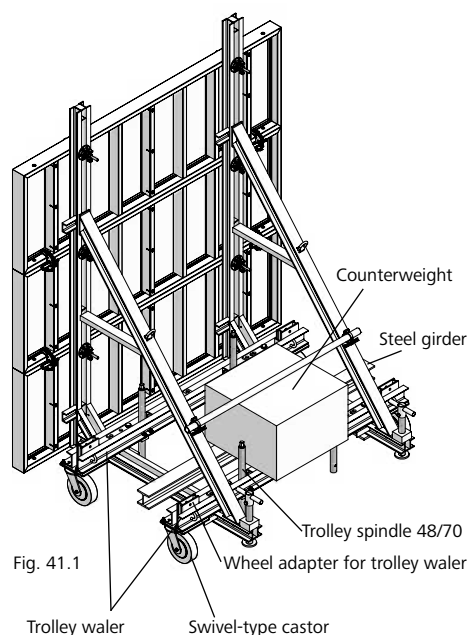


Fig. 41.1

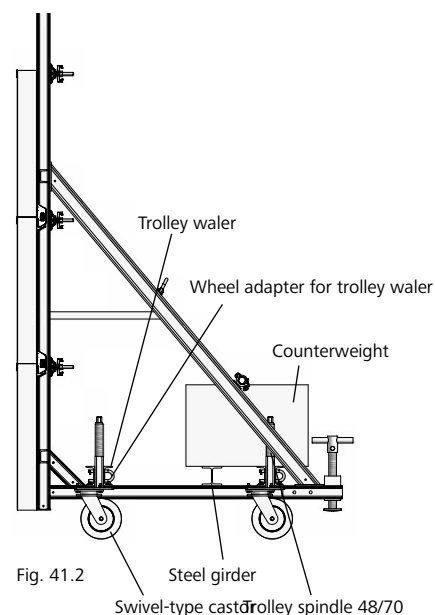


Fig. 41.2

Attention

→ The support frames must not stand on the trolley spindles while pouring. When using the STB 300, remove the trolley waler adjacent to the panels, otherwise anchoring is not possible. Observe the trolley waler instructions.

→ When moving or temporarily setting down the support frame, its stability must be verified by means of a calculation.

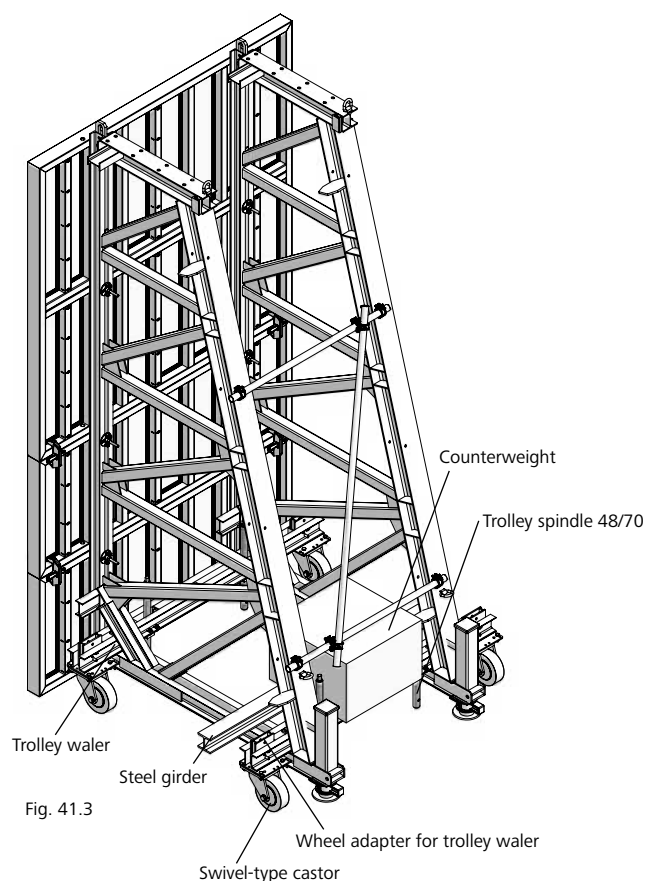


Fig. 41.3

Description	Ref. No.
Trolley waler	29-403-70
Wheel adapter for trolley waler	29-403-75
Trolley spindle 48/70	29-403-80
Swivel-type castor 2 t	29-306-50
Swivel-type castor 6 t	29-306-75

Support frame

Moving STB units on a trolley

STB units with a height above 4.50 m can be moved with trolleys and/or a trolley bracket if a crane cannot be used, e.g. in tunnels.

