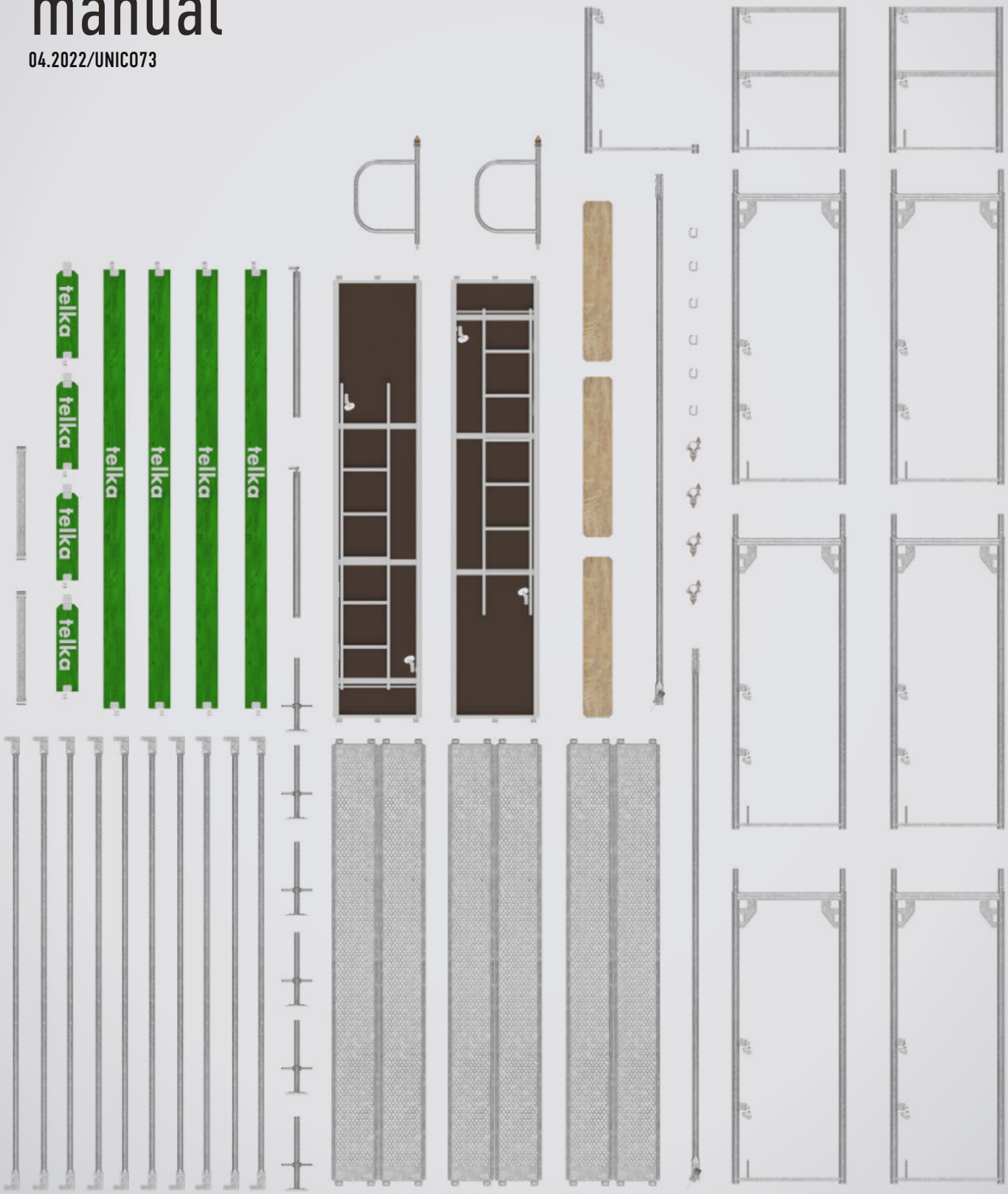
Operating and maintenance manual

04.2022/UNICO73

telka | scaffolding formwork fence



Frame scaffold tFRAME | UNICO 73

3. Detailed erection instructions for frame scaffolds, type tFRAME UNICO73

3.1. Basic version

The erection of tFRAME | UNICO73 frame scaffold should begin with laying out, at appropriate distances, of timber sole plates and placement on them of two screw jacks – *fig. 1* (without unscrewing the nuts) – single sole plates may also be used under each screw jack – *fig. 2*, but the solution may only be used according to the instructions given in section 3.2 (due to the hazard of uneven settlement of external and internal standards (uprights). The erection should start from the highest elevation point of the assembly ground (to check whether it is enough to use the screw jacks to level out the scaffold). If the surface of the site is very uneven, it may be necessary to use 0.66 m, 1.0 m or 1.5 m high frames at the bottom level - see section 3.2.

The appropriate spacing of screw jacks is achieved by laying on the ground railings having the required scaffold bay widths (*fig. 1*).

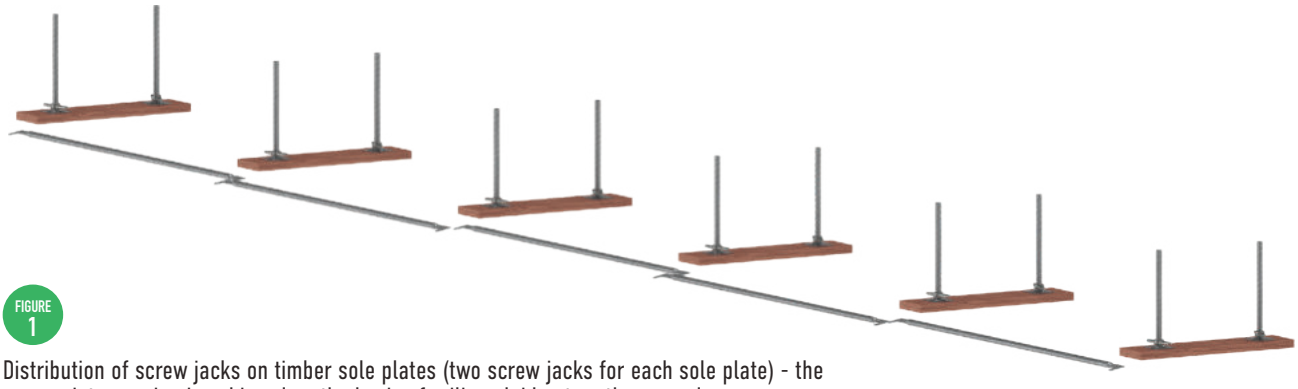


FIGURE 1

Distribution of screw jacks on timber sole plates (two screw jacks for each sole plate) - the appropriate spacing is achieved on the basis of railings laid out on the ground

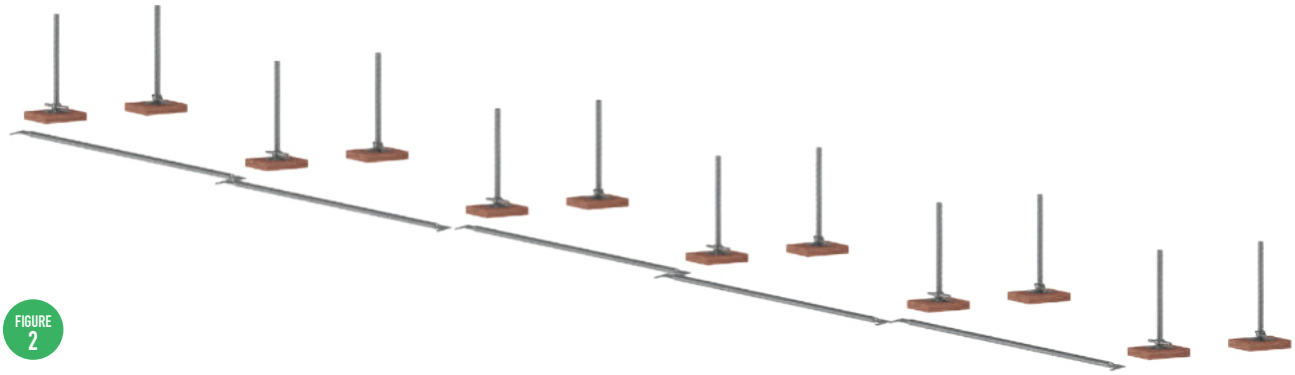


FIGURE 2

Placement of screw jacks on timber sole plates (two screw jacks for each sole plate) - the appropriate spacing is achieved on the basis of railings laid out on the ground

Each two screw jacks on the same single timber sole plate in a single circulation shaft should be joined by starting beams - *fig. 3*, and then two decks, 0.32 m in width, or one deck, 0.61 m in width - fig. 4 should be placed on their U-profiles. Pre-align the scaffold base so erected.

