



TECHNICAL AND ENGINEERING DOCUMENTATION

INSTALLATION AND USER MANUAL FOR

SIGMA 70P

FACADE FRAME SCAFFOLDING

1. This manual is intended for designers, installation personnel and users of the SIGMA 70P facade frame scaffolding.
2. This manual specifies the basic principles of erecting facade frame scaffolding of the SIGMA 70P, incl. detailed technical conditions for standard scaffoldings and design requirements for non-standard structures.
3. The safe assembly and dismantling of the SIGMA 70P scaffolding is the responsibility of the scaffolding company.
4. Assembly and disassembly of the SIGMA 70P must only be carried out by authorized fitters who are familiar with this installation and user manual.
5. The construction company is responsible for ensuring that the SIGMA 70P scaffolding is used as intended and in a safe manner.
6. The user of the scaffolding must strictly observe the instructions specified in this installation and user manual and regulations and standards applicable to scaffolding, in particular:
 - PN-M-47900:1996, PN-EN 12811, PN-EN 12810
 - Regulation of the Minister of Infrastructure of 6 February 2003 on health and safety during the execution of construction works (Journal of Laws No. 47 of 2003, item 401).
 - Regulation of 30 September 2003 of the Minister of Labour, Economy and Social Policy amending the Regulation of 30 October 2002 on the minimum requirements concerning the occupational safety and health while using engines at work (Journal of Laws No. 178, item 1745)
 - Regulation of 20 September 2001 of the Minister of Economy concerning occupational safety and health while operating machines and other technical instruments for earth moving, construction and road-building works (Journal of Laws No. 118, item 1263)
 - Regulation of the Minister of Labour and Social Policy of 26 September 1997 on general health and safety at work (Journal of Laws No. 129, item 844)..

Note:

Appendix no. 1 to this manual is a document entitled: „Guidelines for the design of SIGMA 70P scaffolding. Issue II March 2023”. This document specifies the basic requirements to be considered when designing non-standard scaffolding.

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TABLE OF CONTENTS

1. TECHNICAL DESCRIPTION OF THE SCAFFOLDING	4
1.1. INTENDED USE OF SIGMA 70P FRAME SCAFFOLDING	4
1.2. OVERVIEW OF SIGMA 70P SCAFFOLDING	5
2. GENERAL ASSEMBLY RULES FOR THE SIGMA 70P SCAFFOLDING SYSTEM	6
2.1. PRE-INSTALLATION	6
2.2. ASSEMBLY	7
2.2.1. Elements of the scaffolding	7
2.2.2. Installation sequence of a standard scaffolding	7
2.2.3. Bracing	13
2.2.4. Installation of anchors	14
2.2.5. Installation of extension consoles	15
2.2.6. Installation of safety devices	16
2.2.6.1 Guardrails and toe boards	16
2.2.6.2 Protective canopies	16
2.2.6.3 Fencing, bumpers, signs and warning lights	16
2.3. TRANSPORT OF SCAFFOLDING ELEMENTS	16
2.4. HOISTING DEVICES	17
2.5. LIGHTNING PROTECTION DEVICES	17
2.6. ERECTION OF SCAFFOLDING NEAR POWER LINES	17
3. USE OF SCAFFOLDING	18
3.1. TECHNICAL ASSESSEMENT	18
3.2. COMMISSIONING OF THE SCAFFOLDING	19
3.3. INSPECTIONS OF SCAFFOLDING DURING OPERATION	19
3.4. DISMANTLING THE SCAFFOLDING	19
3.5. STORAGE AND TRANSPORT OF SCAFFOLDING ELEMENTS	20
3.6. VERIFICATION OF SCAFFOLDING PARTS FOR DAMAGE AND WEAR	20
3.7. MARKING OF ELEMENTS	21
4. LEGAL REGULATIONS AND STANDARDS APPLICABLE TO THE ERECTION AND USE OF SCAFFOLDING	22
5. TECHNICAL CONDITIONS FOR INSTALLATION AND USE OF STANDARD WALL ANCHORED SIGMA 70P	23
5.1. GENERAL NOTES	23
5.2. DECKING	23
5.3. ANCHORING	23
5.4. BRACING	24
5.5. SCAFFOLD (NOMINAL) LOAD CAPACITY	24
5.6. STAIRWAYS	24
5.7. GUARDRAILS AND TOE BOARDS	24
5.8. NARROW EXTENSION CONSOLES	24
5.9. WIDE EXTENSION CONSOLES	24
5.10. ANCHOR AND SUBSTRATE LOADS FOR SIGMA 70P TYPICAL STRUCTURES	24
5.11. INSTALLATION DRAWINGS OF ANCHORED WALL SCAFFOLDINGS	25
6. SIGMA 70P FAÇADE SCAFFOLDING – CATALOGUE OF SCAFFOLDING ELEMENTS	31
7. SIGMA 70P DESIGN GUIDELINES	61-65
8. SCAFFOLDING ACCEPTANCE PROTOCOL	66

1. TECHNICAL DESCRIPTION OF THE SCAFFOLDING

1.1. INTENDED USE OF SIGMA 70P FACADE FRAME SCAFFOLDING

The SIGMA 70P scaffolding is a frame facade frame scaffolding assembled from prefabricated elements. The basic load-bearing element of the SIGMA 70P scaffolding are vertical box bearers with a width of 0.739 m. The frame consists of two vertical uprights connected to each other by ledgers (transoms) located at the top and bottom of the frame. The upper ledger is used to fasten the deck. The subsequent vertical frame sections are connected with each other by means of decks, which additionally stiffen the scaffolding in the horizontal planes. Such a design means that the decks must be laid on every floor and in every bay in the installed scaffolding. The bottom frame ledgers serve as a lock that prevents the decks from being removed from the assembled structure. Vertical (diagonal) braces constitute stiffening of the scaffolding in the vertical plane.

The following types of decks are used in the SIGMA 70P scaffolding:

- steel plank decks with anti-slip deck: width 0.32 m, length: 0.7; 1,1; 1,5; 2,0; 2,5; 3.0 m.
- decks of laminated wood: width 0.32 m, length: 0.7; 1,1; 1,5; 2,0; 2,5; 3.0 m.
- aluminium decks made of profiles, with anti-slip grooves: width 0.32 m, length: 0.7; 1,1; 1,5; 2,0; 2,5; 3.0 m.
- aluminium decks with a plywood hatch deck and a ladder: width 0.64 m, length: 2.0, 2.5; 3.0 m.
- aluminium decks with an aluminum hatch deck and a ladder: width 0.64 m, length: 2.0, 2.5; 3.0 m.
- aluminium working deck with plywood deck: width 0.64 m, length: 0.7; 1,1; 1,5; 2,0; 2,5; 3.0 m.
- aluminium working deck with aluminium deck: width 0.64 m, length: 0.7; 1,1; 1,5; 2,0; 2,5; 3.0 m.

The SIGMA 70P frame scaffolding system includes a number of complementary elements ensuring that the erected structures are appropriate for local foundation conditions and the shape of the facade. In addition to the consoles extending the deck, lattice girders, walk-through frames, adjusting frames, cornice frames, levelling frames, narrow (single-deck) and wide (three-deck) frames are used.

The SIGMA 70P working scaffoldings in standard with a frame spacing of 3.0 m are generally intended for inspection and light construction works (painting, plastering, insulation works), where it is not necessary to store a large amount of construction materials on the decking (load class 3 according to PN-EN 12811).

SIGMA 70P working scaffoldings in non-standard, tailor-designed can be used for heavier construction works (load class 4,5,6 according to PN-EN 12811). Such scaffolding structures require calculation of their load-bearing capacity.

All components of the SIGMA 70P system are permanently marked. The stamped marks include the manufacturer's designation and the year of manufacture.

The SIGMA 70P scaffolding system complies with EN 12810-1.

Marking of the SIGMA 70P scaffolding system:

Scaffolding EN 12810-3N-SW06/300-H1-B-LA

1.2. ELEMENTS OF SIGMA 70P SCAFFOLDING

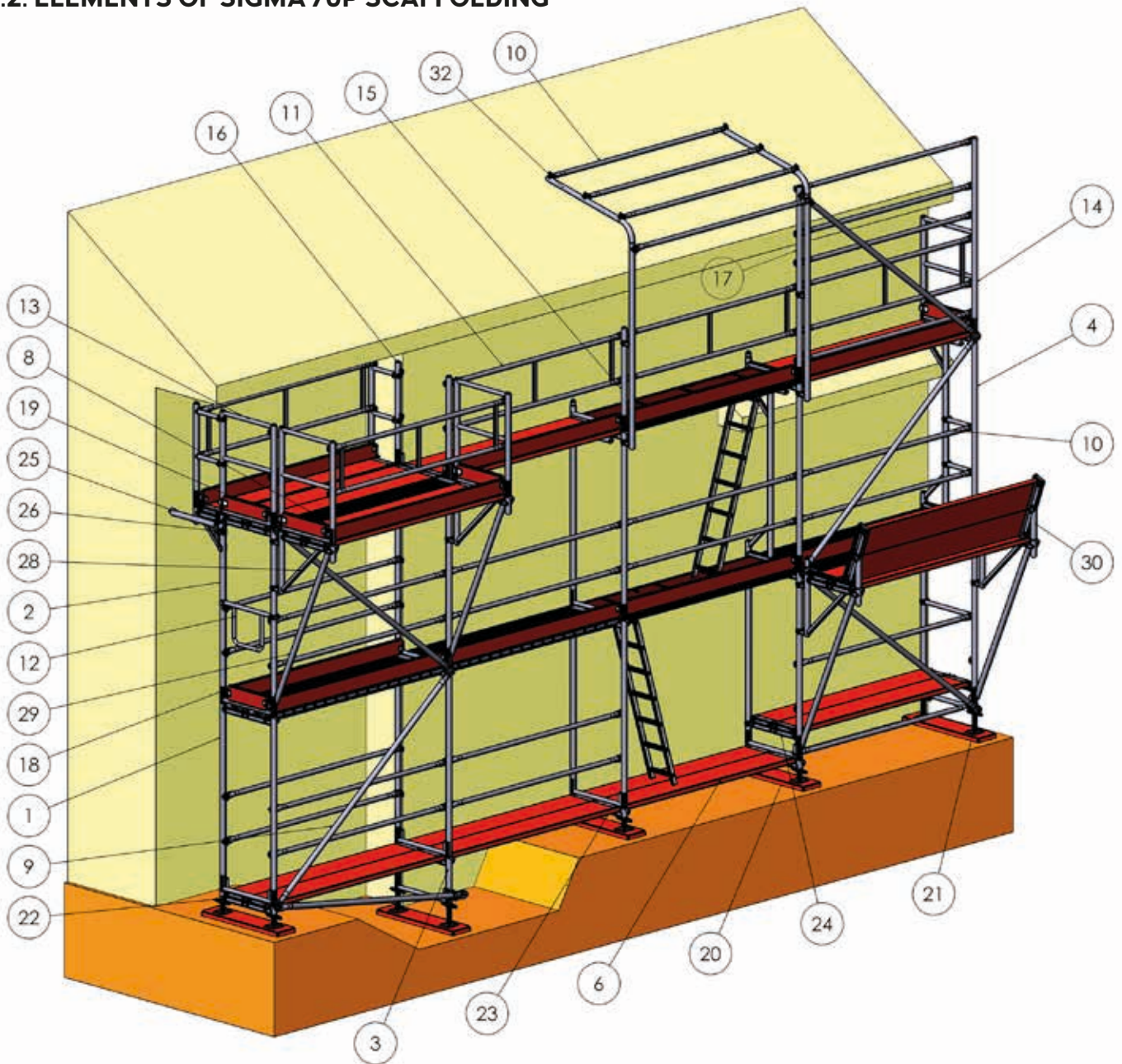


Fig. 1

- | | |
|--|--|
| 1. Vertical frame | 17. Roof guardrail post with deck guard, - "L-shaped", 2.0 m |
| 2. Vertical frame with double locks | 18. Longitudinal toe board |
| 3. Levelling frame | 19. Side toe board |
| 4. Cornice frame | 20. Timber sole board |
| 5. Steel deck | 21. Bottom bracing fixation |
| 6. Timber deck | 22. Adjustable steel screw jack |
| 7. Alu-plywood access deck | 23. Base transom |
| 8. Infill deck for the console | 24. Transom |
| 9. Diagonal brace | 25. Anchor hook |
| 10. Single longitudinal guardrail | 26. Cross brace |
| 11. Double longitudinal guardrail | 27. Console (bracket) 0.32 m |
| 12. Double side guardrail | 28. Console (bracket) 0.74 m |
| 13. Top front guardrail frame | 29. Console support |
| 14. Roof top front guardrail frame | 30. Protective canopy bracket |
| 15. Handrail post with deck guard, - "L-shaped", 1.0 m | 31. Securing device for the protective canopy decks |
| 16. Handrail post with deck guard | 32. Tarpaulin post |

2.1. PRE-INSTALLATION

The assembly of the scaffolding should be carried out in accordance with the pre-prepared layout, including detailed drawings of the structure to be assembled.

The assembly layout should include:

- site conditions (dimensions of the scaffolding base, terrain openness, scaffolding height, the location of the scaffolding in relation to vehicle and pedestrian traffic routes),
- the type of foundation,
- the scope of work performed on the scaffolding,
- dimensions of the scaffolding structural grid (scaffolding width, bay length),
- shape and dimensions of the facade,
- potential points of anchoring,
- arrangement of stairways,
- vertical transport of scaffolding elements during its assembly and transport of materials used during works on the scaffolding,
- installation of safety devices (lightning protection devices, protective canopies),
- protective marking of the scaffolding.

For the configuration of the scaffolding described in the technical conditions (point 5), static calculations were conducted on the basis of which the basic parameters of the scaffolding were determined (dimensions of structural meshes, number and arrangement of anchors, method of installation of scaffolding elements, etc.). These scaffoldings should be recognized as standard.

The standard - most commonly used - projects do not require the calculation of static load capacity. Documentation of static load capacity is also not required for non-standard scaffolding structures, provided that the deviations do not affect the load capacity and stability of the structure and can be verified and carried out by experienced and professional staff from the companies being familiar with the assembly of the SIGMA 70P scaffolding.

Calculations of the SIGMA 70P scaffolding structure should be performed in accordance with the provisions specified in the Appendix to this manual entitled „Guidelines for designing SIGMA 70P scaffolding. Second Edition of 2023” and with the applicable standards and regulations.

The stability and load capacity of non-standard scaffoldings erected using the SIGMA 70P system must be confirmed by static calculations. In particular, the following scaffolding should be considered non-standard:

- wall-mounted scaffolding with a length of less than 10 m,
- scaffolding higher than the maximum height specified for standard scaffolding,
- standard scaffolding to be used in wind load zones other than zone I according to PN-EN 1991-1-4:2008, Eurocode 1: Eurocode 1: Actions on structures - General actions - Part 1-4: Wind actions,
- scaffolds with a load in excess of the nominal value,
- scaffolding with protective canopies installed as an integral part of the scaffolding,
- lattice girders, walk-through frames and levelling frames,
- scaffolding to be assembled next to walls with the opening area exceeding 60%,
- wall-mounted scaffolding to which construction lifts or hoisting equipment with a load capacity of more than 150 kg attached
- scaffolding with a configuration other than specified in this manual

2.2. ASSEMBLY

2.2.1. Scaffolding elements

Only original SIGMA 70P scaffolding elements should be used for installation. All structural elements of the scaffolding have stamped manufacturer's marks, which enables unambiguous identification of the parts. A catalogue of parts used for the assembly of the scaffolding can be found in point 6 of this manual.

Before installation, the technical condition of the following scaffolding elements should be checked for:

- frames, bracings, guardrails, steel decks, ladders – mechanical damage, e.g. buckling, deflection, fracture, tearing,
- screw jacks – cleanliness of the threaded parts, corrosion, damage; slight rotation of the nut,
- wooden decks – cracks and delamination; transverse cracks (unacceptable).

2.2.2. Installation sequence of a standard scaffolding

a) Foundation

- The foundation on which the scaffolding is placed must be appropriately levelled and have sufficient load-bearing capacity. Load-bearing capacity of the ground should not be less than 0,1 MPa and must be determined according to PN-74/B-03020.
- When setting up the scaffolding on the ground, put sole boards under the steel screw jacks. The size of the sole boards should be selected in such a way that the unit load of the scaffolding structure does not exceed the load-bearing capacity of the substrate.
- The installation of the scaffolding begins with laying the sole boards on the ground and placing the guardrails on them to mark the distance between the sole boards and then the steel screw jacks (Fig. 2). Lay the sole boards transversely to the facade of the building in such a way that there are two screw jacks of one frame on one sole board. The spacing of the screw jacks on the sole boards is determined by the width of the frame. The screw jacks on the side of the wall should be arranged in such a way that, after installing the frames and decks, the horizontal distance between the edge of the scaffolding deck and the wall does not exceed 20 cm.
- If the angle of inclination of the ground is greater than 6 degrees, the load bearing capacity of the foundation should be spot checked, considering the angle of inclination.
- When setting up scaffolding on a concrete substrate, it is not necessary to use sole boards, but it is recommended to use them due to the better contact of the screw jack with the sole board than with the concrete surface.
- When setting the scaffolding on a sloping ground, screw jacks of different lengths are used: 0.4 m, 0.6 m, 0.8 m. However, if the compensation of the height by unscrewing the nuts of the scaffolding is not sufficient, levelling frames must be used. Remember to brace the levelling frames from the bottom of the frame (at the screw jack) to the brace pin; this can be done using system bracings or swivel pipe fittings (Fig. 3)

ATTENTION! Placing the steel screw jacks directly on the ground without sole boards is unacceptable.

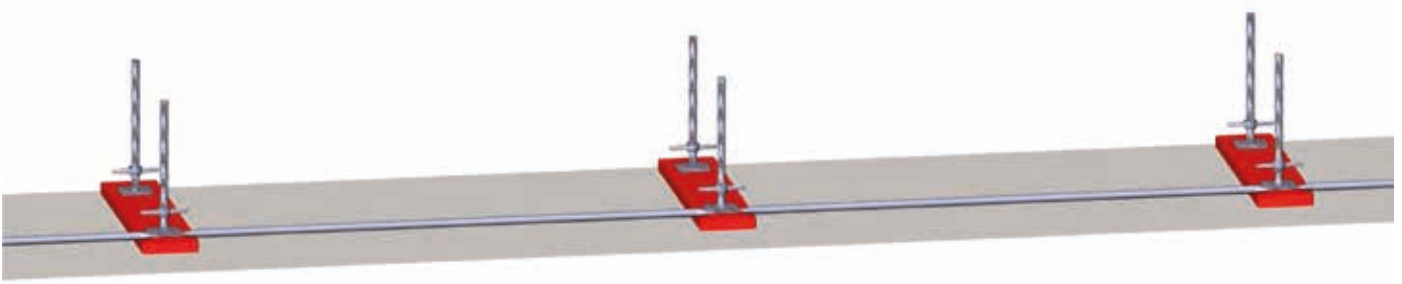


Fig. 2. Placing scaffolding on sole boards on the levelled ground with guardrails marking the spacing between sole boards.

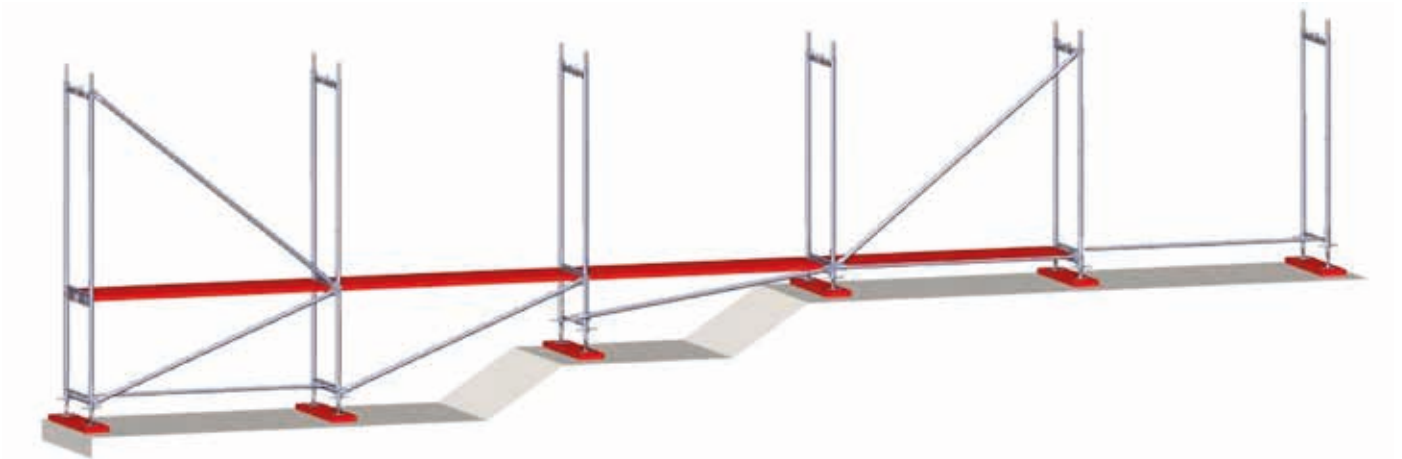


Fig. 3. Compensation of unevenness of the substrate with levelling frames.

b) Framing the first level

- The assembly of the scaffolding begins with laying the sole boards on the ground, and then the steel screw jacks (Fig. 2). Lay the slope boards transversely in such a way that the two feet of one frame were on one sole board. The spacing of sole boards and steel screw jacks is determined by the length of the guardrails and the width of the frame. The steel screw jacks on the wall side should be arranged in such a way that, after installing the frames and decks, the horizontal distance between the edge of the scaffolding deck and the wall does not exceed 20 cm.
- In the place where the stairways will begin, put the base transoms on the steel screw jacks, and then the deck(s) on them. The deck will constitute the support for the entrance ladder leading to the first floor (Fig. 4).
- The installation of the scaffolding should begin from the highest point of the scaffolding installation area. Follow the principle that the first assembled bay of the first floor should be braced with diagonal brace (base bay).

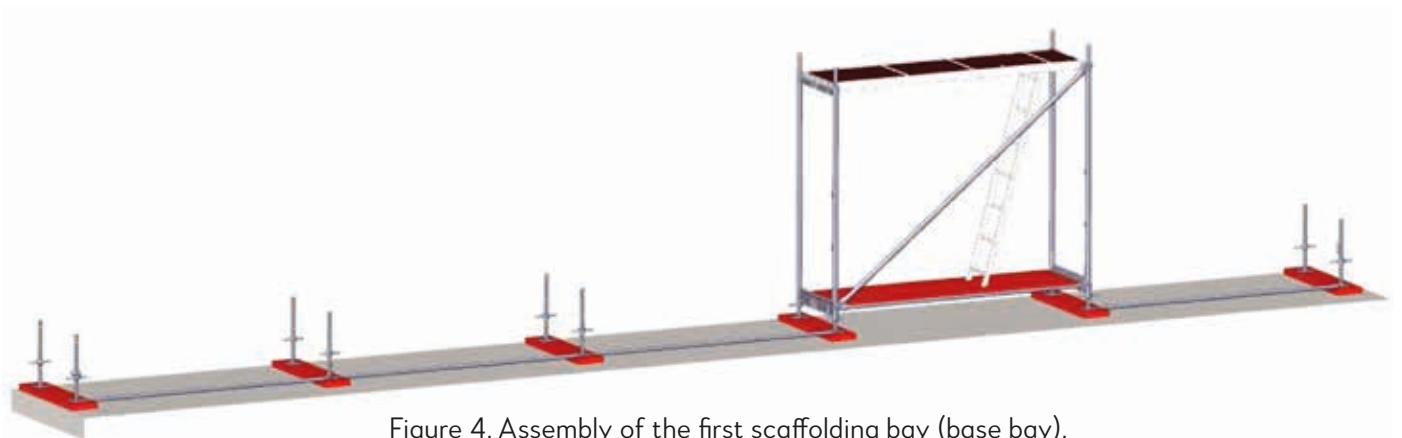


Figure 4. Assembly of the first scaffolding bay (base bay).

- After laying the sole boards and placing the adjustable screw jacks on them, slide the starting ledgers or the bottom brace mount over them, place the guardrail on the latched pins of the ledgers or the lower bracing brackets; the guardrail will serve as a longitudinal transom. Then attach one vertical frame to the mandrels of the screw jacks and install the diagonal brace (Fig. 4).
- Then put on the second frame and install the access deck. Only steel, wooden, aluminium or aluminium-plywood system decks should be used for installation. Two 0.32 m wide decks or one 0.64 m wide deck must be installed in each bay. Level the assembled bay and plumb it up. The bay assembled in this way is the base bay from which the assembly of subsequent bays of the first floor can be started (Fig. 4).
- Install another vertical frame on top of the next screw jacks placed on the sole boards and connect it to the previously made bay with one guardrail and decks (Fig. 5). Mount the guardrail on the side bolts – it will remain as a horizontal inter-frame bolt



Fig. 5. Installation of the second scaffolding bay.

- Use a spirit level to check the horizontal alignment of the guardrail. If necessary, correct the level by removing the outer nut of the screw socket. Level the frame to be mounted by removing the nut of the inner screw socket. Then level the attached frame by unscrewing the screw jack on which the inner upright is placed.
- Assemble the next bays by putting the frames on the screw jacks and connecting them with guardrails and decks until the entire floor is completed. Stiffen the bracing bays (max. every 5 bays if the design or instructions do not provide for the installation of more bracings) with vertical (diagonal) bracings. The number of braces on one floor cannot be less than 2, regardless of the number of bays to be installed. (Fig. 6).