Up to 6 m

Trolley on STB 450 (Fig. 42.1). When moving the unit, a counterweight is required to prevent tilting (the weight depends on the formwork height and support frame used).

Above 6 m

Trolley and trolley bracket STB 450 on support frame unit (Fig. 42.2). When moving the unit, a counterweight is required to prevent tilting (the weight depends on the formwork height and support frame used).

Attention

→ When moving or parking the support frames, ensure that they cannot tip over.

Note

→ Please contact our application engineering department when planning the use of trolleys on support frame units with a height greater than 4.50 m.

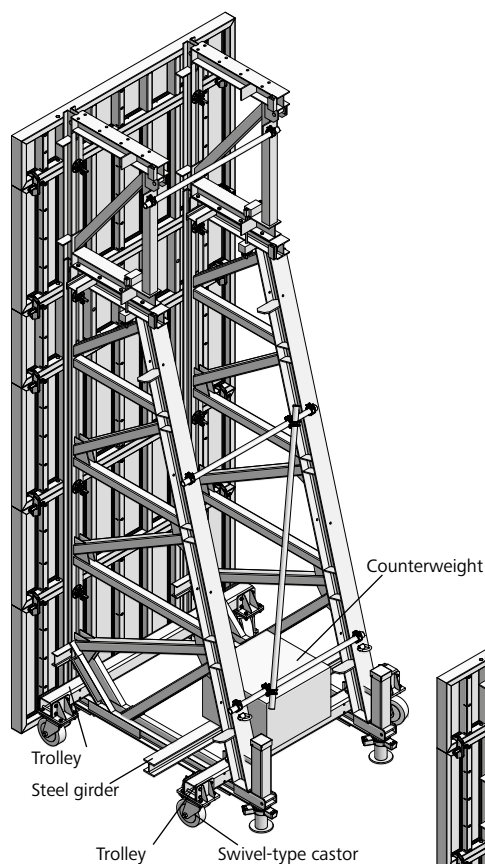


Fig. 42.1

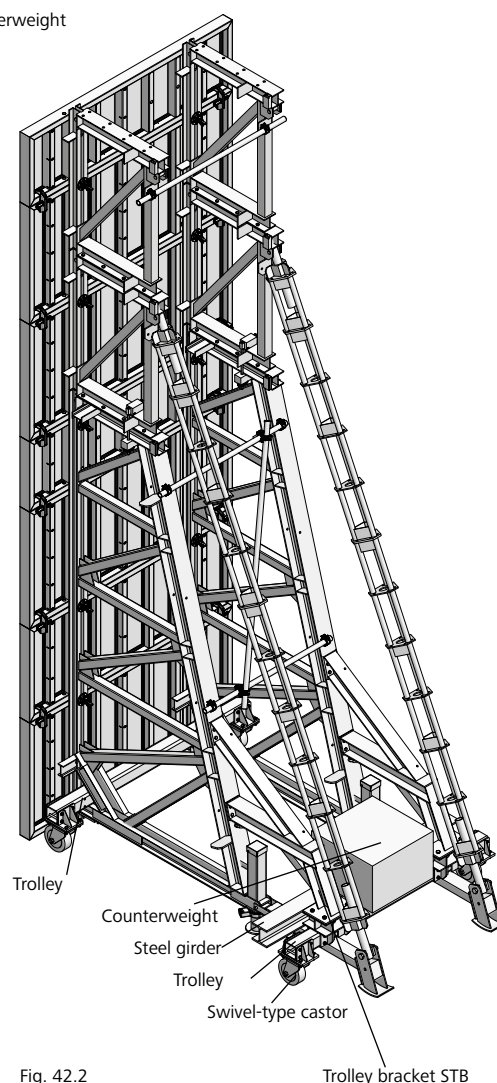


Fig. 42.2

Trolley bracket STB

Support frame

STB special connector

The STB special connector (Fig. 43.1) enables the STB 450 to be securely connected to height extension 150 (Fig. 43.2) and also enables two height extensions 150 to be connected to each other.

