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ALU EURO+ scaffoldings

Operation and Maintenance Documentation [assembly Instructions]



Żabokliki, 2020

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1. CHARACTERISTICS OF THE SCAFFOLDING

The ALU EURO + frame scaffolding is manufactured by OLAN Sp. z o.o. from high-strength AW6082 aluminium. The system consists of basic components, such as bases, frames, guard rails, bracing, platforms, and toeboards. The system also includes many supplementary components that facilitate its use.

The distance between the different levels of the scaffolding is determined by the frames which are 2.00 m high and 0.73 m or 1.09 m wide. The system field lengths are equal to, respectively: 0.73 m, 1.09 m, 1.57 m, 2.07 m, 2.57 m, and 3.07 m.

The load capacity of a scaffolding depends on its dimensions and on the length of the platforms used for scaffolding assembly, and can range from 2 to 6 kN/m² (load classes according to PN-EN 12811-1:2007).

The load-bearing components of the scaffolding are platforms, frames, and bases, and diagonal and transverse bracing is used to stiffen the scaffolding. The components of the safety system in the ALU EURO + façade scaffolding are double guard rails, front guard rails, and side boards, which make it possible to build a safe scaffolding set if the assembly guidelines given in the instructions are followed.

These scaffoldings are used as working scaffoldings, protective scaffoldings, or a support structure for roof structures (e.g. for the COVER DB 750 and DB 500 roofing systems) that are manufactured and offered in OLAN Sp. z o.o. and are widely used as a temporary protection in difficult weather conditions.

Users may go beyond the guidelines and set-up models presented in these instructions, but must use individual designs and static calculations.

The useful load of a single bay of the ALU EURO+ scaffolding is:

- 2.0 kN/m² for the width of 0.73 m

The indispensable components of the system in the design of the scaffolding are working platforms, which are made of aluminium or steel and allow free movement of users and possible transport of materials. Depending on the platforms used, the useful load of these components is the following;

- aluminium platforms (2.5 mm thick sheet)

- 6 kN/m² for a 0.73 m bay
- 6 kN/m² for a 1.09 m bay
- 6 kN/m² for a 1.57 m bay
- 4.5 kN/m² for a 2.07 m bay
- 3 kN/m² for a 2.57 m bay
- 2 kN/m² for a 3.07 m bay

- steel platforms

- 6.0 kN/m² for a 0.73 m bay
- 6.0 kN/m² for a 1.09 m bay
- 6.0 kN/m² for a 1.57 m bay
- 6.0 kN/m² for a 2.07 m bay
- 4.5 kN/m² for a 2.57 m bay
- 3.0 kN/m² for a 3.07 m bay

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- aluminium-plywood platforms

- 2.0 kN/m² for a 2.57 m bay
- 2.0 kN/m² for a 3.07 m bay

2. LIST OF STANDARDS AND REGULATIONS APPLICABLE TO THE SCAFFOLDING.

When designing, assembling, disassembling, and using the ALU EURO+ scaffolding, one must follow the rules and requirements set forth in:

- the Regulation of the Minister of Labour, and Social Policy of 26 August 2003 on general occupation health and safety regulations (Journal of Laws no. 169/03, item 1650);
- the Regulation of the Minister of Economy, Labour, and Social Policy of 20 October 2002 (Journal of Laws no. 191/02, item 1596).
- these instructions.
- the Regulation of the Minister of Infrastructure of 6 February 2003 on the occupational safety and health during performance of construction works (Journal of Laws no. 47/03, item 401).
- the Announcement of the Minister of Economy, Labour, and Social Policy on the publication of the consolidated text of the Regulation of the Minister of Labour and Social Policy on the general occupational safety and health regulations (Journal of Laws no. 169/03, item 1650).
- PN-M-47900-1:1996 'Metal standing working scaffoldings. Definitions, division, and main parameters.'
- PN-M-47900-2:1996 'Metal standing working scaffoldings. Pole scaffoldings made of pipes.'
- PN-M-47900-3:1996 'Metal standing working scaffoldings. Frame scaffoldings.'
- PN-EN 12811-1:2007 'Temporary structures used at construction sites. Scaffoldings. Conditions for construction and general design principles.'
- PN-EN 12810-1:2010 'Façade scaffoldings made of prefabricated components. Technical specifications of the products.'
- PN-EN 12810-2:2010 'Facade scaffoldings made of prefabricated components. Specific methods of design and construction.'
- PN-EN 74:2002 'Couplings, centring pins, and feet used in working and supporting scaffoldings made of steel pipes. Requirements and test methods.'
- PN-EN 39: 2003 'Steel tubes for scaffolding - Technical delivery conditions.'

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3. GENERAL PRINCIPLES OF SCAFFOLDING ASSEMBLY

1. Become familiar with the assembly instructions, the occupational health and safety regulations, and the generally applicable standards related to the assembly of the scaffolding.
2. Before starting to assemble the scaffolding, it is necessary to check the ground, which should be able to transfer the loads from the scaffolding structure and the vertical forces present on the scaffolding. The load bearing capacity of the ground on which the scaffolding is assembled must not be lower than 0.1 MPa. The load bearing capacity of the ground should be determined in accordance with PN-81/B-03020. In case of construction grounds and when the ground is reinforced, the foundation of the scaffolding should meet the requirements of PN-M-47900-2, sec. 4.4.
3. Prepare the necessary tools needed to set up and properly level the scaffolding structure, e.g.:
 - a 500 g hammer;
 - a spirit level;
 - a 19/22 wrench.
4. Place wooden blocks on the ground perpendicular to the walls and spaced according to the planned future sections of the scaffolding to protect the structure against ground subsidence.
5. Place at least 2 adjustable bases on the wood blocks with screw lengths allowing the post pipe to be inserted at least 150 mm deep.
6. The scaffolding may be assembled only by a person who has the appropriate qualifications and is familiar with the assembly and use instructions for the given type of scaffolding. Persons working on an assembled and commissioned scaffolding do not need to have the above-mentioned qualifications. The user is responsible for the use of a scaffolding that has been handed over.

The basic technical and operational data of ALU EURO+ façade scaffolding in a typical setting is the following:

- *useful load - within the range of 2 kN/m² (load class 3 according to PN-EN 12811-1:2007);*
- *number of platforms loaded simultaneously - one scaffolding platform in a given vertical segment of the scaffolding;*
- *bay width: 0.73 m;*
- *bay lengths: 0.73 m, 1.09 m, 1.57 m, 2.07 m, 2.57 m, and 3.07 m;*
- *scaffolding height (the height of the highest working platform): 24.0 m + 0.2 m;*
- *maximum distance of the inner edge of a platform from the wall: 0.2 m;*
- *minimum number of bracings on each level: 2.*

The most common scaffolding set-ups are shown in Chapter 3.

These include installation of protective canopies and walkways under the scaffolding, installation of a transport boom and protective nets and tarpaulins.

For assembly, only original, undamaged components that are part of the ALU EURO+ façade scaffolding system may be used.

Component evaluation criteria

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Components with visible signs of damage must not be used. In particular, it shall not be permitted to use:

- components with traces of corrosion in areas of connections (welds) between components;
- load-bearing posts with visible damage in the form of tube bending and cross-section deformation;
- steel platforms with damaged decking or damaged and bent catches;
- aluminium-plywood platforms with damage to plywood decking in the form of delamination, cracks, swelling, chipped off parts, and bent bearing beams of the platforms; and
- screw bases with damaged threads, bent pins, or nuts that are difficult to turn.

Damaged components should be replaced with defect-free ones, and components damaged to the extent that they can be repaired should be repaired. Straightening of components is allowed only if there is no deformation of the cross-section.

It is forbidden to repair load-bearing components of the structure, i.e. racks, braces, and bases.

7. Level the base level of the scaffolding correctly with a spirit level and a hammer.
8. The scaffolding should be set in such a way that the distance between the scaffolding structure and the building's façade does not exceed 0.2 m. If the distance from the building exceeds 0.2 m, additional guard rails and longitudinal toeboards should be installed on the internal side to protect the working platform.
9. The pin of the adjustable base should enter the frame tube to the depth of at least 150 mm.
10. During installation, it is recommended to secure the frames with RFS-00011 safety pins.
11. When loading the scaffolding platforms, the following principles must be observed:
 - *the load on the platform should be distributed evenly over its entire surface;*
 - *80 kg (0.8 kN) must be counted for each person working on the scaffolding;*
 - *for the purpose of structural analysis, the weight of items delivered by an elevator must be increased by 20%;*
 - *it is forbidden to put dynamic loads on the platform, e.g. by jumping, throwing weights, etc.;*
 - *platforms fixed on brackets (consoles) must be of the same load class as the platforms of the basic scaffolding.*
12. Bracing of a wall-mounted scaffolding is done in the outer plane of the scaffolding that is parallel to the wall, using large-plane or tower bracing.
13. The extreme ends of the platforms should be secured with face guard rails and toeboards.
14. The scaffolding should be equipped with circulation risers. The risers should be made at the same time as the scaffolding structure is erected. The distance between the circulation risers must not exceed 40 m. The distance of the workstation furthest away from the circulation riser must not exceed 20 m.
15. In the bay where the passage platforms with a trapdoor are installed, the girder of the initial stairs should be mounted under the frame on bases, and then a plywood platform should be mounted on it, on which the ladder will rest.
16. All connections of the scaffolding's tubular components must be done with normal or pivot joints according to PN-EN 74:2002. The joint screws must be tightened with the torque of 50 Nm.
17. Steel platforms should be laid so that the gap between two platform components at one level does not exceed 10 mm.

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not exceed 25 mm. When brackets are installed to widen the working platforms, a gap is created which must be filled with wood.

18. It is allowed to widen scaffolding platforms with the use of brackets and frames supported by vertical braces. Platforms may be widened on the external side of the scaffolding on its last level or on any level provided that the level with the widening installed and one level above and one level below it are anchored to the wall. For the working area increased with the 0.36 m bracket on the inner side of the façade scaffolding, the distance of the inner frame stand from the wall is increased to 0.56 m.
19. The rules of façade set-up presented in these instructions apply to scaffoldings with the maximum height of 24.2 m and installation length of more than 10 m.
20. To protect people from objects falling from the scaffolding, protective nets or tarpaulins are used.
21. The scaffolding can be used in all wind load zones according to PN-77/B-02011. For scaffoldings to be used in wind load zone III and in locations more than 1,500 m above the sea level, additional static wind load calculations are required.
22. If the scaffolding is anchored, the anchoring must be done as the assembly progresses. The natural anchor point is the window of the gusset plate. It is permissible to fix the anchor bolts 30 cm below and above the gusset plate window.
23. The scaffolding may be disassembled after completion of the works performed from it and removal of all tools and materials from the working platforms. Partial disassembly from the top is permitted as work progresses. When disassembling the scaffolding, it is not permitted to drop items from a height. After the disassembly, all scaffolding components should be cleaned, inspected, and segregated into those suitable for continued use, those requiring repair, and those requiring replacement.
24. If the scaffolding is anchored, the anchoring must be dismantled simultaneously with the disassembly of the scaffolding structure. It is prohibited to dismantle more than one anchor level below the disassembled scaffolding level.
25. Storage and transport of scaffolding components should be performed in accordance with the provisions of PN-M-47900-2:1996 "Standing metal working scaffoldings. Pole scaffoldings made of pipes".
26. Working hired to assemble and disassemble the scaffolding should be trained and properly qualified.
27. During assembly and disassembly, personal protective equipment should be used.
28. When assembling and disassembling the scaffolding, a danger zone must be designated and secured by marking and fencing it with railings at least 1,5 m high. The danger zone cannot be less than 1/10th of the scaffolding height and not less than 6 m according to PN-M-47900-2:1996, section 4.10.4. In dense urban areas, the danger zone may be reduced if other safeguards are provided. Assembly, use, and disassembly of the scaffolding is prohibited:
 - *at dusk, if no lighting is provided to ensure good visibility;*
 - *during dense fog, rain, snow, or black ice;*
 - *during a storm or at wind speeds in excess of 10 m/s.*
29. The area where a scaffolding is being assembled and disassembled must be marked by placing warning boards in visible places, at the height of up to 2.5 m from the ground level. The inscriptions on the boards must be visible from the distance of at least 10 m.
30. Scaffoldings located directly by traffic routes should have protective canopies in accordance with §22 of the Regulation of the Minister of Infrastructure of 6 February 2003, Journal of Laws no. 47, item 401.
31. Frames located at gates, clearances, and passageways through which vehicle traffic passes should be protected with barriers (bumpers) not connected to the scaffolding structure.
32. If a passageway is closed or obstructed during assembly of a scaffolding (with the permission of the relevant local authority), a barrier and a red shield with a warning sign that the passageway has been closed or obstructed must be put in place at the passageway, and a red light must be installed on the barrier at night.
33. It is not permissible to assemble, disassemble, or use a scaffolding in the vicinity of overhead electric lines if the distance of the scaffolding from the extreme wires of the electric line is less than:

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- 3 m - for lines with nominal voltage not exceeding 1 kV;
- 5 m — for lines with nominal voltage exceeding 1 kV and not exceeding 15 kV;
- 10 m — for lines with nominal voltage exceeding 15 kV and not exceeding 30 kV;
- 15 m — for lines with nominal voltage exceeding 30 kV and not exceeding 110 kV;
- 30 m — for lines with nominal voltage not exceeding 110 kV.