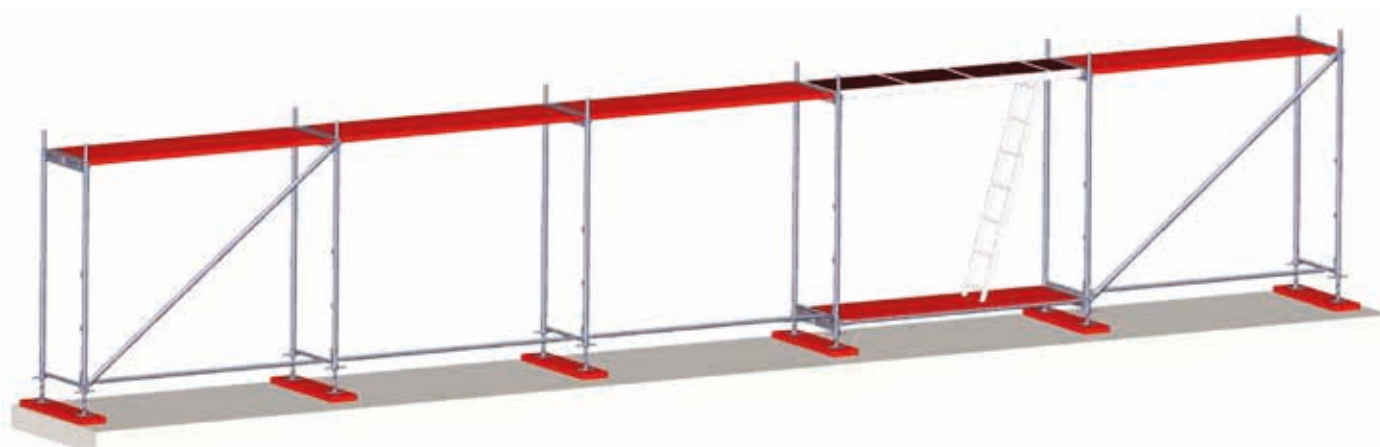


Fig. 6. Installation of the first floor.

c) Installation of upper floors

- During the assembly of the upper floors, it is necessary to determine the method of delivery of the elements to it. For scaffoldings up to 8 m high, manual transport can be used and elements can be carried from floor to floor manually. In the case of this method of transport, one person must stand on each floor and hand the elements higher.
- When installing floors higher than 2 m, advance guardrails or personal protective equipment (harnesses, safety cables, shock absorbers or fall locking devices) should be used.
- The hatches of the access decks must be closed during the installation of the scaffolding. They can be only opened to pass through.
- Inserting the vertical frames of the next floors begins from the place where the stairway is located. While standing on the ladder, mount the first vertical frame of the upper floor, then temporarily attach the frame rod, attach the safety rope to the upper frame beam and extend the entire scaffolding floor in both directions. (Fig. 7).



Fig. 7. Installation of the first frame of the upper floor.

- Immediately connect each vertical frame with the (main and secondary) guardrails (Fig. 8). The open front sides of the floor should be secured with front guardrails (double side railings), and diagonal braces should be installed in the braced bays. (Fig. 9)

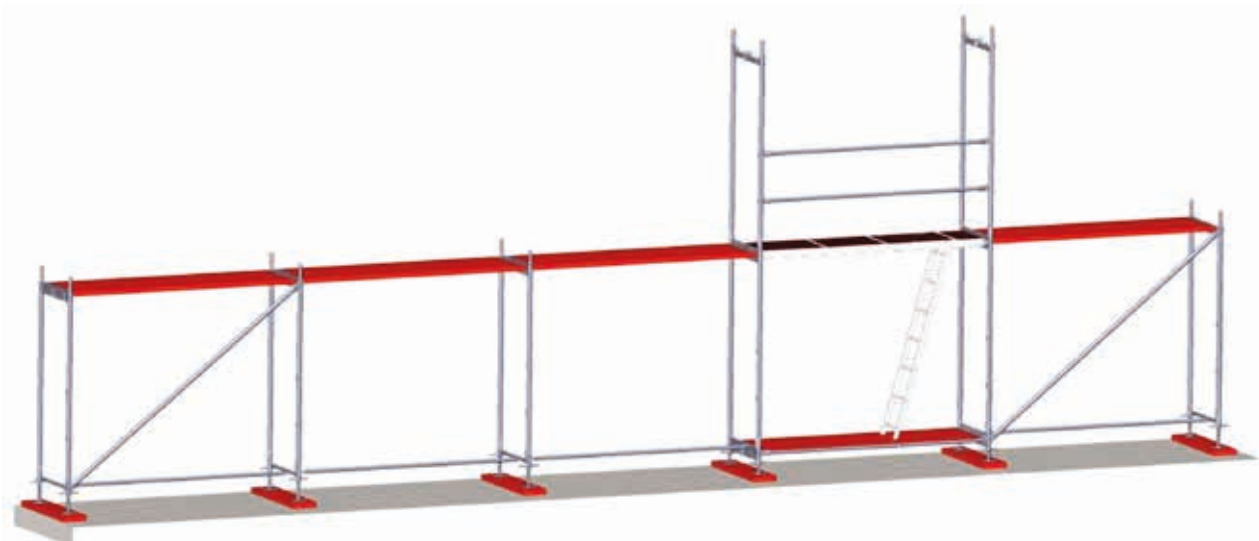


Fig. 8. Installation of the second frame and guardrails of the second floor

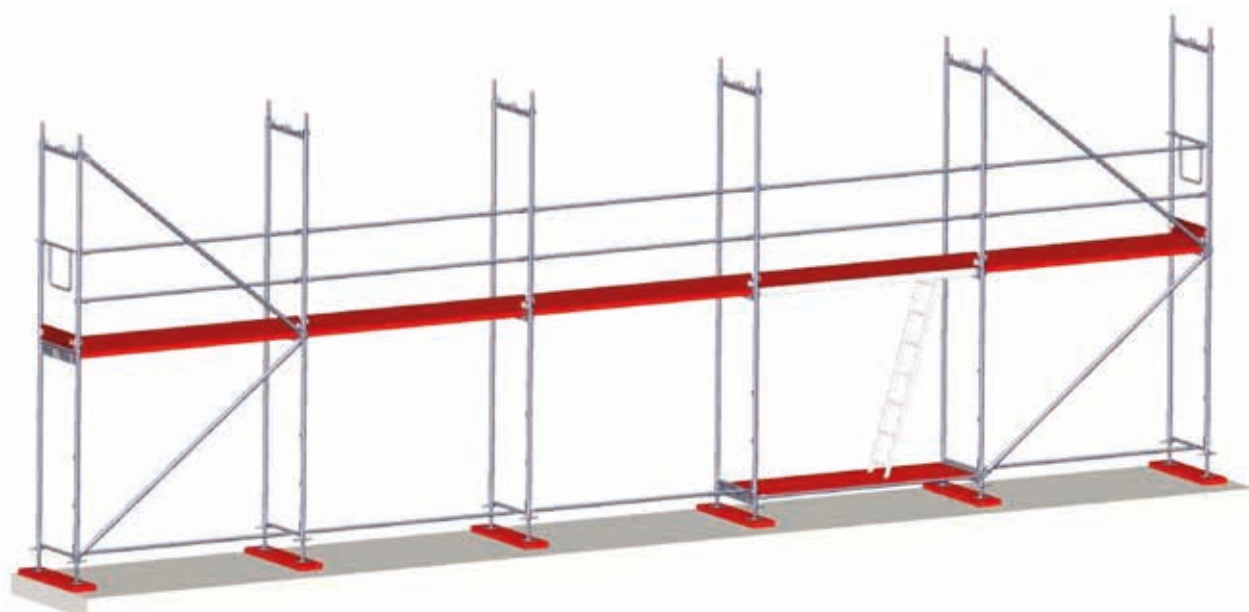


Fig. 9. Installation of subsequent frames, guardrails and bracing of the second floor.



Fig. 10. The second floor assembled with guardrails and decks.

- All subsequent scaffolding floors are assembled by repeating the steps described above in the same order. Anchor the scaffolding successively during the assembly in accordance with the anchor grid shown in the instructions or design.
- After installing the decks on the top floor, the safety devices should be installed in accordance with 2.2.6. (Fig. 12); the front guardrail and the railing posts must be secured with frame cotter pins to eliminate the possibility of uncontrolled disconnection.

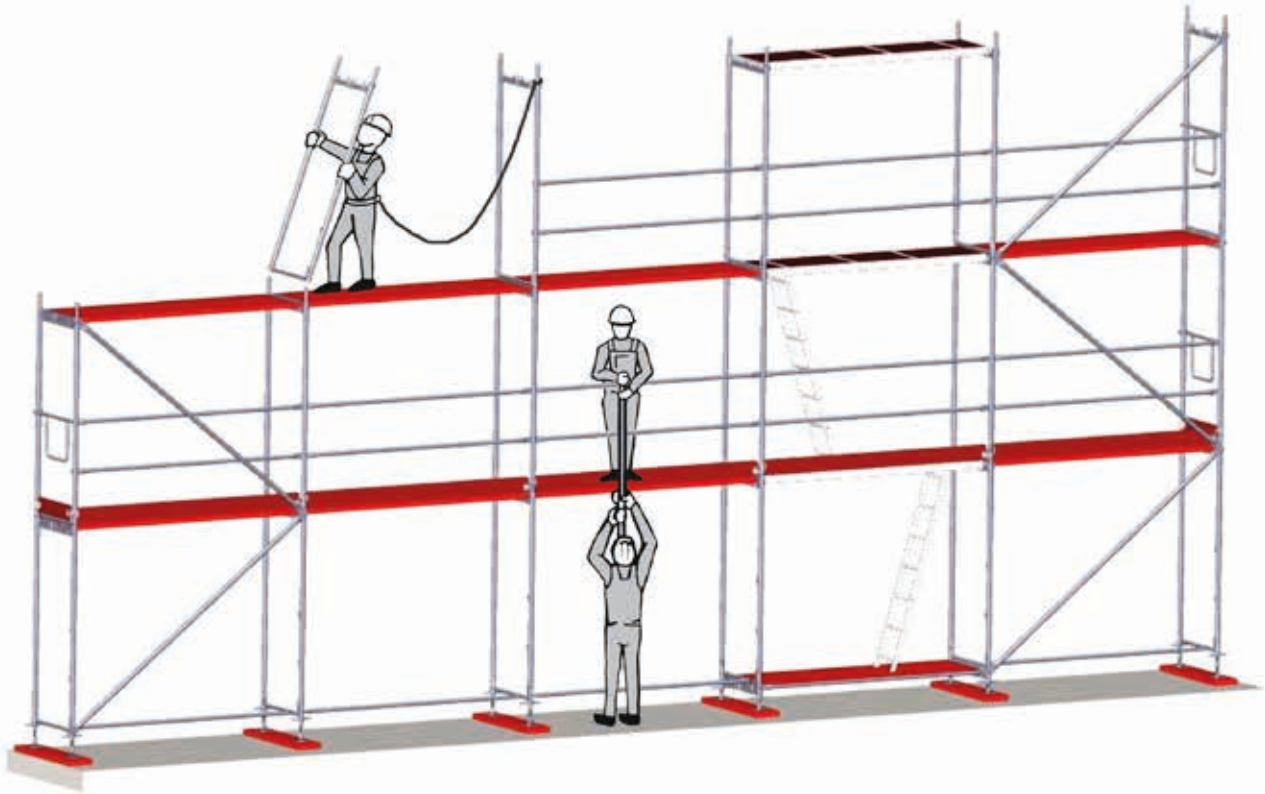


Fig. 11. Installation of upper floors

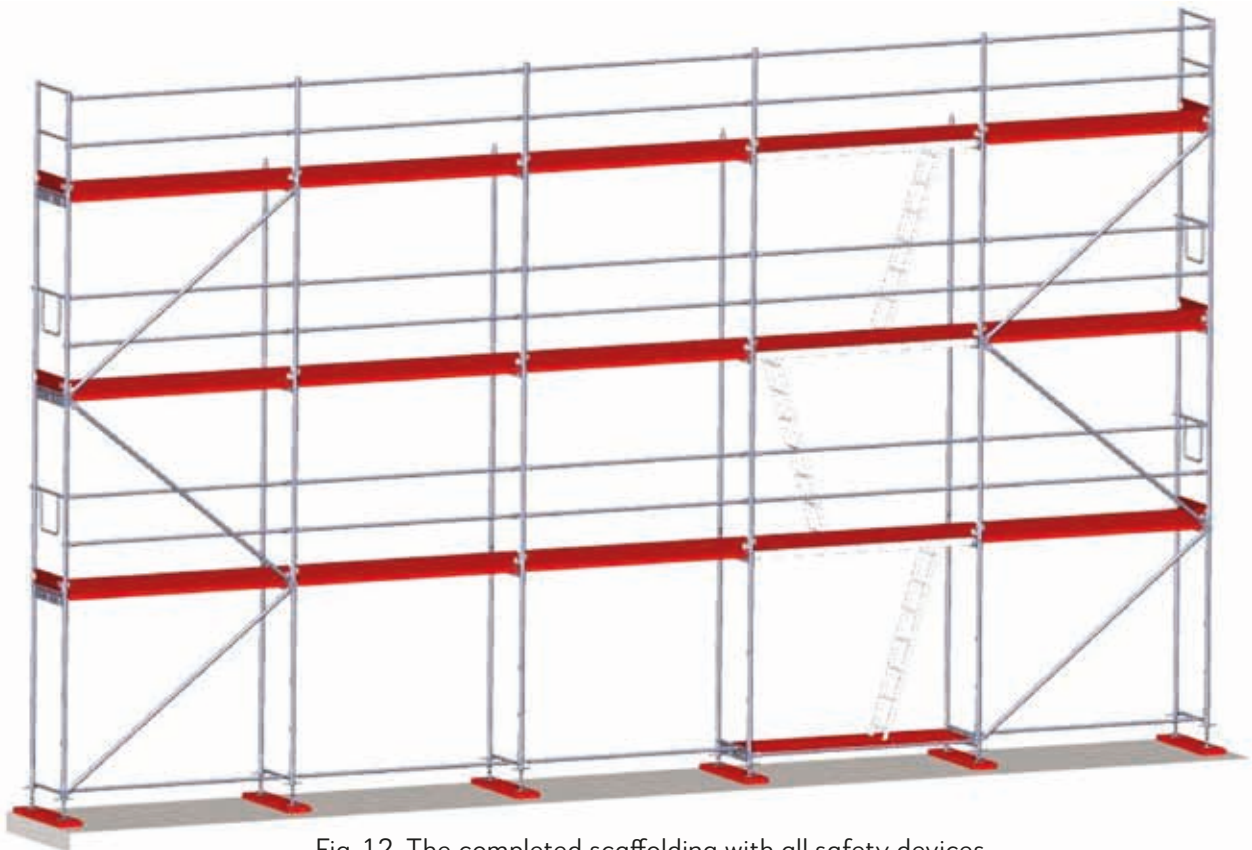


Fig. 12. The completed scaffolding with all safety devices.

d) Corners

Corners can be fitted by placing the upright of one frame on a screw jack and the other by suspending it with two swivel joints to the frame upright of the other plane (Fig. 13); the adjacent frame uprights on the upper floors should then be connected with swivel joints on each floor.

Corners can be also fitted by independent seating of the adjacent frames using 0.32 m or 0.64 m brackets without a connector (Fig. 14). With this arrangement of the frames, the uprights should be connected to each other with cross couplings and tubes, which will also serve as guardrails.

Fitting the corner in this way facilitates anchoring the corner and extends the entire scaffolding by the length of the console.

Starting from the 2nd floor, additional anchors should be applied every 4 m in the corner area (Fig. 13). This applies to both methods of fitting corners. Fill the (more than 8 cm wide) gaps between the scaffolding elements with infill planks.



Fig. 13. Fitting a corner with swivel joints

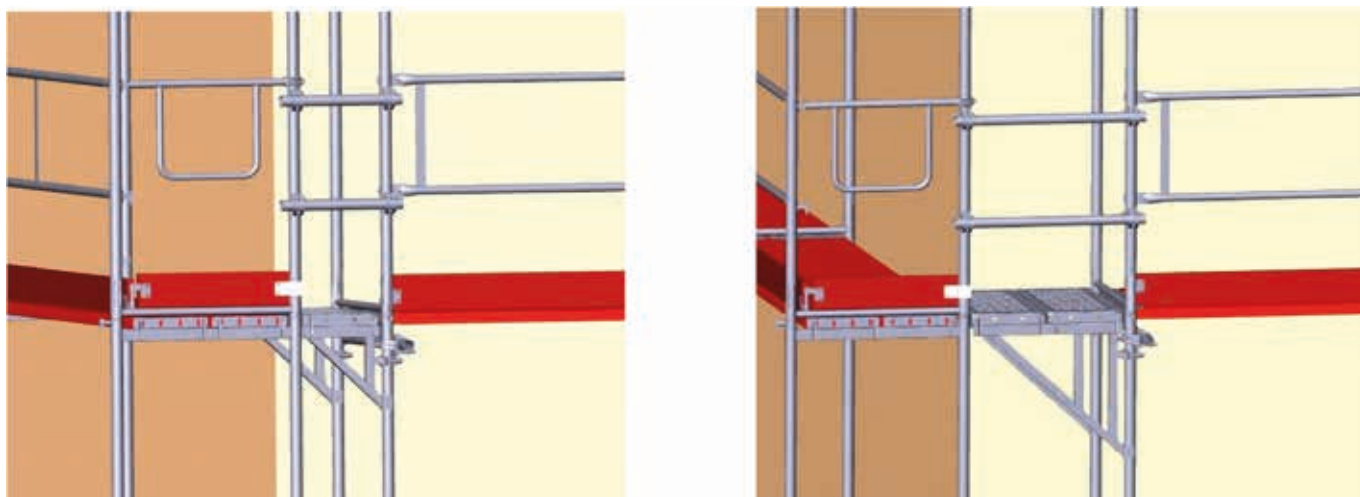


Fig. 14. Fitting the corner with brackets, tubes and cross couplings

2.2.3. Bracing

Bracings are mounted in the outer plane of the scaffolding, parallel to the face of the wall, as a large-format or tower system.

Vertical braces should be placed:

- at least in every 5th bay of the scaffolding grid,
- symmetrically, with the number of braces not less than 2 on each floor.

The bracing grids of standard scaffolds are presented in the technical conditions of this manual (point 5.11). For non-standard scaffolds, the bracing grid should be specified in the scaffolding design.

2.2.4. Installation of anchors

The scaffolding must be anchored to the wall of the structure or building in a way ensuring the stability and rigidity of the scaffolding structure and allowing the transfer of external forces acting on the scaffolding. For the standard configurations described in this manual, the guidelines for anchoring have been clearly defined. The technical conditions of installation specify the number and location of anchors, their type and method of installation, and anchoring forces. For all non-standard scaffolding constructs, static calculations must be performed to determine the anchoring conditions (spacing, number of anchors, anchoring forces). Anchors must not transfer vertical component forces.

Anchoring of the scaffolding should be carried out on an ongoing basis during the erection of the scaffolding in accordance with the anchoring grid specified in the manual or design. Anchor connectors are used to anchor the scaffolding. The hooks of the connectors should be connected to eye bolts screwed into wall plugs embedded in the wall or in other equally firm structure. It is not allowed to anchor the scaffolding to gutters, lightning rods or window frames. The hooks of the anchor links must be mounted in the bolt eye in such a way that they cannot be unintentionally disconnected (Fig. 15).

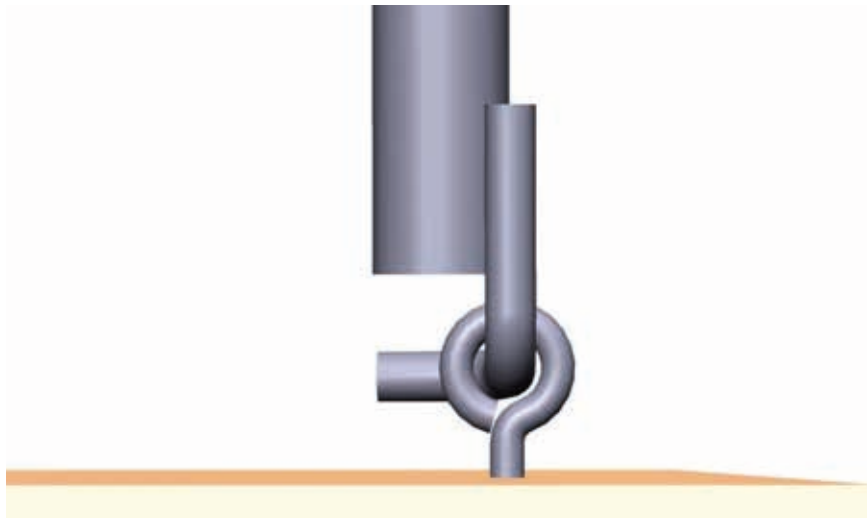


Fig. 15. Alignment of the hook in relation to the bolt eye

Three types of anchors are used to anchor the scaffolding:

Short anchors – one anchoring connector attached to one (internal) upright by means of a single cross coupling (Fig. 16). Short anchors transmit forces in a direction perpendicular to the wall.

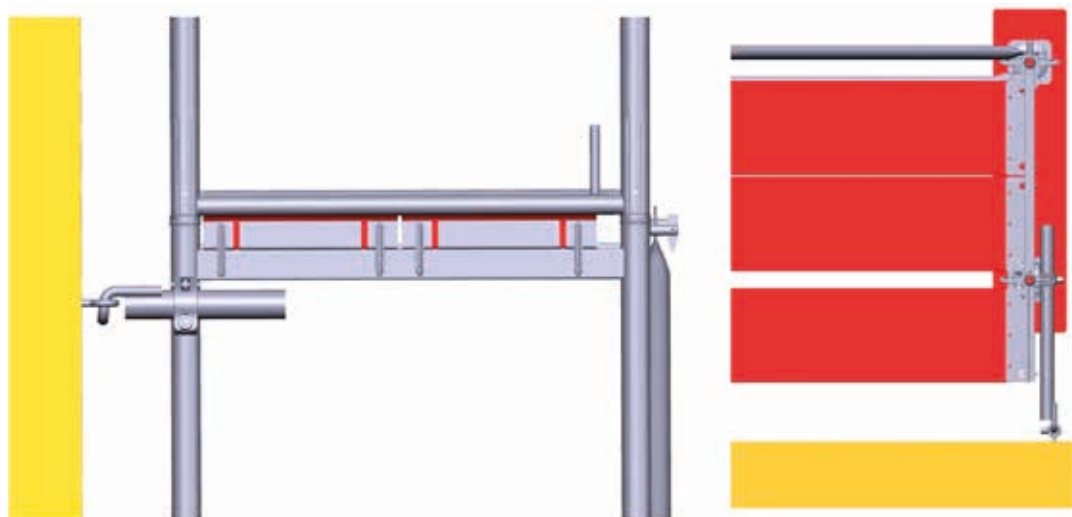


Fig. 16. Short anchors.

Long anchors – one anchoring connector attached to two uprights by means of two cross couplings (Fig. 17). Long anchors transmit forces in the direction perpendicular and parallel to the wall.

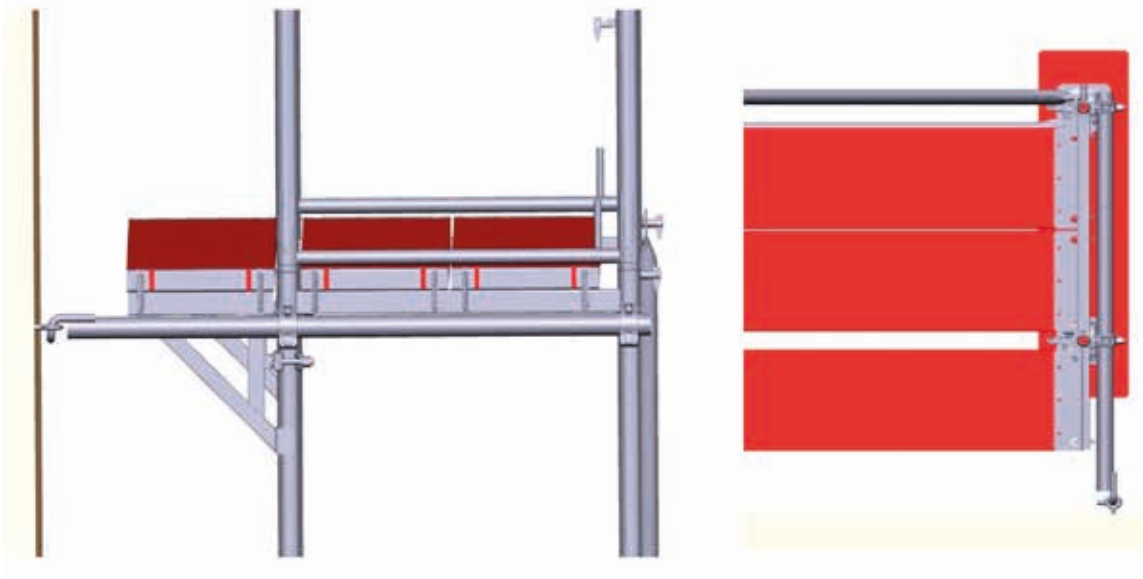


Fig. 17. Long anchors.

„V” anchors – two anchor connectors fixed in a „V” arrangement by means of two cross couplings (Fig. 18).

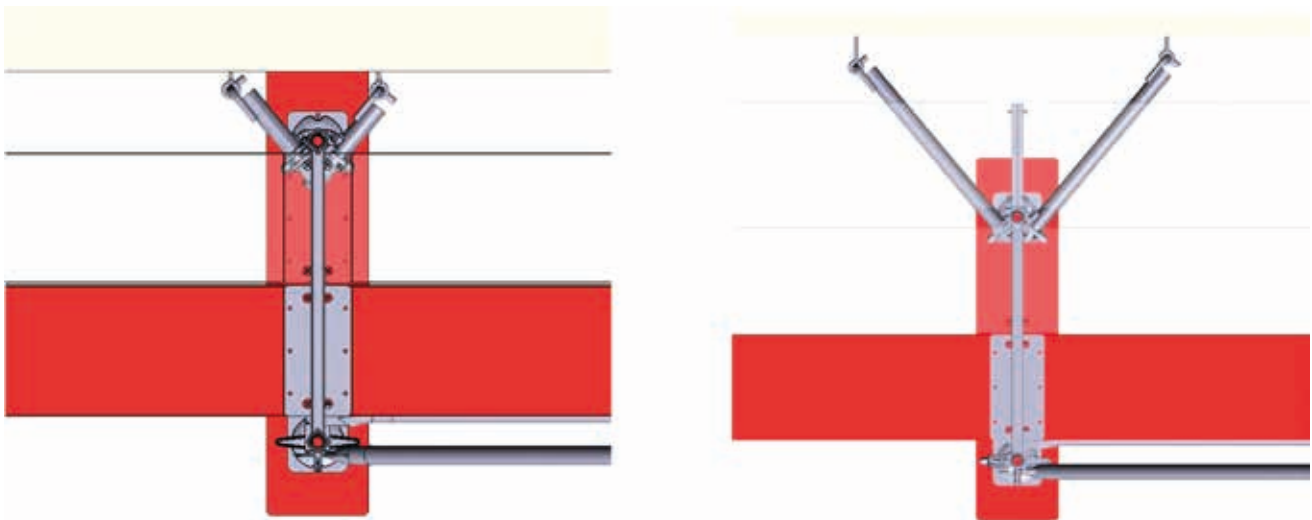


Fig. 18. Anchors in the „V” arrangement.

Tighten the nuts of the cross couplings with a torque of 50 Nm. Anchors should be installed directly under the decks.

2.2.5. Installation of extension consoles

To widen the working decks in the scaffolding, either outwards or inwards, consoles with a width of 0.32, 0.64, 0.74 or 1.1 m can be used. Consoles should be screwed to the frame uprights in such a way that the console transoms are at the height of the upper frame transom. After installing the decks on the console, they must be secured against removal with safety devices. The installation of the console on the highest deck is shown in Fig. 19. Fill the gaps between the main deck and the extension deck with infill planks.