The STB special connector is required when using additional Triplex braces (also refer to the separate load charts).

STB special connectors are also required when an anchor (dry anchor) is used above the single-sided formwork.

One STB special connector is to be used for each connection. It should be installed as close as possible to the rear edge.

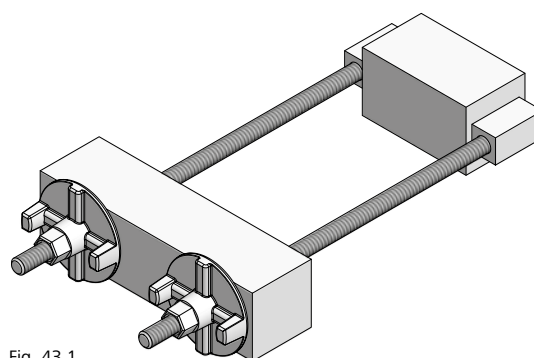


Fig. 43.1

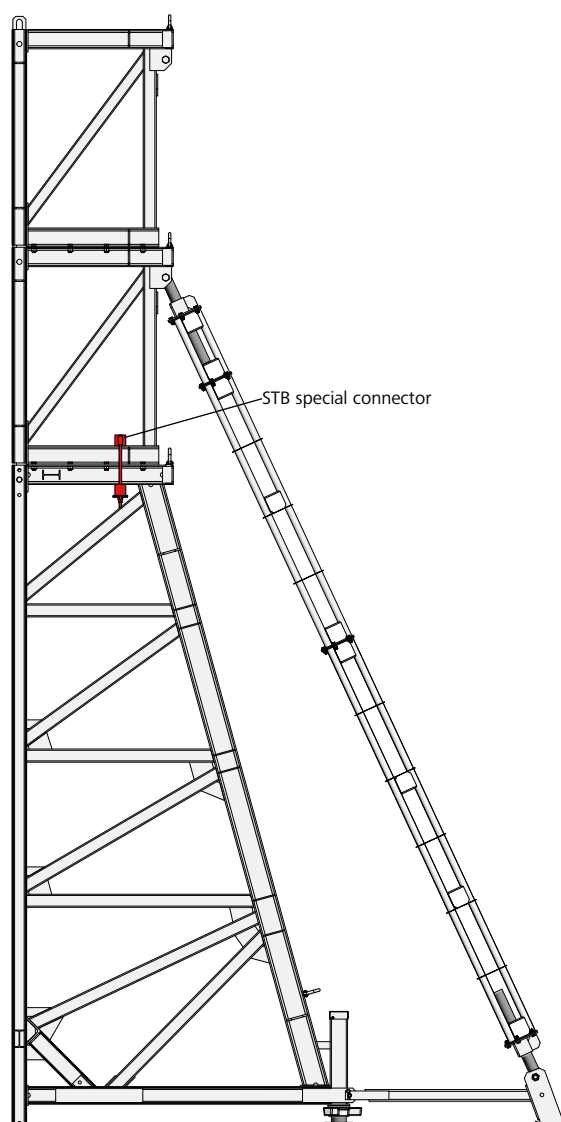


Fig. 43.2

Description	Ref. No.
STB special connector	29-406-87

Support frame

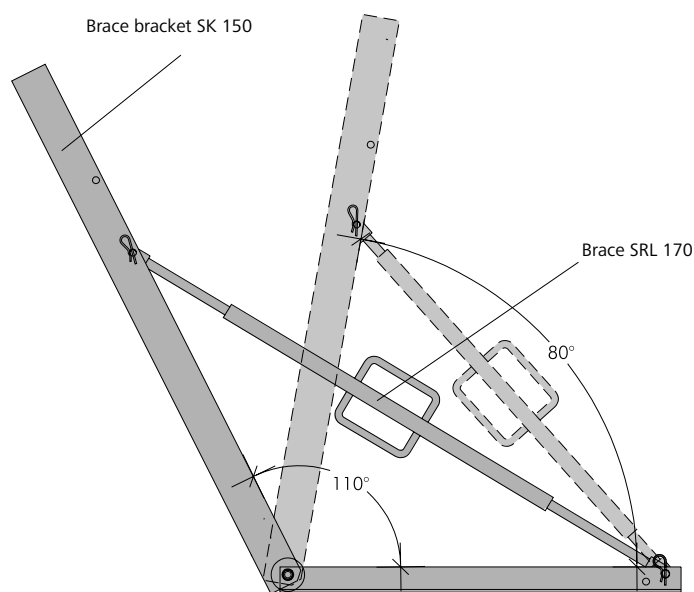
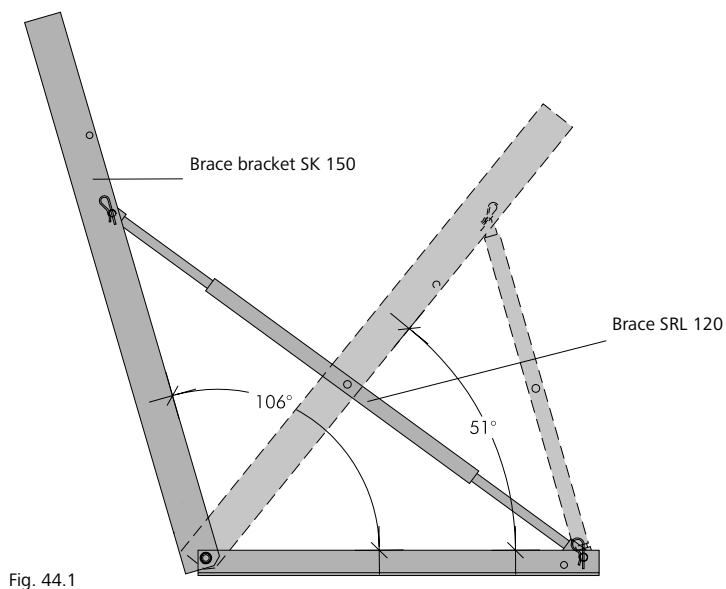
Brace bracket SK 150

The brace bracket SK 150 (Figures 44.1 and 44.2) are used to strip floor slab edges and the joints of floor slabs, see also page STB-45.

Adjustment range

SRL 120 = 51°–106°

SRL 170 = 80°–110°



Description	Ref. No.
Brace bracket SK 150.....	29-403-50
Brace SRL 120.....	29-108-80
Brace SRL 170.....	29-108-90

Support frame

Brace bracket SK 150

Typical application:

Foundation slab with joint tape

Together with the brace bracket SK 150, the positioning support SK allows for exact levelling and positioning of the stop end of the floor slab, even on sloped surfaces. The brace bracket can be easily attached to the multi-function nuts of the formwork panels using flange screws or tie rods DW and flange nuts.

The braces SRL 120 or SRL 170 and the positioning support must be ordered separately.