When assembling and disassembling a scaffolding under overhead electric networks or at distances smaller than those specified above, the voltage must be switched off for the duration of the assembly work.

34. The scaffolding structure should be equipped with lightning protection devices in accordance with PN-M-47900-2:1996. 'Standing metal working scaffolding. Pole scaffoldings made of pipes'.
35. Scaffoldings may only be used after they have been accepted by a technical supervisor or an authorised person. During the acceptance inspection, the scaffolding should be examined in accordance with section 7.3. of PN-M-47900-2:1996. Scaffolding acceptance should be confirmed with a report.
36. An information board must be placed on a scaffolding with information on the permissible load of the platforms. It is forbidden to load the scaffolding decks with materials beyond its load bearing capacity and for workers to gather on the platforms.
37. Scaffoldings can be equipped with a device for transporting material on booms attached to the scaffolding structure. The booms can be made of pipes attached with connectors to the scaffolding. A standard boom and a block offered by the manufacturer may be used. The maximum weight of materials to be lifted must not exceed 150 kg. When using lifts with higher lifting capacities and attached to scaffolding, a static calculation for the scaffolding must be carried out. The transport boom must be additionally anchored in at least two points. The distance between the booms should not exceed 30 m. The distance of the collective axis from the furthest point of the scaffolding in the lifting plane should not exceed 0.5 m. The height from the attachment point of the block to the platform level should not be less than 1.6 m. For vertical transport, it is recommended to use winches with accessories suitable for mounting on the scaffolding. These devices should have an approval certificate issued by the Office of Technical Inspection (UDT). Installation of winches must be performed strictly in accordance with the winch manufacturer's instructions.
38. Each time before using the scaffolding, one must make sure that the structure is still correct and complete and that there are no environmental changes affecting safe use. In particular, one must check whether the foundation has been disturbed. The check should be carried out by the foreman using the scaffolding.
39. Scaffoldings should be inspected after strong winds, heavy precipitation, hail, lightning, and other similar hazardous phenomena and after work breaks longer than 10 days, but at least once a month. During the inspections, the following must be checked:
 - the condition of the ground on which the scaffolding is placed;
 - the condition of protection (guard rails, toe boards);
 - the condition of the platforms (gaps between the platforms, damage, how the platforms are loaded), the passageways (fixing of ladders, correct opening and closing of trapdoors);
 - the way the upper platforms and platforms on brackets are secured against falling out;
 - the condition of the pivot joints;
 - the strength of the anchors;
 - the condition of winches and the support structure;
 - the condition of the lightning protection system.

The inspection should be performed by the site manager or other person authorized to do it. A note should be made from each inspection, or an entry should be made in the construction site log.
40. During winter, snow must be removed from the scaffolding before work starts.

4. SCAFFOLDING ASSEMBLY

ASSEMBLY OF THE BASIC COMPONENTS OF THE ALU EURO+ FACADE SCAFFOLDING SYSTEM (PARTIAL EXAMPLES).

CONNECTING NODES FOR THE ALU EURO+ FAÇADE SCAFFOLDINGS

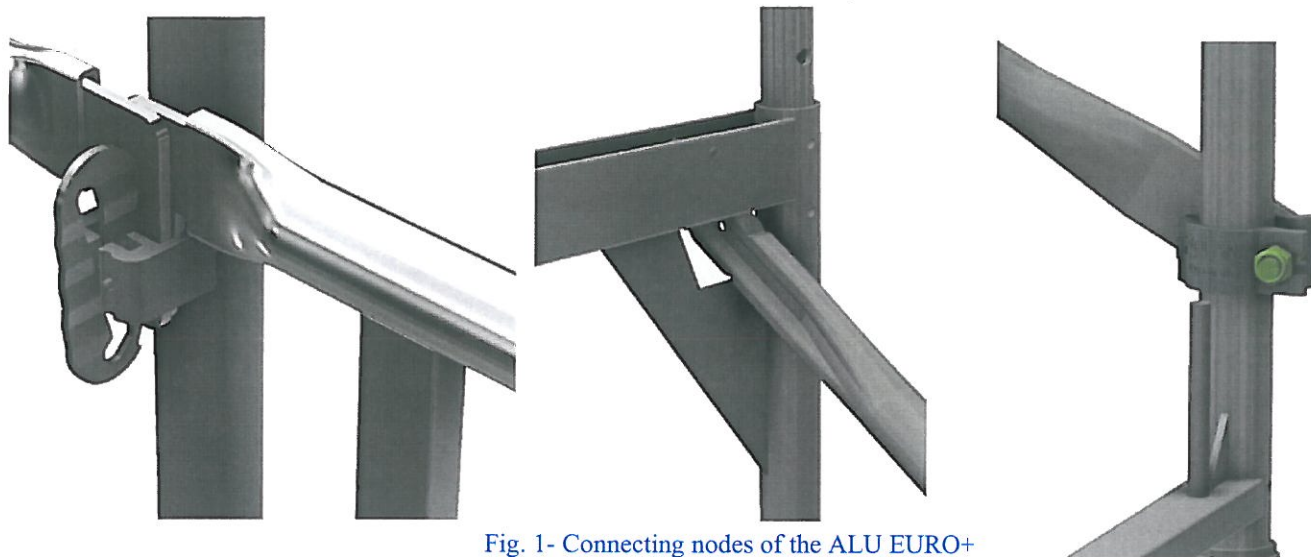


Fig. 1- Connecting nodes of the ALU EURO+

The ALU EURO + façade scaffolding has three typical assembly nodes:

- A cassette in the façade frame for assembly of guard rails that provide the stiffening and protection function. The components are assembled by inserting the guard rail into the cassette and then driving in a wedge of the cassette of the Alu Euro + frame with a 500 g hammer.
- A window between the gusset plate, the U profile, and the dia. 48.3 mm vertical tube used to assemble diagonal braces of the scaffolding with a connector on the other side, which is screwed to the dia. 48.3 mm tube of the façade frame.
- A dia. 12.5 mm opening in the connecting bottle of the façade frame and in the dia. 48.3 mm external pipe, which makes it possible to secure the assembled frames against becoming disconnected using the RFS-00011 safety pin.

ASSEMBLY TIPS FOR INCREASED SAFETY OF USE.

During assembly, disassembly, and use of the scaffolding, it is mandatory to use personal protective equipment.

For increased safety of use, below are examples of where to attach these protective devices.

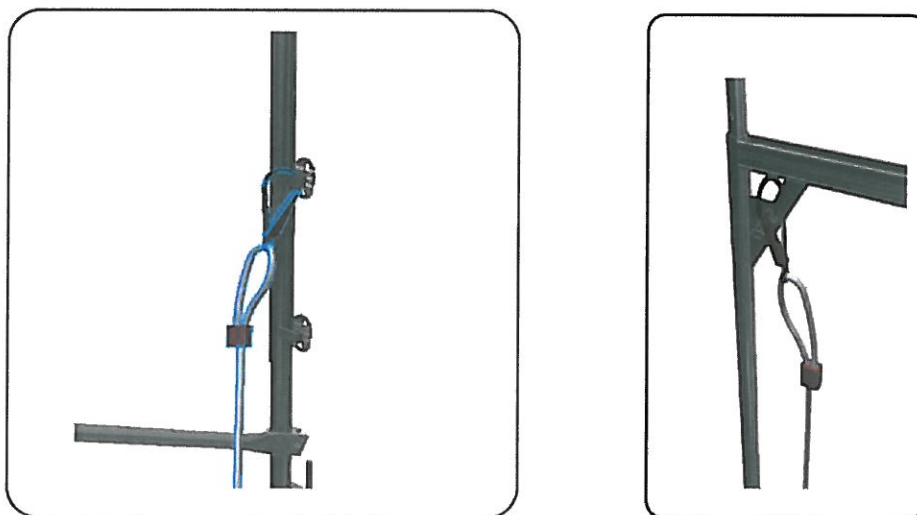
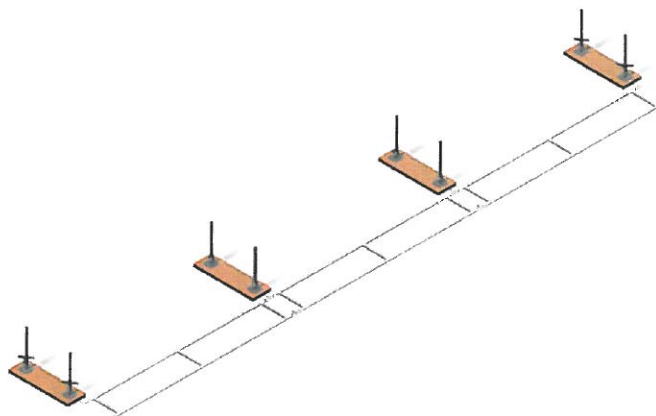


Fig. 2 - Place of attachment of personal protective equipment.

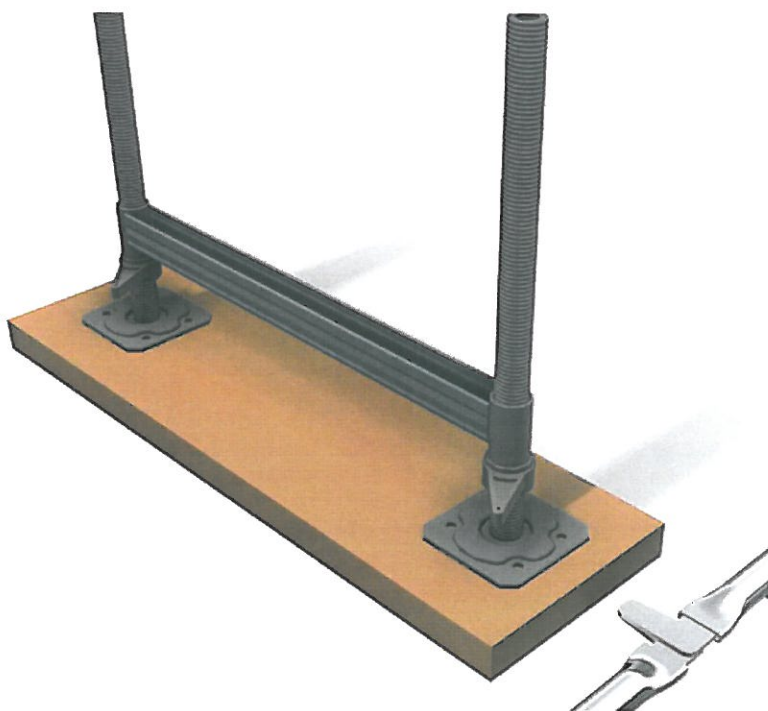
When erecting the scaffolding, the individual safety line must be attached to the scaffolding components. Attach the line to the gusset plates on frames above the level on which the person is standing. This also applies to the fixing cassettes. If the frames of the level being assembled are not connected to each other with guard rails, attach the safety lines to the wedge cassette at a height of 1 m. It is permitted to attach them to components on the level on which the person is standing only if there is no other possibility. There are also ways to attach personal protective equipment directly to the structure with the scaffolding assembled. The way of installing the protection is different for each individual structure.