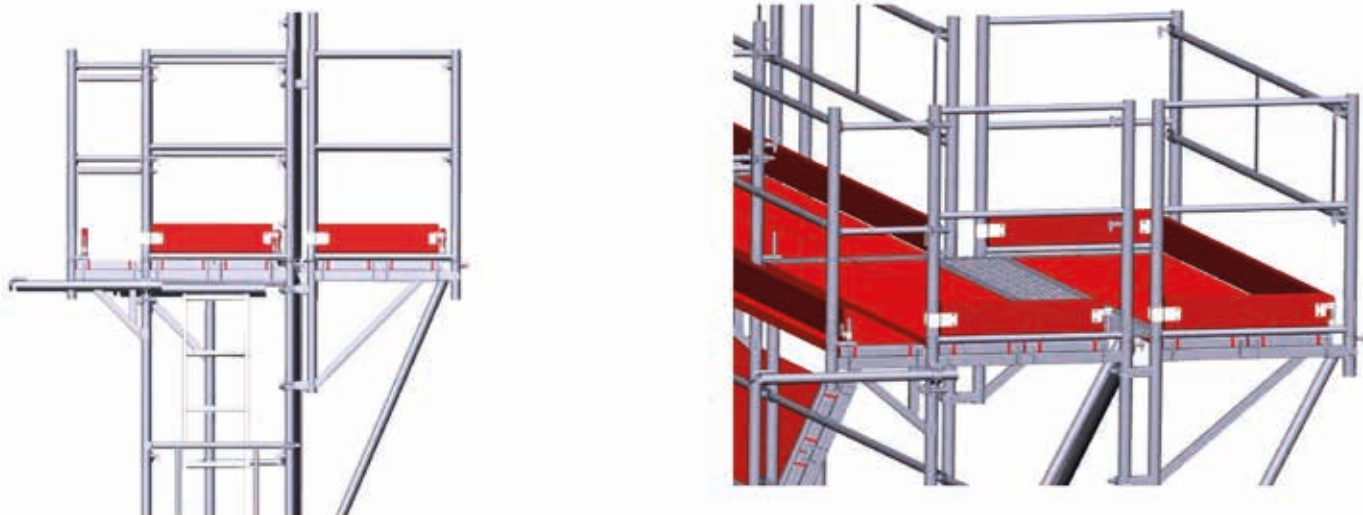


Fig. 19. Installation of extension consoles.

2.2.6. Installation of safety devices

2.2.6.1 Guardrails and toe boards

When assembling the scaffolding, two guardrails and one toe board must be installed in each bay on the longitudinal side of the scaffolding. The guardrails are mounted on ratchet bolts that protect the guardrails from accidental detachment. Secure the decks at the gable ends with transverse toe boards and a front (double side) guardrail.

If the distance between the edge of the deck and the face of the wall exceeds 20 cm, guardrails and toe boards should be installed on the wall side of the scaffolding.

2.2.6.2 Protective canopies

For scaffoldings assembled directly next to traffic routes out of service and cross-passages and passages, protective canopies should be made in accordance with the provisions of the *Regulation of the Minister of Infrastructure of 6 February 2003 on health and safety during the execution of construction works (Journal of Laws No. 47 of 2003, item 401)*.

2.2.6.3. Fencing, bumpers, signs and warning lights

Installation of the above protection devices should be carried out in accordance with the provisions of p. 4.10.4; 4.10.5; 4.10.6; 4.10.7 of the PN-M-47900-2:1996 standard.

2.3. TRANSPORT OF SCAFFOLDING ELEMENTS

Vertical transport of scaffolding elements can be carried out manually or by means of hoisting devices. In the case of vertical manual transport, the main and intermediate guardrails must be assembled.

As a general rule, scaffolding higher than 8 m should be installed with hoisting devices. The use of them may be dispensed with when the height of the erected scaffolding does not exceed 14 m and the elements are not to be manually horizontally over a distance of more than 10 m. Scaffolding elements weighing more than 30 kg must be moved, transported and assembled by two or three persons. Manual transport of scaffolding elements and assembly is shown in Fig. 20.

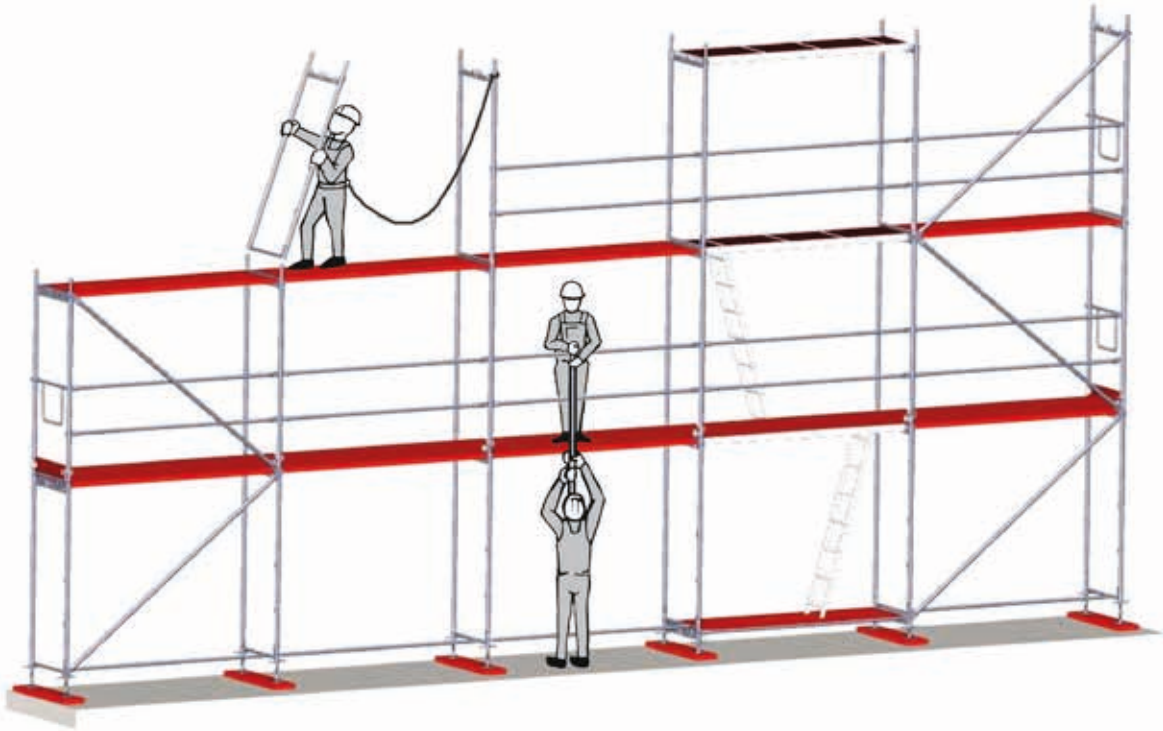


Fig. 20. Manual transport and assembly of scaffolding

2.4. HOISTING DEVICES

For the vertical transport of scaffolding elements during its erection and for the transport of building elements and materials during operation, it is recommended to use scaffolding winches with a swivel arm. The weight of the transported materials must not exceed 1.50 kN (150 kg). Installation of the winch and additional anchoring of the boom must be carried out in accordance with their technical and operational documentation.

For the transport of materials whose weight does not exceed 1.50 kN (150 kg), transport booms made in accordance with the requirements of the PN-M-47900-02:1996 clause 4.7.2 standard can be installed on the scaffolding.

When installing swivel arm winches or transport booms, the distance between the booms must not exceed 30 m and the distance from the boom to the proximal end of the scaffolding must be 15 m.

For the transport of materials weighing more than 150 kg, separate shaft towers should be constructed in accordance with the provisions of the PN-M-47900-2:1996 standard point 4.7.3. Installation of the crane should be carried out in accordance with its technical and operational documentation.

2.5. LIGHTNING PROTECTION DEVICES

Scaffolding should be equipped with lightning protection devices in accordance with the provisions of the PN-M-47900-2:1996 standard point 4.8.

2.6. ERECTION OF SCAFFOLDING NEAR POWER LINES

In the case of setting up scaffolding in the vicinity of power lines, the requirements contained in the Regulation of the Minister of Infrastructure of 6 February 2003 on health and safety during the execution of construction works (Journal of Laws No. 47 of 2003, item 401) must be met.

3. USE OF SCAFFOLDING

3.1. TECHNICAL ASSESSMENT

Technical inspections of the assembled scaffolding are carried out after the completion of all assembly works or after the completion of individual assembly phases.

Preparation of scaffolding for inspection in accordance with PN-M-47900-2:1996 point 7.3.1

Technical inspection includes checking:

:

1. Substrate condition – inspection shall be carried out prior to the start of assembly in accordance with M-47900-2:1996 paragraph 7.3.3.2.
2. Scaffolding foundation – verification for compliance with PN-M-47900-2:1996 point 4.4 shall be carried out after the completion of the installation of the first floor and after the completion of the scaffolding.
3. Verticality of the uprights – verification for compliance with PN-M-47900-2:1996 point 4.5.7 carried out on an ongoing basis after the completion of the individual assembly stages and after the completion of the assembly of the entire structure.
4. Bracing – verification by means of an on-going visual inspection during the assembly stage and after completion of the assembly of the entire construct.
5. Load-bearing capacity of the anchors – on an ongoing basis during the installation phase.
The load-bearing capacity of the anchor connection to the wall must be checked by performing tests. The number of anchors to be inspected should be determined by an expert (site manager, scaffolding supervisor), and the following rules should be observed:
 - the test load must be 1.2 times the required anchoring force specified for the individual scaffolding variants.
 - the number of anchor points tested shall be at least:
 - 10%, for concrete bed,
 - 30%, for beds made of other materials,
 - all types of anchors must be checked,
 - minimum number of anchors to be checked – 5,
 - anchors should be checked using a lever or a special anchorage inspection tool. In cases where the load-bearing capacity of the anchor connection to the bed does not guarantee the transmission of the required anchoring forces, it is necessary to:
 - use multiple anchors, e.g. „V”-shaped at the same anchoring point, so that the individual components do not exceed the permissible value,
 - increase the number of anchors.
6. Platforms and their protections – the checks are carried out after the assembly of the entire construct has been completed. The check is carried out by an external inspection. The check consists of checking proper filling with decks and equipping the decks with guardrails and toe boards.
7. Arrangement of stairways – the check should be carried out on an ongoing basis during the assembly.
8. Hoisting equipment – the check should be carried out immediately after its assembly. Booms installed in accordance with PN-M-47900-2:1996 p. 4.7.2 should be checked with test load of 200daN (approximately 200 kg). Inspection of hoisting equipment should be carried out in accordance with their technical passport.
9. Lightning protection devices – the check is carried out in accordance with PN-M-47900- 2:1996 point 7.3.3.9.
10. Location of the scaffolding in relation to the power lines – the check is carried out in accordance with PN-M-47900-2:1996 point 7.3.3.10 taking into account the requirements of the Regulation of the Minister of Infrastructure of 6 February 2003 on health and safety during the execution of construction works (Journal of Laws No. 47 of 2003, item 401).
11. Safety devices– after the installation of the scaffolding, protective canopies, fences, bumpers, information boards, warning lights, guardrails, toe boards are checked, in accordance with PN-M-47900-2:1996 point 7.3.3.11.

Evaluation of inspection results.

The scaffold inspected is considered to have been properly assembled if the result of the tests or checks carried out in the above-mentioned scope is positive. If non-compliance is found, the faults must be removed and re-checked.

Confirmation of the completion of the tests (acceptance of the scaffolding).

A report should be drawn up on the tests (acceptance) carried out.

3.2. COMMISSIONING OF THE SCAFFOLDING

The use of scaffolding that has not been commissioned is forbidden. After the completion of all the assembly work, the scaffolding should be inspected by an inspection team, technically approved and handed over for use on the basis of the acceptance protocol. The report should be accompanied by the result of the test on substrate load bearing capacity.

3.3. INSPECTIONS OF SCAFFOLDING DURING OPERATION

During operation, the scaffolding is subject to the following inspections:

Daily inspections

Daily inspections should be carried out by the personnel using the scaffolding. The inspection consists of checking:

- the technical condition of the scaffolding and the correctness of its anchoring,
- the condition of the surface of the working and access decks (cleanliness, anti-slippery protection in winter months),
- any negative impact on the safety of the scaffolding - all identified defects should be removed before commencing works.

Inspections carried out every 10 days

Some inspections should be carried out every 10 days by a scaffolding maintenance technician or an engineer and technician appointed by the site management.

The purpose of the inspections is to check whether the structure of the scaffolding does not pose a risk to the safe use of scaffolding.

In particular, the following points should be checked:

- erosion of the substrate under the scaffolding,
- subsidence of the ground,
- anchors in terms of any deterioration of fixation,
- tightness and condition of protective canopies,
- lightning protection system and ground conductor,
- protection of working and access decks is adequate

Ad hoc inspections

Ad hoc inspections are always carried out after the non-use period is longer than 2 weeks and after very windy days (above 60 on the Beaufort scale).

They should be carried out by an inspection team accompanied by a building inspector.

Any defects noticed during the inspection must be removed before further use of the scaffolding.

The results of every-10-day- and ad hoc inspections should be recorded in the construction log by the persons performing the inspections

3.4. DISMANTLING THE SCAFFOLDING

Before dismantling, the scaffolding site must be secured by fencing and free of pedestrian and vehicular traffic. The scaffolding may be dismantled after works on the scaffolding have been completed and all tools and materials have been removed from the structure and decks. It is permissible to partially dismantle the scaffolding from the top as the work continues on the top deck, provided that no works are conducted on the lower floors during dismantling on the upper floors.

It is not allowed to the elements from a height during dismantling works. Disassembly is carried out in the reverse order to the assembly steps.

After the completion of dismantling, all elements of the scaffolding should be cleaned, inspected and sorted into those suitable for further use or in need of repair or replacement.

3.5. STORAGE AND TRANSPORT OF SCAFFOLDING ELEMENTS

Small parts of the scaffolding, e.g. steel screw jacks and connectors, should be packed into boxes and containers. Scaffolding elements should be stored and protected from direct precipitation and contact with the ground. For transport, scaffolding elements (frames, decks, bracings, guardrails) should be bundled or stacked and placed in racks or pallets suitable for loading and unloading in transport.

Scaffolding parts can be transported by any means of transport able to accommodate the length of the transported elements, but it is recommended to use means of transport equipped with appropriate handling equipment.

On-site storage should comply with the requirements of the applicable regulations. It is recommended that the distance between the folded material and the vertical transport station does not exceed 10 m.

3.6. CHECK OF SCAFFOLDING PARTS FOR DAMAGE AND WEAR

After dismantling, all elements of the scaffolding should be cleaned, inspected and sorted into those that are suitable for further use or require repair or replacement.

The rules for such a verification are described below.

Frames:

You should check for:

- cracks or loss of the joints connecting the transoms to the steel screw jacks,
- any damage to the uprights,
- any deformation of the pipe cross-sections.

Diagonal bracings, consoles, girders:

You should check for:

- bent elements,
- cracks in the cross-sections weakened by holes,
- any deformation of the pipe cross-sections,
- cracks or defects of the welds.

Ladder passages (access decks):

You should check for:

- the condition of the plywood sheathing in the decks, especially whether there are no delamination, cracks and any dirt or oiling on the plywood surface reducing its anti-slip properties,
- the condition of the deck beams, in particular for their bending, cracking or scratching on the welded joints,
- smooth opening of hatch.

The decks must not be used even if only one of the above issues has been discovered.

Steel decks :

You should check for:

- any deformations in the form of bending and lateral-torsional buckling,
- corrosion pits, which affect the strength of the decks.

Wooden decks :

You should check for:

- cracks in lamination on the decks,
- dirt or oiliness on the surface of the decks reducing its anti-slip properties,
- knots in the planks if they are ingrown.

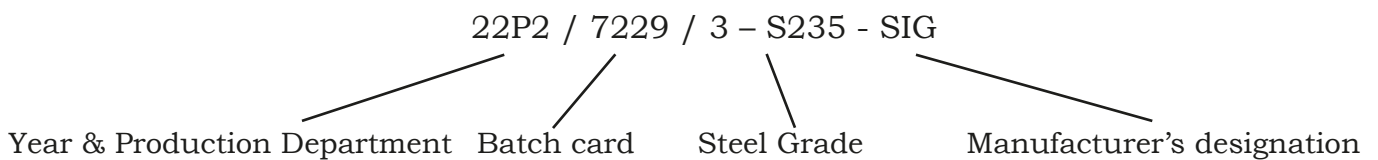
Adjustable steel screw jacks :

You should check for:

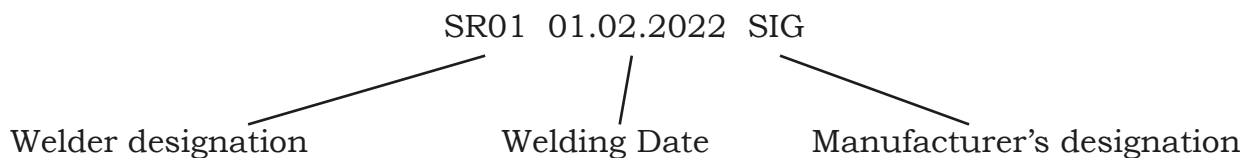
- any damage to the thread that makes it impossible to adjust the height of the nut position sockets or reducing the strength of the „pin-nut” connection; the nut should rotate smoothly,
- perpendicularity of the bolt to the foot of the jack.

3.7. MARKING OF ELEMENTS.

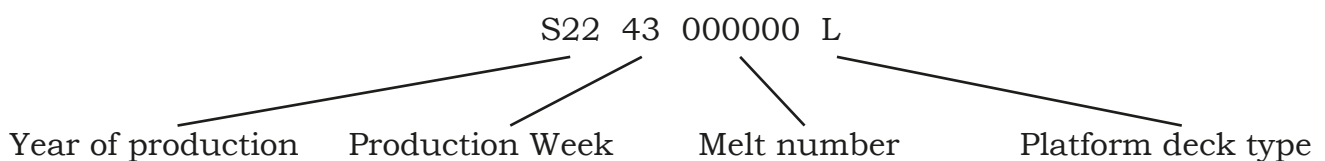
1. Structural elements of the SIGMA 70P scaffolding made of steel tubes (frames, guardrails, bracings) are permanently marked with the following code:



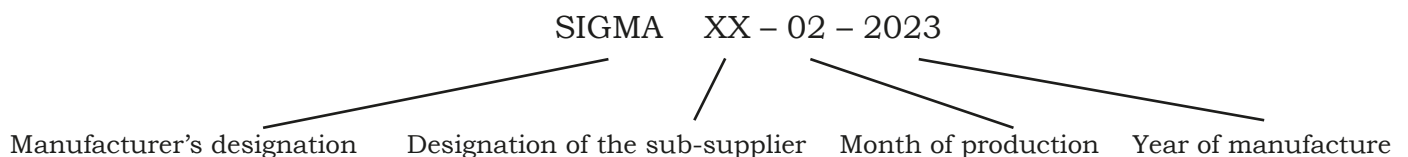
Additional marking of the 200 frame:



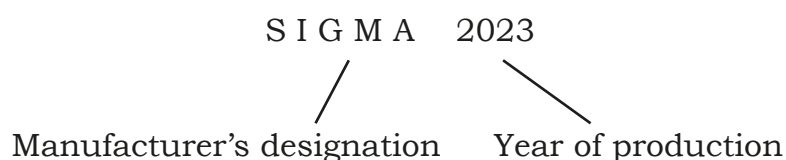
2. Steel decks:



3. Steel screw jack:



4. Wooden decks:



4. LEGAL REGULATIONS AND STANDARDS APPLICABLE TO THE ERECTION AND USE OF SCAFFOLDING

Erection and use of scaffolding is subject to applicable health and safety regulations and legal standards, in particular:

- *Regulation of the Minister of Infrastructure of 6 February 2003 on health and safety during the execution of construction works (Journal of Laws No. 47 of 2003, item 401)*
- *Regulation of the Minister of Labour and Social Policy of 26 September 1997 on general health and safety at work (Journal of Laws No. 129 of 23 October 1997, item 844).*
- *Regulation of 30 September 2003 of the Minister of Labour, Economy and Social Policy amending the Regulation of 30 October 2002 on the minimum requirements concerning the occupational safety and health while using engines at work (Journal of Laws No. 178, item 1745).*

In particular, the following rules must be observed:

- a) The scaffolding must only be used by workers who familiar with the conditions of its use specified in this manual and the health and safety regulations applicable to the construction industry.
- b) Scaffolding fitters and workers using scaffolding must have appropriate qualifications and a certificate confirming that their health condition allows them to work at height.
- c) When assembling and dismantling scaffolding, workers must use safety equipment protecting from falling from a height.
- d) It is forbidden to use scaffolding
 - not checked and approved by an inspection team,
 - during storms, intense winds (over 10 m/s), reduced visibility and black ice and fog,
 - with damaged elements and not original elements of the SIGMA 70P scaffolding system,
 - contrary to its intended use.
- e) The following points must be implicitly observed:
 - forbidden access to decking in excess of the permissible loads,
 - uniform distribution of the load over the entire surface of the deck,
 - materials and tools on the deck must not interfere in carrying out works,
 - assembly (disassembly) in winds exceeding 10 m/s and during storms, black ice and fog is forbidden,
 - dropping scaffolding elements even from a small height is forbidden,
 - presence of persons under influence is strictly banned,
 - using protective canopies for storing materials and workstations is forbidden,
 - vehicle and pedestrian passages must be properly protected,
 - carrying out assembly works while any other work is conducted on lower floors is forbidden

In particular, the following standards apply to the design of scaffolding structures in the SIGMA 70P system and to the assembly, operation and dismantling of scaffolding:

PN-M-47900-2:1996	Standing metal working scaffolding. Upright scaffolding made of tubes. General requirements and testing and operation
PN-M-47900-3:1996	Standing metal working scaffolding. Frame scaffolding. General requirements and testing and operation
PN-EN 12811-1:2007	Temporary structures used on construction sites. Part 1: Scaffolding. Execution conditions and general design principles
PN-EN 12810-1:2010	Façade scaffolding made of prefabricated elements. Part 1: Technical specifications of the products
PN-EN 12810-2:2010	Façade scaffolding made of prefabricated elements. Part 2: Specific Methods of Structural Design
PN-EN 39:2003	Steel tubes for scaffolding. Technical conditions of delivery.
PN-EN 74-1:2006	Couplings, centring pins and steel screw jacks used in formwork scaffolding — Part 1: Pipe couplings — Requirements and test methods.

5. LEGAL REGULATIONS AND STANDARDS APPLICABLE TO THE ERECTION AND USE OF SCAFFOLDING

5.1. GENERAL NOTES

The standard structures described in this manual may be used provided that the following rules are observed:

- Only one deck in a given scaffolding bay can be operated and fully loaded. Other load distribution of the scaffolding need to be confirmed by static calculations of the scaffold structure,
- The height of the scaffolding must not exceed a height of 24.2 m.
- It is unacceptable to exceed the permissible load-bearing capacity of the decking.
- Any variants not described in this DTR (or going beyond the scope described in this DTR) require a separate design confirmed by static calculations for the scaffolding structure.

5.2. DECKS

Platforms of the standard scaffolding can be fixed with system decks adapted to be mounted on bolts.

The decks in the scaffolding also perform the function of horizontal bracing in the plane of the scaffolding bays, which is why they must be absolutely installed in each scaffolding bay.

The following elements can be used for the installation of working decks:

- 2 steel, wooden or aluminium decks with a width of 0.32 m,
- 1 deck with a width of 0.64 m (as a walking or working deck).

5.3. ANCHORING

Basic anchoring grid

Uncovered scaffolding should be anchored starting from the second floor, every second floor and every second horizontal bay, with adjacent horizontal anchor lines offset from each other by one bay.

The scaffolding covered with mesh should be anchored starting from the first floor, on each floor and every second horizontal bay, with adjacent horizontal anchor lines offset by one bay from each other.

Additional anchors

- anchor the outermost frames on the edge of the scaffolding in the given horizontal row of anchors,
- areas of passageways should be additionally anchored on both sides in a given row of anchors,
- additional anchors should be installed according to the drawings of the respective variants.

Fasten the anchor elements to the frame uprights using cross couplings. Tighten the nuts of the cross couplings to 50 Nm.

Anchors should not transmit vertical forces.

Anchor fasteners should be installed in the two uprights directly below the decks, according to the anchor grids shown in the drawings. The permissible deviation from the theoretical anchor points along the uprights is 40 cm for scaffoldings up to 24.2 m high.

The required values of anchoring forces given in the drawings have been determined for scaffoldings located at:

- partially open walls, i.e. those with evenly spaced openings with an area not exceeding 60% of the total surface area of the wall,
- closed walls, i.e. with no openings.

Linear interpolation of anchoring forces is not allowed for walls with a wall „permeability” of 0% to 60%.

5.4. BRACING

Bracing should be installed in every 5th bay in a tower system or in a large-format system, and the number of braces cannot be less than two on a given scaffolding floor. The additional bracings according to the grid are shown on the figures of the respective variants.

5.5. SCAFFOLD PAYLOADS (NOMINAL)

The standard variants of the SIGMA 70P with a frame spacing of 3.0 m are scaffolds with a load capacity of 2kN/m². Nominal size 3 according to PN-M-47900:1996.

5.6. LADDERWAYS

The installation of stairways should be carried out successively along with the erection of scaffolding. Ladderway decks should be installed alternately in a given scaffolding bay so that the hatches are placed on both sides of the bay and are not located on the outermost bays.

Frame uprights adjacent to the stairway must be anchored at vertical intervals not exceeding 4 m.

5.7. GUARDRAILS AND TOE BOARDS

All decks shall be secured in accordance with clause 2.2.6.1.

If the scaffolding is placed at a distance of more than 20 cm from the wall, guardrails and toe boards must also be installed on the wall side.

5.8. NARROW CONSOLES

Narrow (one-deck) brackets can be installed only on the inside of the scaffolding and only at the level of the main deck.

5.9. WIDE CONSOLES

Wide (two- or three-deck) brackets may only be used on the outside of the scaffolding and only at the level of the highest main deck. For 0.74 and 1.10 m consoles, console supports must be mounted.

5.10. ANCHOR AND SUBSTRATE PAYLOAD WITH STANDARD SIGMA 70P CONSTRUCTS

Table 2 SIGMA 70P Scaffolding - 24.2 m high - Design load capacity of anchors and substrate (load bearing coefficient $\gamma_f=1.5$).