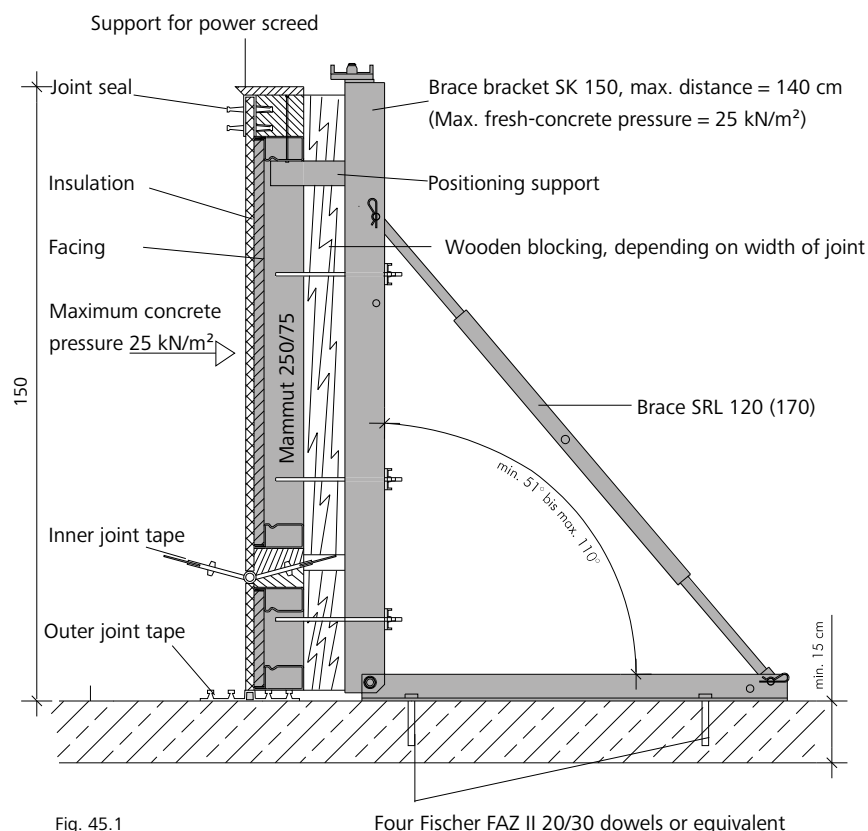


Fig. 45.1

Four Fischer FAZ II 20/30 dowels or equivalent

Description	Ref. No.
Positioning support SK.....	29-403-55
Flange screw 18.....	29-401-10
Flange screw 28.....	29-401-12

Support frame

Brace bracket 80

The brace bracket 80 (Fig. 46.1) enables stop ends for floor slabs and slab edges to be created up to a height of 80 cm.

The brace bracket 80 has an integrated plastic nailing bar for the attachment of shuttering panels or boards.

To support standard panels, the brace bracket 80 is clamped to the multi-function nut of the panel using flange screw 12 (Fig. 46.2).