ALU EURO+ FACADE SCAFFOLDING ASSEMBLY METHOD

1. Scaffolding assembly should begin by placing wooden shims under the adjustable bases [min. 2 bases on one shim] at the highest point of the ground at a distance corresponding to the future position of the posts. The future spacing can be measured on the ground using the double guard rails of the scaffolding.



2. Place on the adjustable bases the U-bolt of the initial stairs in the circulation bay of the scaffolding.



3. In the planned circulation bay of the scaffolding, install on the U-bars of the initial stairs a

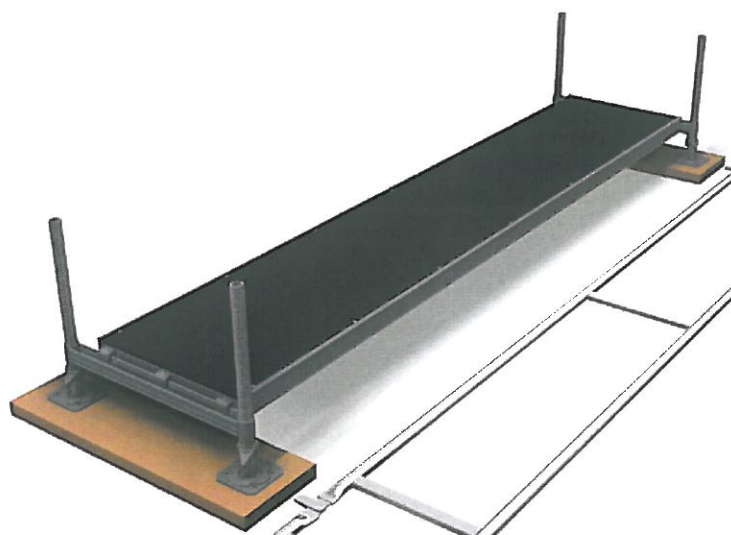
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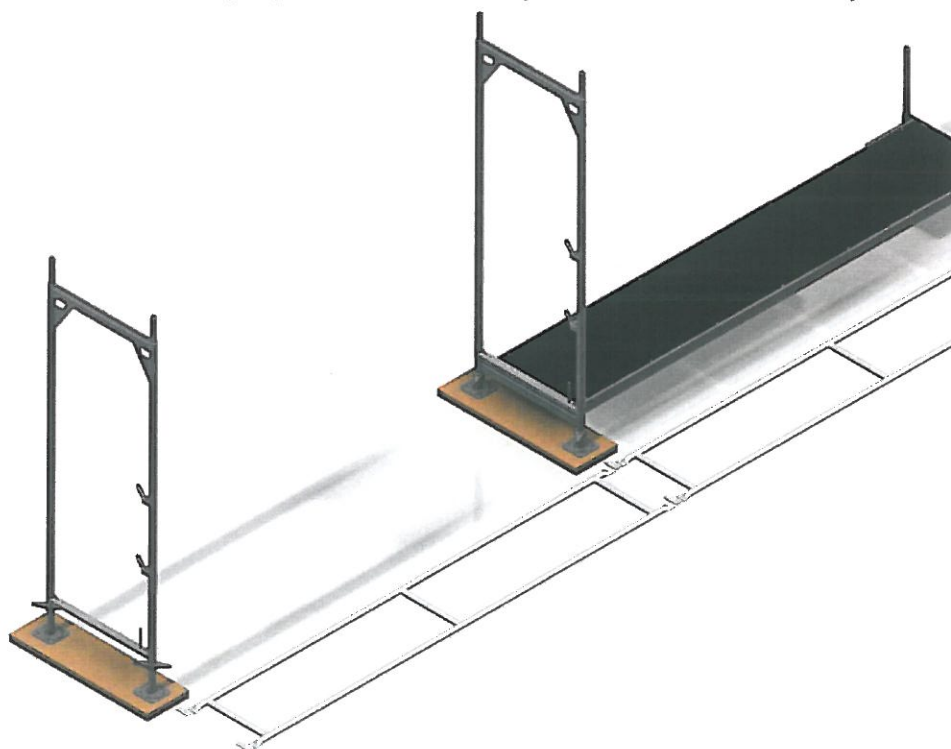
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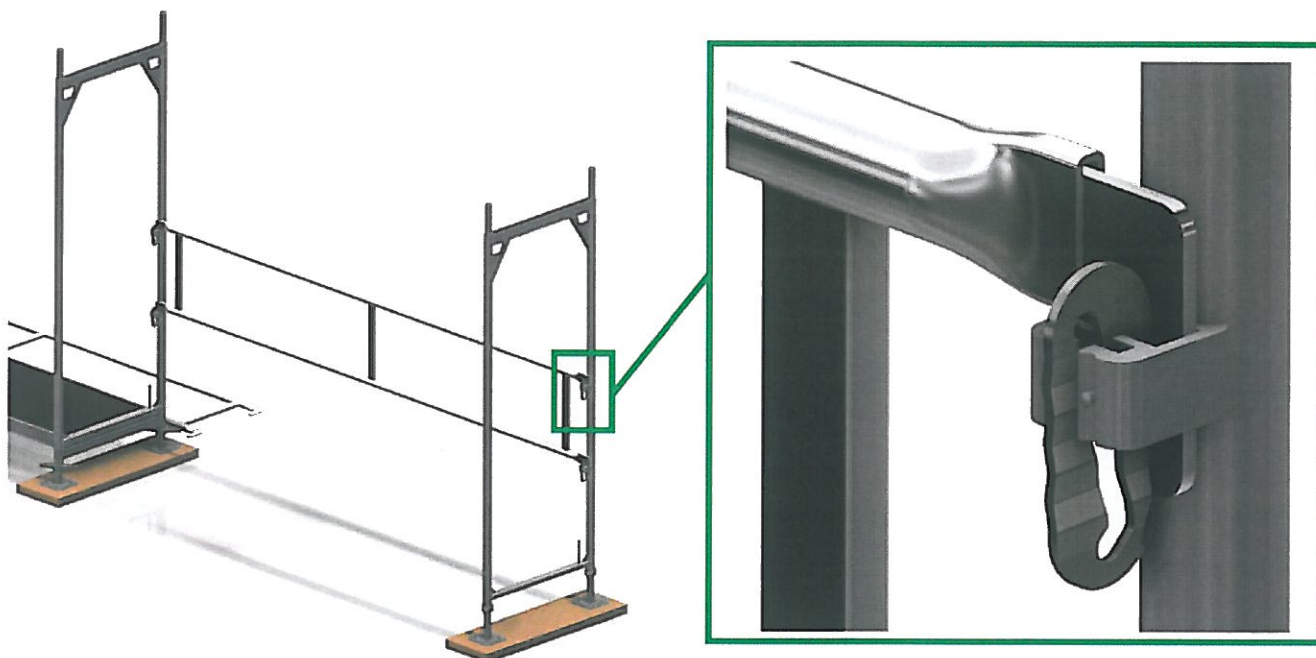
plywood platform on which the ladder will be supported.



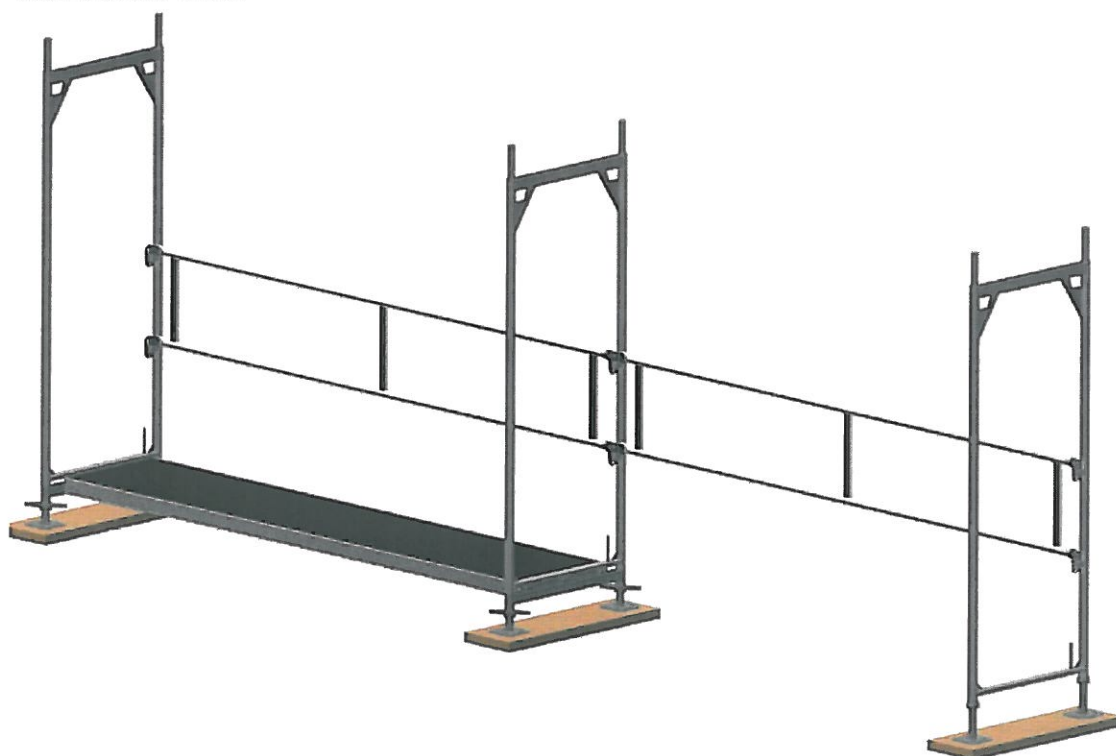
4. Place the scaffolding façade frames on the adjustable bases in the first bay.



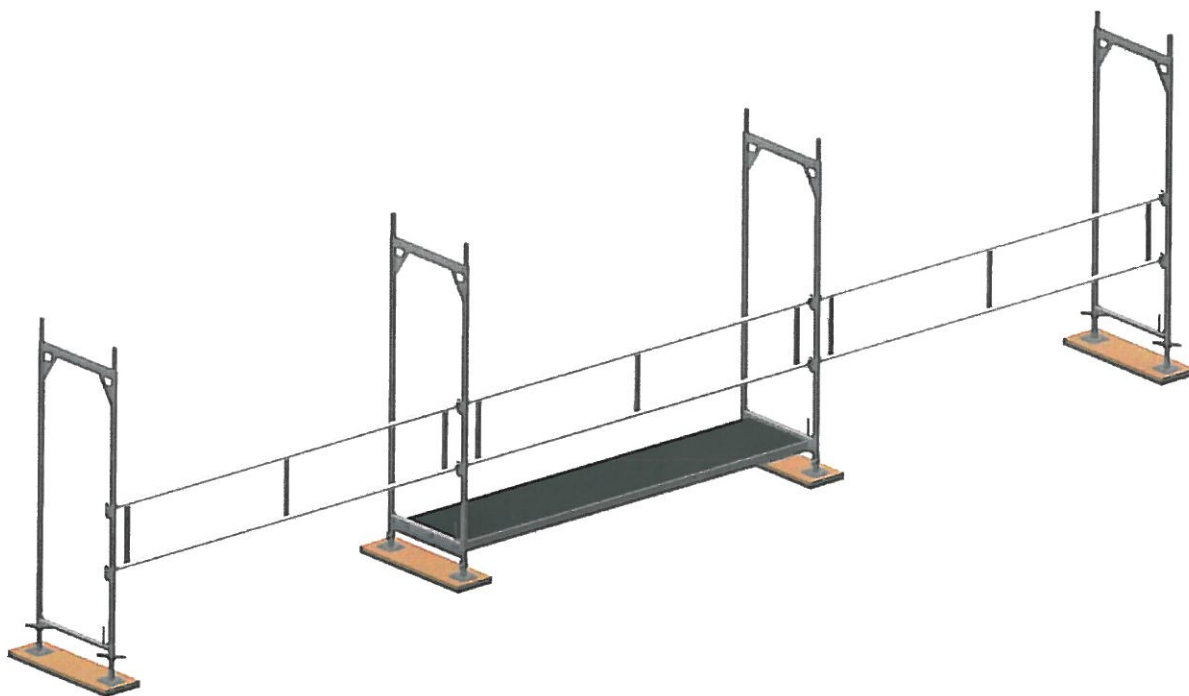
5. Connect the façade frames to each other using the double guard rails, which are assembled by inserting the ends of the guard rails into the façade frame cassettes, and then adjust the scaffolding level with the spirit level placed on the upper edge of the guard rail and by adjusting the nuts in the adjustable bases. After making sure that the scaffolding has been initially levelled, drive the wedge with a 500 g hammer, thus securing the guard rails against separating.