VARIANTS	VARIANT					
	01 70P GW FO NO	02 70P GW FZ PS	03 70P GW FZ NO	04 70P KWS FO NO	05 70P KWS FZ PS	06 70P KWS FZ NO
Load						
Anchor load capacity						
P_{\perp} [kN]	6.8	4.0	2.7	6.4	4.8	2.6
P_{\parallel} [kN]	3.5	5.6	2.5	2,5	5.6	2.5
Substrate load capacity per upright						
F [kN]	29.7	26.4	26.3	38.6	38,5	38,4

5.11. INSTALLATION DRAWINGS OF ANCHORED WALL SCAFFOLDINGS

5.11.1. 5.11.1.SIGMA 70P wall anchored scaffolding, 24.2 m high, no consoles, uncovered scaffolding to be erected at the partially open facade (openings: 60%)

Structure model: 01 70P GW FO NO

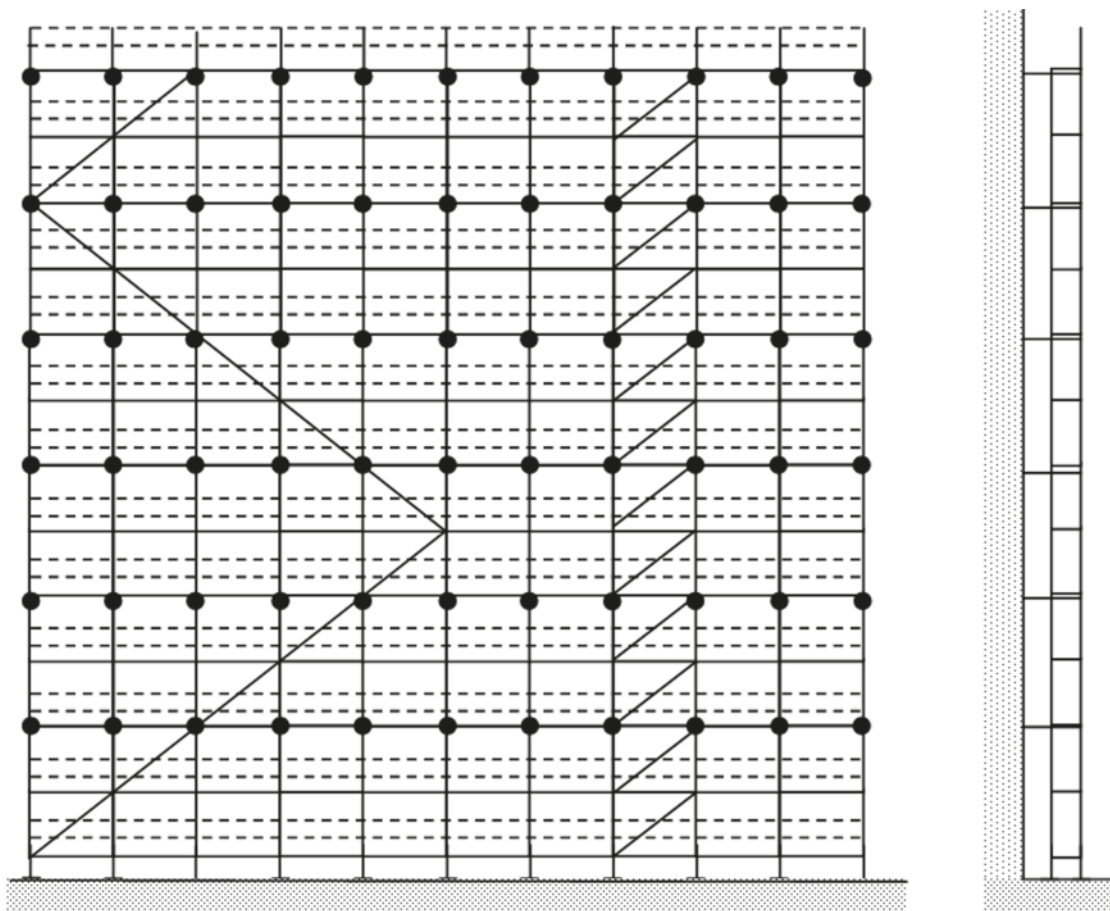


Fig. 21

- Max. bay length: 3.0 m
- Lift height: 2.0 m
- Scaffolding height: 24.2 m
- Load capacity: 2 kN/m²
- Decking: steel decking on each floor
- Guardrails: installed in every bay on each floor
- Bracing layout: large-format and/or tower
- The scaffolding must be seated on a sufficiently stable ground (no subsidence)
- Height of the adjustment nut of the screw jack in relation to the base plate: 0.20 m
- The maximum distance between the scaffolding and the wall (the distance between the edge of the deck and the wall): 0.20 m
- Consoles: none
- Covering: none
- Anchoring: long anchoring ties attached to two uprights

5.11.2. SIGMA 70P wall anchored scaffolding, 24.2 m high, no consoles, mesh-covered scaffolding to be erected at the closed facade

Structure model: **02 70P GW FZ PS**

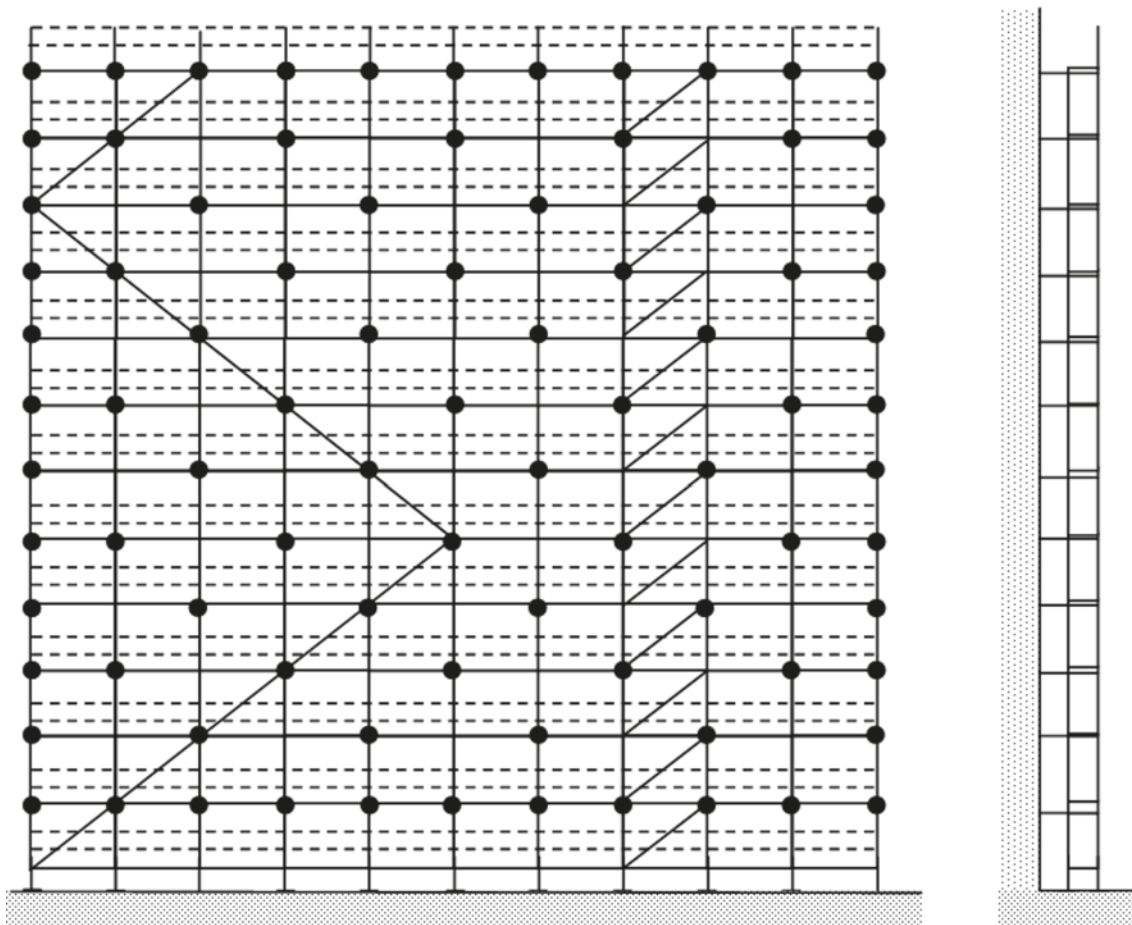


Fig. 22

- Max. bay length: 3.0 m
- Lift height: 2.0 m
- Scaffolding height: 24.2 m
- Load capacity: 2 kN/m²
- Decking: steel decking on each floor
- Guardrails: installed in every bay on each floor
- Bracing layout: large-format and/or tower
- The scaffolding must be seated on a sufficiently stable ground (no subsidence)
- Height of the adjustment nut of the screw jack in relation to the base plate: 0.20 m
- The maximum distance between the scaffolding and the wall (the distance between the edge of the deck and the wall): 0.20 m
- Consoles: none
- Covering: mesh
- Anchoring: long anchoring ties attached to two uprights

5.11.3. SIGMA 70P wall anchored scaffolding, 24.2 m high, no consoles, uncovered scaffolding to be erected at the closed facade

Structure model: **03 70P GW FZ NO**

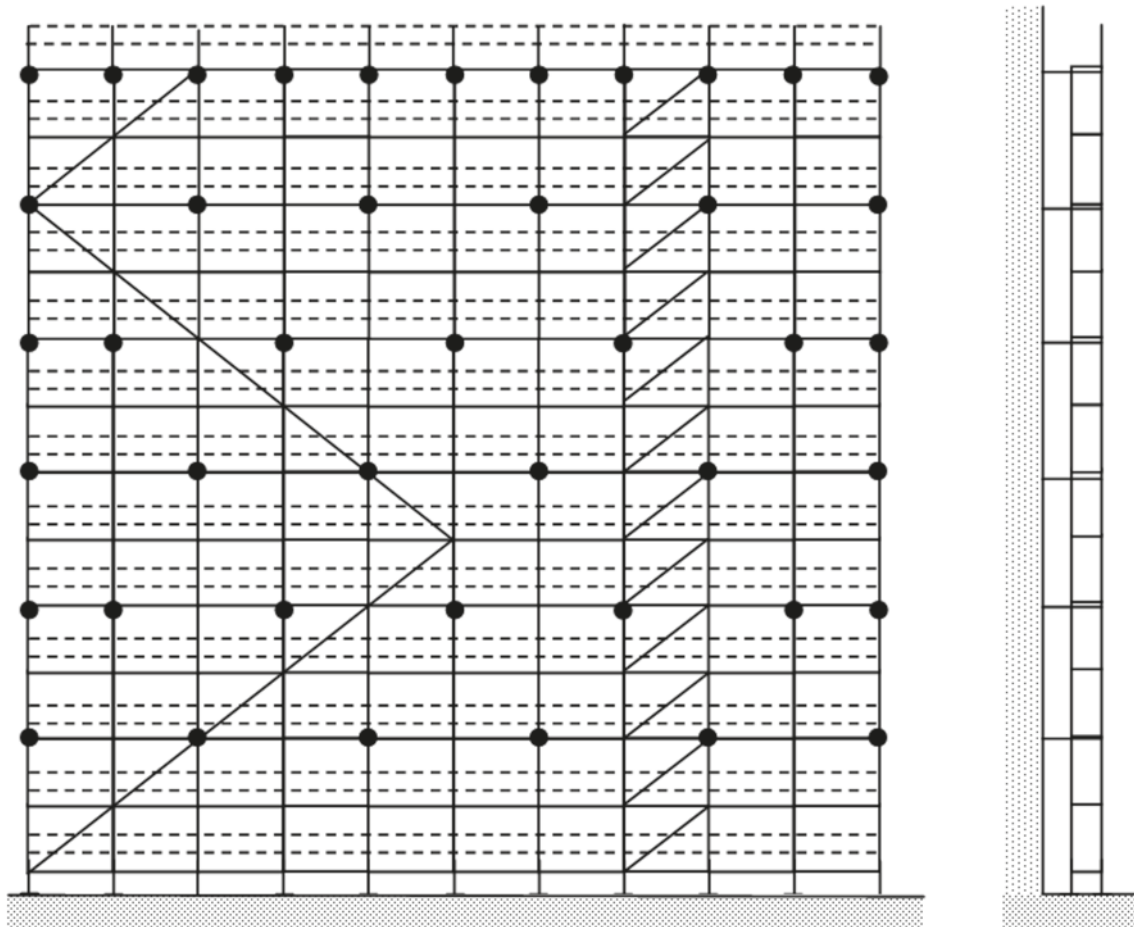


Fig. 23

- Max. bay length: 3.0 m
- Lift height: 2.0 m
- Scaffolding height: 24.2 m
- Load capacity: 2 kN/m²
- Decking: steel decking on each floor
- Guardrails: installed in every bay on each floor
- Bracing layout: large-format and/or tower
- The scaffolding must be seated on a sufficiently stable ground (no subsidence)
- Height of the adjustment nut of the screw jack in relation to the base plate: 0.20 m
- The maximum distance between the scaffolding and the wall (the distance between the edge of the deck and the wall): 0.20 m
- Consoles: none
- Covering: none
- Anchoring: long anchoring ties attached to two uprights

5.11.4. SIGMA 70P wall anchored scaffolding, 24.2 m high, narrow consoles in each bay on each floor, wide consoles in each bay on the top floor, uncovered scaffolding to be erected at the partially open facade (openings: 60%)

Structure model: **04 70P KWS FO NO**

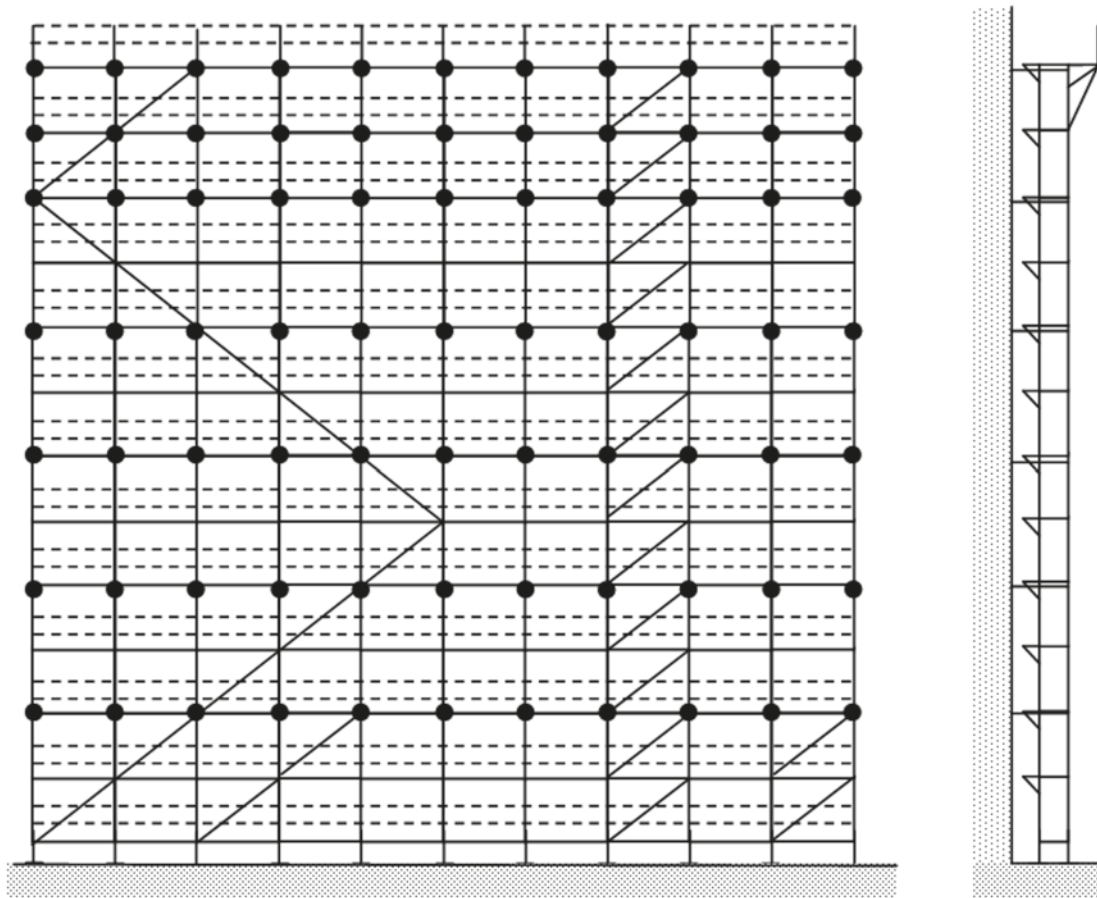


Fig. 24

- Max. bay length: 3.0 m
- Lift height: 2.0 m
- Scaffolding height: 24.2 m
- Load capacity: 2 kN/m²
- Decking: steel decking on each floor
- Guardrails: installed in every bay on each floor
- Bracing layout: large-format and/or tower
- The scaffolding must be seated on a sufficiently stable ground (no subsidence)
- Height of the adjustment nut of the screw jack in relation to the base plate – 0.20 m
- The maximum distance between the scaffolding and the wall (the distance between the inner upright of the frame and the wall): 0.40 m
- Consoles: narrow consoles on each floor on the wall side and a wide console on the top floor on the outside of the scaffolding
- Covering: none
- Anchoring: long anchoring ties attached to two uprights

5.11.5. SIGMA 70P wall anchored scaffolding, 24.2 m high, narrow consoles in each bay on each floor, wide consoles in each bay on the top floor, mesh-covered scaffolding at the closed facade

Structure model: **05 70P KWS FZ PS**

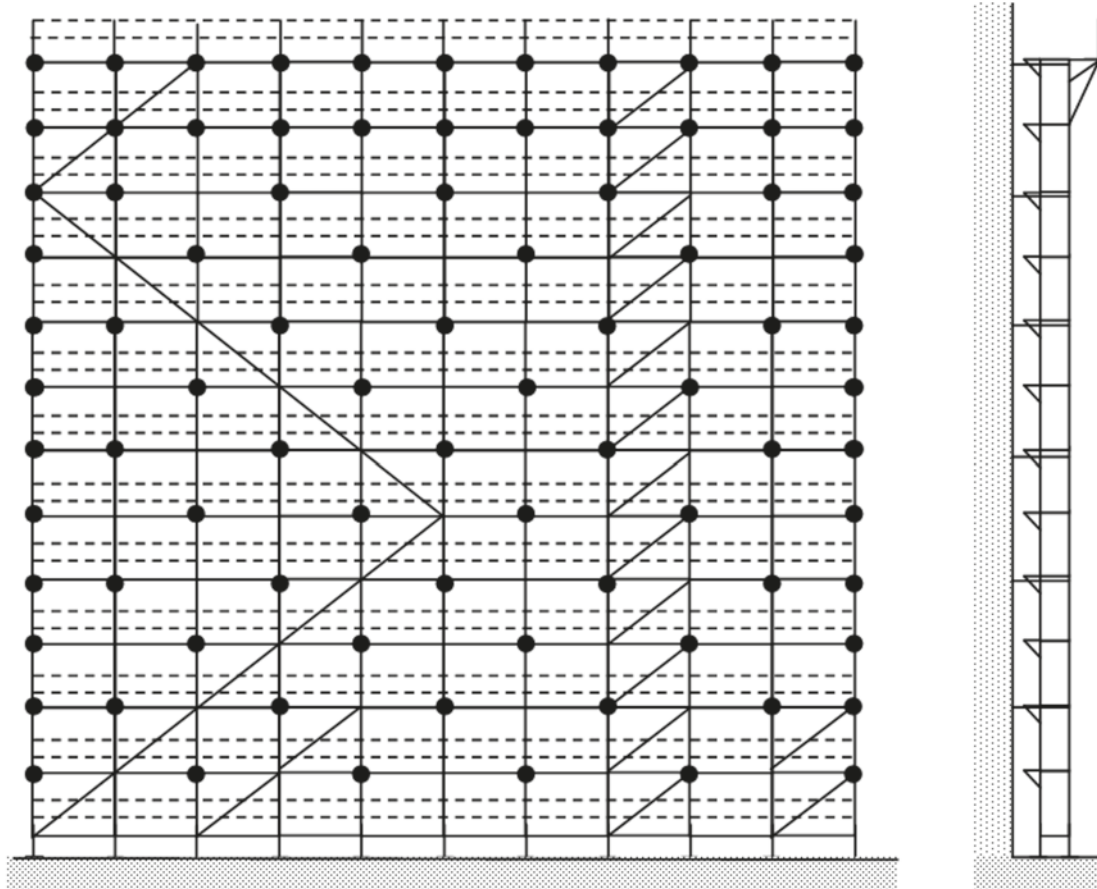


Fig. 25

- Max. bay length: 3.0 m
- Lift height: 2.0 m
- Scaffolding height: 24.2 m
- Load capacity: 2 kN/m²
- Decking: steel decking on each floor
- Guardrails: installed in every bay on each floor
- Bracing layout: large-format and/or tower
- The scaffolding must be seated on a sufficiently stable ground (no subsidence)
- Height of the adjustment nut of the screw jack in relation to the base plate: 0.20 m
- The maximum distance between the scaffolding and the wall (the distance between the inner upright of the frame and the wall): 0.40 m
- Consoles: narrow consoles on each floor on the wall side and a wide console on the top floor on the outside of the scaffolding
- Covering: mesh
- Anchoring: long anchoring ties attached to two uprights

5.11.6. SIGMA 70P wall anchored scaffolding, 24.2 m high, narrow consoles in each bay on each floor, wide consoles in each bay on the top floor, uncovered scaffolding to be erected at the closed facade (openings: 0%)

Structure model: **06 70P KWS FZ NO**

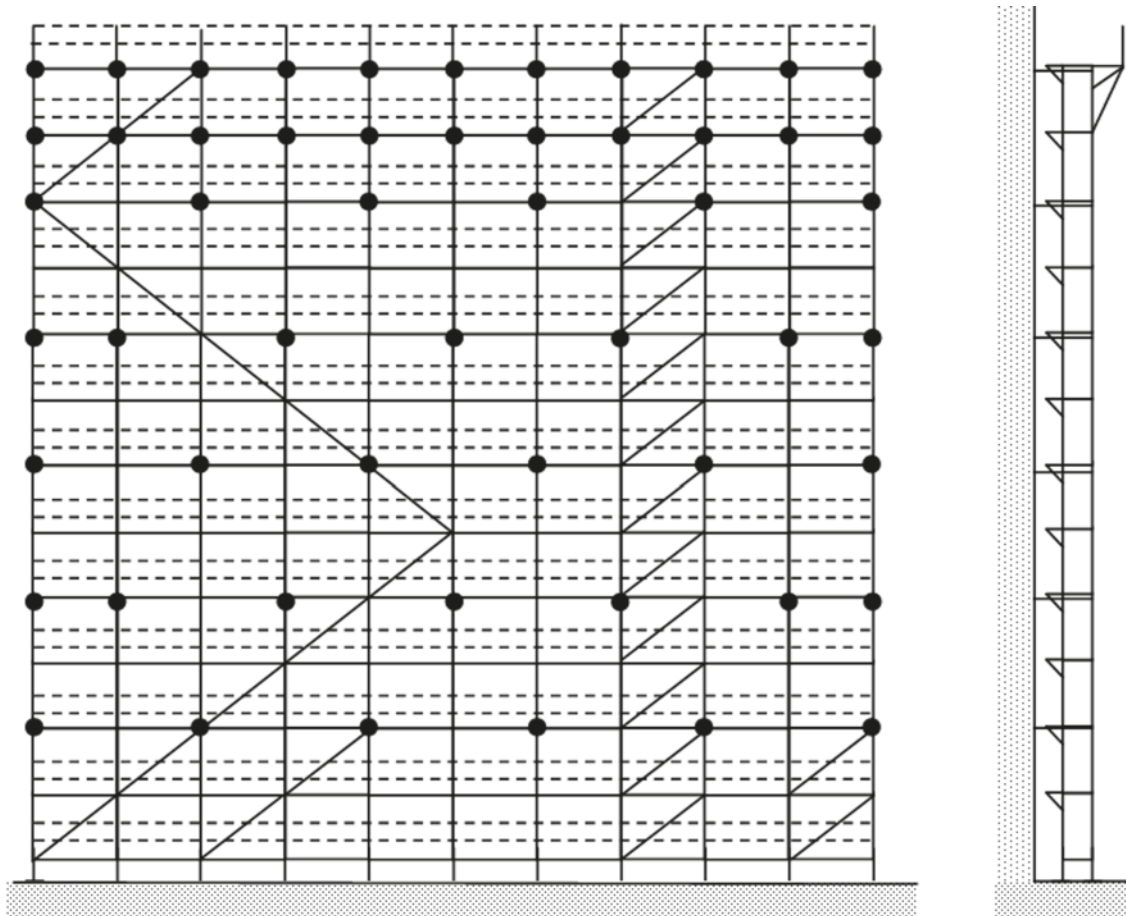
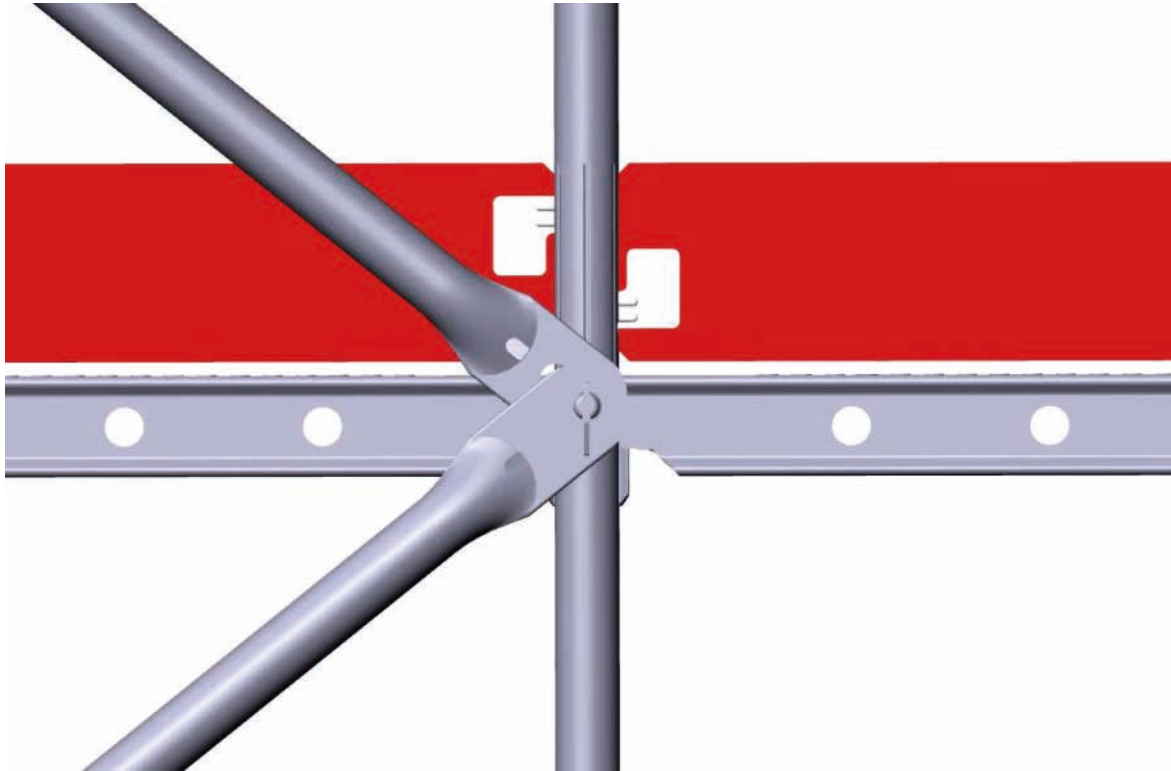


Fig. 26

- Max. bay length: 3.0 m
- Lift height: 2.0 m
- Scaffolding height: 24.2 m
- Load capacity: 2 kN/m²
- Decking: steel decking on each floor
- Guardrails: installed in every bay on each floor
- Bracing layout: large-format and/or tower
- The scaffolding must be seated on a sufficiently stable ground (no subsidence)
- Height of the adjustment nut of the screw jack in relation to the base plate: 0.20 m
- The maximum distance between the scaffolding and the wall (the distance between the inner upright of the frame and the wall): 0.40 m
- Consoles: narrow consoles on each floor on the wall side and a wide console on the top floor on the outside of the scaffolding
- Covering: none
- Anchoring: long anchoring ties attached to two uprights



FAÇADE SCAFFOLDING SIGMA 70P

CATALOGUE OF SCAFFOLDING ELEMENTS

SIGMA 70P SCAFFOLDING – INTRODUCTION

SIGMA 70P scaffolding – system frame axial sizes: 739 mm wide two-deck basic frames, 413 mm narrow single-deck frames and 1065 mm wide three-deck frames. System height of the frames is 2000 mm. Fastening of guardrails and braces on auto-lock latch locks and fastening decks on the star bolts of the frame.