Depending on the subsurface, the brace bracket can be anchored to the ground using the large holes (d = 28 mm) with ground nails or using the small holes (d = 12 mm) with anchor bolts (Fig. 46.1).

Using the adjustable strut of the brace bracket, the angle of installation can be set steplessly between -15° (Fig. 46.3) and $+15^{\circ}$ (Fig. 46.4).

The brace bracket can be folded up for transport and storage purposes.

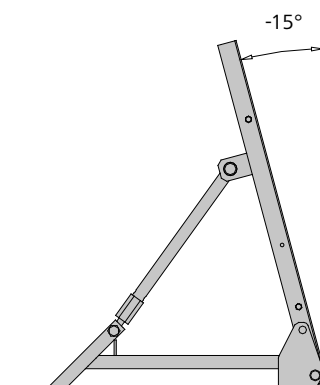
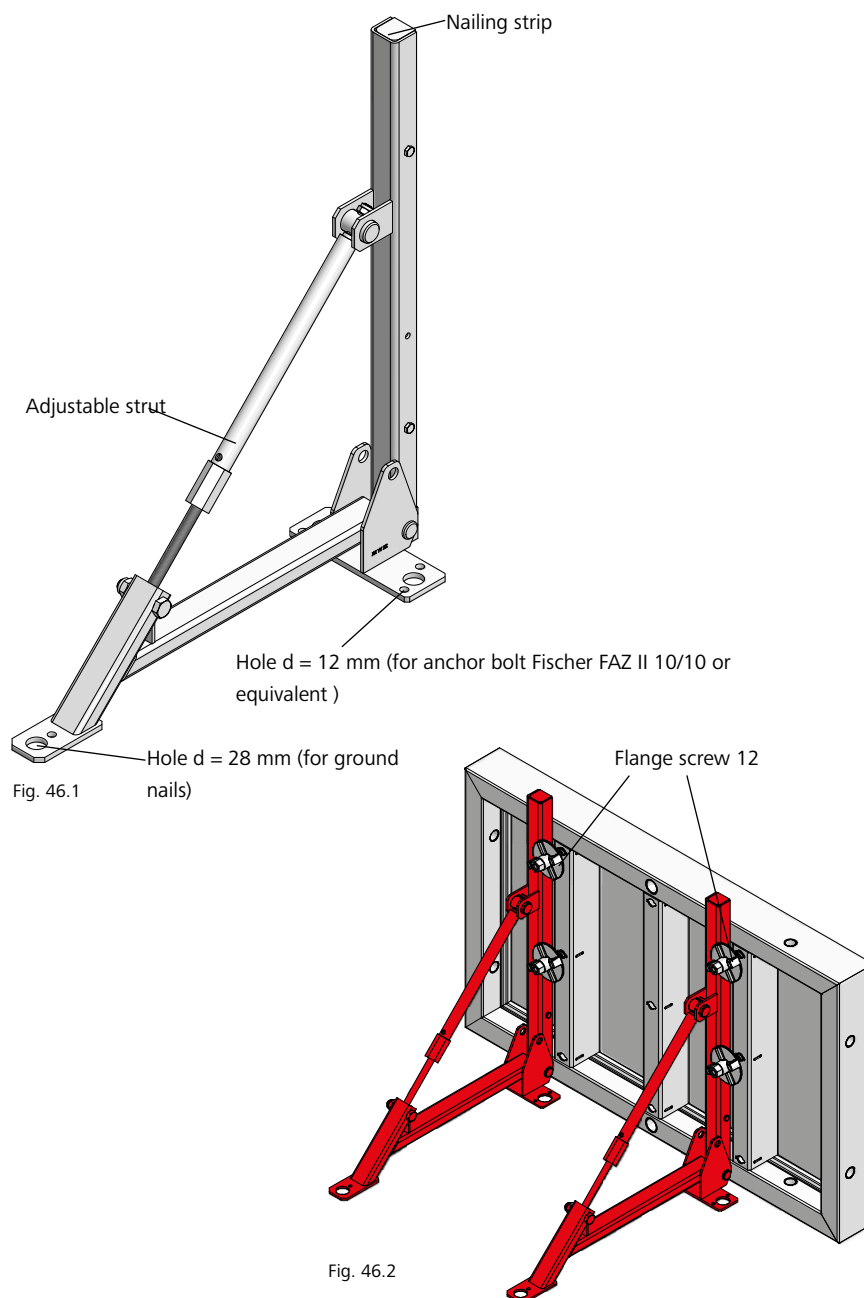