6. Continue the assembly of frames and guard rails from the bay thus assembled. After placing the frame on the adjustable bases adjacent to the bay, a double guard rail should be mounted directly to the previously assembled bay and to the added scaffolding frame - check the horizontal position of the guard rail in each bay and, if necessary, adjust the position of the frames by means of the nuts on the screw bases.



7. Continue assembling the scaffolding frames and the double guard rails bay by bay until the full length of the scaffolding has been completed, checking the horizontal position of the guard rails in each bay and adjusting the position of the frames with the nuts of the screw bases if necessary.



8. Place two 0.32 m platforms on the U profile in the prepared bay in the façade frame. Align the frames by checking their position with a spirit level.

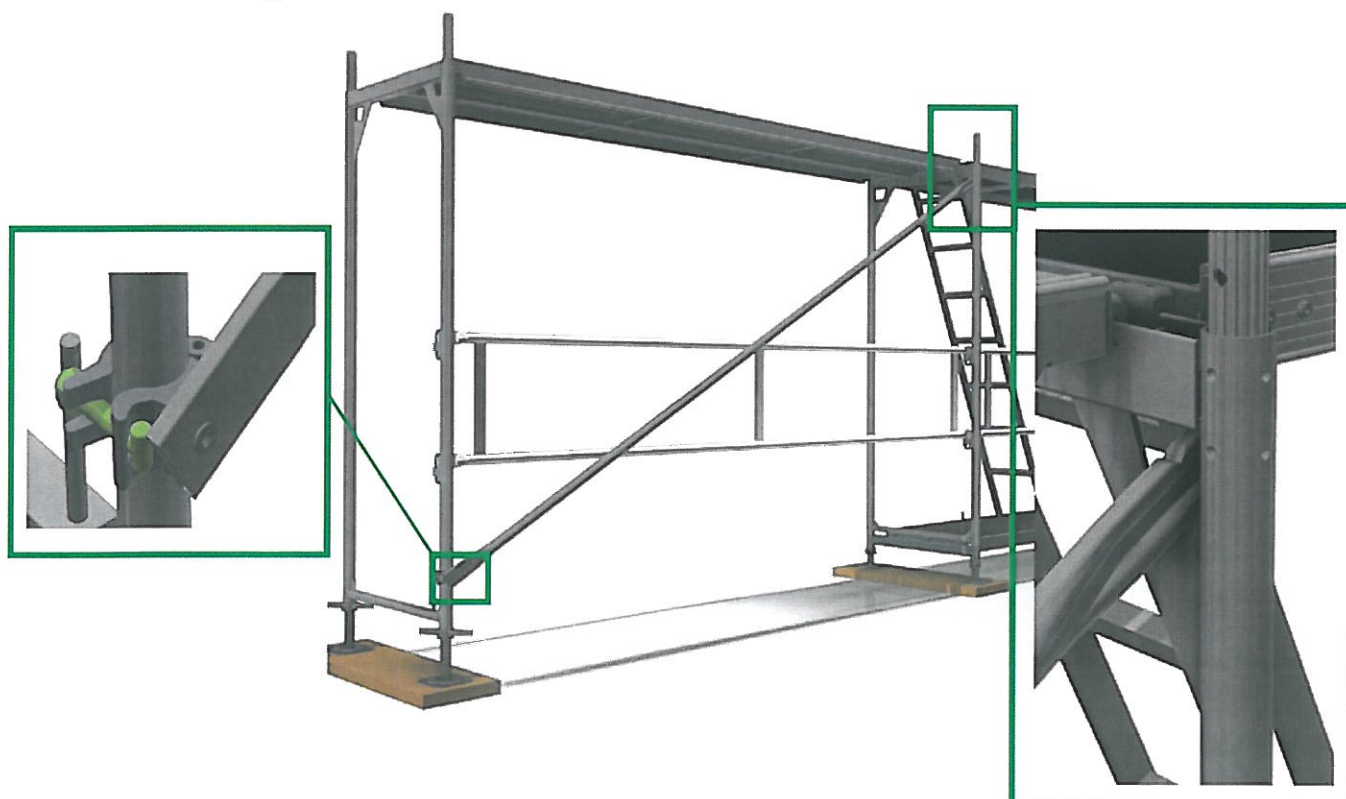


9. Then, starting from the bay thus assembled, continue the assembly of the first level by placing working platforms in the remaining bays of the scaffolding. Remember to use in the circulation path an aluminium walkway platform with a ladder.



10. Fix a brace to the scaffolding by inserting the profiled end into the hole between the gusset plate, the U profile, and the tube, and fasten the other end with a connector to the 48.3 mm tube of the façade frame.

Note: the brace must be located in front of the guard rail when viewed from the outside of the scaffolding.



12. In bays where there are no platforms, the frames should be connected using horizontal bracing.

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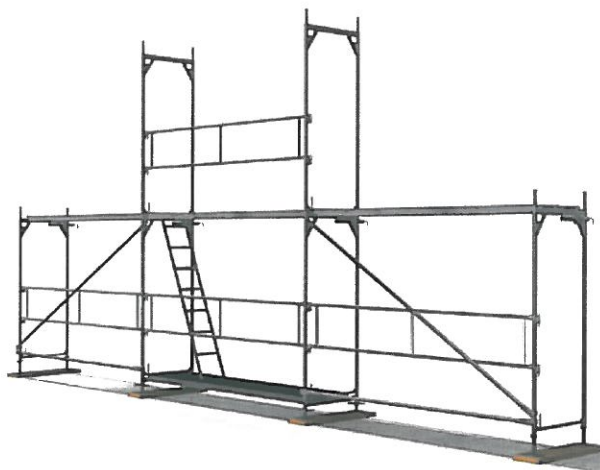
13. After the first level of the scaffolding has been completed, its correct assembly (levelling, use of all required components, and correct installation of guard rails] must be checked. Below is a view of the first level of the scaffolding.



14. Anchor the scaffolding to the wall according to principles described in the 'General principles of scaffolding assembly' section.

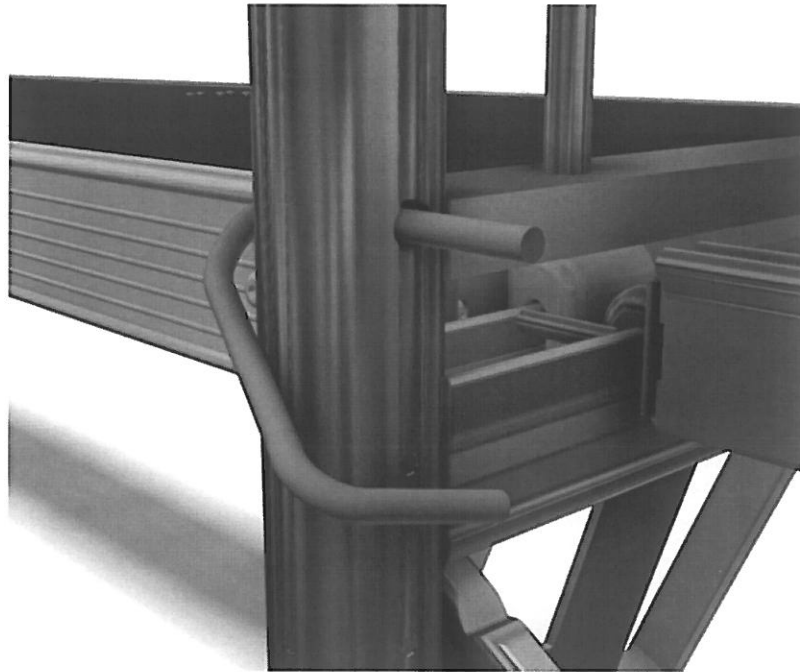


15. It is advisable to start the assembly of the next level by installing frames and guard rails in the circulation riser while being equipped with personal fall protection equipment.