The **SIGMA 70P** is a universal facade scaffolding system. The basic element of the scaffolding structure are welded steel frames, and the frame uprights are manufactured in the technology of double-sided pipe end forming. The frames are equipped with star bolts for mounting decks and locks for attaching guardrails, braces and toe boards. The decks serve as the horizontal stiffening of the system, while the diagonal bracing serves as vertical stiffening.

A variety of scaffolding bay lengths: 0.7 m; 1.1 m; 1.5 m; 2.0 m; 2.5 m; 3.0 m, various frame widths: 0.41 m, 0.74 m and 1.10 m, as well as a wide range of accessories, e.g. levelling frames, cornice frames, adjusting frames, walk-through frames, extension consoles - make it easier to install the scaffolding at the building facade and precisely position the structure in difficult and irregular terrain conditions, regardless of the conditions on site. An additional advantage of the Sigma 70P scaffolding system is the ease and speed of assembly. All this makes it **one of the most popular facade scaffolding systems in Europe**.

The **SIGMA 70P scaffolding**, with the appropriate configuration of the scaffolding bays, meets the load capacity requirements for decks according to scaffolding group 6 for traffic loads, DIN EN 12811-1:2004-03 - table 3, and table 6 for the safety and protection of scaffoldings protecting roofing works of class FL1 with a fall height of up to 2 m according to DIN 4420-1:2004-03 - class D according to DIN EN 12810-1:2004-03).

In the production of the Sigma 70P scaffolding, we focus on the quality. For the production of steel elements of the scaffolding, we always use grade I steel, with an appropriate chemical composition to ensure excellent quality of hot dip galvanizing. The steel elements of our scaffoldings are galvanized in plants ensuring the highest quality of products. Wooden elements of the scaffolding, such as decks, toe boards and sole boards made of softwood, are impregnated with a waterproof acrylic agent. In addition, wooden decks are finger jointed with D4 hot glue. The quality of corrosion protection and impregnation is an additional advantage that improves the service life of the SIGMA 70P scaffolding.

The SIGMA 70P scaffolding is manufactured in accordance with the European Union standards. **The SIGMA 70P scaffolding has a safety certificate "B", a certificate of compliance with K/0812-72/1/12 criteria, and a certificate of compliance with the PN-EN 12810-1:2010 and PN-EN 12811-1:2007 standards** issued by the Łukasiewicz Research Network of the Warsaw Institute of Technology (formerly IMBIGS). As a scaffolding manufacturer since 2019, we have obtained **EXC2 welding certificates confirming the compliance with EN 1090-2:2018 standard, issued by DVS ZERT Gmbh Dusseldorf**.



- a. **Working length** – the axial distance between the first and last scaffolding frame seated in one level (on one floor).
- b. **Maximum working height** – the height measured from the level of the surface on which the scaffolding is seated, incl. all the elements used: a 50 mm thick wooden sole board, an adjustable screw jack unscrewed to the maximum height (450 mm for a 0.6 m jack; with a 150 mm of the threaded bolt remaining inside the scaffolding frame) up to the height of the top scaffolding deck plus 2 m. This is due to the possibility of carrying out works on the top deck up to a height of 2 m.
- c. **Scaffolding height** – the height measured from the level of the surface on which the scaffolding is seated, incl. all the elements used for foundation up to the height of the most top scaffolding element. Most often, it is the highest guardrail.
- d. **Scaffolding bay** – the distance in the axes between two frames measured by the length of the deck used; the SIGMA 70P scaffolding system offers decks with a length of: 3.0 m, 2.5 m, 2.0 m, 1.5 m, 1.1 m, 0.7 m.
- e. **Scaffolding working area** – the area calculated as the product of the maximum working height and the length of the scaffolding.
- f. **Scaffolding deck** – an area consisting of one, two, three or more decks (mounted on frames, consoles or walk-through frames) mounted in a single bay.
- g. **Frames with double locks** - In accordance with health and safety regulations, if the scaffolding is seated with the distance between the deck and the wall greater than 20 cm, additional guardrails and toe boards on the wall side should be installed. Thanks to the double locks and toe board pins, this can be done at low cost and with little effort.

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DECLARATION OF CONFORMITY

Company:
PHU SIGMA Joanna Nowak
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declares under its sole responsibility that:

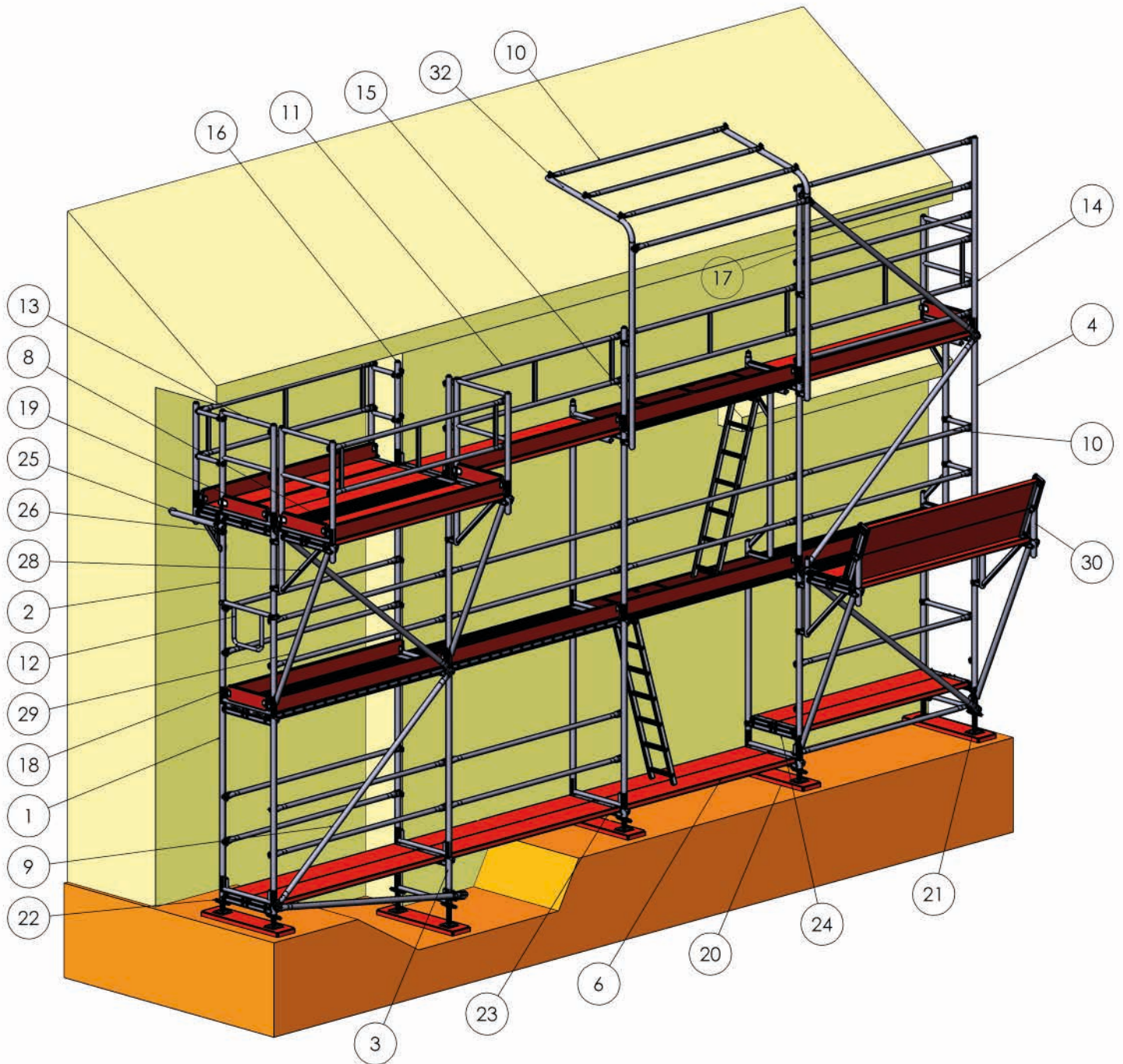
SIGMA 70P facade scaffolding

and its elements are manufactured in accordance with Polish and European Union standards specified below:

- PN-EN 12810-1:2010:** Façade scaffolds made of prefabricated components.
Part 1: Product specifications.
- PN-EN 12810-2:2010:** Façade scaffolds made of prefabricated components.
Part 2: Particular methods of structural design.
- PN-EN 12811-1:2007:** Temporary works equipment.
Part 1: Scaffolds – Performance requirements and general design.
- PN-EN 12811-2:2008:** Temporary works equipment.
Part 2: Information on materials.
- PN-EN 74-1:2006:** Couplers, spigot pins and baseplates for use in falsework and scaffolds.
Part 1: Couplers for tubes – Requirements and test procedures.
- PN-M-47900-1:1996:** Steel, standing working scaffoldings. Definitions, divisions and main parameters
- PN-M-47900-3:1996:** Steel, standing working scaffoldings. Frame scaffolding.
- PN-M-47900-4:1996:** Steel, standing working scaffoldings. Couplers.
- K/0812-72/1/12:** Criteria for products safety assessment. Scaffolding system, standing, immovable, working. Institute of Mechanized Construction and Rock Mining in Warsaw.

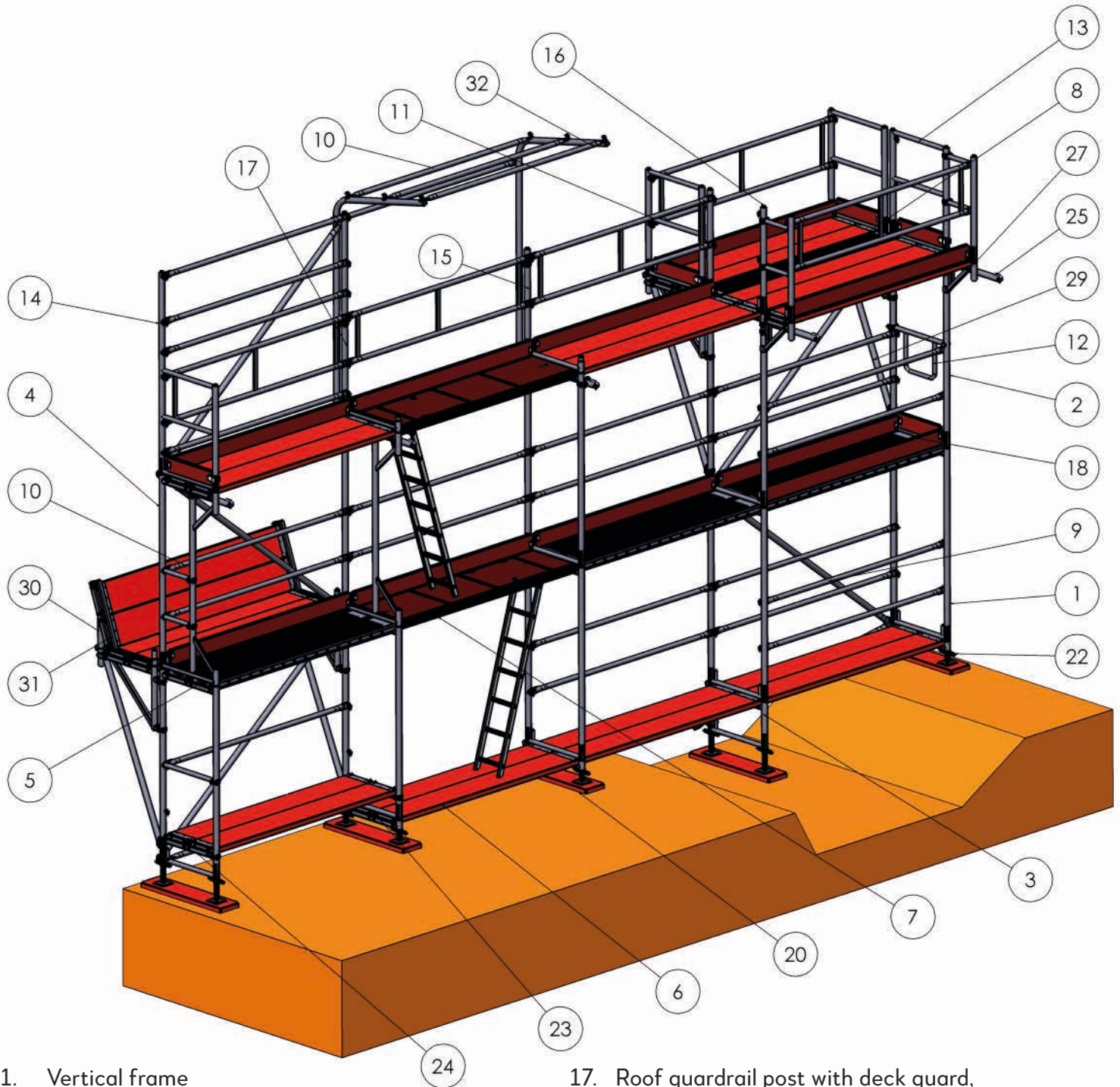
PHU SIGMA
Joanna Nowak
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REGON: 100385422, NIP: 827-210-66-04

VIEW OF THE SIGMA 70P SCAFFOLDING FROM THE OUTSIDE



- | | |
|--|--|
| 1. Vertical frame | 17. Roof guardrail post with deck guard, - "L-shaped", 2.0 m |
| 2. Vertical frame with double locks | 18. Longitudinal toe board |
| 3. Levelling frame | 19. Side toe board |
| 4. Cornice frame | 20. Timber sole board |
| 5. Steel deck | 21. Bottom bracing fixation |
| 6. Timber deck | 22. Adjustable steel screw jack |
| 7. Alu-plywood access deck | 23. Base transom |
| 8. Infill deck for the console | 24. Transom |
| 9. Diagonal brace | 25. Anchor hook |
| 10. Single longitudinal guardrail | 26. Cross brace |
| 11. Double longitudinal guardrail | 27. Console (bracket) 0.32 m |
| 12. Double side guardrail | 28. Console (bracket) 0.74 m |
| 13. Top front guardrail frame | 29. Console support |
| 14. Roof top front guardrail frame | 30. Protective canopy bracket |
| 15. Handrail post with deck guard, - "L-shaped", 1.0 m | 31. Securing device for the protective canopy decks |
| 16. Handrail post with deck guard | 32. Tarpaulin post |

GENERAL WALL VIEW OF THE SIGMA 70P SCAFFOLDING



- | | |
|--|--|
| 1. Vertical frame | 17. Roof guardrail post with deck guard, - "L-shaped", 2.0 m |
| 2. Vertical frame with double locks | 18. Longitudinal toe board |
| 3. Levelling frame | 19. Side toe board |
| 4. Cornice frame | 20. Timber sole board |
| 5. Steel deck | 21. Bottom bracing fixation |
| 6. Timber deck | 22. Adjustable steel screw jack |
| 7. Alu-plywood access deck | 23. Base transom |
| 8. Infill deck for the console | 24. Transom |
| 9. Diagonal brace | 25. Anchor hook |
| 10. Single longitudinal guardrail | 26. Cross brace |
| 11. Double longitudinal guardrail | 27. Console (bracket) 0.32 m |
| 12. Double side guardrail | 28. Console (bracket) 0.74 m |
| 13. Top front guardrail frame | 29. Console support |
| 14. Roof top front guardrail frame | 30. Protective canopy bracket |
| 15. Handrail post with deck guard, - "L-shaped", 1.0 m | 31. Securing device for the protective canopy decks |
| 16. Handrail post with deck guard | 32. Tarpaulin post |

FRAMES

STANDARD VERTICAL FRAME

Frame axial width: 0.739 m; frame uprights made in the technology of tube end forming from tubes of S235JRH grade steel with a minimum yield strength of $Re > 320 \text{ N/mm}^2$. Diameter 48.3 mm, wall thickness 2.7 mm. Equipped with star bolts for mounting 2 decks with a width of 0.32 m or one deck with a width of 0.64 m. Ratchet locks with auto-lock function for the installation of guardrails and bracings and a pin for toe board installation.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0200	2,0 m x 0,74 m	17,9

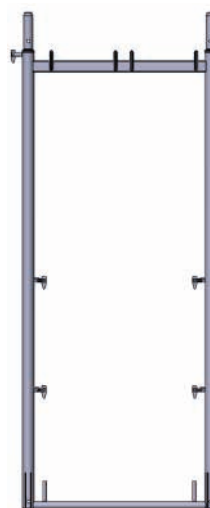


STANDARD VERTICAL FRAME (with double locks)

Frame axial width: 0.739 m; frame uprights made in the technology of tube end forming from tubes of S235JRH grade steel with a minimum yield strength of $Re > 320 \text{ N/mm}^2$. Diameter 48.3 mm, wall thickness 2.7 mm. Equipped with star bolts for mounting 2 decks with a width of 0.32 m or one deck with a width of 0.64 m. Ratchet locks with auto-lock function for the installation of guardrails and bracings and a pin for toe board installation. Locks and pins are available on both sides of the frame. This allows the installation of guardrails and toe boards from the inside of the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0205	2,0 m x 0,74 m	18,1



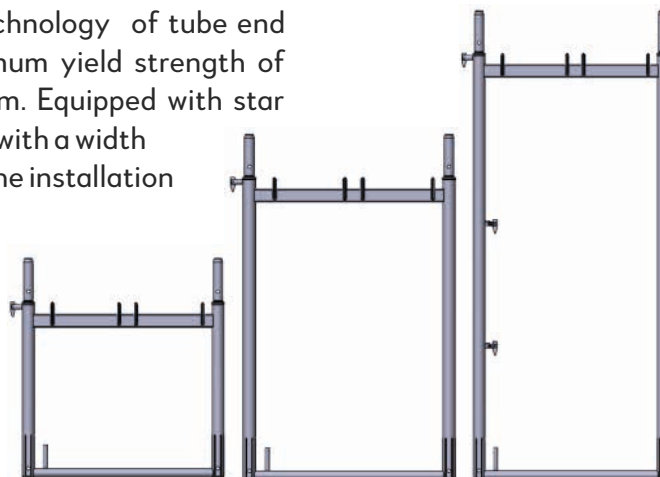
STANDARD LEVELLING FRAME

Frame axial width: 0.739 m; frame uprights made in the technology of tube end forming from tubes of S235JRH grade steel with a minimum yield strength of $Re > 320 \text{ N/mm}^2$. Diameter 48.3 mm, wall thickness 2.7 mm. Equipped with star bolts for mounting 2 decks with a width of 0.32 m or one deck with a width of 0.64 m. It is used to level unevenness of the ground during the installation of the first level of scaffolding.

If the braces are mounted from the bottom of the levelling frames, a base transom placed under the frame should be used instead of the lower bracing fixation.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0201	1,5 m x 0,74 m	14,9
SIGP0202	1,0 m x 0,74 m	11,4
SIGP0203	0,5 m x 0,74 m	8,2

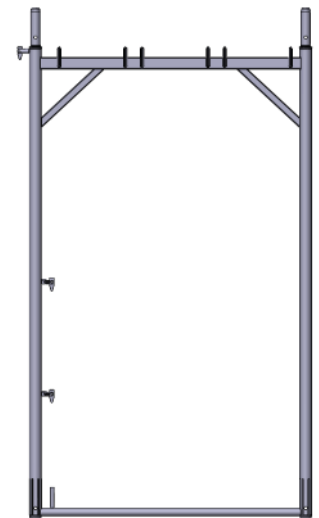


WIDE VERTICAL FRAME

Frame width 1.065 m in the axes of the uprights, frame uprights made in the technology of tube end forming from tubes of S235JRH grade steel with a minimum yield strength of $Re > 320 \text{ N/mm}^2$. Diameter 48.3 mm, wall thickness 2.7 mm. Equipped with star bolts for mounting 3 working decks with a width of 0.32 m or one deck with a width of 0.64 m and one with a width of 0.32 m. Ratchet locks with auto-lock function for the installation of guardrails and bracings and a pin for toe board installation. Thanks to the larger width of the frame, working on the scaffolding is more comfortable. In addition, the larger width of the total surface of the deck allows more building materials to be stored on the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0210	2,0 m x 1,10 m	20,8

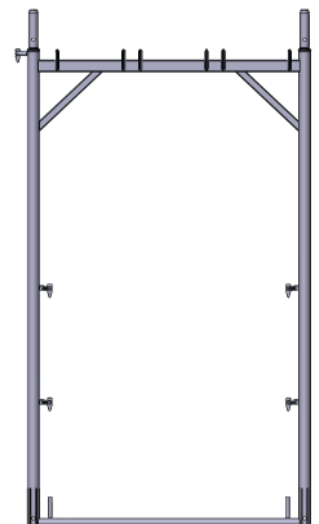


WIDE VERTICAL FRAME (with double locks)

Frame width 1.065 m in the axes of the uprights, frame uprights made in the technology of tube end forming from tubes of S235JRH grade steel with a minimum yield strength of $Re > 320 \text{ N/mm}^2$. Diameter 48.3 mm, wall thickness 2.7 mm. Equipped with star bolts for the installation of 3 working decks with a width of 0.32 m or one deck with a width of 0.64 m and one with a width of 0.32 m. Ratchet locks with auto-lock function for the installation of guardrails and bracings, and pins for the installation of toe boards. Locks and pins are available on both sides of the frame. This allows the installation of guardrails and toe boards from the inside of the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0208	2,0 m x 0,74 m	21,0



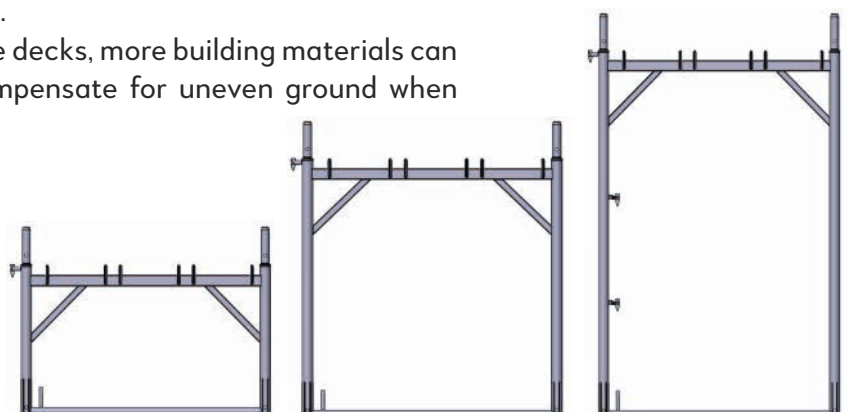
WIDE LEVELLING FRAME

Frame width 1.065 m in the axes of the uprights, frame uprights made in the technology of tube end forming, made of tubes of S235JRH grade steel with a minimum yield strength of $Re > 320 \text{ N/mm}^2$. Diameter 48.3 mm, wall thickness 2.7 mm. Designed for the installation of 3 decks with a width of 0.32 m or one deck with a width of 0.64 m and one with a width of 0.32 m.

In addition, thanks to the larger total area of the decks, more building materials can be stored on the scaffolding. It is used to compensate for uneven ground when installing only the first level of scaffolding.

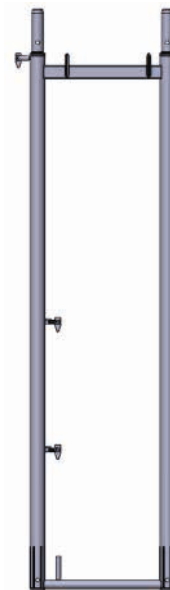
Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0211	1,5 m x 1,10 m	18,3
SIGP0212	1,0 m x 1,10 m	14,9
SIGP0213	0,5 m x 1,10 m	11,7



NARROW VERTICAL FRAME

Frame width 413 m in the axes of the uprights, frame uprights made in the technology of tube end forming from tubes of S235JRH grade steel with a minimum yield strength of $Re > 320 \text{ N/mm}^2$, diameter 48.3 mm, wall thickness 2.7 mm. Equipped with star bolts for mounting 1 0.32 m wide work deck, ratchet locks with auto-lock function for mounting guardrails and bracings, and a pin for mounting the toe board. It is used if the scaffolding is needed in locations where there is no space for a wider scaffolding, e.g. the distance between buildings is short, in working or elevator shafts or if it is not allowed to occupy the pavement with a wider frame.

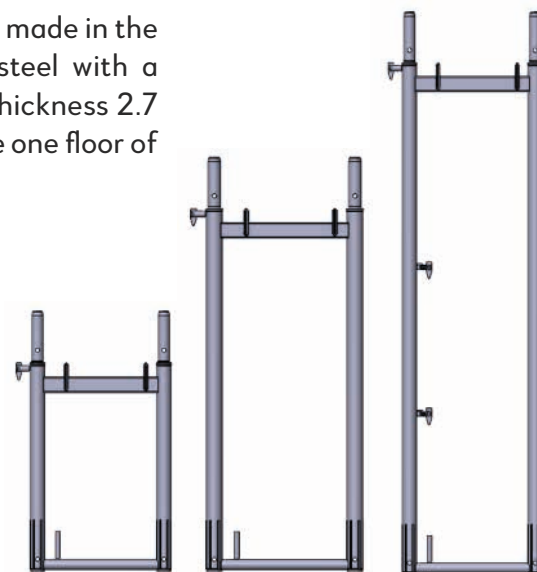


Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0240	2,0 x 0,41 m	16,1

NARROW LEVELLING FRAME

Frame with a width of 413 m in the axes of the uprights, frame uprights made in the technology of tube end forming from tubes of S235JRH grade steel with a minimum yield strength of $Re > 320 \text{ N/mm}^2$, diameter 48.3 mm, wall thickness 2.7 mm. It is used to compensate for uneven ground when installing only the one floor of scaffolding.