Fig. 46.3

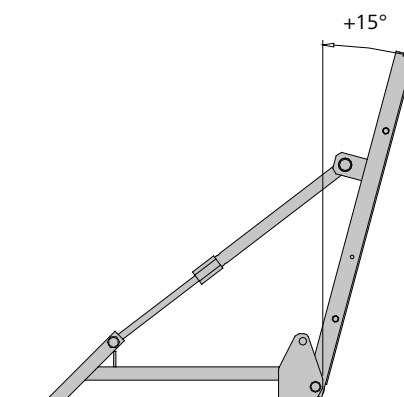


Fig. 46.4

Description	Ref. No.
Brace bracket 80.....	29-921-35
Flange screw 12.....	29-900-70

Support frame

Transport: stacking material

Brace bracket SK 150

The MEVA stacking rack is used to transport brace brackets. A stacking rack can hold 25 folded brace brackets without braces (Fig. 47.1).

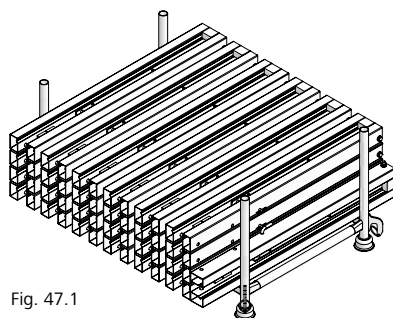


Fig. 47.1

Support frame STB 300

Ten support frames can be stacked on top of each other. The support frames have a welded-in stacking aid (Figures 47.2 and 47.3).