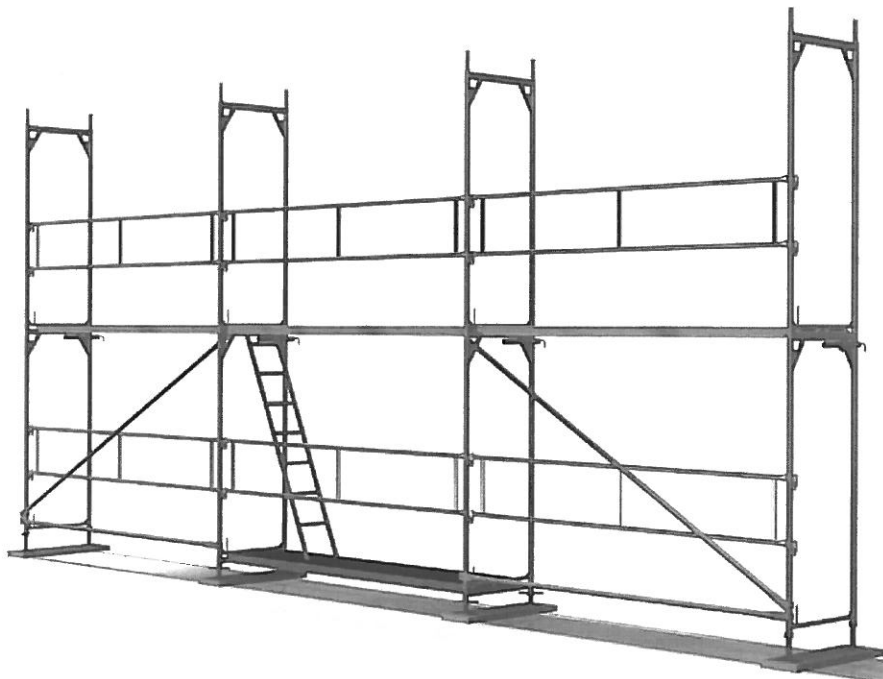


16. Secure the Alu Euro+ system façade frames against separation with the RFS-00011 safety pin.

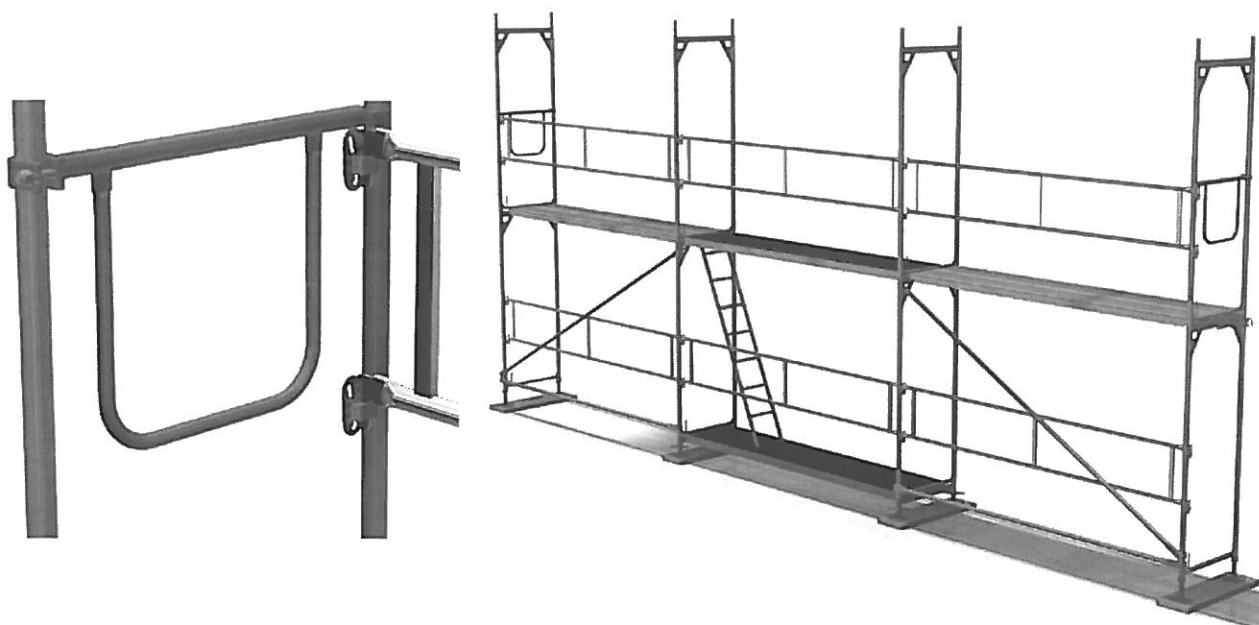
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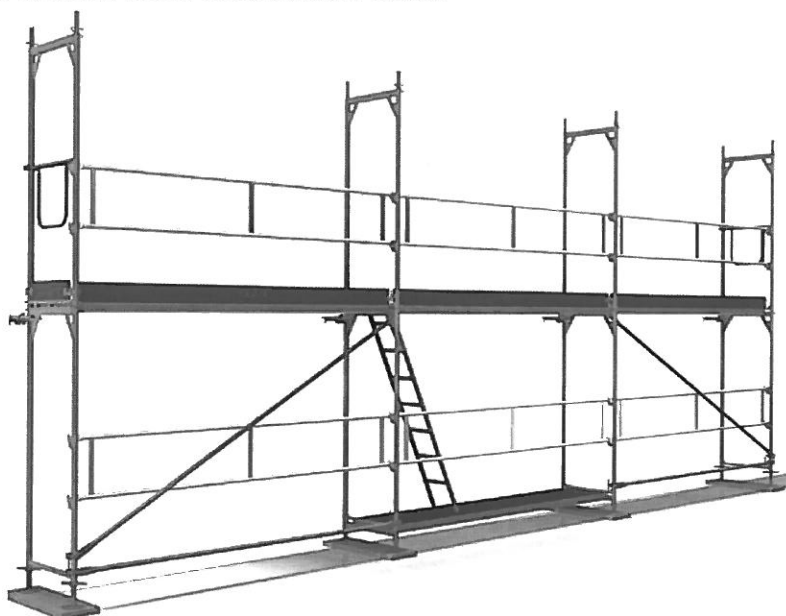
17. Starting from the circulation riser, assemble the double guard rails and scaffolding frames in both directions following the same procedure as in items 5, 6, and 7 above. The double guard rails stiffen the scaffolding but most of all they protect workers against falling from the working platforms.
Note: Remember to install safety pins in all the frames to secure them .



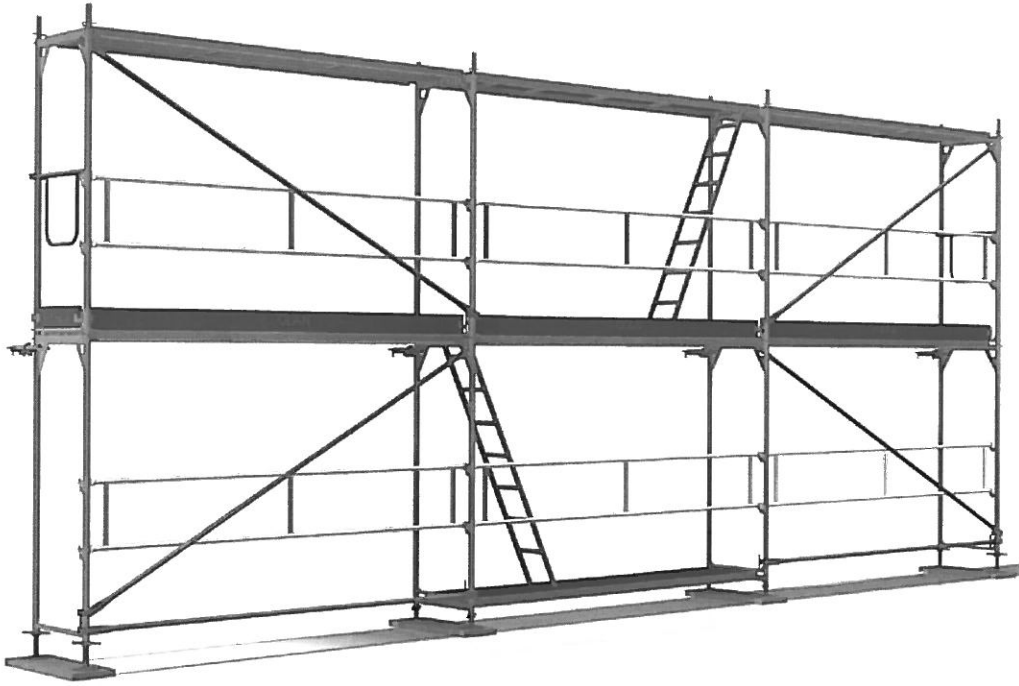
18. Secure the work area at both opposite ends of the scaffolding with the RFS-15073 front guard rails. The front guard rail is attached to the frame on the opposite side with a connector and is secured against pivoting with a channel profile.



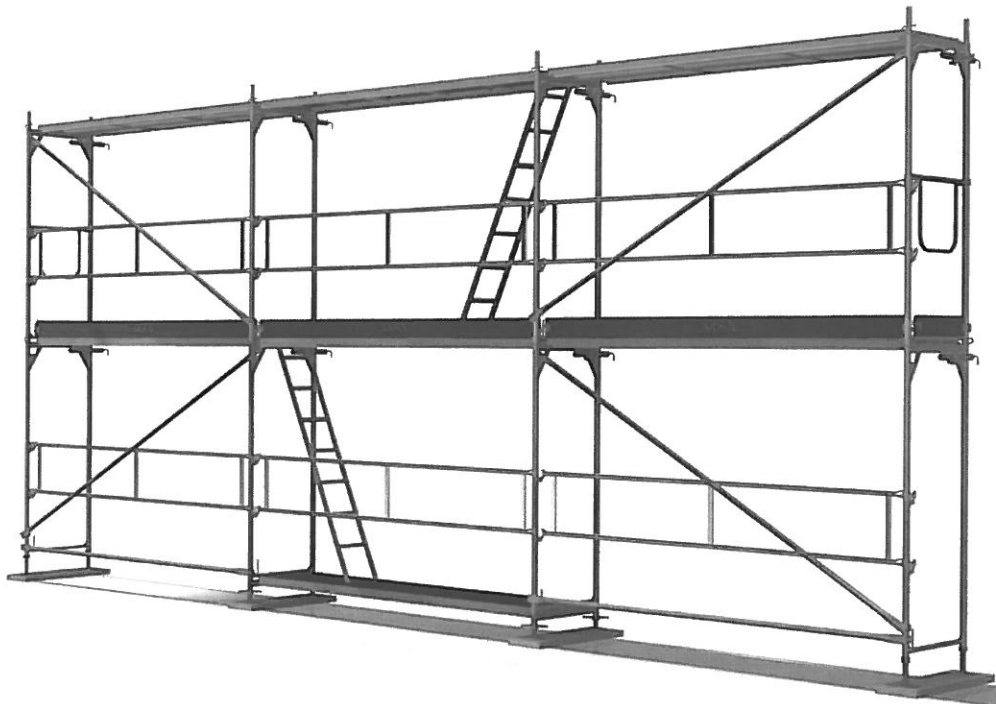
19. Secure all scaffolding levels from 2 m upwards with side boards. Hook the side boards on the rods in the façade frames. The platforms should be secured along the scaffolding with a longitudinal toe board and on the front with a transverse toe board.



20. Place the platforms on the 2nd level of the scaffolding onto the U profile in the façade frames.
 Note: Place walkway platforms with ladders alternately in the circulation riser. The trapdoor is secured against opening. The trapdoor may only be opened when passing between the scaffolding levels. After ascending to or descending from a platform, the trapdoor must absolutely be closed.
21. Mount diagonal braces, remembering to level the second scaffolding level before tightening them.

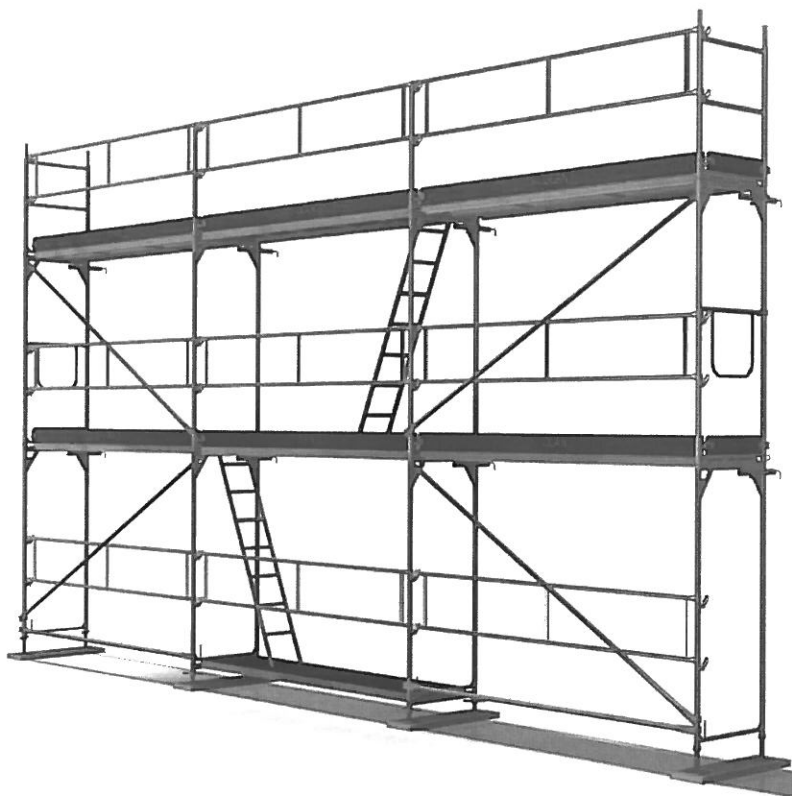


22. Anchor the 2nd level of the scaffolding to the wall according to the rules described in the “General principles of scaffolding assembly” section.



23. In order to erect other levels of the scaffolding, it is necessary to repeat the steps described in the previous items above.
24. When assembling the last level of the scaffolding, the guard rail posts must be installed in place of the façade frames. Start the assembly analogically by installing the posts starting from the circulation riser.
25. Install the double guard rails in the post cassettes.
26. The scaffolding must be secured from the front by installing the front frame.
27. Secure the scaffolding with side boards. Hook the side boards onto the rods in the front frame and

the guard rail posts. Secure the platforms along the scaffolding with a longitudinal toe board and on the front with a transverse toe board.



Note: the following rules must be observed when assembling the scaffolding:

- Each level needs to be levelled each time using a spirit level. The levelling must be carried out in the bays where vertical bracing has been installed. The verticality of the scaffolding must be corrected by adjusting the position of the lower brace connector in relation to the vertical tube of the frame.
- The anchoring must be performed gradually with the assembly of the entire scaffolding, according to the anchoring grid specified for the specific scaffolding assembly version.

Scaffolding disassembly is carried out in a reverse order.

LEVELLING THE ALU EURO+ FACADE SCAFFOLDING

Assembly of the scaffolding must always start from the highest level of the surface on which it will be placed with the nuts of the adjustable bases lowered as much as possible. The frames are aligned by tightening or loosening the nuts in the adjustable bases. If the scaffolding is to be installed on a soil, it is absolutely necessary to use wooden shims that distribute the load over a larger area. The use of shims is also recommended when placing the scaffold on a construction ground. There must be at least two screw bases on one wooden shim. If the ground slope is large, compensating frames 0.6 m, 1 m or 1.5 m high should be used. If the ground slope on which the scaffolding is to be erected exceeds 10°, tilting bases must be used, and the scaffolding must be reinforced with tubes fastened with connectors. The tubes should be placed 20 cm above the ground level parallel to the direction of the slope.