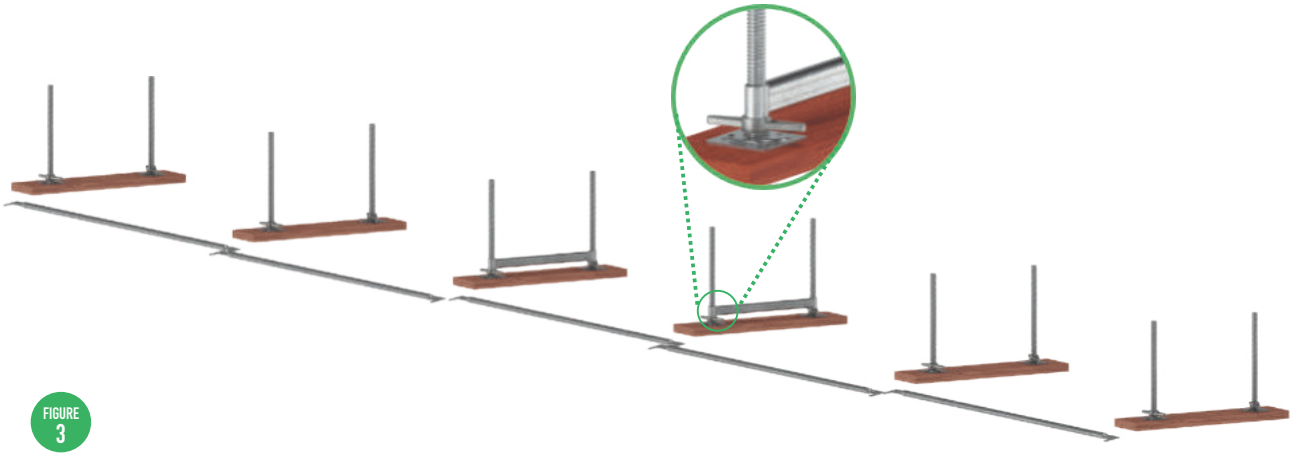


FIGURE 3

Connection of screw jacks in the circulation shaft using starting beams

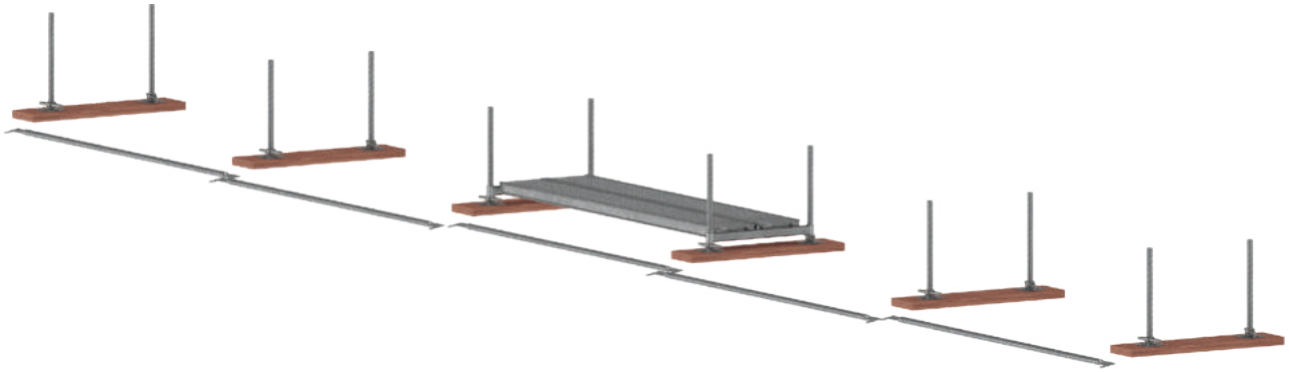


FIGURE 4

Erection of two decks, 0.32 m wide, in the circulation shaft

Alternatively to the method described above (decks only in the circulation shaft on the bottom level), starting beams can be placed on all screw jacks – *fig. 5*. (non-standard version) Mount two 0.32 m wide or one 0.61 m wide deck on their U profiles - *fig. 6*.

Below in the manual, the standard (typical) version will be the solution with the decks on the ground level installed only in the circulation shaft - as per *fig. 4*

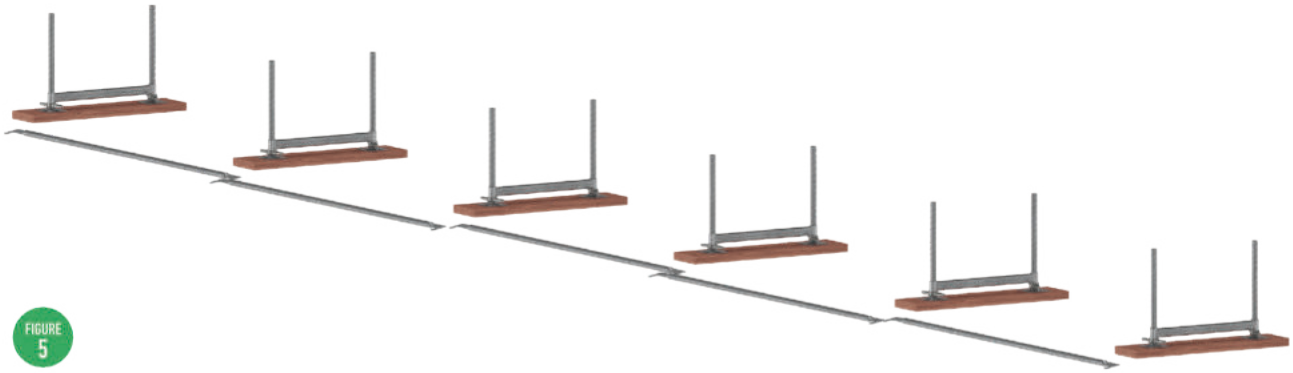


FIGURE 5

Coupling of screw jacks using starting beams

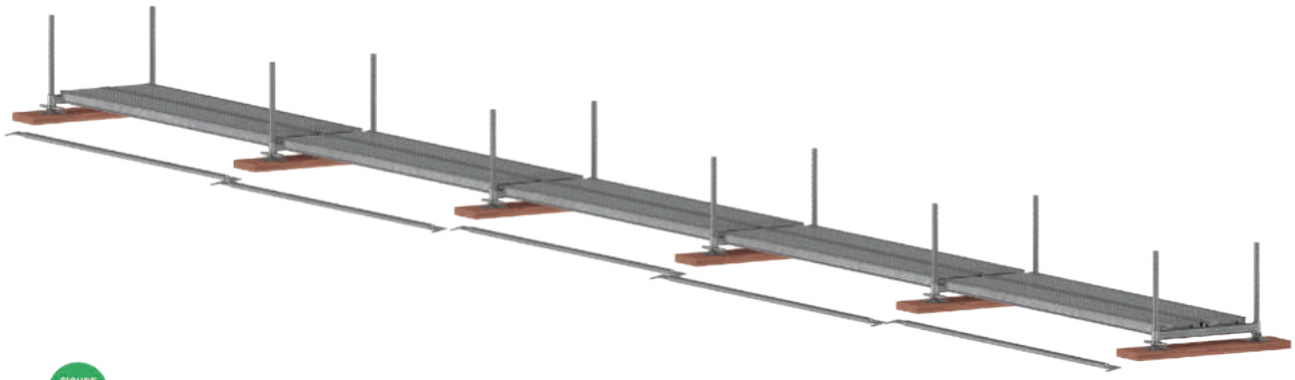


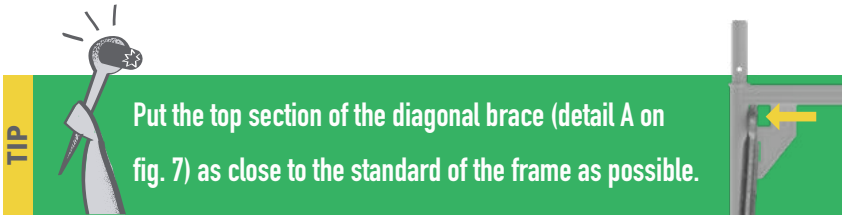
FIGURE 6

Steel decksmounted on starting beams over the entire length of the scaffold

The erection of level one of the scaffold should begin with the section being braced. First mount two frames and join them with the railing (inserted into the socket at 0.5 m and protected by a wedge) and the horizontal brace (in the bottom section of the external standards of the frame) as well as the diagonal bracing – *fig. 7* - according to the following rules:

- insert one, profiled end of the diagonal brace – marked "A" on *fig. 7* and *8* - in the top mounting hole of the frame (detail A on *fig. 7*);

- mount the second, flat end of the diagonal brace with a semi-coupling - "B" on *fig. 7* and *8* - on the standard of the opposite frame in its bottom section, with the flat end of the tube to the outside of the scaffold (detail B on *fig. 7*) and pre-tighten the semi-coupling nut.



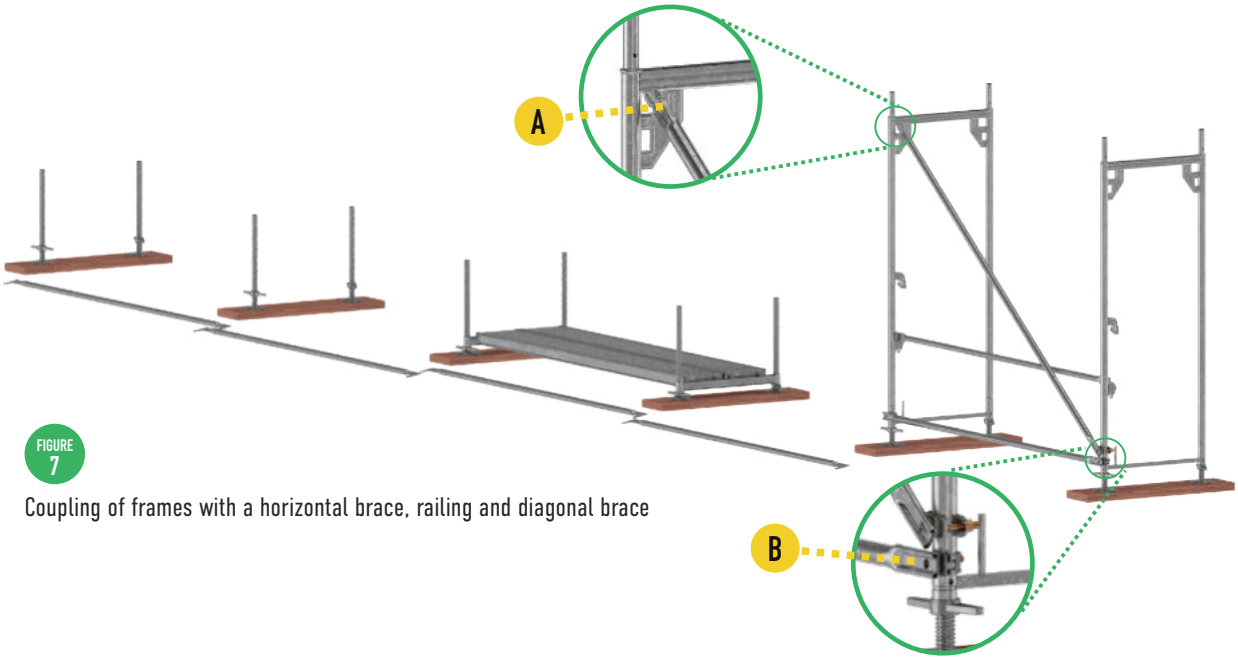


FIGURE 7

Coupling of frames with a horizontal brace, railing and diagonal brace

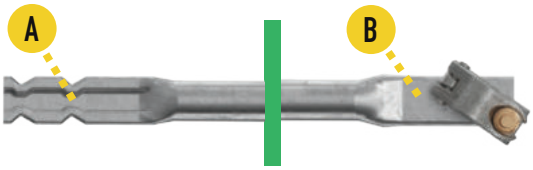


FIGURE 8

Structure of the diagonal brace

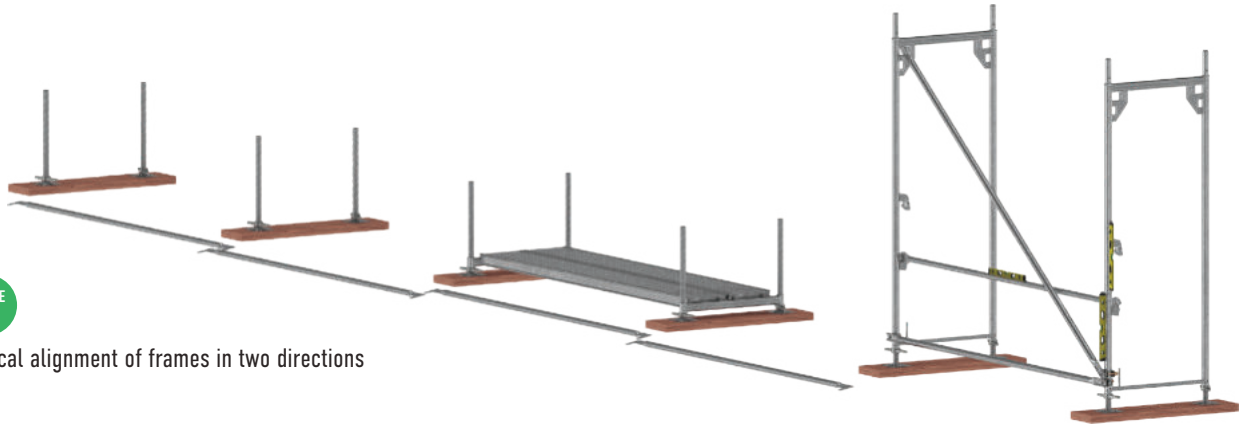


FIGURE 9

Vertical alignment of frames in two directions

Pre-align the frames in two directions: perpendicularly and in parallel to the exterior wall (*fig. 9*). Couple the adjacent frames with decks mounted on U-profiles of the frames (*fig. 10*) and tighten the nut of the diagonal brace semi-coupling.