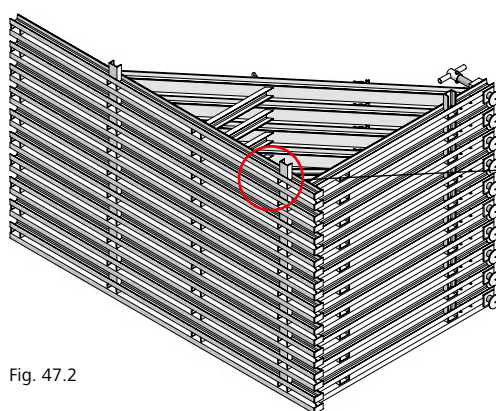


Fig. 47.2

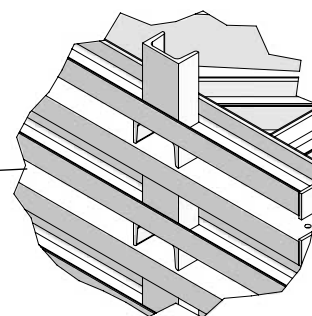


Fig. 47.3 Stacking aid

Support frame STB 450

Four support frames can be stacked on top of each other. The support frames have a welded-in stacking aid (Figures 47.4 and 47.5).

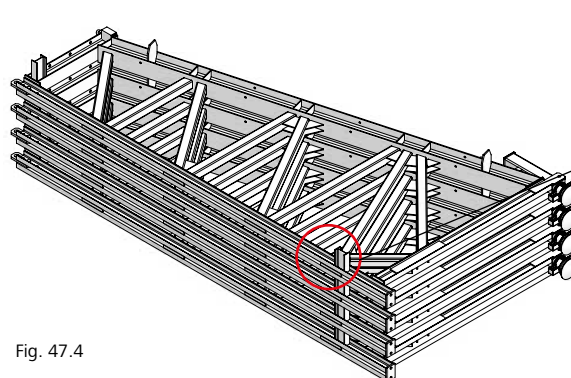


Fig. 47.4

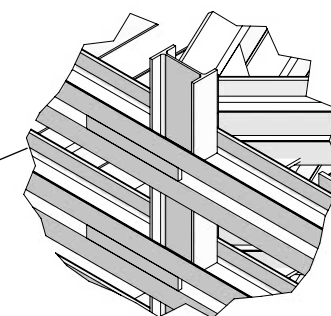


Fig. 47.5 Stacking aid

Description	Ref. No.
Stacking rack.....	27-000-20

Support frame

Transport: loading trucks

Make sure that all material is secured properly.

Support frame STB 300

6 x 10 = 60 frames (Figures 48.1 and 48.2)

Support frame STB 450

3 x 4 = 12 frames (Figures 48.3 and 48.4)