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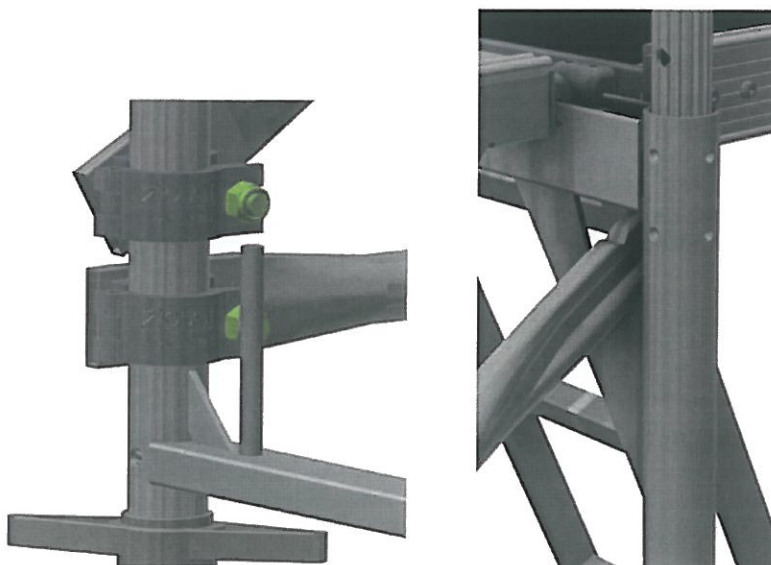


BRACING THE ALU EURO+ FACADE SCAFFOLDING

The bracing system for the scaffolding should completely ensure the stability of the structure, giving it kinetic invariability from external forces, with the lowest node of the bracing located immediately above the ground.

Diagonal braces should be arranged symmetrically, but the number of braces must not be less than 2 on each scaffolding level. The distance between the bracing bays must not exceed 10 m (for 3.07 m long bays, the bracing may be placed in a maximum of every fourth bay, and for 2.57 m long bays - in every fifth bay).

The braces are attached to the scaffolding with the rolled end in the hole between the gusset plate and the U profile and the other end attached to the dia. 48.3 mm tube of the façade frame using a connector. The bracing is to be located in front of the guard rail, as viewed from the outside of the scaffolding. The horizontal bracing is installed with two connectors to the dia. 48.3 mm tube in the lower part of the façade frame in which the platforms are not fixed.



RULES FOR ANCHORING THE ALU EURO+ FACADE SCAFFOLDING

Anchoring of the ALU EURO + frame scaffolding should be carried out with the use of anchoring connectors fastened to the façade frame tubes in the hole of the gusset plate by means of cross or pivot joints. The hooks of the anchor connectors must be placed in the eyelets of the anchor bolts installed in the building wall. The hook of the anchor connector must be set to transfer only horizontal forces as the anchor connector cannot transfer vertical forces. It is permissible to use short anchor connectors (e.g. 0.4 m long) attached to internal frame stands or long connectors (e.g. 1.3 m long) attached to both frame

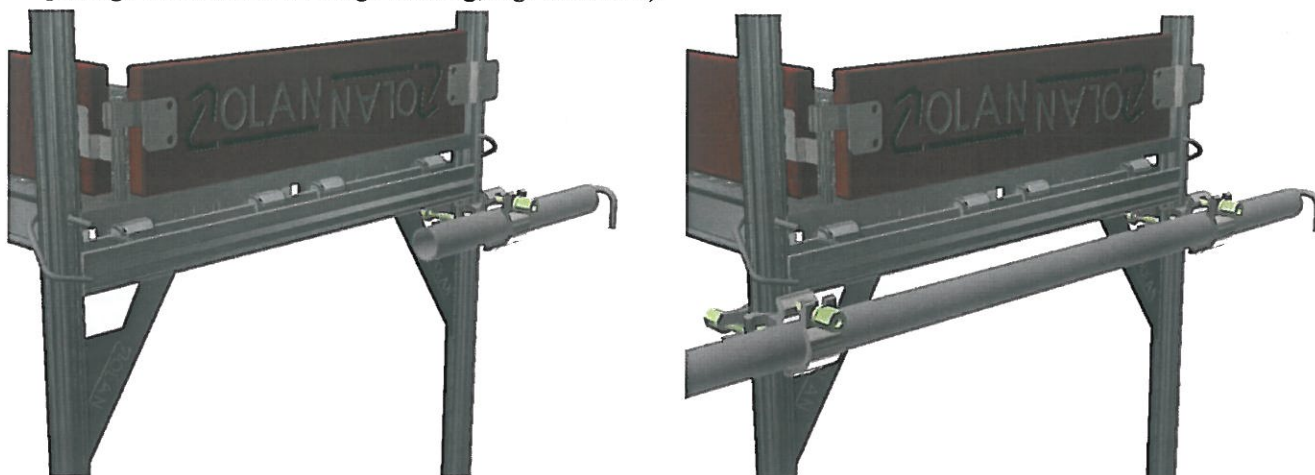
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stands, depending on the scaffolding configuration (e.g. additional components, such as consoles, passage frames, scaffolding cladding, e.g. with nets).



Below are some basic rules for anchoring the scaffolding :

- start anchoring from the second level with anchor connectors and normal connectors;
- the anchors should be located symmetrically on the entire surface of the scaffolding and the horizontal distance between the anchors should not exceed 6 m (for the 2.57 m and 3.07 m dimensions, every other bay should be anchored);
- the vertical distance between rows of anchors should not exceed 4 m (an anchor on every other level), but anchors in rows should be staggered horizontally;
- each row of anchors should end at the edge of the scaffolding;
- in bays with circulation paths, the bays should be additionally anchored on both sides in a given row of anchors;
- anchoring 30 cm below or above the hole in the gusset plate is permitted.

Additional anchoring to the building wall is required if the scaffolding is combined with additional components such as tarpaulin or net covers, scaffoldings with mounted gantry beams, walkway frames, and protective canopies. For scaffoldings with an attached 0.36 m bracket on the inside of the scaffolding, when anchoring the scaffolding with a single connector to the inner stand, 20% of the total number of anchors must be made as double anchors.

These anchors should be distributed evenly over the entire surface, observing the rule of installation of at least two V-type anchors on each anchored level.



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SIDE PROTECTION OF the ALU EURO+ FACADE SCAFFOLDING

The ALU Euro+ frame scaffolding has the following side protections:

- Single guard rails;
- Double guard rails;
- Side boards;
- Front frames; and
- Front guard rails.

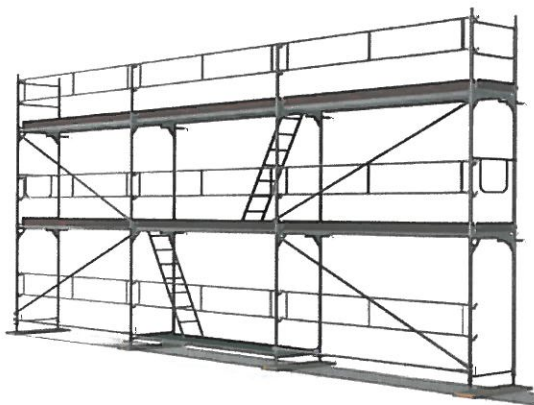
Each bay with working platforms must be secured with side boards, the upper edge of which must be at least 150 mm above the level of the platforms. The guard rails must be fitted into the Alu Euro+ frame cassettes and then secured with a wedge. If the distance of the working platforms from the wall is more than 0.2 m, a full set of protections must be installed on the inside of the scaffolding. The side boards on the wall side should be made from planks with the cross-section of 150 mm x 30 mm, using side board catches, or from ALUFOX system boards, and the overlap on the bay should be equal to 200-400 mm.



FRONT PROTECTION OF THE ALU EURO+ FACADE SCAFFOLDING

The extreme scaffold frames should be secured with RFS-15073 front guard rails at both opposite ends of the work area scaffolding. The front guard rails are fastened to the frame with a connector and on the opposite side they are secured with a channel profile to prevent pivoting.

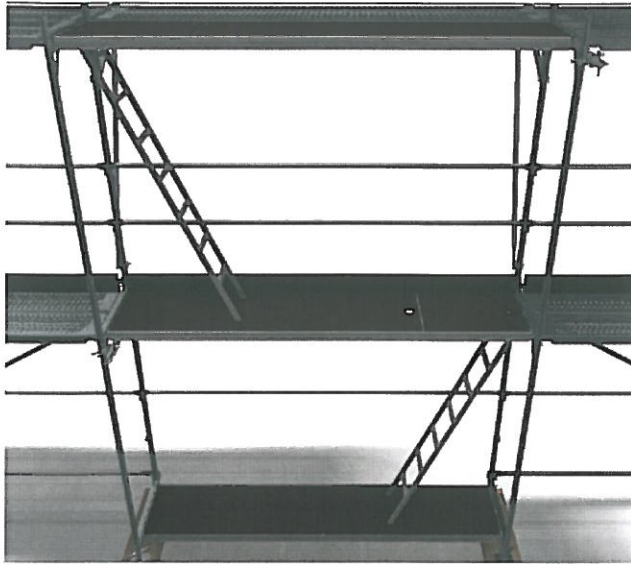
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The upper edges of the scaffolding bay must be secured with a front frame. If the working area is extended with brackets, the scaffolding must be secured with a front frame and a front guard rail or with 4 cross connectors and 2 dia. 48.3 mm tubes. Here are some ways to secure an enlarged work area by using brackets.



STANDARD CIRCULATION BETWEEN LEVELS OF THE ALU EURO+ FACADE SCAFFOLDING

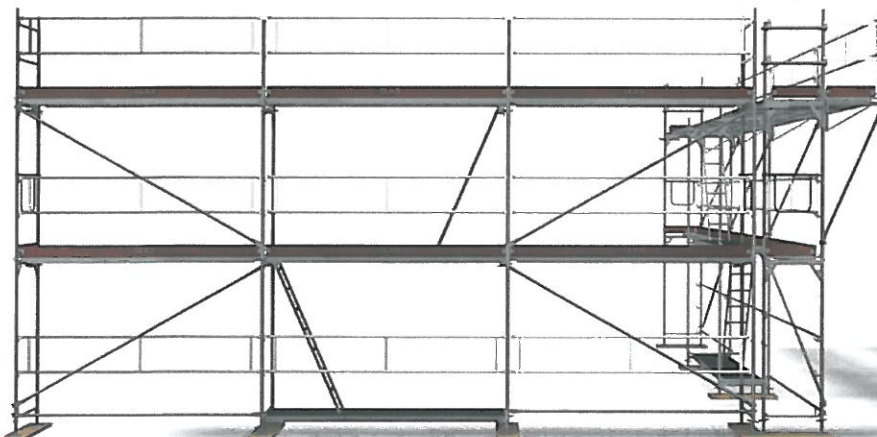
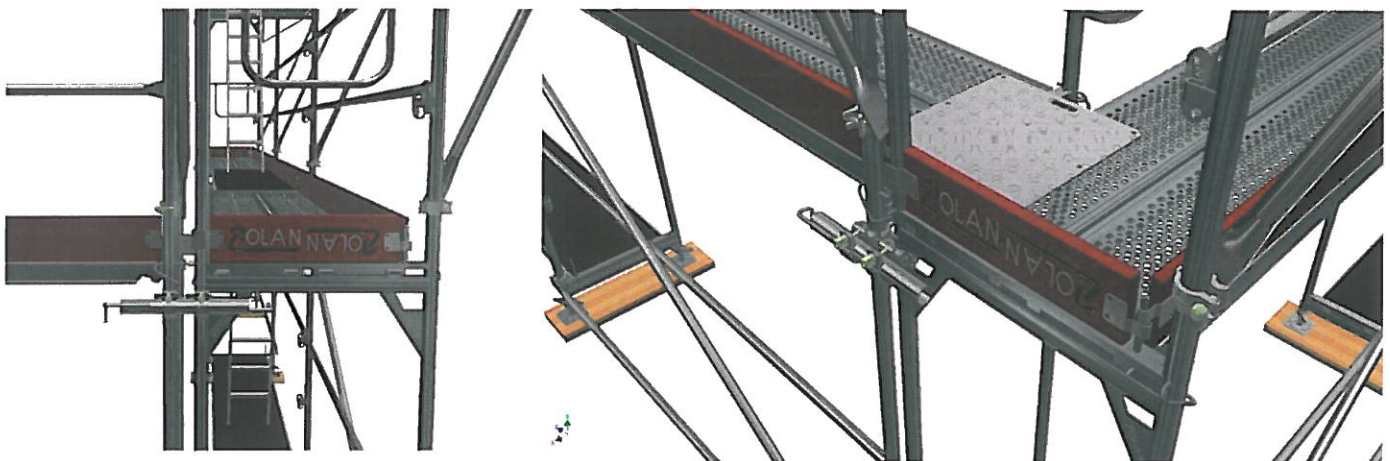


For circulation between scaffolding levels, passage platforms with a ladder are used as standard, but it is also possible to use a staircase for better ergonomics.