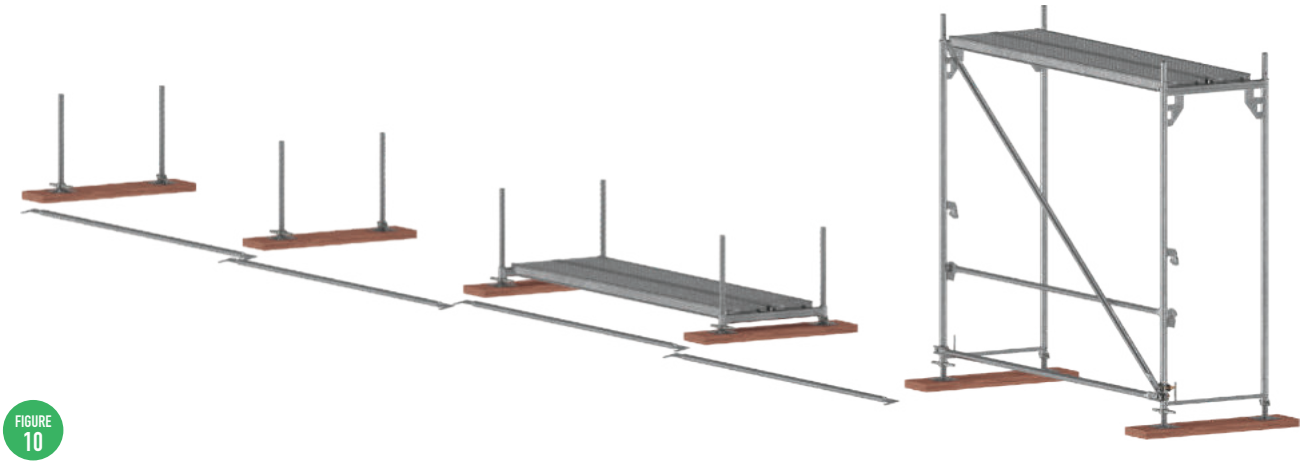


FIGURE 10

Coupling of the frames using 0.32 m wide decks

Mount further frames from the bay so erected, with railings at 0.5 m (also in the circulation path) and horizontal and diagonal brace in the shaft being braced – *fig. 11* and *12*. Remember to vertically align the subsequent frames.

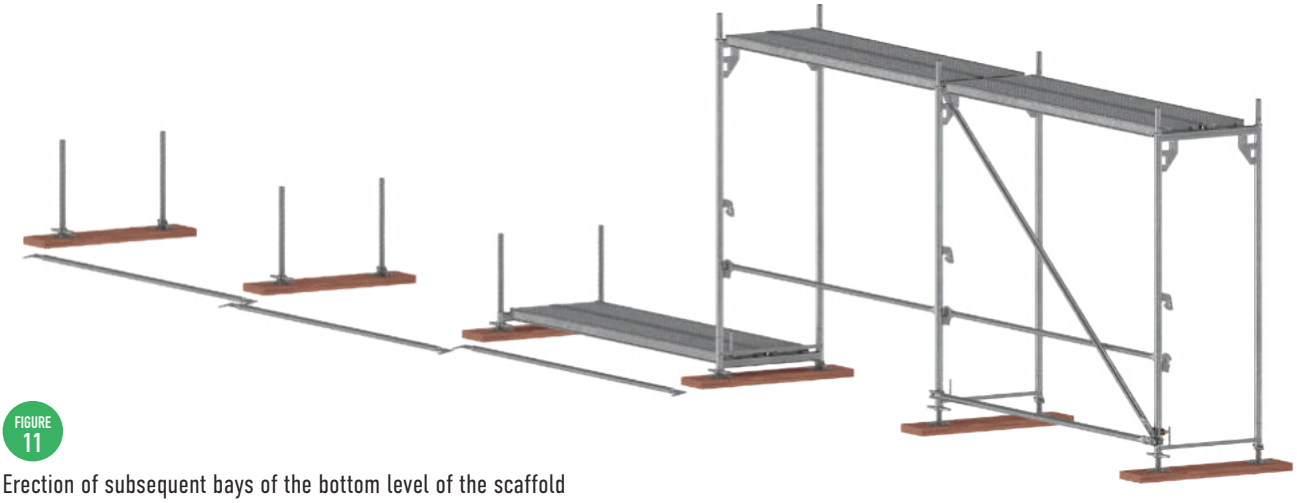


FIGURE 11

Erection of subsequent bays of the bottom level of the scaffold

FIGURE 12

Complete first level of the frame scaffold tFRAME | UNIC073

After erecting the first level, check vertical and horizontal alignment of the respective frames. Do not exceed the maximum permitted screw jack unscrewing rate - *fig. 13* and section 3.2 and 6 of this O&MM. Remember that 20 cm is the maximum offset permitted in Poland for scaffold decks against the building façade where internal guardrails are not required on the inside of the scaffold. After that value is exceeded, it is necessary to install additional guardrails (top rail, bottom rail and toe board) facing the wall - *fig. 14* and section 3.4 of this O&MM.

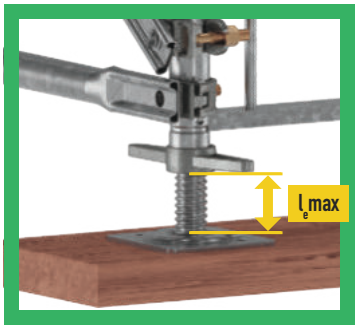


FIGURE 13

Maximum permitted unscrewing rate of the screw jacks in typical scaffold units (values specified in section 6 O&MM).

TIP

If the scaffold is set off against the wall by more than 20 cm, protect the scaffold on the side facing the wall with a complete guardrail.

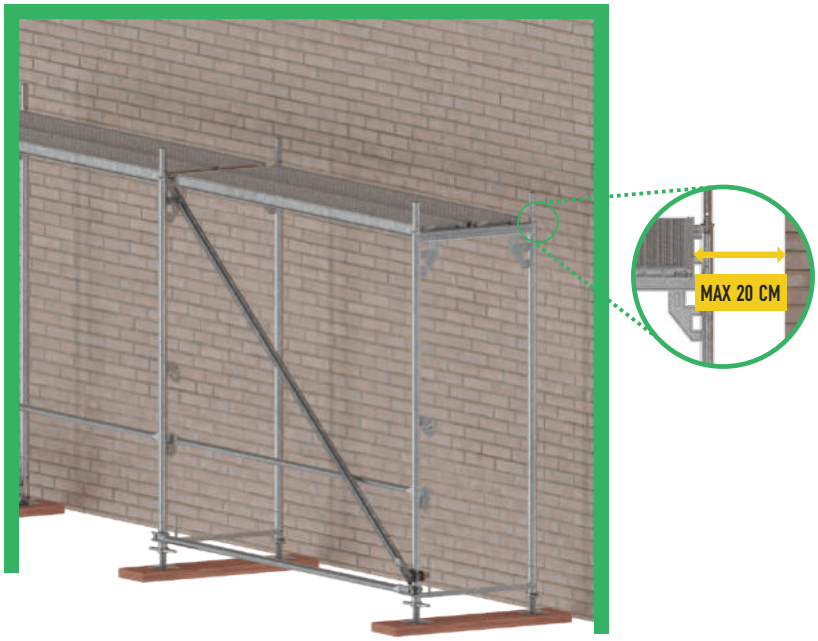


FIGURE 14

Maximum permitted offset of the scaffold decks from the exterior wall where complete guardrails on the side facing the wall are not required

If the decks on level zero are mounted on the entire length of the scaffold (non-standard version), the erection of the bottom level differs from the standard version in that two frames must first be mounted (according to the instructions given above), and then vertically aligned. Then mount the decks (*fig. 15*).

The frames should then be coupled by decks (also in the circulation shaft), and only diagonal braces should be installed in the bays being braced.

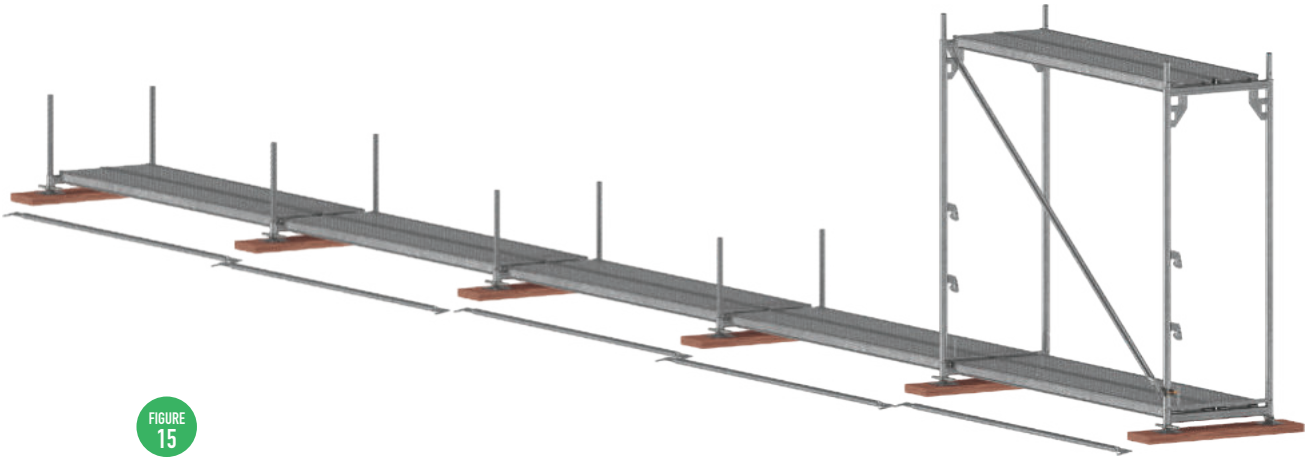


FIGURE 15

Coupling of frames with a horizontal brace, railing and diagonal brace

TIP

On each scaffold comprising at least 3 bays, use two diagonal braces as a minimum for each level. For scaffolds with a greater number of bays, the maximum spacing of the braces is every 5th bay.