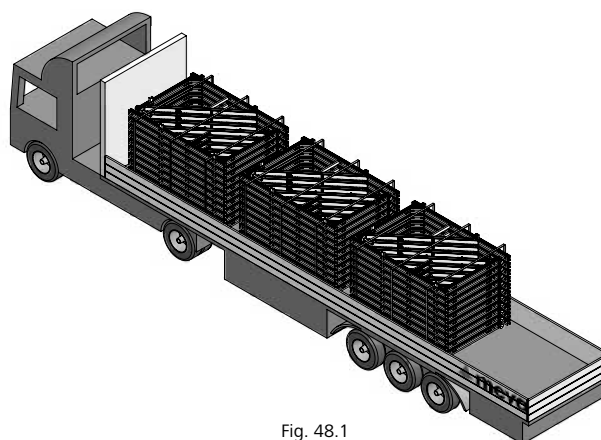


Fig. 48.1

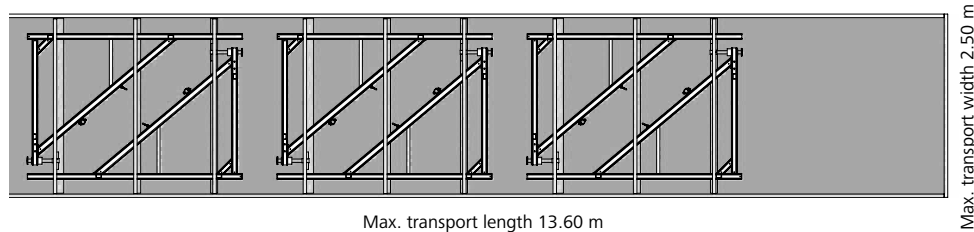


Fig. 48.2

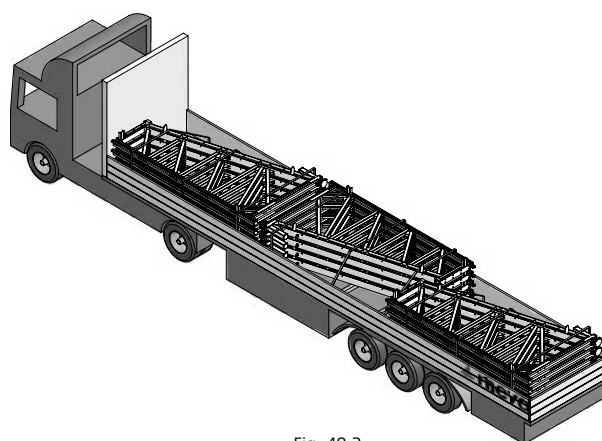


Fig. 48.3

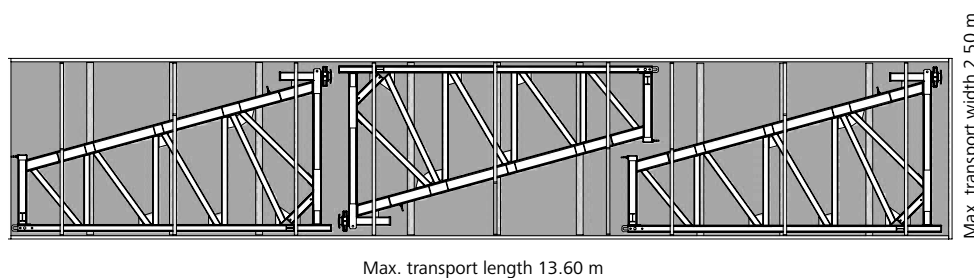


Fig. 48.4

Support frame

Services

Cleaning

The component parts of the support frame STB are cleaned professionally upon return.

Cleaning and reconditioning of wall formwork

The formwork is cleaned using industrial equipment. Reconditioning is carried out as follows: The frames are checked and, if necessary, repaired, coated and provided with a new facing. As long as the formwork equipment still has its full load capacity, correct dimensions and is fully functional, reconditioning will always be a more economical solution than purchasing new formwork. Please note that the cleaning and reconditioning service is not available in all countries in which MEVA does business.

Rentals

As we have a comprehensive range of equipment in stock, we offer our customers the option of renting supplementary material at peak times. The MEVA logistics centre guarantees rapid delivery throughout Europe. We also give prospective customers the chance to test MEVA formwork so they can see its benefits for themselves in actual use.

RentalPlus

For a flat-rate fee MEVA's "fully comprehensive insurance" for rental formwork and equipment covers all secondary costs that occur after return (excludes losses and write-offs). For the customer this means: Costing certainty instead of additional

charges, an earlier end of the rental period and thus lower rental costs because you save the time required for cleaning and repairs.

Formwork drawings

Our application engineers worldwide work with CAD systems. This ensures that you always receive optimum formwork solutions and practice-oriented formwork and work cycle plans.

Special solutions

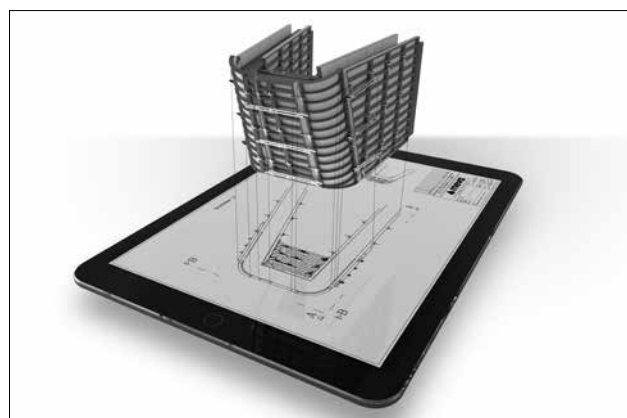
We can help with special parts, custom-designed for your project, to supplement our standard formwork systems.

Structural calculations

Generally, this is only necessary for applications such as single-sided formwork where the anchor parts are embedded in the foundation or the base slab. On request, we can perform structural calculations for such applications at an additional charge.

Formwork seminars

To ensure that all our products are used properly and efficiently, we offer formwork seminars. They provide our customers with a good opportunity to keep themselves up to date and to benefit from the know-how of our engineers.



Notes

Grid of dots for notes.