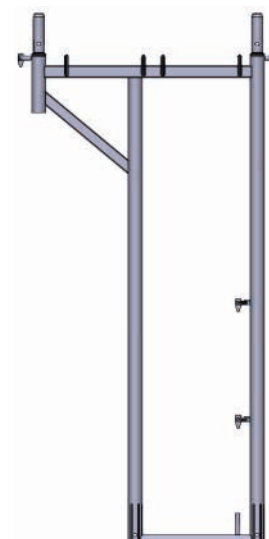


Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0241	1,5 m x 0,41 m	13,5
SIGP0242	1,0 m x 0,41 m	10,0
SIGP0243	0,5 m x 0,41 m	6,8

FRAME WITH EXTENSION BRACKET - 0.41/0.74 m

Frame with a width of 413 m in the axes of the uprights, frame uprights made in the technology of tube end forming from tubes of S460MH grade STEEL, diameter 48.3 mm, wall thickness 2.7 mm. It is used to switch from a 0.41 m to a 0.74 m wide scaffolding.



Corrosion protection: hot-dip galvanizing

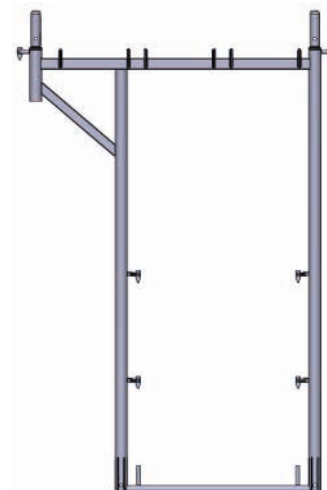
Catalogue No.	Dimensions	Weight (kg)
SIGP0224	2,0 x 0,41 x 0,74 m	18,5

FRAME WITH EXTENSION BRACKET - 0.74/1.10 m

Frame uprights made in the technology of tube end forming from tubes of S460MH grade STEEL, diameter 48.3 mm, wall thickness 2.7 mm. It is mostly used at the top storey of scaffolding to widen the working area during roofing work and where it is necessary to switch from 0.74 m to 1.10 m wide scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0225	2,0 x 0,74 x 1,1 m	20,5

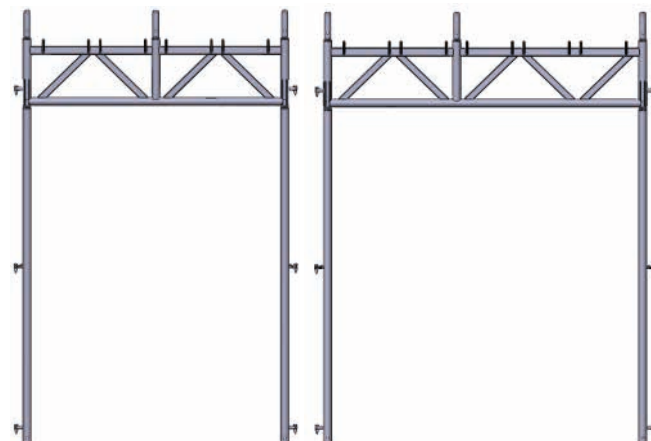


GIRDER WALK-THROUGH FRAME (for pavements)

Frame uprights made of 48.3x2.9 mm tubes and lower girder transom made of 48.3x2.7 mm tube, of S460MH grade steel. Equipped with star bolts for mounting 4 or 5 decks with a width of 0.32 m, and ratchet locks with auto-lock function for mounting guardrails and braces.

Used as the base frame of scaffolding placed at the buildings located directly next to pedestrian passageways - pavements. Together with the protective canopy support and decks, it serves as a pavement cover – they allow to create a safe passage under the scaffolding for pedestrians.

Split-type frame for easier transport and storage. It consists of 3 parts: 1 frame girder and 2 uprights.



Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0215	2,4 m x 1,5 m	32,3*
SIGP0216	2,4 m x 1,8 m	35,5*

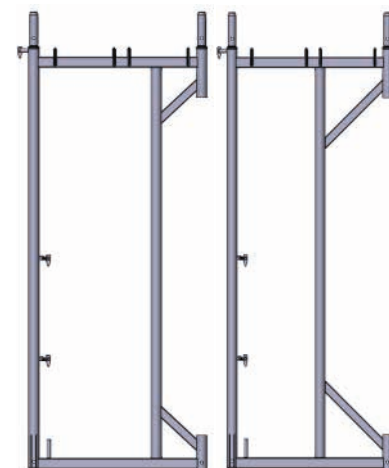
STANDARD CORNICE FRAME

Frame upright made of steel tubes of S460MH grade, diameter 48.3 mm, wall thickness 2.7 mm. One frame stand made in tube end forming technology. It is used when it is necessary to bypass cornices or other obstacles protruding from the facade.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0221	2,0 x 0,74 x 0,40 m	20,5
SIGP0220	2,0 x 0,74 x 0,59 m	19,9

* - to be carried and assembled by two persons

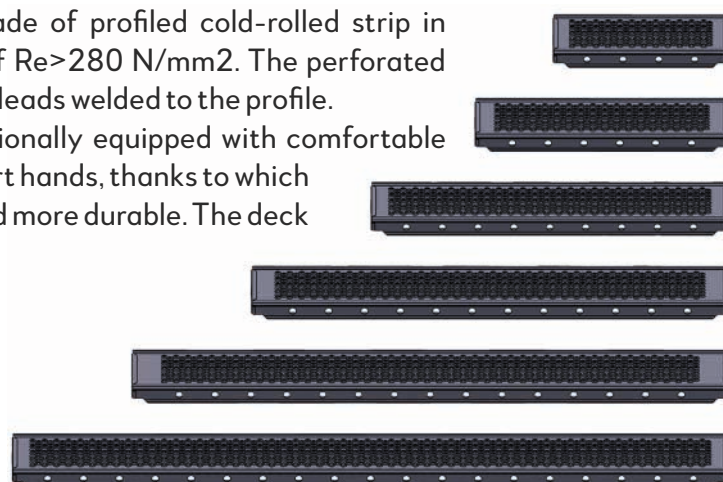


WELDED STEEL DECKS

A light welded steel deck with a width of 0.32 m. Made of profiled cold-rolled strip in HC260LA grade steel with a minimum yield strength of $Re > 280 \text{ N/mm}^2$. The perforated surface increases its rigidity and protects from slipping. Heads welded to the profile. The deck with a length of 3.0 m, 2.5 m, 2.0 m is additionally equipped with comfortable mounting brackets made of an oval tube, which do not hurt hands, thanks to which the deck is easier to assemble and disassemble, stiffer and more durable. The deck serves as a horizontal stiffening of the scaffolding.

Zabezpieczenie antykorozyjne: cynkowanie ogniowe.

Catalogue No.	Dimensions	Weight (kg)
SIGP3405	0,7 m x 0,32 m	5,3
SIGP3404	1,1 m x 0,32 m	6,5
SIGP3403	1,5 m x 0,32 m	9,9
SIGP3402	2,0 m x 0,32 m	12,6
SIGP3401	2,5 m x 0,32 m	16,5
SIGP3400	3,0 m x 0,32 m	19,6

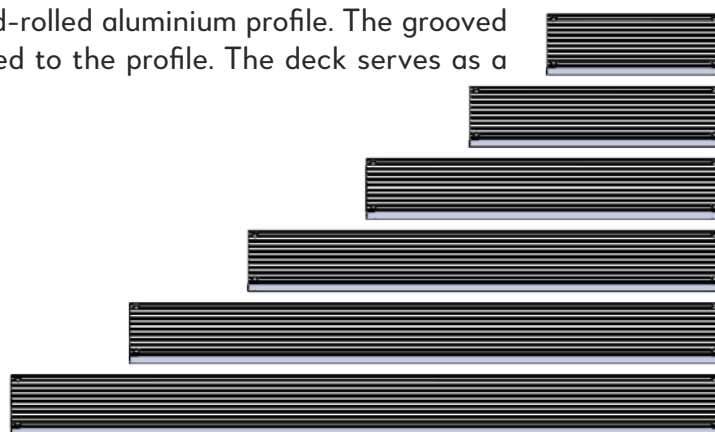


ALUMINIUM DECKS

A super light 0.32 m wide aluminium deck made of cold-rolled aluminium profile. The grooved surface protects against slipping. Platform heads riveted to the profile. The deck serves as a horizontal stiffening of the scaffolding.

Corrosion protection: aluminium

Catalogue No.	Dimensions	Weight (kg)
SIGP3505	0,7 m x 0,32 m	4,5
SIGP3504	1,1 m x 0,32 m	5,9
SIGP3503	1,5 m x 0,32 m	7,8
SIGP3502	2,0 m x 0,32 m	9,7
SIGP3501	2,5 m x 0,32 m	11,7
SIGP3500	3,0 m x 0,32 m	15,5



TIMBER DECKS

Platform with a width of 0.32 m and a thickness of 48 mm, made of 3 or 4 softwood lamellas, finger-jointed with D4 class waterproof hot glue. The edges of the deck are chamfered.

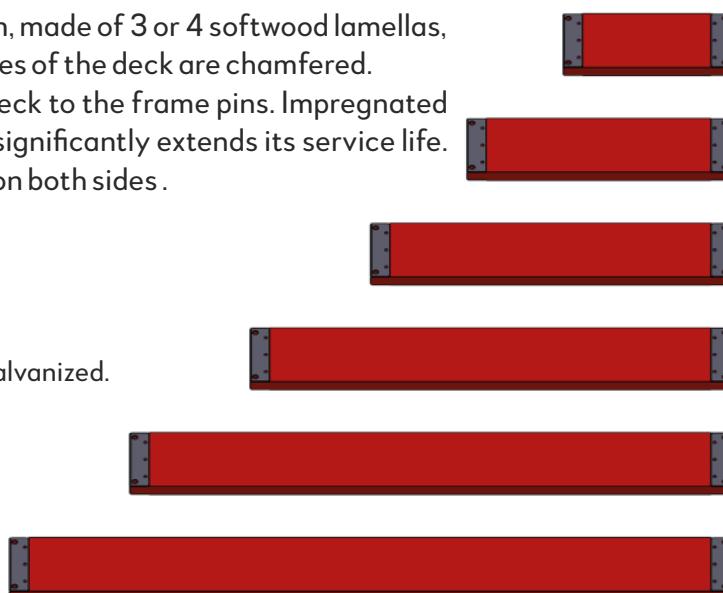
Equipped with steel fittings that are used to attach the deck to the frame pins. Impregnated with immersion waterproof acrylic impregnation, which significantly extends its service life.

Thanks to the symmetry, it is possible to mount the deck on both sides.

The decks are a horizontal stiffening of the scaffolding.

Corrosion protection: acrylic impregnation; fittings hot dip galvanized.

Catalogue No.	Dimensions	Weight (kg)
SIGP3305	0,7 m x 0,32 m	6,6
SIGP3304	1,1 m x 0,32 m	8,7
SIGP3303	1,5 m x 0,32 m	11,7
SIGP3302	2,0 m x 0,32 m	16,2
SIGP3301	2,5 m x 0,32 m	18,3
SIGP3300	3,0 m x 0,32 m	20,7

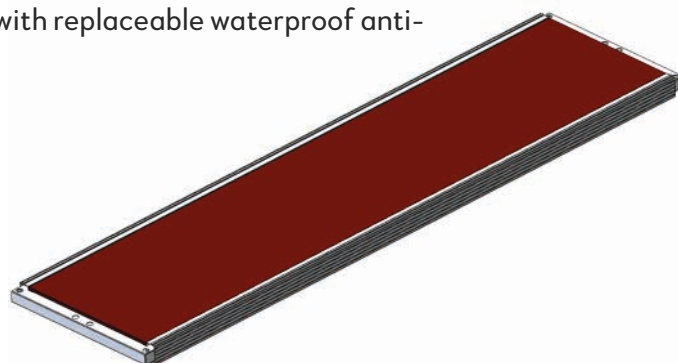


ALUMINUM-PLYWOOD DECK

A working deck with a width of 0.64 m. Aluminum structure with replaceable waterproof anti-slip plywood plank.

Corrosion protection: aluminum

Catalogue No.	Dimensions	Weight (kg)
SIGP0305	0,7 m x 0,64 m	5,4
SIGP0304	1,1 m x 0,64 m	7,8
SIGP0303	1,5 m x 0,64 m	10,2
SIGP0302	2,0 m x 0,64 m	13,2
SIGP0301	2,5 m x 0,64 m	16,2
SIGP0300	3,0 m x 0,64 m	19

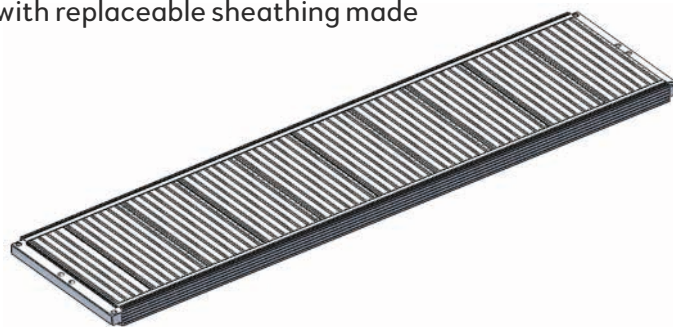


ALUMINIUM DECK

A working deck with a width of 0.64 m. Aluminium structure with replaceable sheathing made of aluminium profiles.

Corrosion protection: aluminum.

Catalogue No.	Dimensions	Weight (kg)
SIGP0315	0,7 m x 0,64 m	5,3
SIGP0314	1,1 m x 0,64 m	7,4
SIGP0313	1,5 m x 0,64 m	9,5
SIGP0312	2,0 m x 0,64 m	12,2
SIGP0311	2,5 m x 0,64 m	14,9
SIGP0310	3,0 m x 0,64 m	17,6



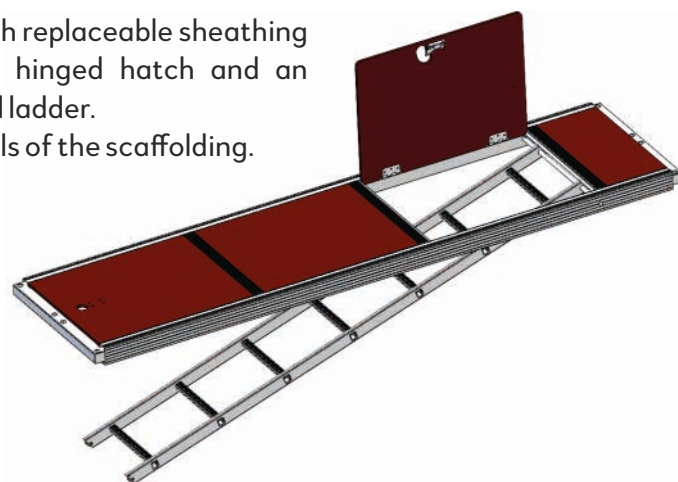
ALU-PLYWOOD ACCESS DECK WITH A LADDER

Access deck with a width of 0.64 m. Aluminium structure with replaceable sheathing made of waterproof anti-slip plywood. Equipped with a hinged hatch and an integrated aluminium ladder. 2.0 m long deck with suspended ladder.

It is used to ensure safe communication between various levels of the scaffolding.

Corrosion protection: aluminum.

Catalogue No.	Dimensions	Weight (kg)
SIGP0402	2,0 m x 0,64 m	16,2
SIGP0401	2,5 m x 0,64 m	19,2
SIGP0400	3,0 m x 0,64 m	22,0

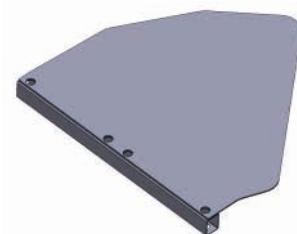


CORNER DECK

Made of 45x45x2 mm steel profile and 4/6 mm checker plate. Used when it is necessary to bend the scaffolding line up to 50°.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP3490	0,74 m	12,8

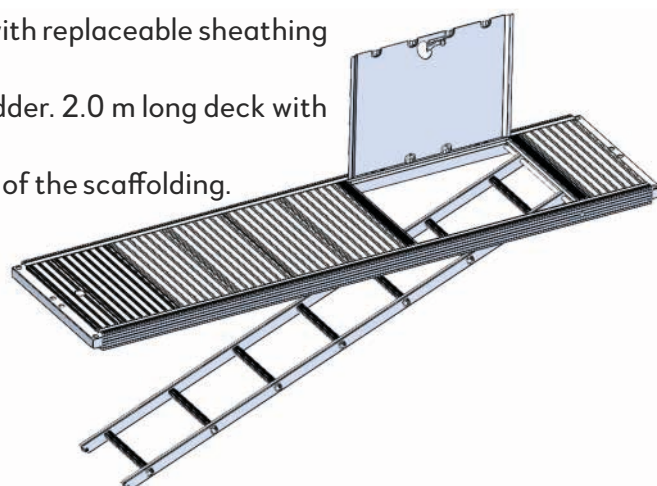


ALUMINUM-PLYWOOD ACCESS DECK

Access deck with a width of 0.64 m. Aluminium construction with replaceable sheathing made of corrugated aluminium sheet.

Equipped with a hinged hatch and an integrated aluminium ladder. 2.0 m long deck with suspended ladder.

It is used to ensure safe communication between various levels of the scaffolding.



Corrosion protection: aluminum.

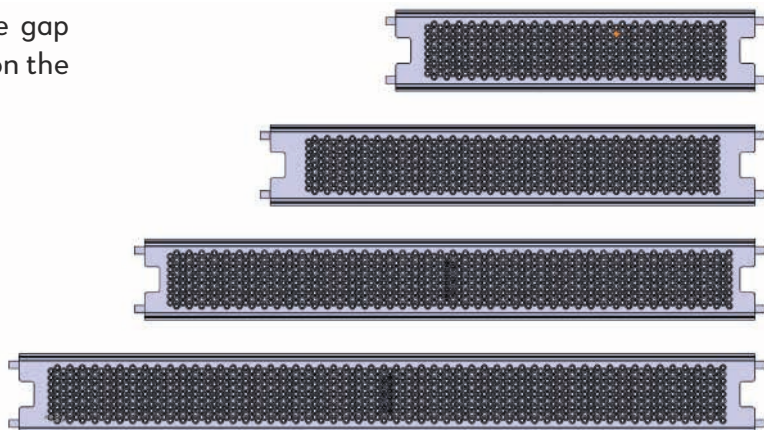
Catalogue No.	Dimensions	Weight (kg)
SIGP0452	2,0 m x 0,64 m	15,2
SIGP0451	2,5 m x 0,64 m	17,9
SIGP0450	3,0 m x 0,64 m	20,6

STEEL INFILL DECKS for 0.74 and 1.10 m consoles

Made of perforated deck sheet. It is used to fill the gap between the decks laid on the frames and the decks on the consoles 0.74 and 1.10 m.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP3603	1,5 m x 0,3 m	5,0
SIGP3602	2,0 m x 0,3 m	6,3
SIGP3601	2,5 m x 0,3 m	8,3
SIGP3600	3,0 m x 0,3 m	9,8



TIMBER DECKS FOR CONSOLE 0.15 m

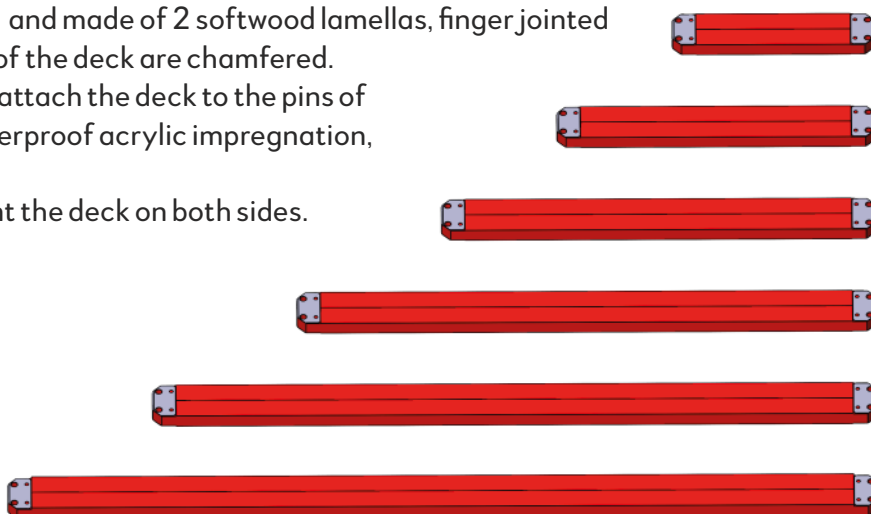
The deck is 0.15 m wide and 48/60 mm thick, and made of 2 softwood lamellas, finger jointed with D4 class waterproof hot glue. The edges of the deck are chamfered.

Equipped with steel fittings, which are used to attach the deck to the pins of the console. Impregnated with immersion waterproof acrylic impregnation, which significantly extends its service life.

Thanks to the symmetry, it is possible to mount the deck on both sides.

Corrosion protection: acrylic impregnation; fittings hot dip galvanized.

Catalogue No.	Dimensions	Weight (kg)
SIGP3315	0,7 m x 0,15 m	3,4
SIGP3314	1,1 m x 0,15 m	4,5
SIGP3313	1,5 m x 0,15 m	6,0
SIGP3312	2,0 m x 0,15 m	8,2
SIGP3311	2,5 m x 0,15 m	9,3
SIGP3310	3,0 m x 0,15 m	10,5



VERTICAL (DIAGONAL) BRACES

Made of steel tube with a diameter of 48.3 mm and a thickness of 2.0 mm.

Equipped with holes designed for attaching the ratchet locks of the frames.

Necessary for stiffening vertical axis of the scaffolding.

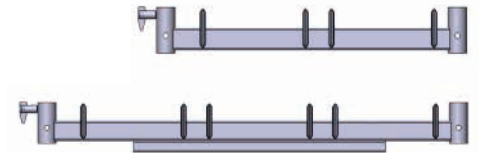


Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0503	150/200 - 2,5 m	5,7
SIGP0502	200/200 - 2,8 m	6,5
SIGP0501	250/200 - 3,2 m	7,2
SIGP0500	300/200 - 3,6 m	8,1

BASE DECK TRANSOM (PUTLOG)

A steel element equipped with a ratchet lock and star bolts. It is used to fix braces and decks or stairs at the level of the steel screw jacks (between the nut of the jack and the upright).



Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1220	0,74 m	3,2
SIGP1221	1,10 m	4,5

BASE TRANSOM

A steel element equipped with a ratchet lock. It is used to fix braces at the lowest level of the scaffolding (between the jack nut and the upright).

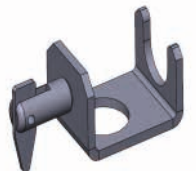


Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0511	0,74 m	2,4
SIGP0512	1,10 m	2,8

BOTTOM BRACE TIE

A steel element, equipped with a ratchet lock with auto-lock function for fixing braces at the lowest level of the scaffolding (between the jack nut and the upright).