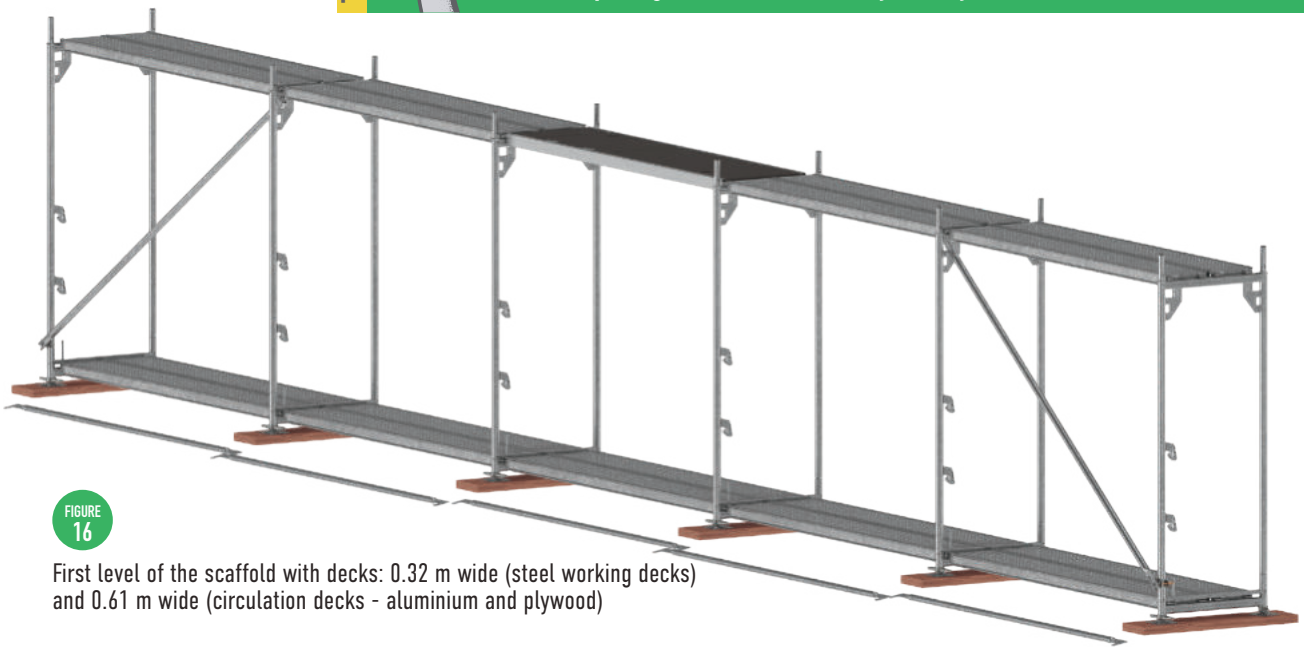


FIGURE 16

First level of the scaffold with decks: 0.32 m wide (steel working decks) and 0.61 m wide (circulation decks - aluminium and plywood)

The erection of level two of the scaffold should start with the vertical circulation shaft. Standing on the ladder of the circulation deck, mount the first frame of the next level up and secure it against unlocking by two locking pins (*fig. 17*).

TIP

The use of locking pins means that the frame can be treated as an anchoring point for personal protective equipment against falling from height.

FIGURE 17

Mounting the first frame of the second level and securing it with two locking pins

Then enter the circulation deck using fall protection personal protective equipment and hooking to the frame secured by the locking pins, close the circulation deck and mount the second frame in the circulation shaft (also securing it with locking pins). The scaffold bay so erected should be supplemented with a full guardrail installed in the following sequence: top rail, bottom rail and toe board - *fig. 18*.

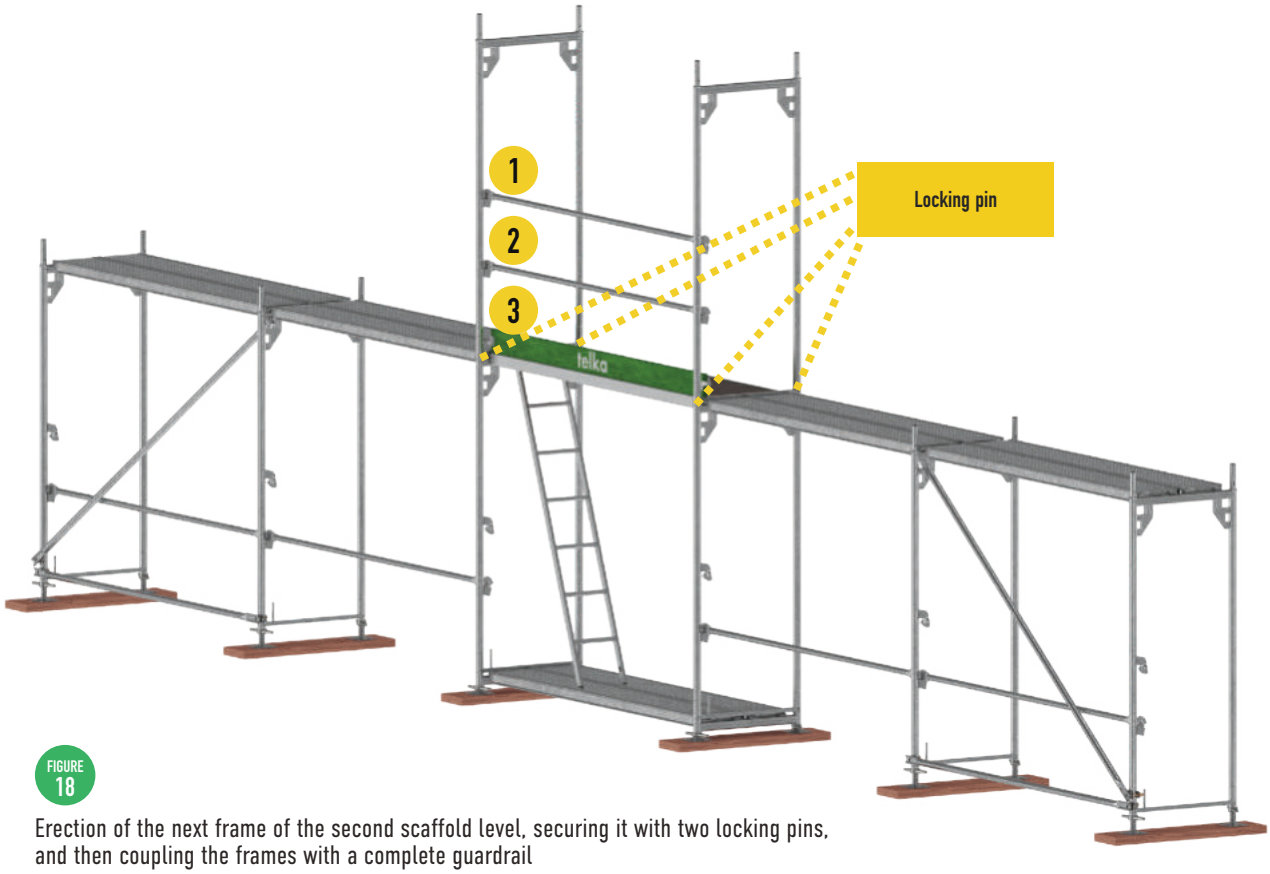


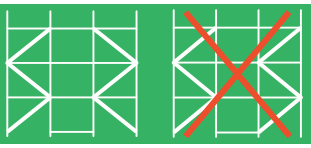
FIGURE 18

Erection of the next frame of the second scaffold level, securing it with two locking pins, and then coupling the frames with a complete guardrail

Mount the subsequent frames from the direction of the bay so erected, first in one direction (*fig. 19*) and then in the other, and immediately mount guardrails and diagonal braces (if so required by the scaffold plan). Secure the scaffold level from the front, installing end railings and toe boards - *fig. 20*.

TIP

Mount the diagonal braces alternately, changing the direction on each level.