Note: it is absolutely necessary to close the trap door in the platform after each passage between scaffolding levels to prevent falling into the opening in the platform.

CORNER CONNECTORS OF THE ALU EURO+ FAÇADE SCAFFOLDING

The corner of the scaffolding can be constructed in several ways; the most common is to use cross connectors and dia. 48.3 mm tubes. In order to build this type of corner, the scaffoldings must be placed perpendicularly to each other at their edge and then connected by means of cross connectors and a dia. 48.3 tube; an anchor connector can be used instead of the tube. The spaces between the platforms of interconnected scaffoldings must be secured with supplementary plates. Note: the plates should be protected against being torn off by wind.



Scaffoldings can also be connected to each other using pivot joints by connecting two corner frames to each other; in this way, it is possible to obtain an almost identical corner connection of scaffoldings to the one in the option described above.

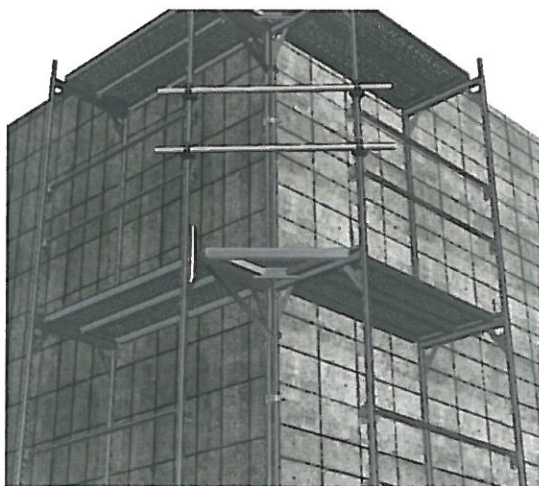


The scaffolding corner can also be constructed using 0.73 m consoles and 0.73 m platforms as shown below.

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The scaffoldings can also be connected by means of a 0.73 m console and a corner platform as shown below. Note: make the guard rails using 2 pieces of dia. 48.3 mm tube and pivot connectors.



INCREASING THE WORKING AREA OF THE ALU EURO+ FACADE SCAFFOLDING

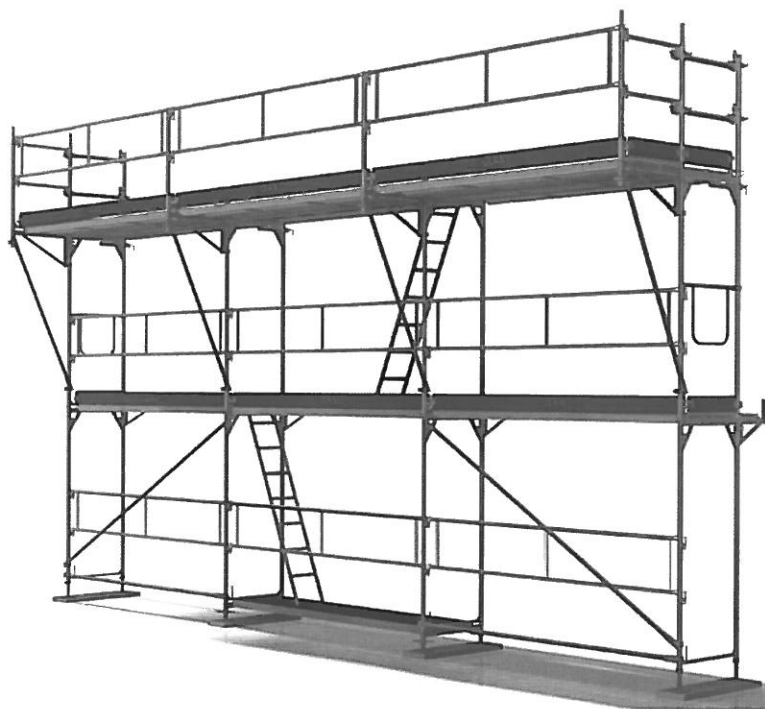
If it is necessary to enlarge the working area, 0.76 m or 0.36 m consoles are mounted in the windows between the gusset plate and the Alu Euro+ frame tube. When using the 0.76 m consoles, it is essential to support them with RFS-54179 braces (if suitable braces are not available, pivot connectors and a dia. 48.3 mm tube can be used).

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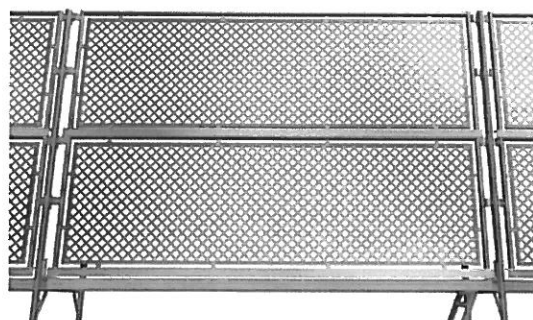
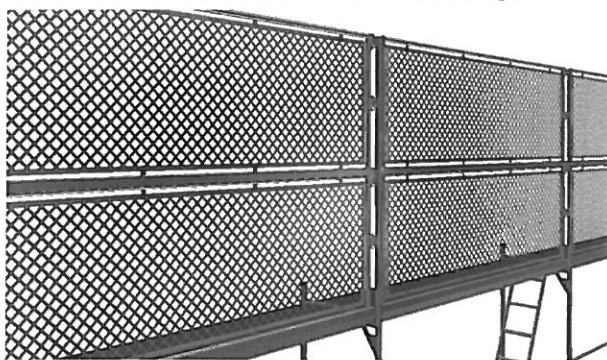
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The load on the working area increased by using consoles may not exceed the load permitted for the main platform. The 0.73 m bracket may be mounted on the last bay of the level on the external side of the scaffolding or on any level provided that the bay with the bracket mounted, as well as the bay above and below it, are additionally anchored to the wall.

PROTECTION IN THE EVENT OF WORK PERFORMED ON THE ROOF FOR THE ALU EURO+ FACADE SCAFFOLDING

In order to secure the works carried out on the roof of the building, on the upper level of the façade scaffolding, net cover posts are installed and then the net covers are mounted in their cassettes. In this case, longitudinal toe boards are not used where net covers are used because the net covers protect the working area of the scaffolding.



PASSAGE UNDER THE ALU EURO+ FACADE SCAFFOLDING

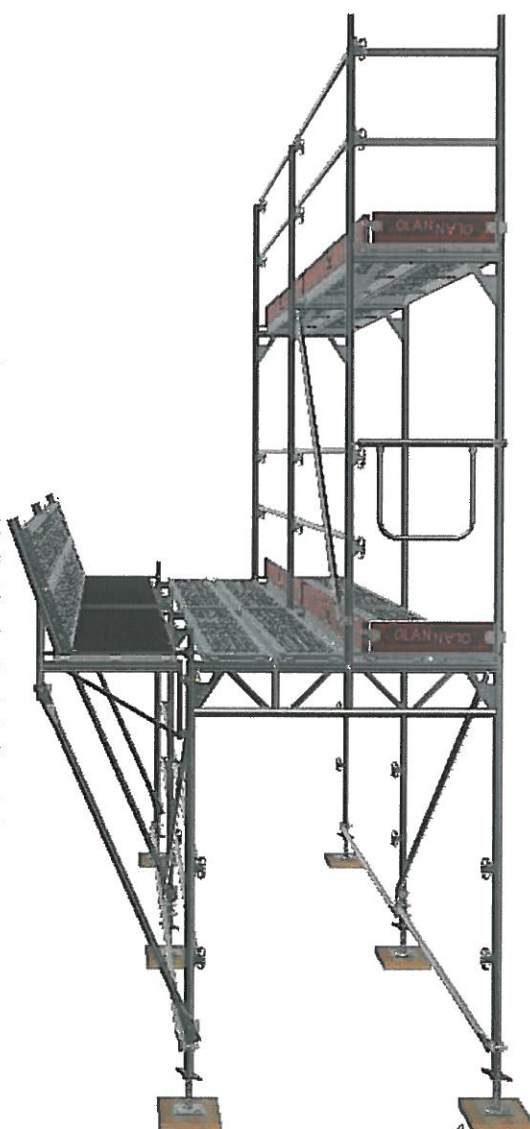
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ALU EURO+
FACADE

SCAFFOLDING PROTECTION CANOPY

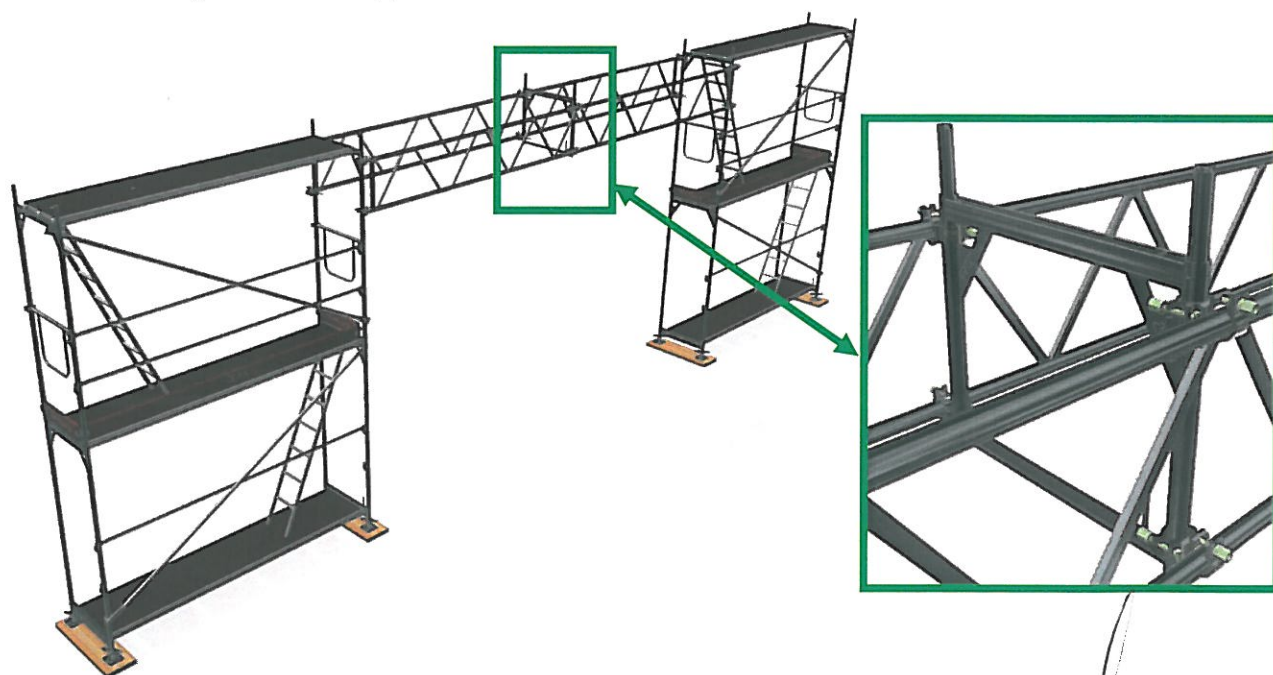
When carrying out repair and construction works along sidewalks in cities, it is necessary to provide a safe circulation path for pedestrians, with protection against items falling from the scaffolding. For this purpose, a protection canopy should be used, which is mounted on a 0.73 m bracket. An example of such a solution is shown next to the sketch. The canopy may be additionally separated from the entire scaffolding by means of balustrades (guard rails and side boards), as they do not constitute a working area and it is forbidden to gather materials on them. The design of the canopies is in accordance with DIN-4420.