Corrosion protection: hot-dip galvanizing

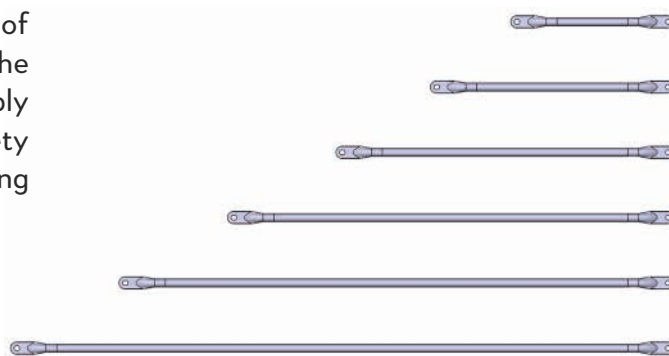
Catalogue No.	Dimensions	Weight (kg)
SIGP0510	---	0,5

SINGLE LONGITUDINAL GUARDRAIL

Made of steel tube with a diameter of 38 mm and a thickness of 1.8 mm. Flattened at the ends, with holes for fastening on the ratchet locks of the frames and guardrail posts. Quick assembly without the need for tools. An essential health and safety element as it serves as a longitudinal protection against falling out of the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0605	0,7 m	1,4
SIGP0604	1,1 m	2,0
SIGP0603	1,5 m	2,6
SIGP0602	2,0 m	3,3
SIGP0601	2,5 m	4,1
SIGP0600	3,0 m	4,9

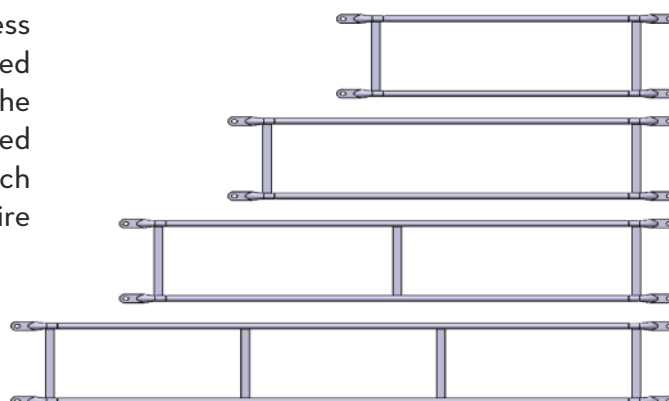


DOUBLE LONGITUDINAL GUARDRAIL

Made of steel tubes with a diameter of 38 mm and a thickness of 1.8 mm, and 40x20x2 mm profiles. The guardrail is flattened at the ends, with holes for attaching to the ratchet locks of the frames and guardrail posts. Quick assembly without the need for tools. It protects workers working on the scaffolding much better from falling out and additionally stiffens the entire scaffolding structure.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0613	1,5 m	6,6
SIGP0612	2,0 m	8,2
SIGP0611	2,5 m	10,7
SIGP0610	3,0 m	13

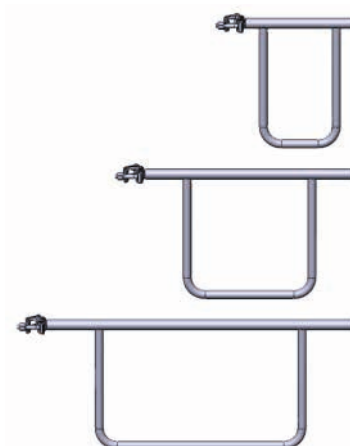


DOUBLE SIDE GUARDRAIL

Made of 33.7x2.25mm and 26.9x2mm steel tubes and half-connectors. The double side handrail is used to protect the upfront working area - it closes the front side of the scaffolding. Fastening to the frame by means of a half-connector.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0503	0,41 m	2,9
SIGU0500	0,74 m	3,4
SIGU0505	1,1 m	4,1

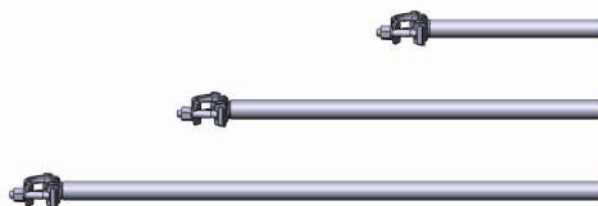


SINGLE SIDE GUARDRAIL

Made of 33.7x2.25mm steel tube and half-connector. A single side guardrail is used to protect the front surface of the working area - it closes the front side of the scaffolding. Mocowanie przy pomocy pół-złącza do ramy.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0513	0,41 m	1,5
SIGU0510	0,74 m	2,0
SIGU0515	1,1 m	2,9

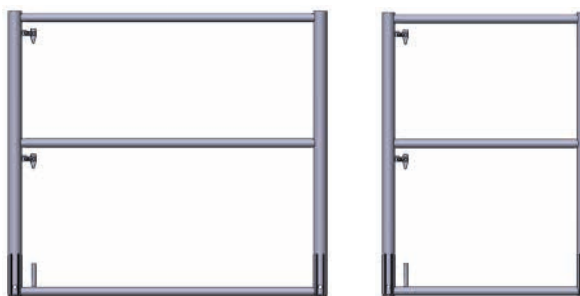


GUARDRAIL FRONT FRAME

The frame is 0.74 m or 1.10 m wide, made of 48.3 mm diameter tubes with a wall thickness of 2.7 mm. Equipped with ratchet locks with auto-lock function for mounting guardrails, a pin for mounting the toe board and integrated face guardrails. Used to protect the front surface and the deck at the top storey of the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1000	1,0 m x 0,74 m	11,0
SIGP1020	1,0 m x 1,10 m	14,1

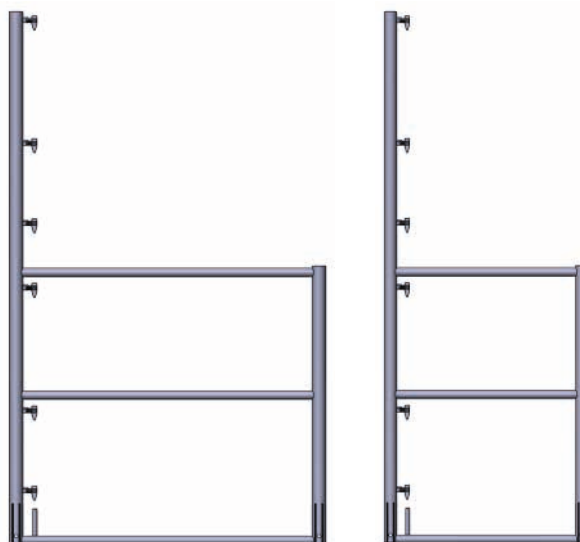


ROOFER'S FRONT HANDRAIL FRAME

The frame is 0.74 m or 1.10 m wide, made of 48.3 mm diameter tubes with a wall thickness of 2.7 mm. Equipped with ratchet locks with auto-lock function for mounting guardrails, a pin for mounting the toe board and integrated face handrails. Equipped with integrated front guardrails. Used to protect the front surface and the deck at the top storey of the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1030	2,0 m x 0,74 m	14,2
SIGP1040	2,0 m x 1,10 m	17,3

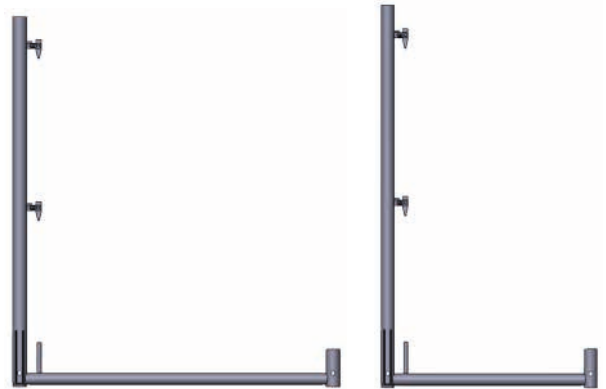


HANDRAIL POST WITH DECK PROTECTION, "L-SHAPED"

A post with a width of 0.74 m or 1.10 m, made of steel pipe with a diameter of 48.3 mm and a thickness of 2.7 mm. Equipped with ratchet locks for attaching guardrails and roofing nets and a pin for mounting the toe board. Together with guardrails, it is used to secure the top storey of the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0900	1,0 m x 0,74 m	5,6
SIGP0920	1,0 m x 1,10 m	5,8

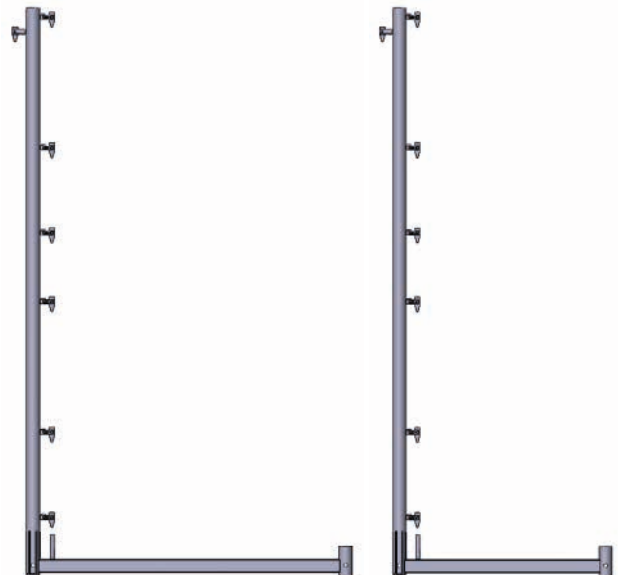


ROOFER'S HANDRAIL POST WITH DECK PROTECTION, "L-SHAPED"

The post is 0.74 m or 1.10 m wide and 2.0 m high, made of S460MH steel pipe with a diameter of 48.3 mm and a thickness of 2.7 mm and from a 50x35x2 mm profile. Equipped with ratchet locks for attaching guardrails and roofing nets and a pin for mounting the toe board. Together with guardrails and nets, it is used to protect the top storey of scaffolding from falling out during roofing works.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0901	2,0 m x 0,74 m	9,3
SIGP0921	2,0 m x 1,10 m	10,4



GUARDRAIL POST WITHOUT DECK PROTECTION (with toe board fix pin)

The post is 1.0 m high, made of steel tube with a diameter of 48.3 mm and a thickness of 2.7 mm. Equipped with ratchet locks for attaching the guardrail and a pin for mounting the toe board. Used to protect against falling out when using a 0.32 m console with a connector.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0902	1,0 m	3,8



SIDE PROTECTION ELEMENTS

HANDRAIL POST WITHOUT DECK PROTECTION (without toe board fix pin)

The post is 1.0 m high, made of steel tube with a diameter of 48.3 mm and a thickness of 2.7 mm. Equipped with ratchet locks for attaching the guardrails. Used when it is necessary to protect against falling out when using a 0.32 m console with a connector.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP0907	1,0 m	3,6



LONGITUDINAL AND SIDE (FRONT) TOE BOARDS

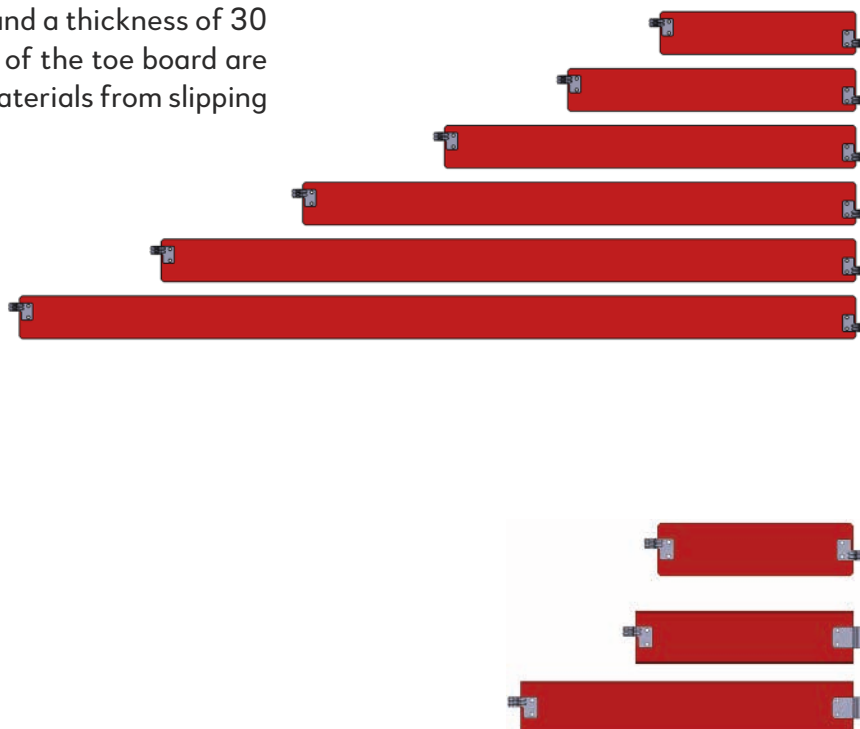
Wooden toe boards with a height of 150 mm and a thickness of 30 mm. Immersed, made of softwood. The edges of the toe board are chamfered. It prevents the tools or building materials from slipping from the scaffolding deck.

Corrosion protection: acrylic impregnation; fittings - hot-dip galvanized.

Catalogue No.	Dimensions	Weight (kg)
SIGP1105	0,74 m	1,6
SIGP1104	1,10 m	2,0
SIGP1103	1,5 m	2,95
SIGP1102	2,0 m	4,25
SIGP1101	2,5 m	4,9
SIGP1100	3,0 m	5,6

krawężnik boczne:

SIGP1112	0,66 m	1,3
SIGP1110	0,74 m	1,4
SIGP1111	1,10 m	2,0

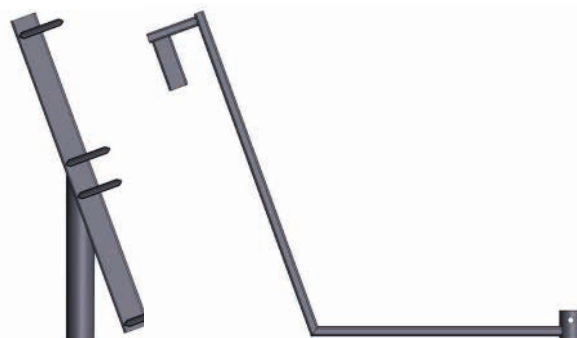


PROTECTIVE CANOPY BRACKET / DECK PROTECTION BRACKET

The bracket is made of 50x35x2 mm profile. Equipped with star pins for attaching two wooden or steel decks. Together with the 0.74 m console, it is used to protect pedestrian paths against objects falling from the scaffolding. Platform protection made of 40x20x2mm profiles.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1410	0,64 m	3,6
SIGP1411	0,64 x 0,74 m	2,8



TIMBER SOLE BOARDS

Made of softwood, necessary for seating the scaffolding. Thanks to the sole boards, the weight of the scaffolding is distributed over a larger area.

Corrosion protection: acrylic impregnation.

Catalogue No.	Dimensions	Weight (kg)
SIGUD001	320 x 320x50 mm	1,8
SIGUD002	1100x250x50 mm	5,3
SIGUD003	1400x250x50 mm	6,7

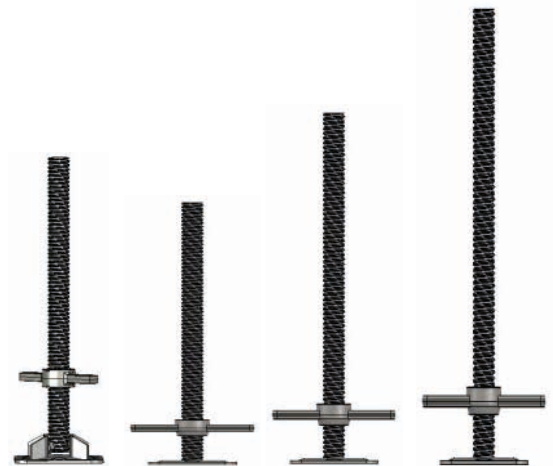


ADJUSTABLE STEEL SCREW JACKS

The stand is made of 5 mm thick steel plate, 38 mm diameter extruded threaded steel rod with 4 mm wall thickness and a ring nut with a socket for the frame tube. The base sheet is embossed for reinforcement and has holes for optional mounting of the castor set. Necessary to set up and level the first storey of the scaffolding. The screw jack has a protection against excessive unscrewing of the ring nut.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0302	400 mm	2,75
SIGU0301	600 mm	3,4
SIGU0300	800 mm	4
SIGU0319	500 mm - Uchylna	3,6

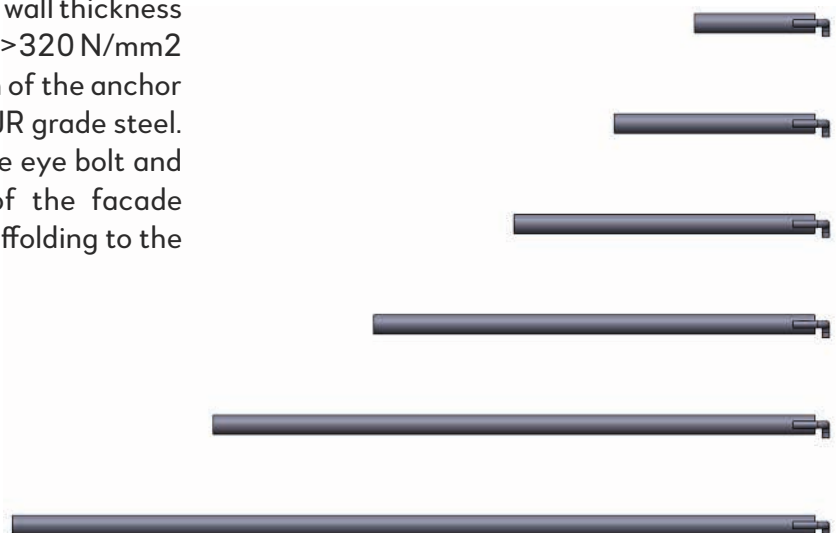


ANCHORING CONNECTOR WITH ROD HOOK (ANCHOR)

Made of a tube with a diameter of 48.3 mm and a wall thickness of 2.7 mm made of S235JRH grade steel with $Re > 320 \text{ N/mm}^2$ or S460MH grade steel depending on the length of the anchor and a hook made of $\phi 18 \text{ mm}$ round bar in S235JR grade steel. Together with the cross coupling(s) as well as the eye bolt and wall plug, it is an essential safety element of the facade scaffolding structure. It is used to anchor the scaffolding to the wall of the building.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0203	0,3 m	1,4
SIGU0205	0,5 m	1,9
SIGU0207	0,7 m	2,5
SIGU0210	1,0 m	3,3
SIGU0215	1,5 m	4,9
SIGU0220	2,0 m	6,5

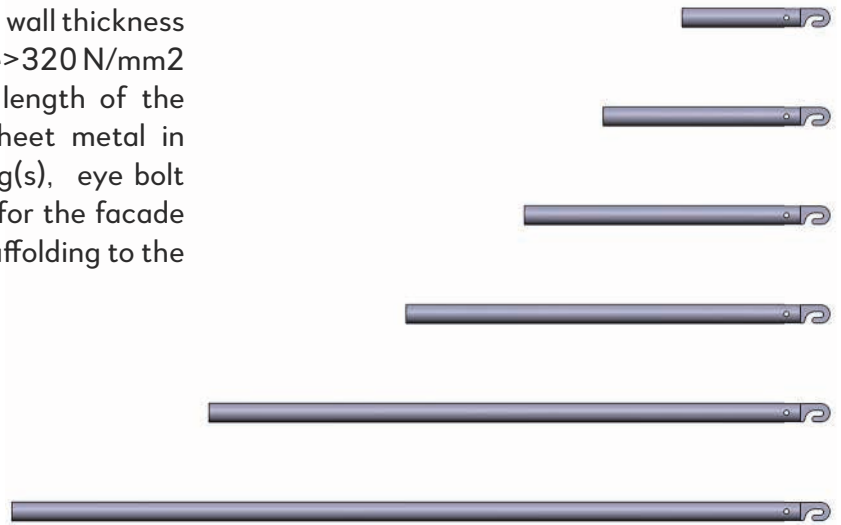


ANCHORING CONNECTOR WITH FLAT HOOK (ANCHOR)

Made of a pipe with a diameter of 48.3 mm and a wall thickness of 2.7 mm made of S235JRH grade steel with $Re > 320 \text{ N/mm}^2$ or S460MH grade steel – depending on the length of the anchor and a hook made of 12 mm thick sheet metal in S355J2 grade. Together with the cross coupling(s), eye bolt and wall plug, it is an essential safety element for the facade scaffolding structure. It is used to anchor the scaffolding to the wall of the building.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0203HP	0,3 m	1,4
SIGU0205HP	0,5 m	1,9
SIGU0207HP	0,7 m	2,5
SIGU0210HP	1,0 m	3,3
SIGU0215HP	1,5 m	4,9
SIGU0220HP	2,0 m	6,5



CROSS COUPLING

Die-forged coupling, manufactured according to DIN EN 74-B, hot-dip or electro-galvanized, with T-bolts and flange nuts for 19/22 mm spanner. It is used to connect the scaffolding tubes at a 90-degree angle; together with the anchor connector, eye bolt and wall plug, it is an essential element of anchoring the scaffolding to the building.

Corrosion protection: hot dip/electro-galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0100	48,3 x 48,3 mm	1,25

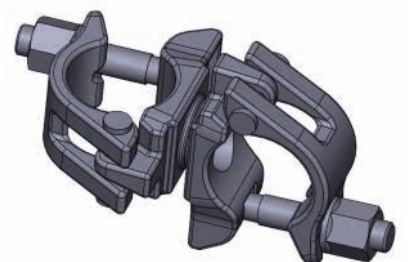


SWIVEL COUPLING

Die-forged coupling, made according to DIN EN 74-B, hot-dip or electro-galvanized, with 19/22 mm spanner flange nuts. It is used to connect the scaffolding tubes at any angle.

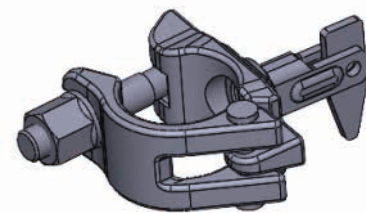
Corrosion protection: hot dip/electro-galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0101	48,3 x 48,3 mm	1,36



HANDRAIL COUPLING

Die-forged coupling, made according to DIN EN 74-B, hot-dip or electro-galvanized, with 19/22 mm wrenched flange nuts, equipped with a ratchet lock for fastening the guardrails. It is used to attach additional guardrails.

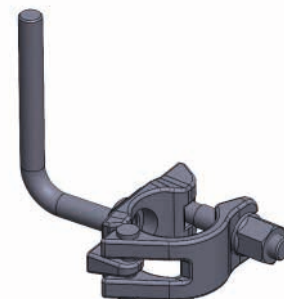


Zabezpieczenie antykorozyjne: cynkowanie ogniowe/galwaniczne.

Catalogue No.	Dimensions	Weight (kg)
SIGU0102	48,3 mm	0,8

TOE BOARD COUPLING

Die-forged coupling, made according to DIN EN 74-B, hot-dip or galvanized, with 19/22 mm spanner flange nuts, equipped with a pin for fastening toe boards.



Corrosion protection: hot dip/electro-galvanizing

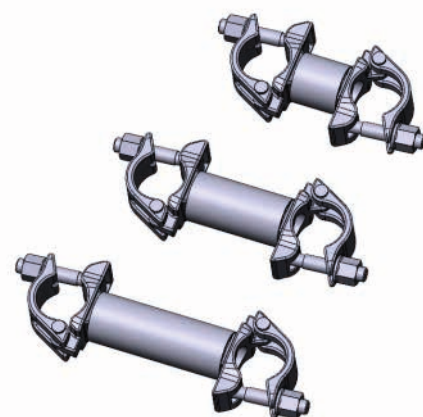
Catalogue No.	Dimensions	Weight (kg)
SIGU0103	48,3 mm	1

SPACER/PARALLEL COUPLER

Made of two half-connector with a tube section of 48.3x2.7 mm. It is used, for example, to connect facade scaffolding frames and stairway frames, or to connect two different frame/facade frame systems.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0110	48 x 113 mm	1,5
SIGU0111	48 x 160 mm	1,7
SIGU0112	48 x 200 mm	1,9



LONGITUDINAL COUPLER

Die-forged coupling, made according to DIN EN 74-B, hot-dip galvanized or galvanized, with 19/22 mm spanner flange nuts. It is used for longitudinal connection of tubes with a diameter of 48.3 mm.



Corrosion protection: hot dip/electro-galvanized

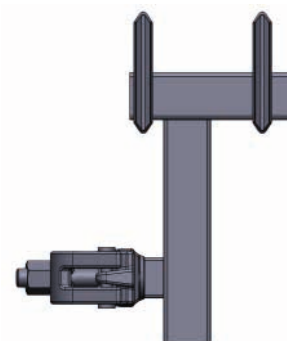
Catalogue No.	Dimensions	Weight (kg)
SIGU0120	48,3 x 48,3 mm	1,4

CONSOLE 0.15 m

Made of 35x35x2 mm profiles. Equipped with one half-connector for attaching the element to the scaffolding supporting frame, and star bolts for attaching decks. It is used to extend the scaffolding from the wall side by one deck with a width of 0.15 m. Thanks to the use of a 0.15 m bracket with 0.15 m decks, the need to use guardrails and internal sides is avoided when insulating with thick polystyrene or wool.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1506	0.15 m	1.8

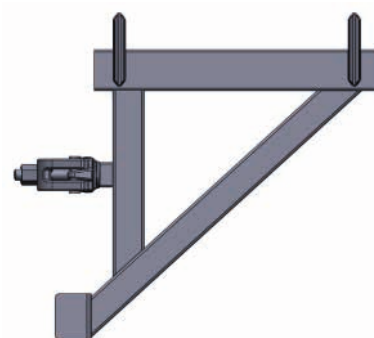


CONSOLE 0.32 m (without connector)

Made of 50x35x2 mm and 35x35x2 mm profiles. Equipped with one half-connector for attaching the element to the scaffolding support frame, star bolts for attaching one deck. Used to extend the scaffolding from the wall side by one deck with a width of 0.32 m.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1511	0.32 m	3.3

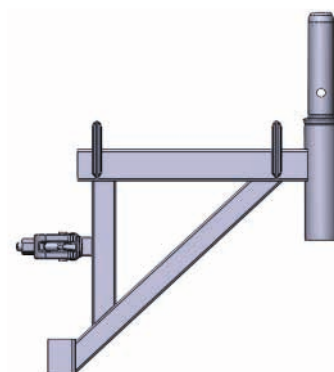


CONSOLE 0.32 m (with connector)

Made of 50x35x2 mm and 35x35x2 mm profiles. Equipped with one half-connector for attaching the element to the scaffolding support frame, star bolts for attaching two 0.32 m wide decks and a connector for attaching the guardrail post. Used to extend the scaffolding by one deck with a width of 0.32 m. It has a connector for the installation of a guardrail post.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1501	0.32 m	4.4

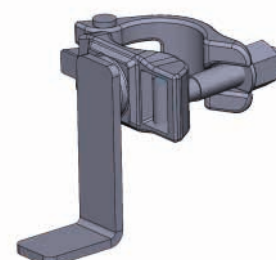


SECURITY DEVICE FOR CONSOLE DECKS 0.15/0.32 m

Made of half-connector and 40x5 mm angle. It is used to protect single decks laid on 0.15 m and 0.32 m consoles against being lifted by the wind.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU1530	---	1.0



CONSOLE 0.50 m

Made of 40x30x2 mm profiles. Equipped with one half-connector for attachment to the scaffolding support frame. It is used to extend or shorten the scaffolding area by 0.5 m along the length of the scaffolding if it is necessary to bypass e.g. balconies or other protruding elements of the building.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1505	0,5 m	4,8

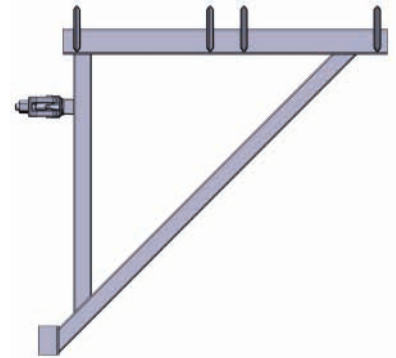


CONSOLE 0.64 m (without connector)

Made of 50x35x2 mm and 35x35x2 mm profiles. Equipped with one half-connector for attaching the element to the scaffolding supporting frame and star bolts for attaching decks. Used to extend the scaffolding inwards by two wooden/steel decks with a width of 0.32 m or one with a width of 0.64 m.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1512	0,64 m	7,1

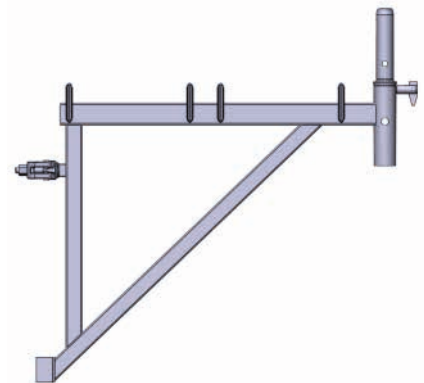


CONSOLE 0.64 m (with connector)

Made of 50x35x2 mm and 35x35x2 mm profiles. Equipped with one half-connector for attaching the element to the scaffolding supporting frame and star bolts for attaching decks. Used to extend the scaffolding outside by two wooden/steel decks with a width of 0.32 m or one with a width of 0.64 m. It has a connector for mounting a guardrail post or a safety canopy.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1502	0,64 m	8,2



GIRDER FRAME/CONSOLE DECK PROTECTION 0.64 m

Made of semi-joint and 40x5mm angle plate. Used to protect double decks laid on 0.64 m consoles and on a girder frame (pavement) against being lifted up by wind.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1531	0,45 m	1,8



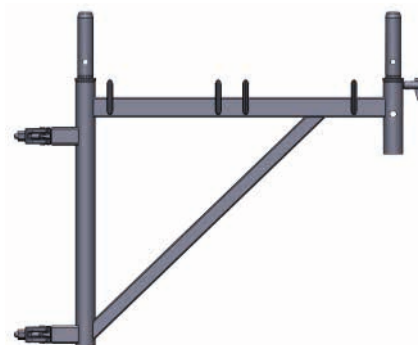
CONSOLE 0.74 m

Made of 50x35x2mm and 35x35x2 mm profiles and 48.3x2.7 mm tubes. Equipped with two half-connectors for attaching the element to the supporting frame of the scaffolding, star bolts for attaching two 0.32 m wide decks or one 0.64 m wide deck, connectors for attaching a guardrail frame, end or regular, and a special dowel for mounting the console support. Used to extend the scaffolding outside by 2 wooden/steel decks with a width of 0.32 m or one with a width of 0.64 m.