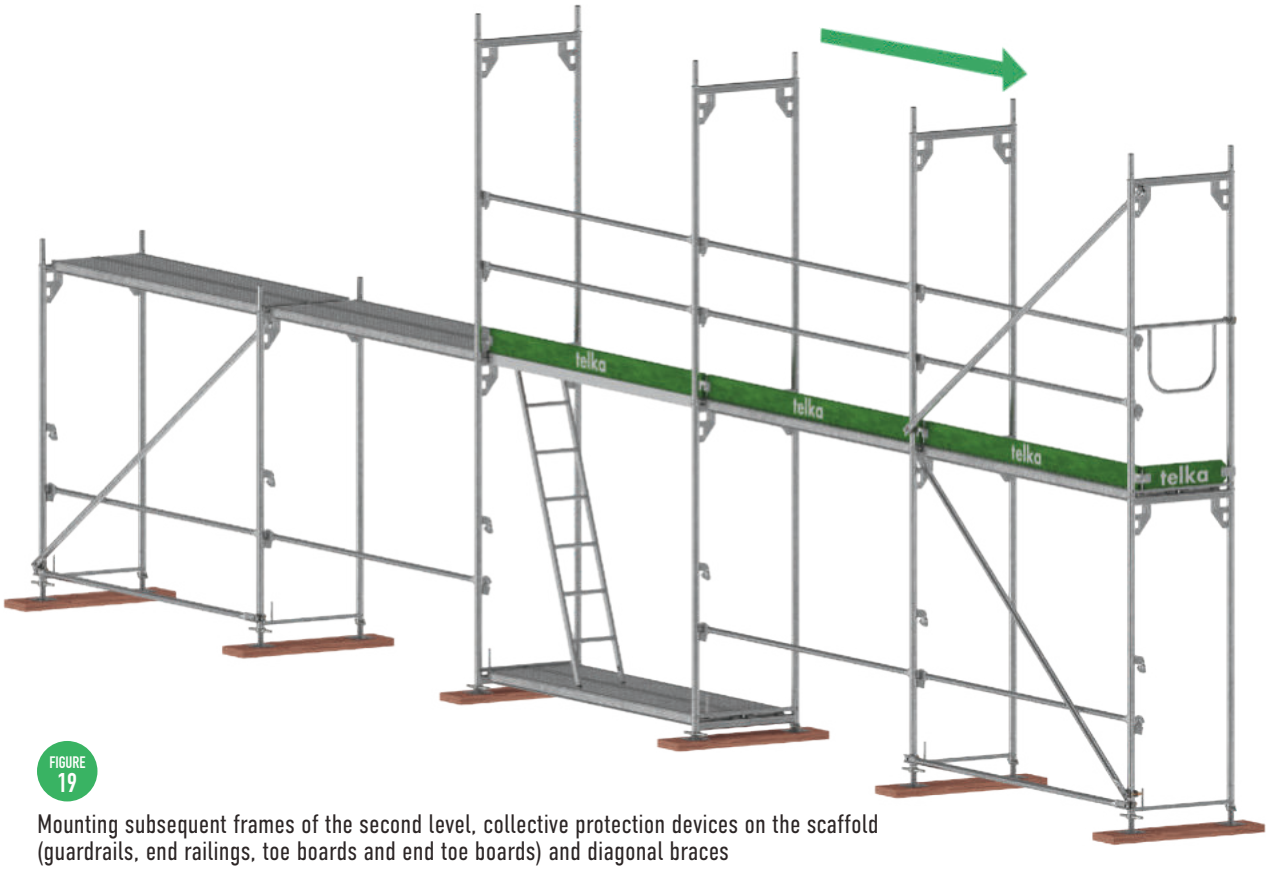


FIGURE 19

Mounting subsequent frames of the second level, collective protection devices on the scaffold (guardrails, end railings, toe boards and end toe boards) and diagonal braces

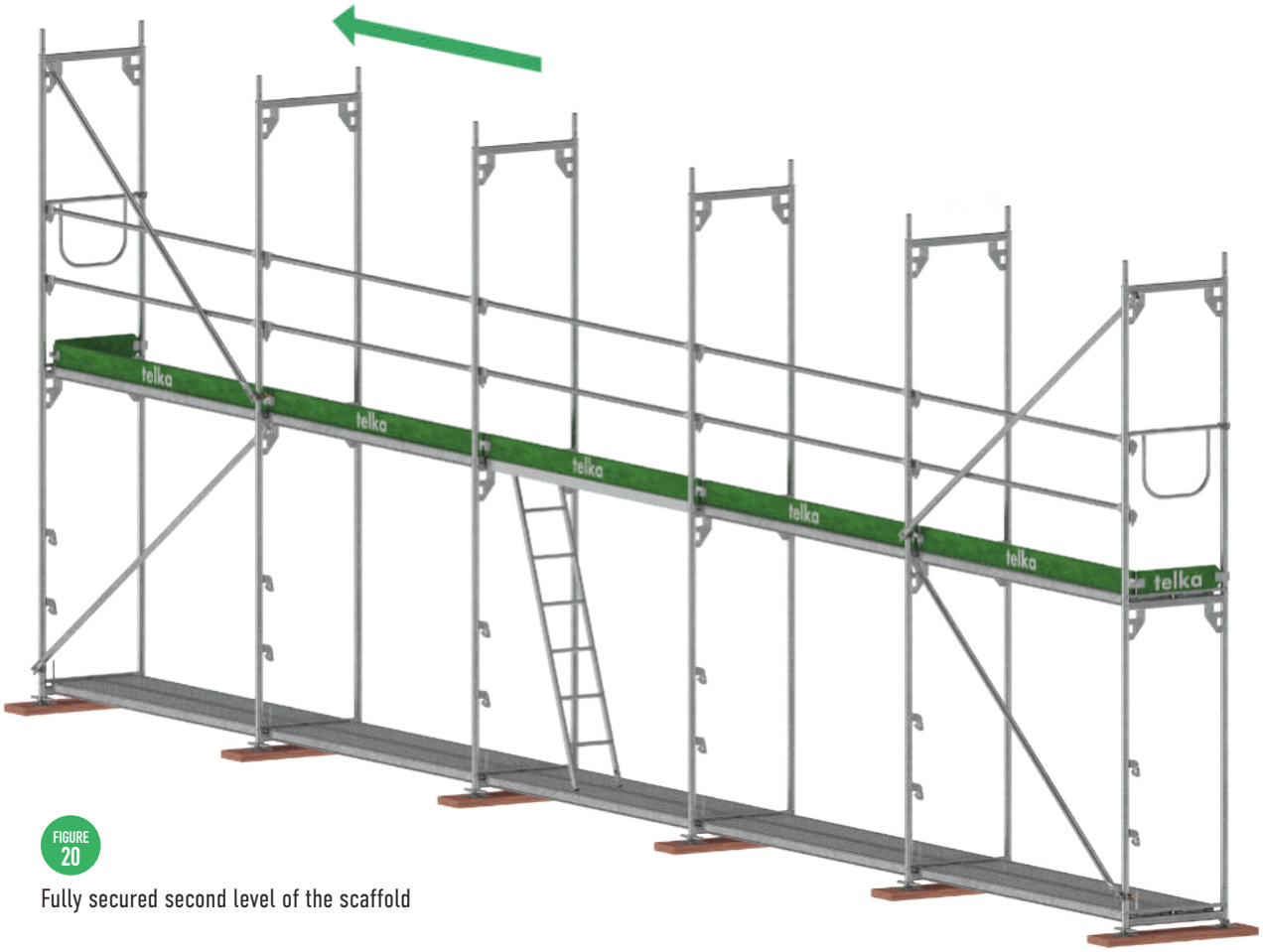
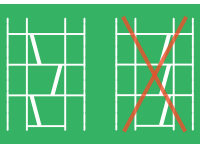


FIGURE 20

Fully secured second level of the scaffold

TIP

Mount circulation shafts alternately, so that the ladder does not rest on the hatch of the deck below.



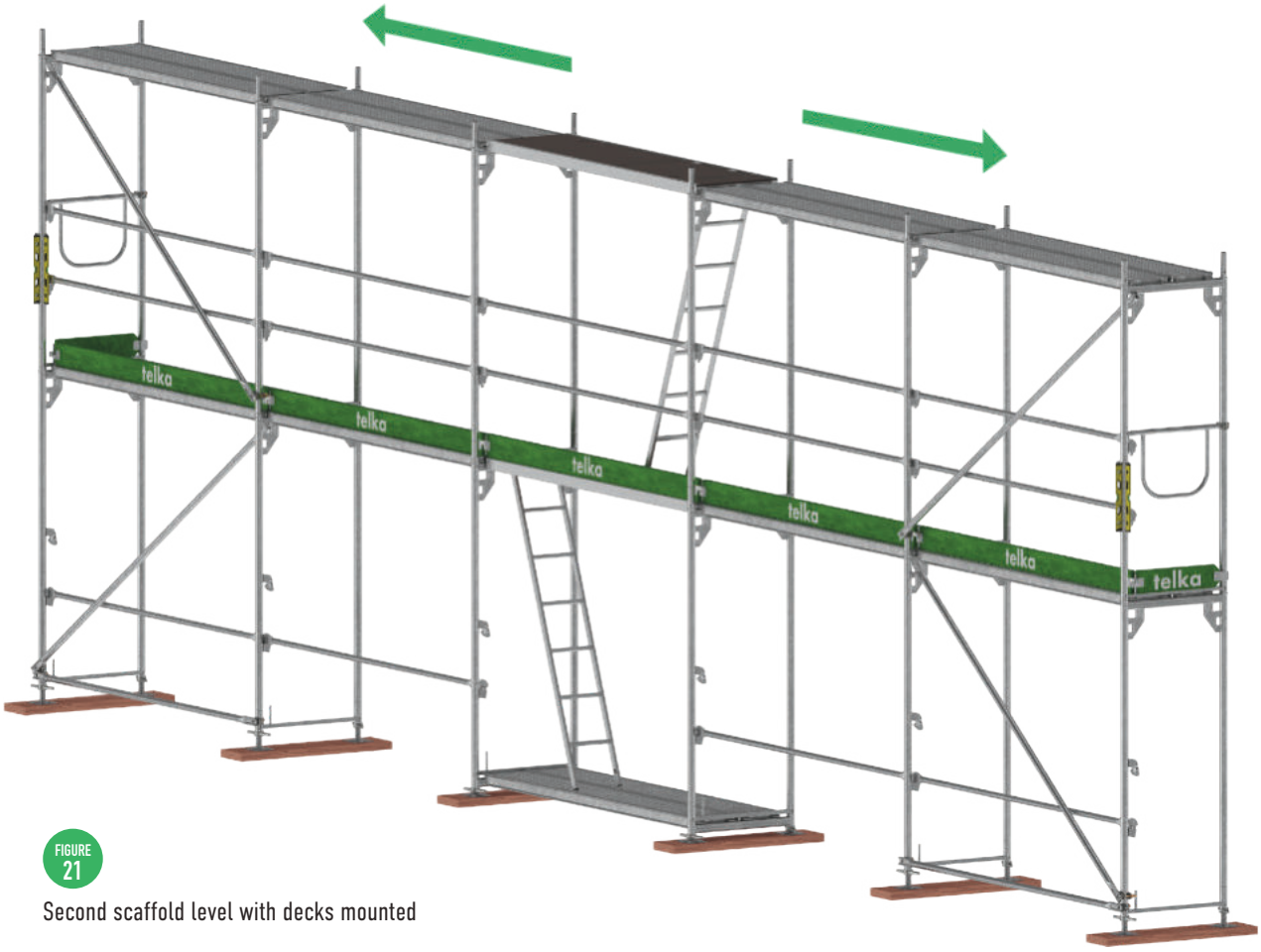


FIGURE 21

Second scaffold level with decks mounted

Then mount the circulation deck, remembering that it should be mounted alternately on each subsequent level, so that the ladder does not rest on the hatch of the deck below. Then place the decks in the subsequent scaffold bays, in both directions from the circulation shaft to the end of the scaffold (*fig. 21*). The frames should be vertically aligned in the bays where the diagonal braces are mounted.

Perform the anchoring operation (*fig. 22*) – for standard versions according to the bracing and anchoring grid, presented below in this O&MM - section 6.1.6., and for non-standard version - as per the individual design. More details on the anchoring method are provided in section 3.3 of this O&MM.

The erection of each subsequent scaffold level should start with the circulation shaft - *fig. 23*, as per the instructions above, i.e. remaining secured on the ladder of the circulation deck, mount the first frame of one level up and secure it against unlocking using locking pins.

TIP

Vertical alignment of the frames (scaffold offset from the wall) can also be adjusted using anchor joints, by adjusting their position relative to the wall.

DESCRIPTION	METHOD OF USE	GRAPHIC SYMBOL
Triangular anchor - one anchoring connector mounted with the right-angle joint to the internal standard of the frame, and another coupled with the first right-angle joint - both at an angle of 900		▲
Short anchor - anchoring joint mounted with the right-angle joint to the internal standard of the frame		○

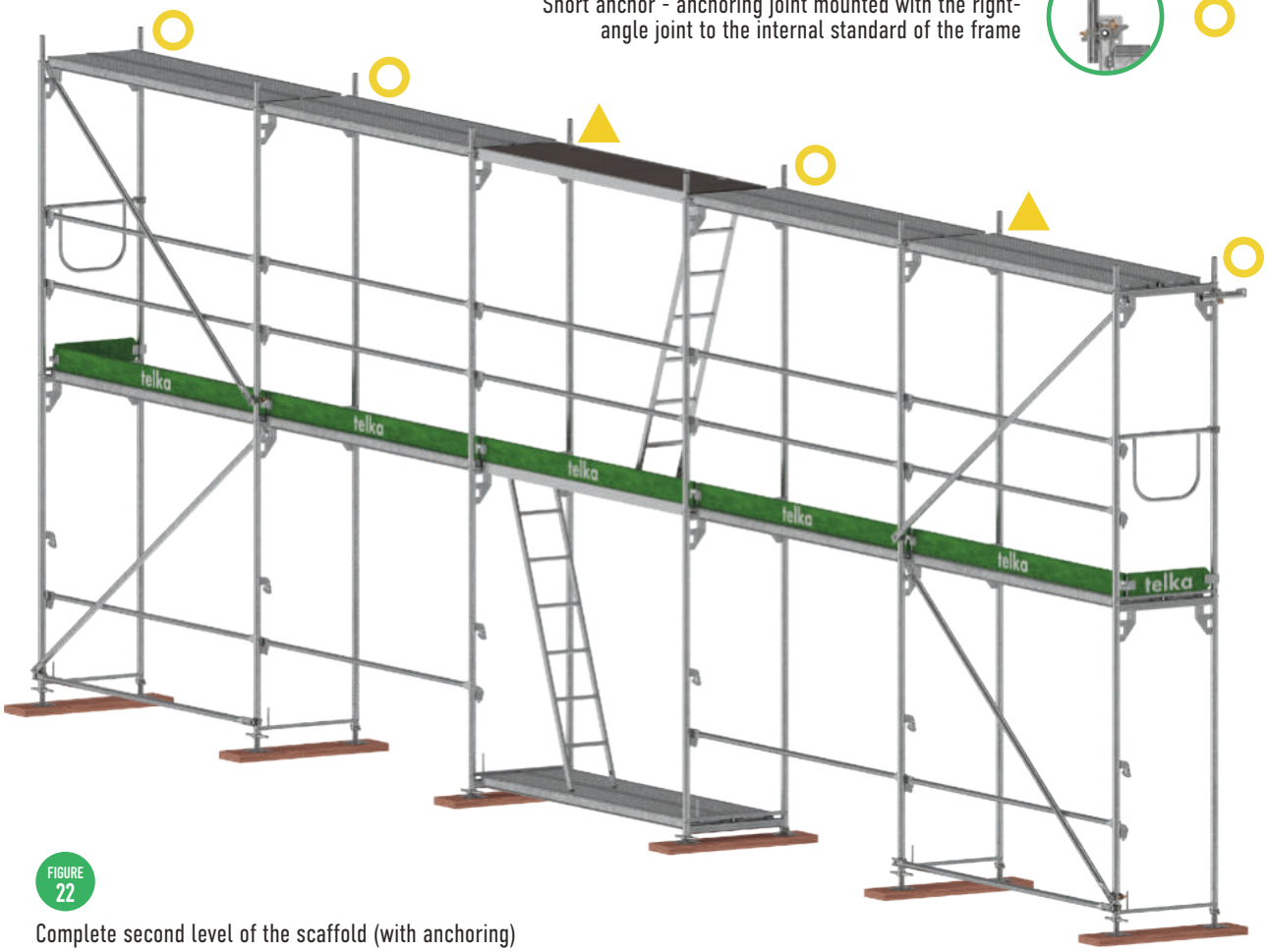


FIGURE 22

Complete second level of the scaffold (with anchoring)

Then enter the circulation deck using fall protection personal protective equipment and hooking to the frame secured by the locking pins, close the circulation deck and mount the second frame in the circulation shaft (also securing it with locking pins). The scaffold bay so erected should be supplemented with a full rail installed in the following sequence: top rail, bottom rail and toe board. Mount subsequent frames, guardrails, diagonal braces, double end guardrails, end toe boards, decks and anchors (if required) - *fig. 24* and *25* – according to the sequence given for the second level of the scaffold, remembering to use fall protection personal protective equipment.

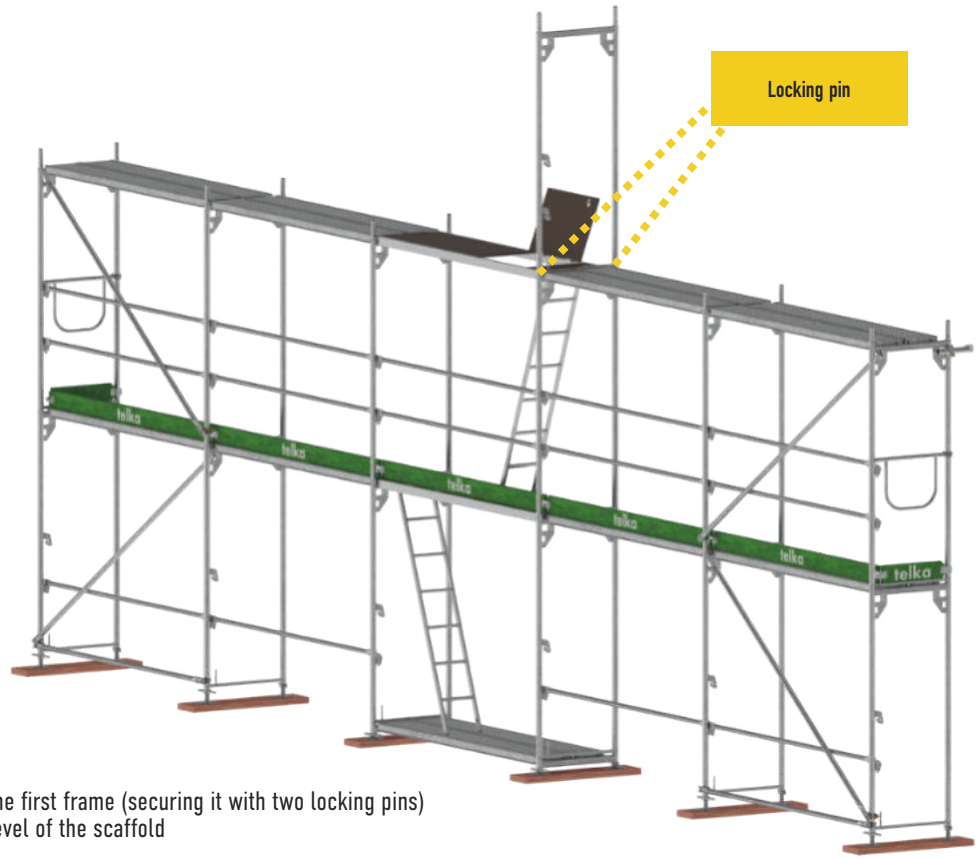


FIGURE 23

Erection of the first frame (securing it with two locking pins) of the next level of the scaffold

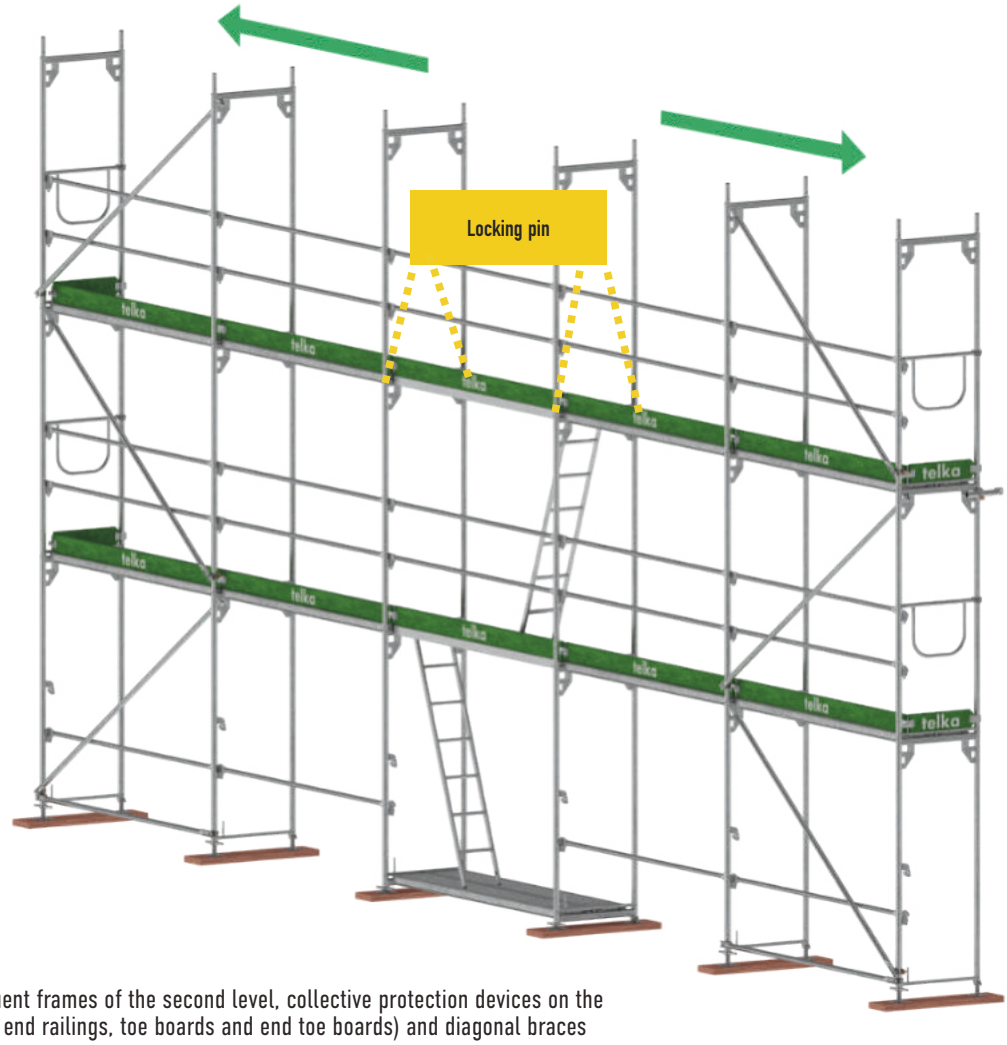


FIGURE 24

Mounting of subsequent frames of the second level, collective protection devices on the scaffold (guardrails, end railings, toe boards and end toe boards) and diagonal braces