Together with the console support, it is also used to move the scaffolding axis.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1500	0,74 m	9,9

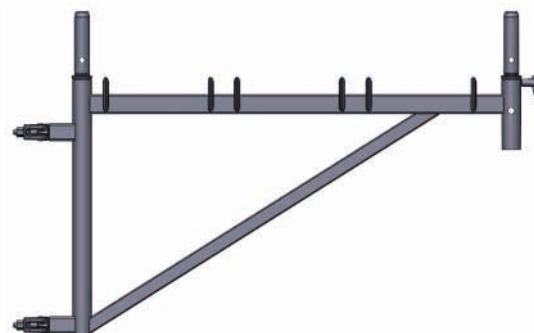


CONSOLE 1.10 m

Made of 50x35x2 mm and 35x35x2 mm profiles and 48.3x2.7 tubes mm. Equipped with two half-connectors for attaching the element to the scaffolding support frame and star pins for attaching the decks. Used to extend the scaffolding outside by 3 wooden/steel decks with a width of 0.32 m. It has a connector for mounting the guardrail post and a special dowel for attaching the console support. Together with the console support, it is also used to move the scaffolding axis.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1503	0,32 m	11,3



CONSOLE SUPPORT 0.74 m, 1.10 m

Made of 48.3x2.7 mm tube with $Re > 320N/mm^2$.

Equipped with one half-connector for attachment to the scaffolding support frame and a special sheet for hanging on the console peg for easy installation. Used to reinforce decks mounted on 0.50 m, 0.74 m, 1.10 m consoles.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1400	2,0 x 0,74 m	7,6
SIGP1401	2,0 x 1,10 m	8,1

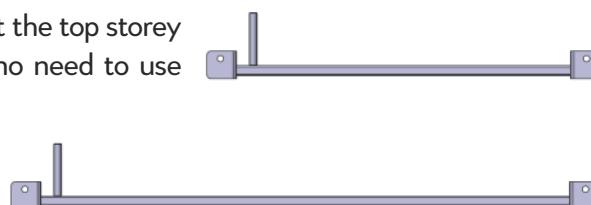


UPPER SAFETY DEVICE FOR CONSOLE DECKS 0.74/1.1 m

Made of 33.7x2.25 mm and 57x2.7 mm tubes. Used to secure decks at the top storey of the scaffolding extended by 0.74 / 1.1 m consoles when there is no need to use guardrail posts on the wall side.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1530	0,74 m	1,9
SIGP1531	1,10 m	2,6



ALUMINIUM STAIRS

Aluminum stairs made of extruded AW-6063-T66 aluminum alloy profiles. Used to assemble a comfortable stairway leading to the upper storeys of the scaffolding, a self-contained and independent staircase to support the construction site or to provide emergency access to already existing buildings.

Corrosion protection: aluminum.

Catalogue No.	Dimensions	Weight (kg)
SIGP5001	2,0 x 2,5 x 0,64 m	27,0*
SIGP5000	2,0 x 3,0 x 0,64 m	32,0*

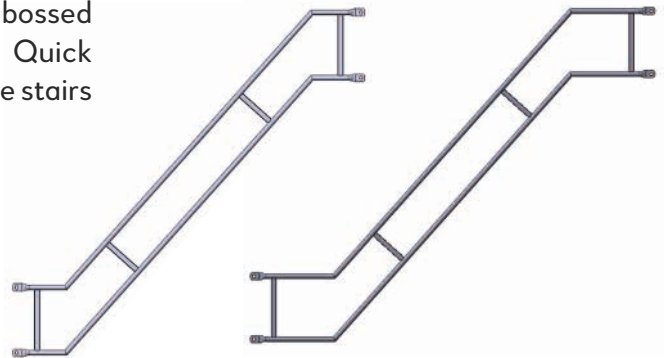


DOUBLE STAIR HANDRAILS

Made of 38x1.8 mm steel tubes and 40x20x2 mm profiles. Embossed at the ends, with holes for fastening on frame/stair locks. Quick assembly without the need for tools. It prevents falling down the stairs of the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP5101	2,0 x 2,5 m	15,5
SIGP5100	2,0 x 3,0 m	17,0



INNER STAIR HANDRAILS

Made of 38x1.8 mm steel tubes and 30x30x2 mm profiles. Equipped with special mounting brackets for the side profile of the stairs. Quick installation with the use of a connector spanner. It prevents from falling down the stairs inside the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU5110	2,25 m	14,5

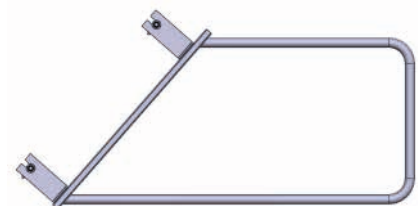


INNER UNDER-STAIR HANDRAIL

Made of 26.9x2 mm steel tubes and 40x20x2mm profile. Equipped with special mounting brackets for the side profile of the stairs. Quick installation with the use of a connector spanner. It prevents from falling down the stairs inside the scaffolding.

Corrosion protection: hot-dip galvanizing

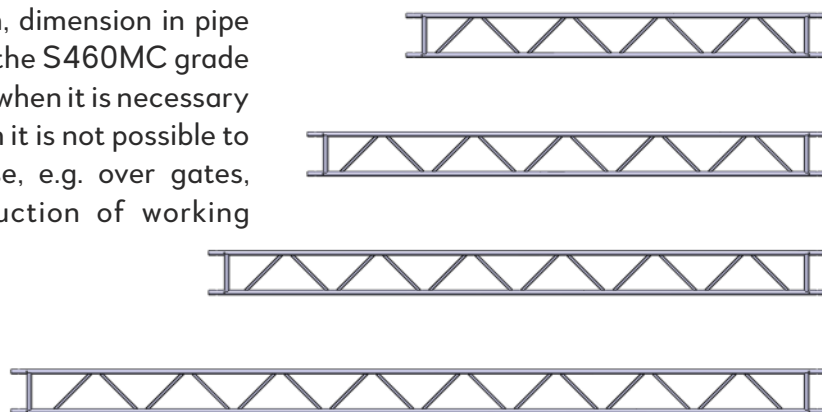
Catalogue No.	Dimensions	Weight (kg)
SIGU5115	2,0 x 2,5 m	4,5



* - to be carried and assembled by at least 2 persons

STEEL GIRDER HS – H 45

Reinforced girder with a total height of 0.45 m, dimension in pipe axes 0.4 m, made of high-strength steel tubes in the S460MC grade 48.3x2.7 mm and a profile of 30x20x2mm. Used when it is necessary to create a passage under the scaffolding or when it is not possible to place every scaffolding bay on the frame base, e.g. over gates, protruding building elements, in the construction of working platforms, etc.

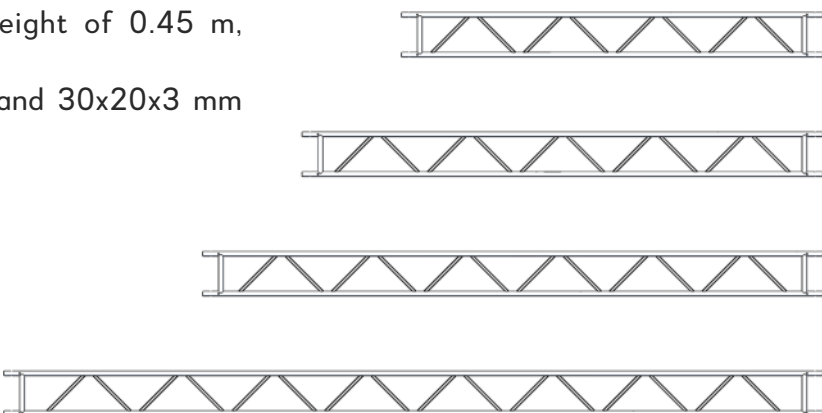


Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0604	0,45 x 4,24 m	39,0*
SIGU0605	0,45 x 5,24 m	48,5*
SIGU0606	0,45 x 6,24 m	58,0*
SIGU0608	0,45 x 8,24 m	67,5*

ALUMINIUM GIRDER H – 45

Lightweight aluminium girder with a total height of 0.45 m, dimension in tube axes 0.4 m. Made of EN AW 6082-T6 48.3x4 mm tubes and 30x20x3 mm aluminium profile.



Corrosion protection: aluminum.

Catalogue No.	Dimensions	Weight (kg)
SIGU0614	0,45 x 4,24 m	17,7*
SIGU0615	0,45 x 5,24 m	21,3*
SIGU0616	0,45 x 6,24 m	24,5*
SIGU0618	0,45 x 8,24 m	27,7*

DECK GIRDER TRASOM

Made of 50x35x2 mm steel profile, equipped with star pins for attaching decks and half-connectors for attaching to the girder. Used to mount working decks on girders.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1230	0,64 m	3,5
SIGP1231	1,0 m	4,7
SIGP1232	1,3 m	5,8

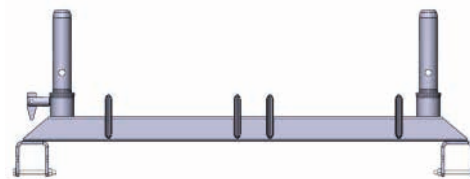


* - to be carried and assembled by at least 2 persons

GIRDERS AND OVERHANGS

GIRDER LEDGER

Made of 50x35x2 mm steel profile, equipped with star bolts for attaching decks, trunnion connectors to the frame, pin for toe board and special brackets for attaching to the girder. Used to mount frames and working decks on girders.



Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1239	0,5 x 8,24 m	6,5

GIRDER WALL CONNECTOR

Made of 70x40x5 mm steel channel section, equipped with spigot connectors for mounting the girder, it has holes $\varnothing 18$, used to be attached to the wall of the building with glued anchors, expansion anchors or construction ties. Used to mount girders directly to the wall of a building.



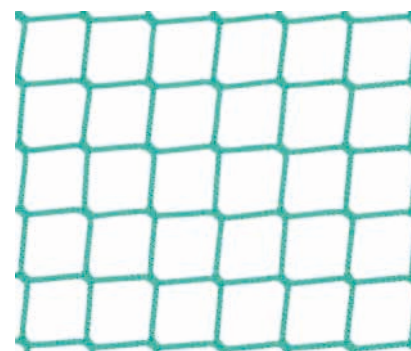
Corrosion protection: hot-dip galvanizing

Nr katalogowy	Dimensions	Weight (kg)
SIGU1500	0,4 m	5,2

SAFETY & COMFORT ELEMENTS

ROOFING PROTECTIVE MESH

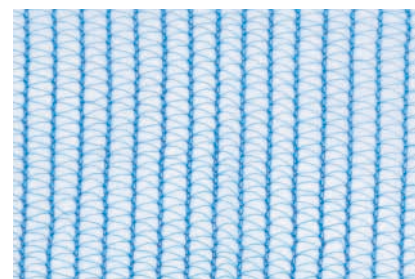
Made of polypropylene cord with a diameter of 5 mm. It is used to protect roofers and people working on the roofs of buildings, especially on buildings with sloping roofs, against falling. The height of the grid is adjusted to the distance of the first and last guardrail of the roofing railing post or roofing end frame, the length is adjusted to 4 scaffolding bays.



Catalogue No.	Dimensions	Weight (kg)
SIGU0711	1,9x 10,4 m	5,5
SIGU0710	1,9 x 12,4 m	6,5

COVER MESH

Made of HDPE with a weight of 50 g/m², the net is used to protect building materials such as polystyrene or mineral wool from blowing away from the scaffolding. It blocks 20% of wind and 30% of light. Equipped with eyelets for mounting with bands. UV resistance – 12Kly.



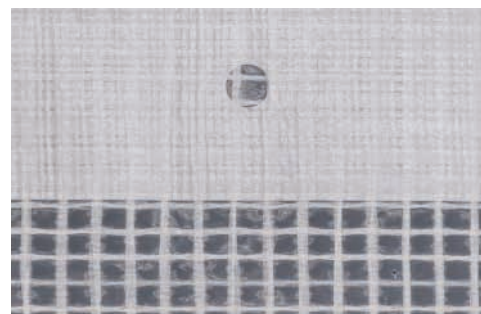
Catalogue No.	Dimensions	Weight (kg)
SIGU0702	2,57 x 10,0 m	1,3
SIGU0700	3,07 x 10,0 m	1,5
SIGU0703	2,57 x 20,0 m	2,6
SIGU0701	3,07 x 20,0 m	3,1

COVER TARPAULIN

Reinforced tarpaulin made of transparent PEHD PE-coated, with a weight of 170 g/m².

Ideal for protection against severe weather. Equipped with 5 reinforcement belts: a reinforcement belt with holes on one side, a double reinforcement belt with holes on the other side and 2 internal reinforcement strips. It blocks 100% of wind and 30% of light.

Equipped with eyelets for mounting with bands. UV-120Kly resistance.



Catalogue No.	Dimensions	Weight (kg)
SIGU0722	2,57 x 10,0 m	4,4
SIGU0720	3,07 x 10,0 m	5,2
SIGU0723	2,57 x 20,0 m	8,8
SIGU0721	3,07 x 20,0 m	10,5

TARPAULIN POST

Made of 48.3x2.7 mm steel tube in grade S460MH, equipped with ratchet locks for attaching the guardrail and half-connectors for attaching to the frame or guardrail post. Used to assemble the canopy on the top storey of the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1700	2,4 x 1,2 m	11,5



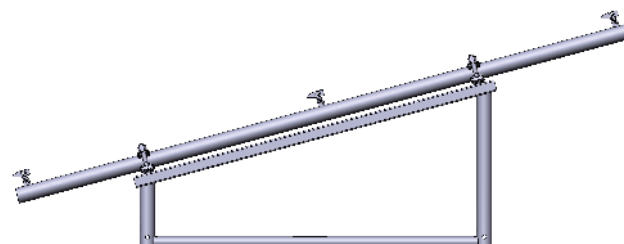
TARPAULIN BRACKET

Made of 48.3x2.7 mm steel tubes and a 40x2x2 mm profile, equipped with ratchet locks for attaching guardrails. Used to assemble a canopy on the top storey of the scaffolding if frames are installed on the top storey. Double-sided mounting and relocation of the roof bolt are possible.

If there are guardrail posts at the top storey, tarpaulin posts should be used.

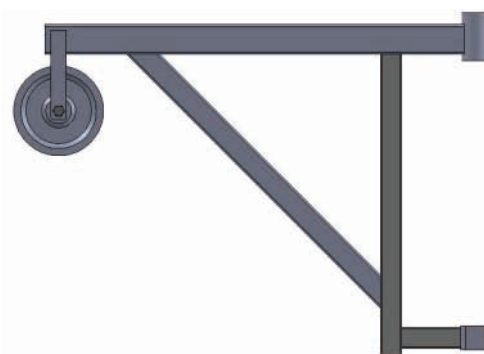
Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1701	0,74 x 2,0 m	13,4
SIGP1702	1,10 x 2,0 m	15,2



BOOM WITH INTEGRATED PULLEY

A steel element made of a 50x35x2 mm profile. Equipped with an integrated pulley with a double-bearing polyamide roller for a 16 mm rope. It is used for scaffolding assembly (pulling scaffolding elements to higher levels) and for vertical transport of building materials to scaffolding. Permissible load 150 kg.



Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU1520	0,7 m x 20 m	7,5

Ø 16MM ROPE FOR THE BOOM

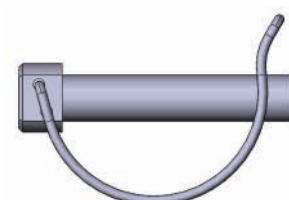
Braided PP rope made, equipped with a stainless-steel thimble for attaching a hitch or hook. It is used for scaffolding assembly (hoisting devices) and for vertical transport of building materials to scaffolding. High-strength rope; please note that the permissible load of the hoisting equipment is 150 kg.



Catalogue No.	Dimensions	Weight (kg)
SIGU1523	30 m	3,8
SIGU1525	50 m	6,5

FRAME COTTER PIN

Made of C45 steel bar (class 8.8), it has a spring to prevent accidental slipping out of the frame holes. It is used to connect frames vertically. Necessary especially on the last level of scaffolding to protect frames, guardrail posts, end frames, roofing posts against disconnection, as well as for hanging scaffolding, connecting girders, etc.



Corrosion protection: galvanized, electroplated

Catalogue No.	Dimensions	Weight (kg)
SIGU0490	12 x 75 mm	0,07

EYE BOLT WITH WALL PLUG

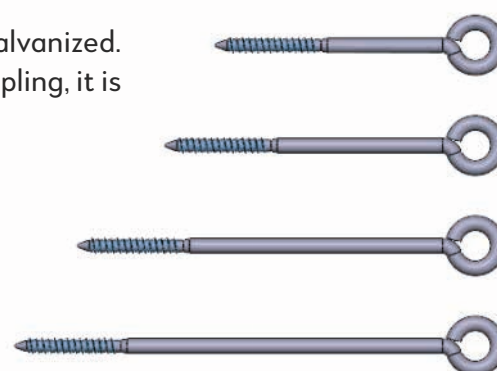
Steel bolt with welded eyelet, made of 12 mm diameter rod, electro-galvanized. Together with the wall plug as well as the anchor connector and cross coupling, it is used to anchor the scaffolding to the building wall.

Corrosion protection: galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0419	12 mm x 190 mm	0,23
SIGU0423	12 mm x 230 mm	0,26
SIGU0430	12 mm x 300 mm	0,32
SIGU0435	12 mm x 350 mm	0,38

Kołek rozporowy:

SIGU0405	14 mmx70 mm	0,01
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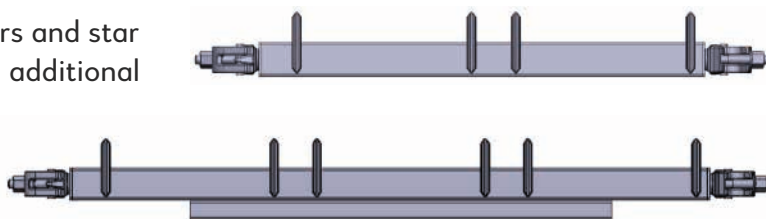


FRAME TRANSOM

The steel element, equipped with two half-connectors and star pins for attaching the decks, which is used to attach additional decks at any height of the frame.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1210	0,74 m	3,6
SIGP1211	1,10 m	5,9

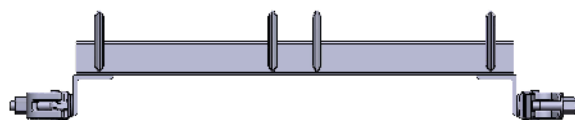


DECK TRANSOM

A steel element, equipped with two half-connectors and star pins for attaching the decks, which is used to make a wide working deck, connecting the frames in such a way that it is possible to obtain a wide deck in one plane with the decks arranged on adjacent frames.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGP1212	0,74 m	3,9



SAFETY DEVICE FOR TRANSOM DECKS

Made of half-connector and 40x5mm angle sheet with a pin for fixing the toe board. Used to secure decks laid on transoms, consoles in a situation where an additional toe board must be installed.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU1532	---	1,2



STEEL HOOK LADDER

Steel hook ladder, made of 40x20x2 and 20x20x2 steel profiles. It is used when access decks are not equipped with an integrated ladder and often on the first level to make it difficult for outsiders to climb the scaffolding.

Corrosion protection: hot-dip galvanizing

Catalogue No.	Dimensions	Weight (kg)
SIGU0800	2,15 m x 0,35 m	8,7





**TECHNICAL DOCUMENTATION
OF FRAME SCAFFOLDING
TYPE**

SIGMA 70P

DESIGN GUIDELINES

**Sales office
and production site:**
ul. Graniczna 1
05-555 Wólka Jezewska

Company Legal Details:
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Ul. Armii Krajowej 6/3,
98-200 Sieradz
NIP 827 210 66 04,

Contact details:
Tel. 508 759 759
biuro@sigma-bud.pl
www.sigma-bud.pl

1. DESIGN PRINCIPLES

1.1. Standard version

SIGMA 70P scaffolding in standard versions is specified in DTR. Only structures assembled in the configuration specified in the DTR and used as specified in the DTR can be considered as standard scaffolding.

1.2. Non-standard version

Any scaffolding designs that deviate from those described in the DTR should be treated as standard. In particular, the following scaffoldings should be treated as standard:

- less than 10 m long,
- higher than the maximum specified in the DTR,
- erected next to fully open or partially open walls with the contribution of openings greater than specified in the DTR,
- loaded above the nominal value of 2kN/m²,
- to which construction cranes or hoisting equipment with a lifting capacity of more than 150 kg are attached,
- in which more than one deck in a given bay is loaded,
- with transom frames, gantry girders and protective canopies,
- of a structure other than that specified in the DTR

1.3. Deviations from standard

If scaffolding elements of the SIGMA 70P system are used to erect scaffolding that deviate from the standard design, these deviations must be assessed in accordance with the technical regulations applicable to scaffolding, general construction regulations and the provisions of this annex. The assessment of deviations must be carried out by a competent and authorized person, under his/her sole responsibility.

During the assessment, particular attention should be paid to possible deviations in the following areas:

- anchorage spacing,
- protective mesh and tarpaulins used to cover the scaffolding,
- hoisting equipment structurally connected with scaffolding,
- distance of the scaffolding from the wall of the building.

2. ASSESSMENT

2.1. General Provisions

The basis for the assessment of the capacity and stability of scaffoldings made with the use of elements specified in the DTR are static calculations for standard scaffoldings or separate calculations for non-standard scaffoldings.

For standard scaffoldings assembled and used in accordance with the DTR, the load-bearing capacity and stability parameters have been proved and no additional static calculations of the scaffolding structure are necessary.

2.2. Calculation assumptions

2.2.1 Load-bearing capacity of SIGMA 70P scaffolding decks

All wooden/aluminum-plywood decks with a maximum length of 3.0 m have a load capacity suitable for carrying the working loads specified for scaffoldings with a load group less than or equal to 3 according to PN-EN 12811-1.

The load-bearing capacity of steel decks by length of the decks is specified in Tab 1.

Table 1. Load-bearing capacity of 1.25 mm thick sheet steel decks; HC260LA grade steel

Platform length	Load capacity group according to PN-EN 12811-1					
	1	2	3	4	5	6
0.66 m	•	•	•	•	•	•
1.016 m	•	•	•	•	•	•
1.5 m	•	•	•	•	•	•
2 m	•	•	•	•	•	•
2.5 m	•	•	•	•	X	X
3.0 m	•	•	•	X	X	X

• - permissible use

X - impermissible use

2.2.2 Resilient support for uprights of the SIGMA 70P scaffolding system

For static calculations, it should be assumed that the decks stiffen the scaffolding structure at the storey. The values of stiffness and load capacity of bridging systems determined experimentally in accordance with PN-EN 12810-2 are included in Table 2. These values should be referred to the two scaffolding bays.

Table 2. Stiffness and Load-Bearing Capacity of Bracing Systems

Specification	R_{dop} [kN]	R_d [kN]	R_k [kN]	Limit force F_g [kN]	Design rigidity		f_0 [mm]
					c_1 [kN/cm] in the range $<0; F_g >$	c_2 [kN/cm] in the range $<F_g; R_d >$	
Steel decks 3.0m – parallel direction	6,15	9,23	10,5	0.8	–	8.5	10,7
Steel decks 3.0m – perpendicular direction	2,54	3,80	4,19	–	–	2.6	46,8
Wooden decks 3.0m - parallel direction	7,61	11,41	12,55	–	0.9	5.4	–
Wooden decks 3.0m - perpendicular direction	2,33	3,49	3,84	–	–	1.0	43,9

Notes:

R_{dop} – permissible load

R_d – design load capacity

R_k – characteristic load capacity

2.2.3 Material characteristics

Detailed information on materials and geometric dimensions can be found in the construction drawings of the elements available from the manufacturer.

2.2.4 Welded joints

Welded joints must be verified considering the standard yield strength of the material of the individual components..

2.2.5 Average values of screw jack bolts

For the evaluation of stress and calculation of base deformations, the following equivalent mean values for the cross-section of the screw jack must be assumed:

$$\begin{aligned} A = A_S &= 3.89 \text{ cm}^2 \\ W_{el} &= 2.83 \text{ cm}^3 \\ W_{pl} &= 1,25 \times 2.83 = 3,54 \text{ cm}^3 \end{aligned}$$

2.2.6 Couplings

Cross and swivel couplings can be used in accordance with the requirements of PN-EN 74-1. Half-connectors used in various scaffolding elements can be used in accordance with the requirements specified in the PN-EN 74-1 standard for swivel fasteners.

2.2.7 Calculations for scaffolding structures

The calculation model of the structure should reflect all relevant parameters and factors influencing the behaviour of the structure in the considered limit state, i.e.: loads and acting forces, material properties, geometric features and stiffness (rigidity) of elements and supports.

In the calculation of wall anchored scaffolding, flat calculation models in the perpendicular and parallel directions to the wall should be considered if the spatial model is not considered.

The following requirements should be considered in the design and calculation of wall anchored scaffolding:

- § Scaffolding anchoring must transmit horizontal forces perpendicular and parallel to the facade,
- § Anchoring must not carry vertical loads,
- § The calculations should consider the slack and inclination at the joints of the uprights and the scaffolding steel screw jacks.

The basis for the assessment of the use of the bearing capacity of individual bar cross-sections in the considered calculation model is the bearing capacity criteria specified in the subject standards.

SCAFFOLDING ACCEPTANCE PROTOCOL

1. Protocol Registration No.:
2. Scaffolding acceptance date:
3. Scaffolding contractor:
4. Scaffolding user/scaffolding contractor:
.....
.....
5. Location of the scaffolding and its dimensions (height, length, area, length and type of decks):
.....
.....
.....
6. Scaffolding type:
7. Permissible load of:
 - working decks:
 - scaffolding construction:
8. The contractor has provided the user with the following acceptance documents:
 - User manual
 - Technical & engineering documentation
 - Other

9. Statement:

The Contractor declares that the scaffolding described in this protocol is complete, has been assembled in accordance with the state-of-art, DTR and assembly instructions issued by the manufacturer and in accordance with health and safety requirements. The installation was carried out by authorised fitters (Regulation of the Minister of Economy of 20 September 2001 Journal of Laws No. 118 of 15 October 2001, item 1263). The acceptance committee concludes that the scaffolding is fit for operation without objections.

10. Composition of the committee accepting the scaffolding:

- – Site Manager
 - – Installation Contractor
 - – Scaffold user
 - – Scaffold user
- | | |
|------------------|-----------|
| Name and Surname | Signature |
|------------------|-----------|

Note:

Any interference with the scaffolding structure, dismantling of components, etc., is unacceptable. without the consent of the fitter. Modifications in the scaffolding structure can only be made by a person licenced to assemble/disassemble metal scaffolding, appointed by the scaffolding installation contractor. Upon modification, the scaffolding must be reappraised the site manager (authorised person).