TIP

Mount the anchors in each bay at the top level of the scaffold

DESCRITPION	METHOD OF USE	GRAPHIC SYMBOL
Triangular anchor - one anchoring connector mounted with the right-angle joint to the internal standard of the frame, and another coupled with the first right-angle joint - both at an angle of 90^0		▲
Short anchor - anchoring joint mounted with the right-angle joint to the internal standard of the frame		○

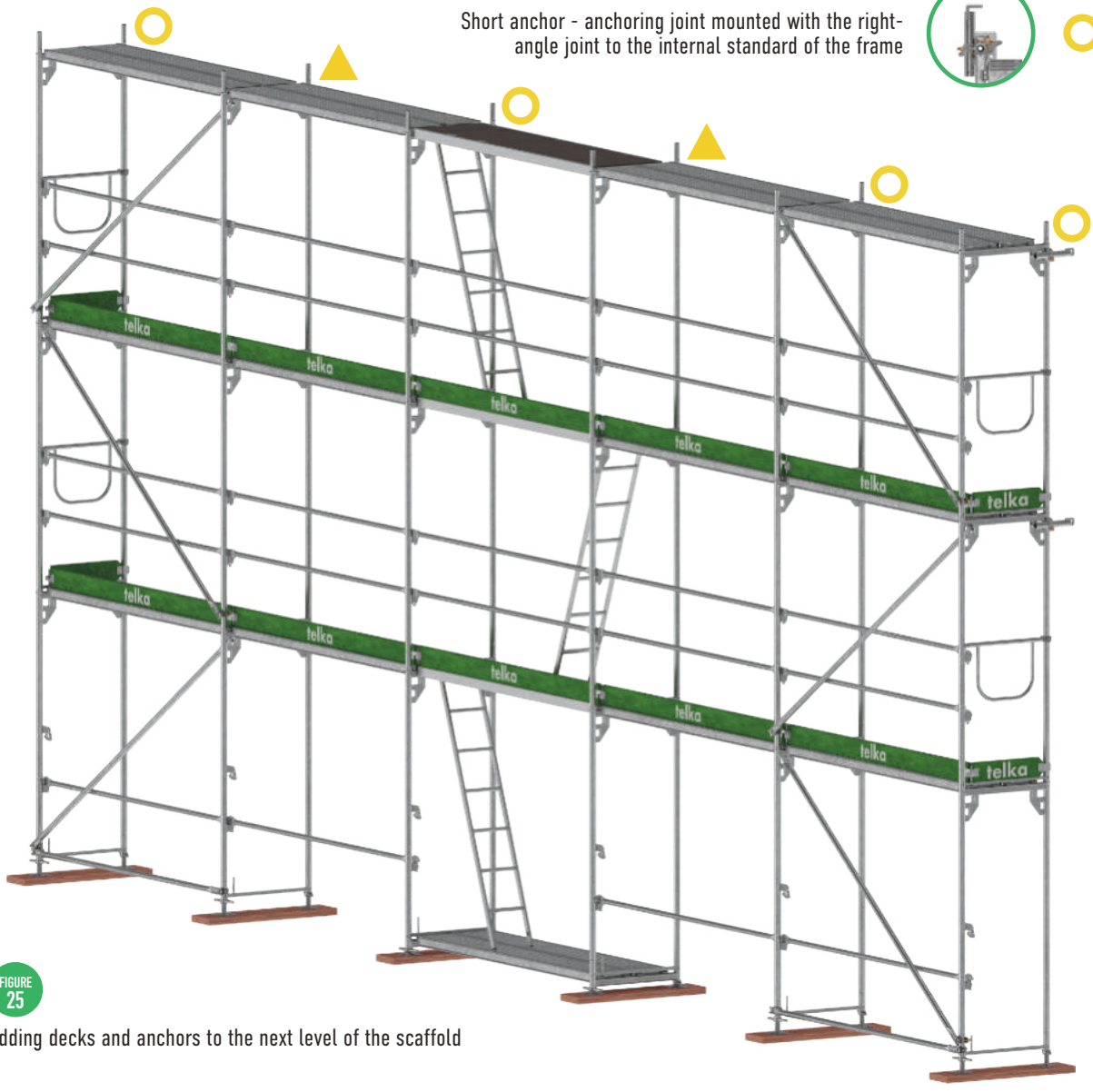


FIGURE 25

Adding decks and anchors to the next level of the scaffold

The top-most level of the scaffold can be erected in two ways.

The first solution involves the installation of secured rail posts on all frames (except for extreme frames), 1 m or 2 m in height, and of end frames (with integrated end rails) on extreme frames.

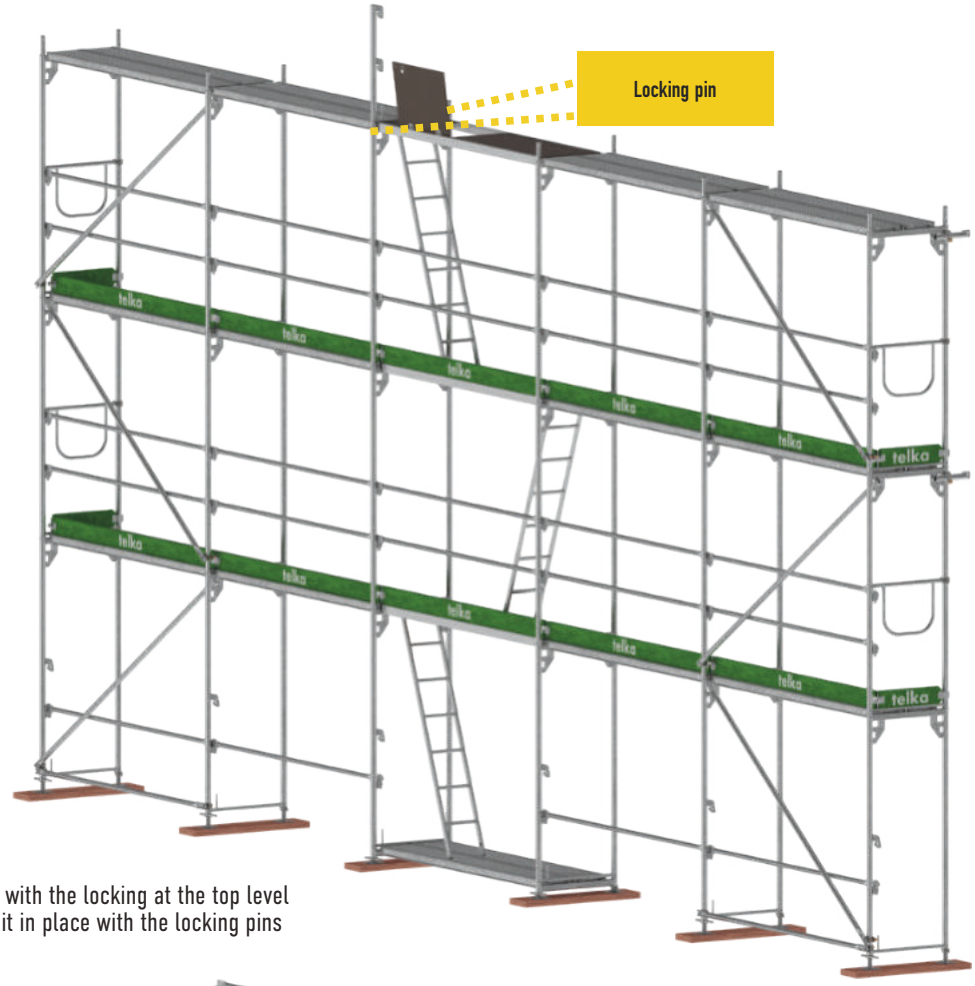


FIGURE 26

Mounting the first rail post with the locking at the top level of the scaffold and secure it in place with the locking pins

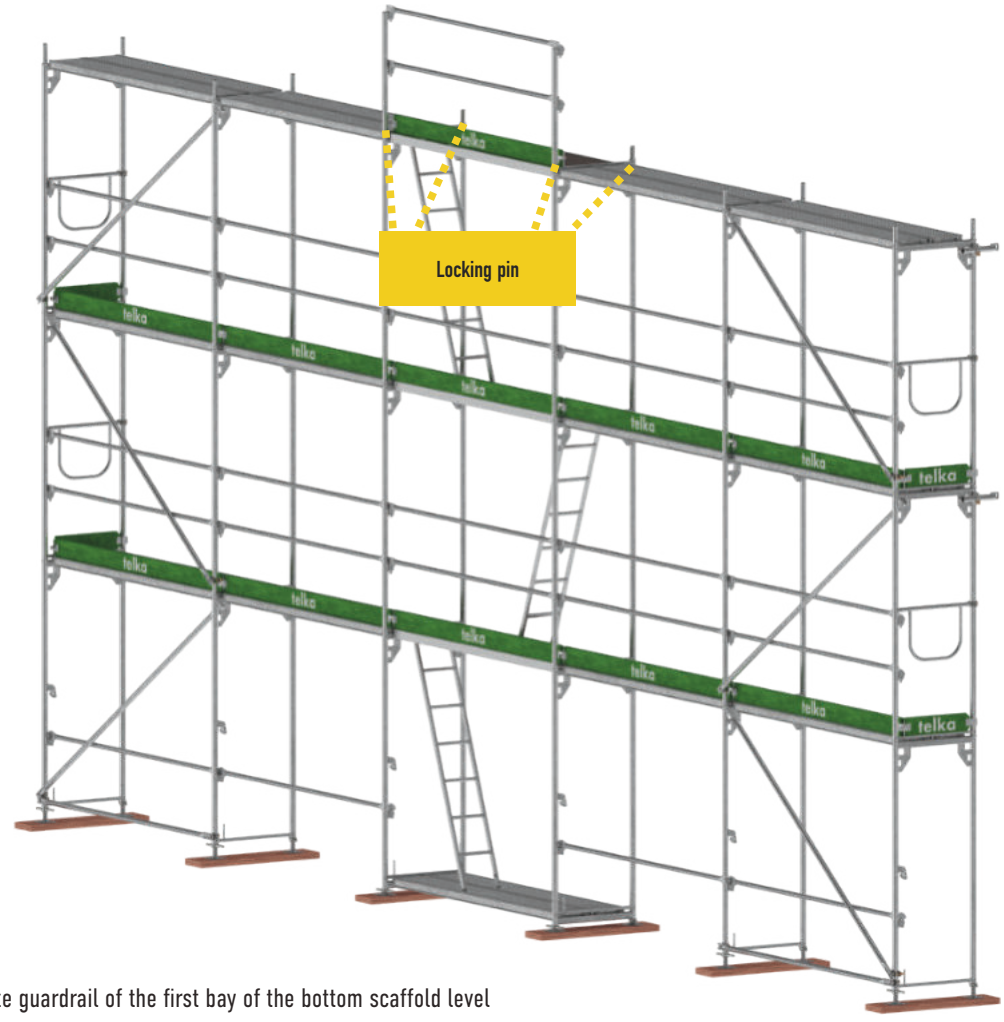


FIGURE 27

Complete guardrail of the first bay of the bottom scaffold level

The erection of the top-most level should also start from the circulation shaft (*fig. 26*). Remaining secured to the ladder of the circulation deck, mount the first secured rail post and prevent it from unlocking using two locking pins. Then, after entering the circulation deck, use PPEs for fall protection, securing yourself to the secured post using locking pins, and then close the circulation deck hatch.

Mount another secured rail post (locking it with a locking pin) and the full guardrail in the circulation core (*fig. 27*). You can attach yourself to the secured rail post between the top and bottom rail in the bay so erected.

FIGURE 28

Mounting of secured rail posts and end frames (secured with locking pins) at the top level of the scaffold, adding subsequent guardrails for the bays

TIP

Secure all rail posts and end frames of the top level using locking pins.

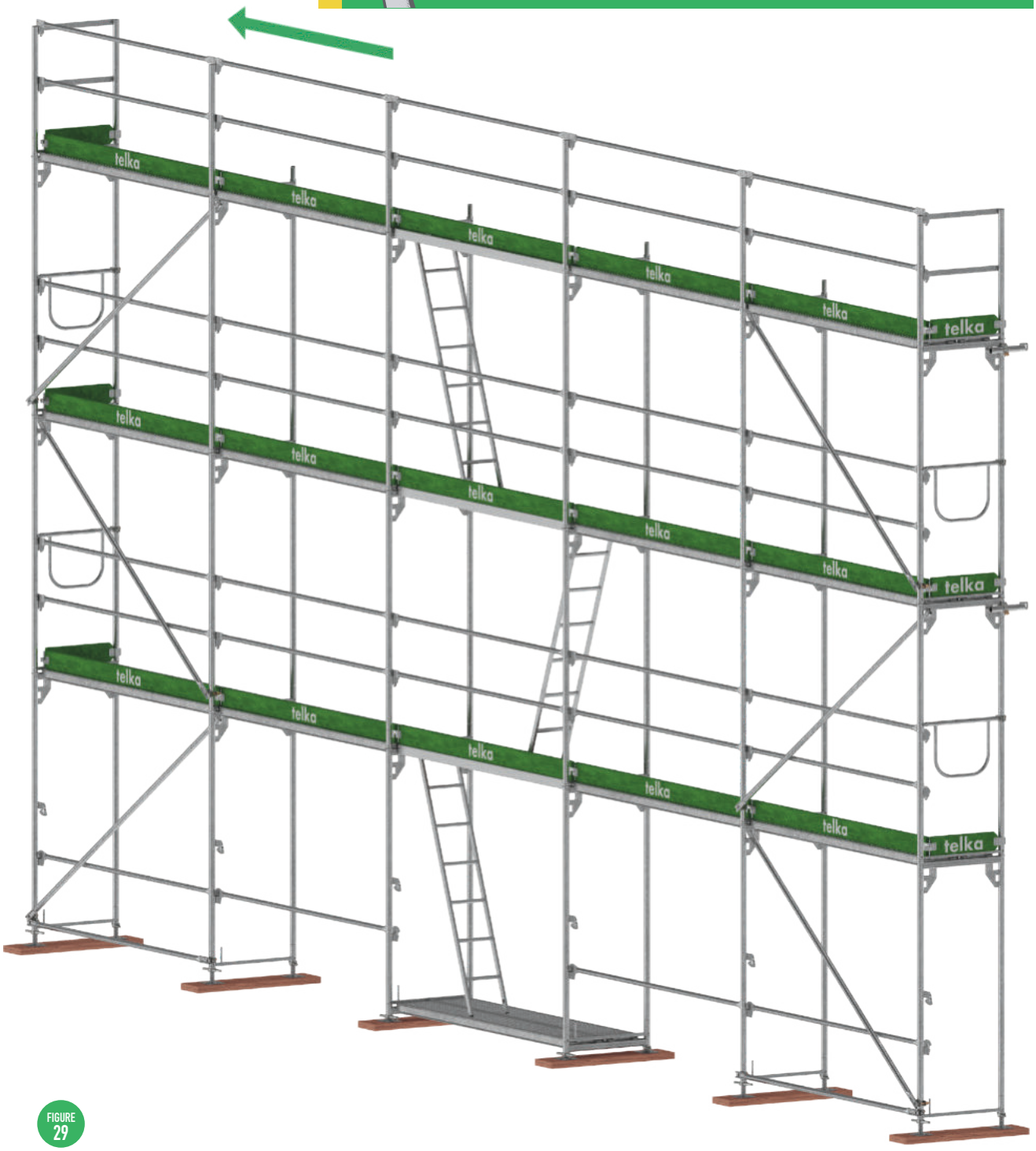


FIGURE 29

Complete scaffold unit

Secured rail posts should be mounted in two directions from the circulation path and immediately secured on both sides using locking pins, and add complete guardrails (two top rails and toe board) for the bays. Mount end frames (also secured with locking pins) and end toe boards in extreme bays - *fig. 28*.

The complete scaffold unit is shown on *fig. 29*.

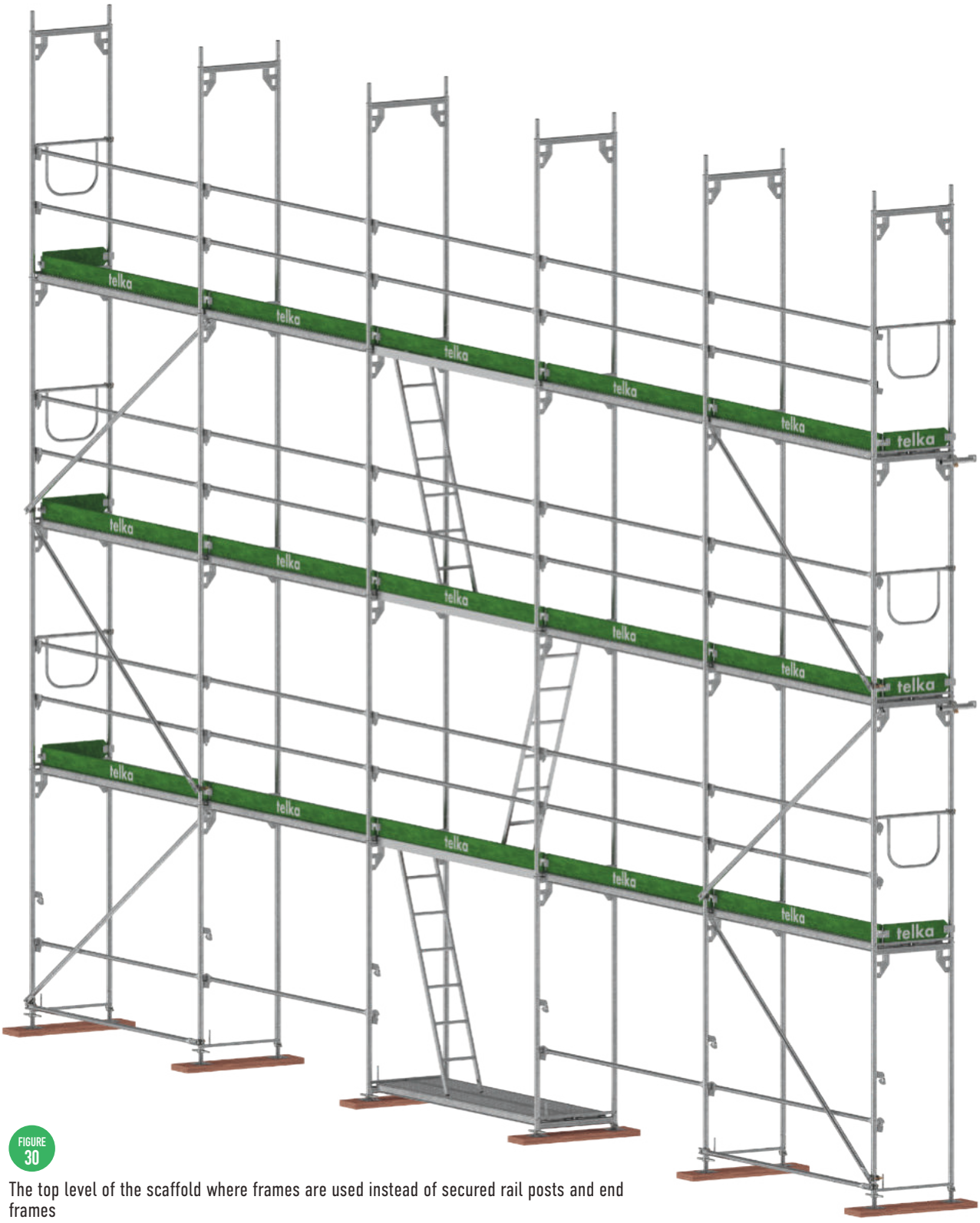


FIGURE 30

The top level of the scaffold where frames are used instead of secured rail posts and end frames

The other erection option for the top-most level involves the use of frames instead of rail posts and end frames (*fig. 30*) and so the erection is the same as described above (for level two and higher), however decks and anchors do not need to be installed on these frames. Frames of the top level are recommended to be protected on both ends using locking pins, and the diagonal brace should be mounted in the shafts being braced.