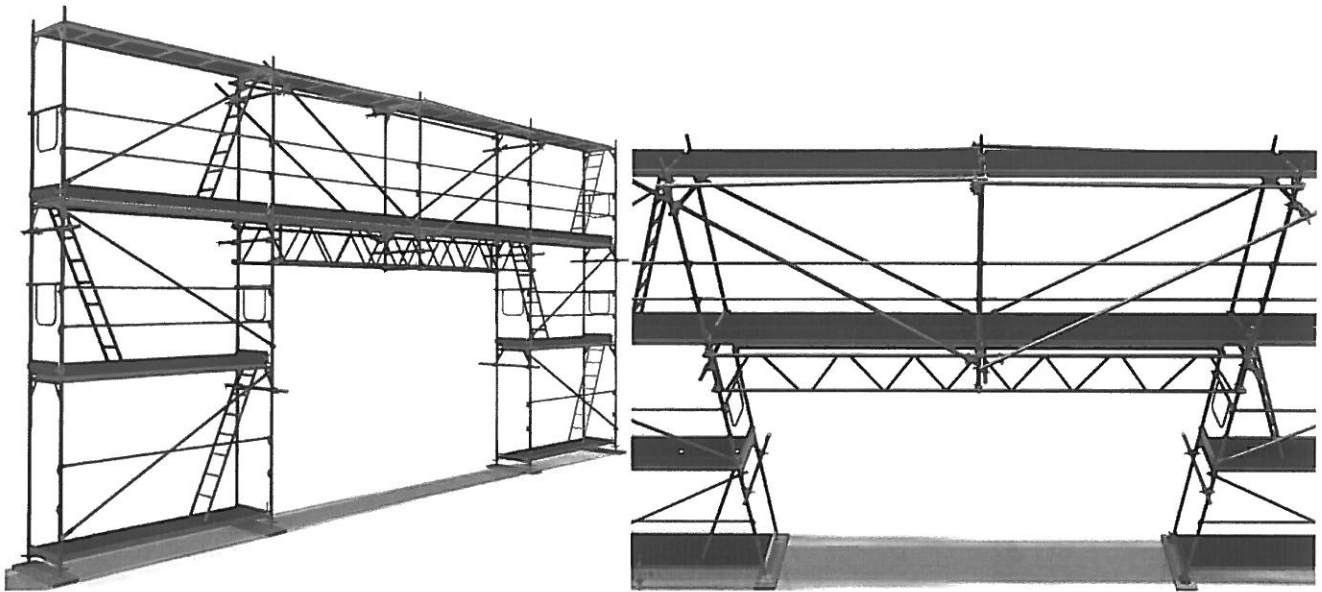
GANTRY PASSAGE FOR THE ALU EURO+ FACADE SCAFFOLDING

It often happens that there is a need to make passages to the inside of buildings during repair work. The solution to the problem is shown in the sketches below. The sketch does not show the protective canopy required for the passage. The scaffolding must be anchored at the level of the platforms placed below and above the protective canopy.



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In order to make a passage under the scaffolding according to the attached drawing, it is necessary to use lattice girders, which are to transfer the load from the scaffolding resting on them. The assembly of the structure should begin by attaching the girders to the frames using cross connectors on the outside of the adjacent frames. In the case of a passage with a width greater than 3.07 m, a girder transom or a 0.66 m RFA-07066 balancing frame should be mounted so that the profiles in the frames are at the same height, which in turn makes it possible to install the platforms on them. The space between the adjusting frame and the adjacent frames should be filled with 2.57 m or 3.07 m long platforms, depending on the girder used. When installing a passage under the scaffold with a lattice girder, no more than two scaffold bays may be replaced. For scaffolding heights above 20 m and widths of 1.09 m, additional reinforcement above the girder must be provided and 6 m long universal tubes must be installed to strengthen the frame stands in the passage zone.



ALU EURO+ FACADE SCAFFOLDING BYPASS FRAMES

Bypass frames are used to bypass building projections, such as cornices and eaves. The use of a bypass frame makes it possible to continue assembling the scaffolding code without changing the width of the platforms. With the bypass frames, a maximum of 4 scaffold levels can be built above the mounted bypass frame. The clear passage width of the frame is 367 mm, which allows the use of frames for 480 mm cornices, assuming a maximum distance of 20 cm from the wall. If bypass frames are used, it is important to properly arrange the scaffolding vertically, i.e. to use corrective bypass frames of proper height so as to match the bypass frames to the positions of cornices and eaves on the building.

Safety nets - permeable material for protective covering

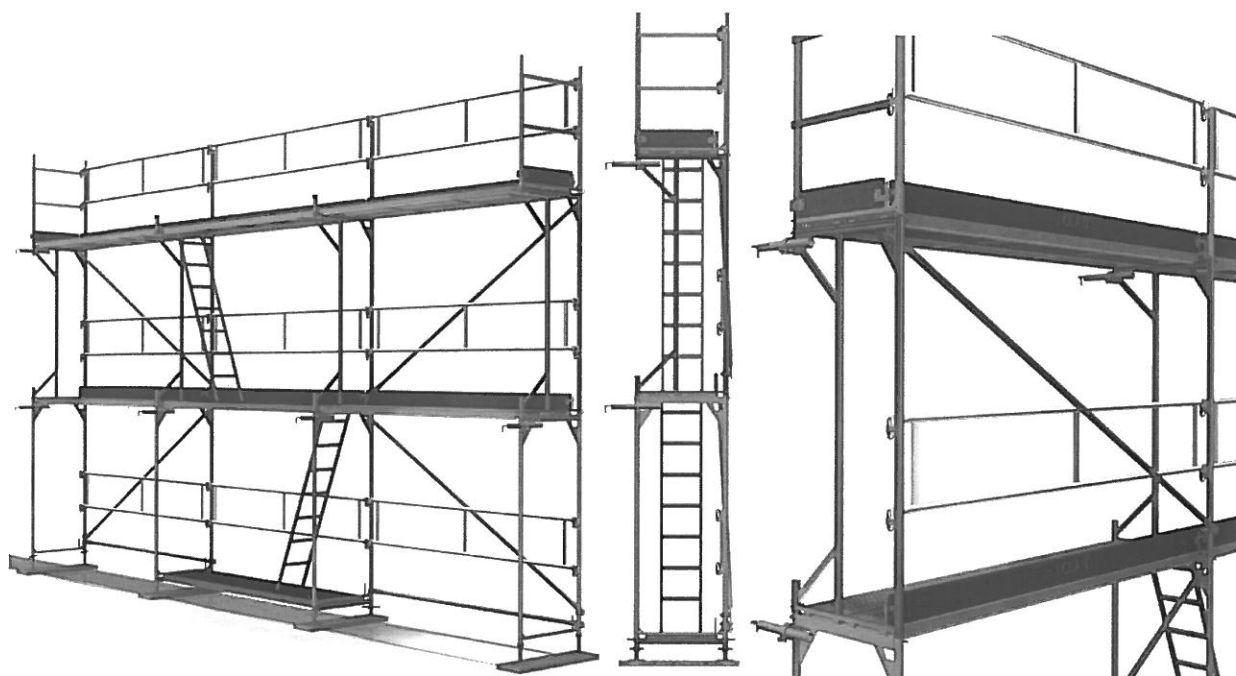
Scaffolding nets are available in different surface densities e.g. 50 g/m² and 130 g/m². The net has small meshes which provide good protection, e.g. during spray painting or corrosion-protection works. The nets are fixed to the scaffolding with 4.8 mm self-locking ties. The ties must be put through special mounting holes in the net and fastened around the 48.3 mm main tube of the stands. It is forbidden to block the net with scaffolding components. If too much force is exerted on the protective net, the ties should break and the net should tear to prevent damage to the scaffolding.

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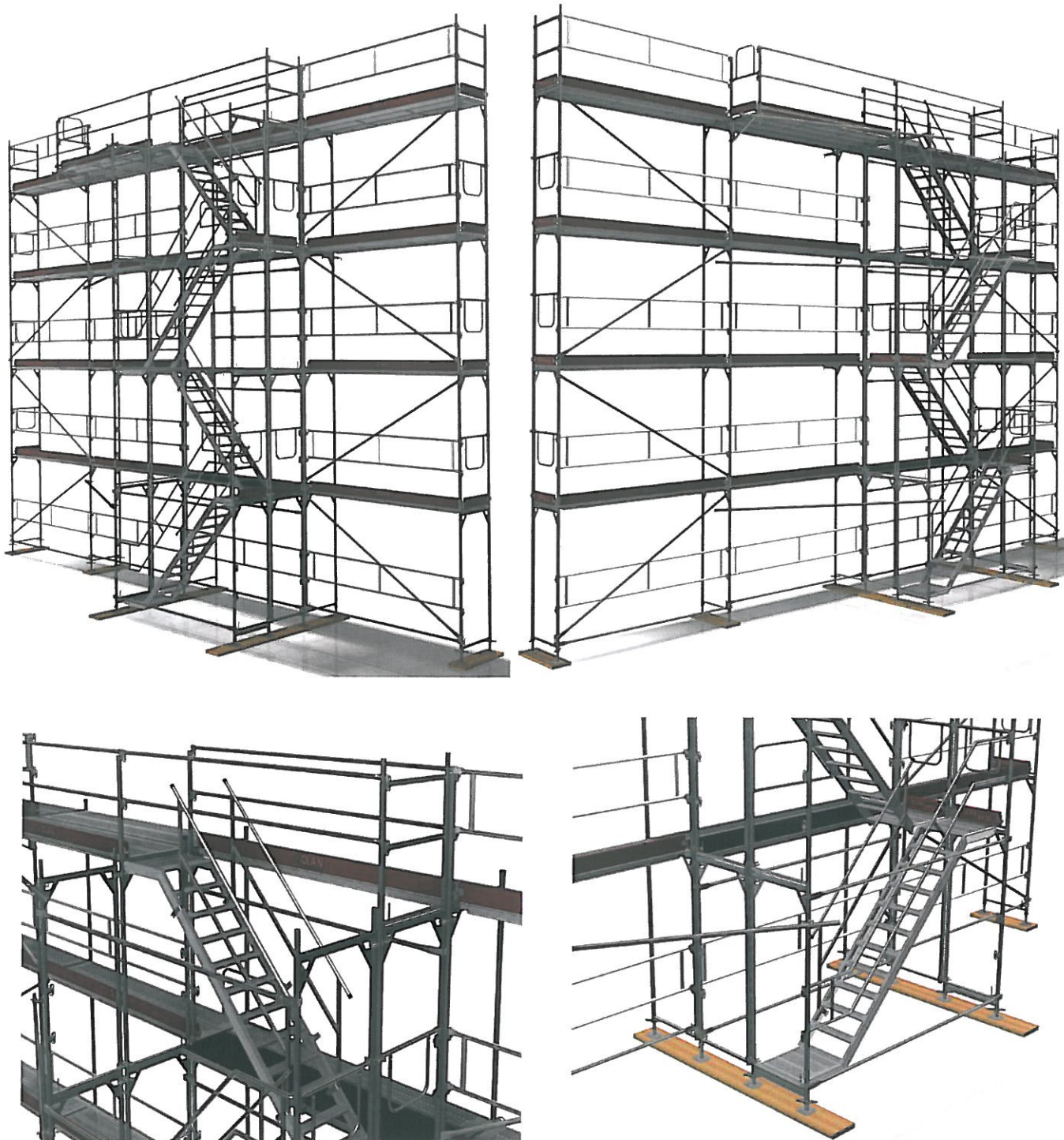
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EXTERNAL STAIRCASE OF THE ALU EURO+ FACADE SCAFFOLDING

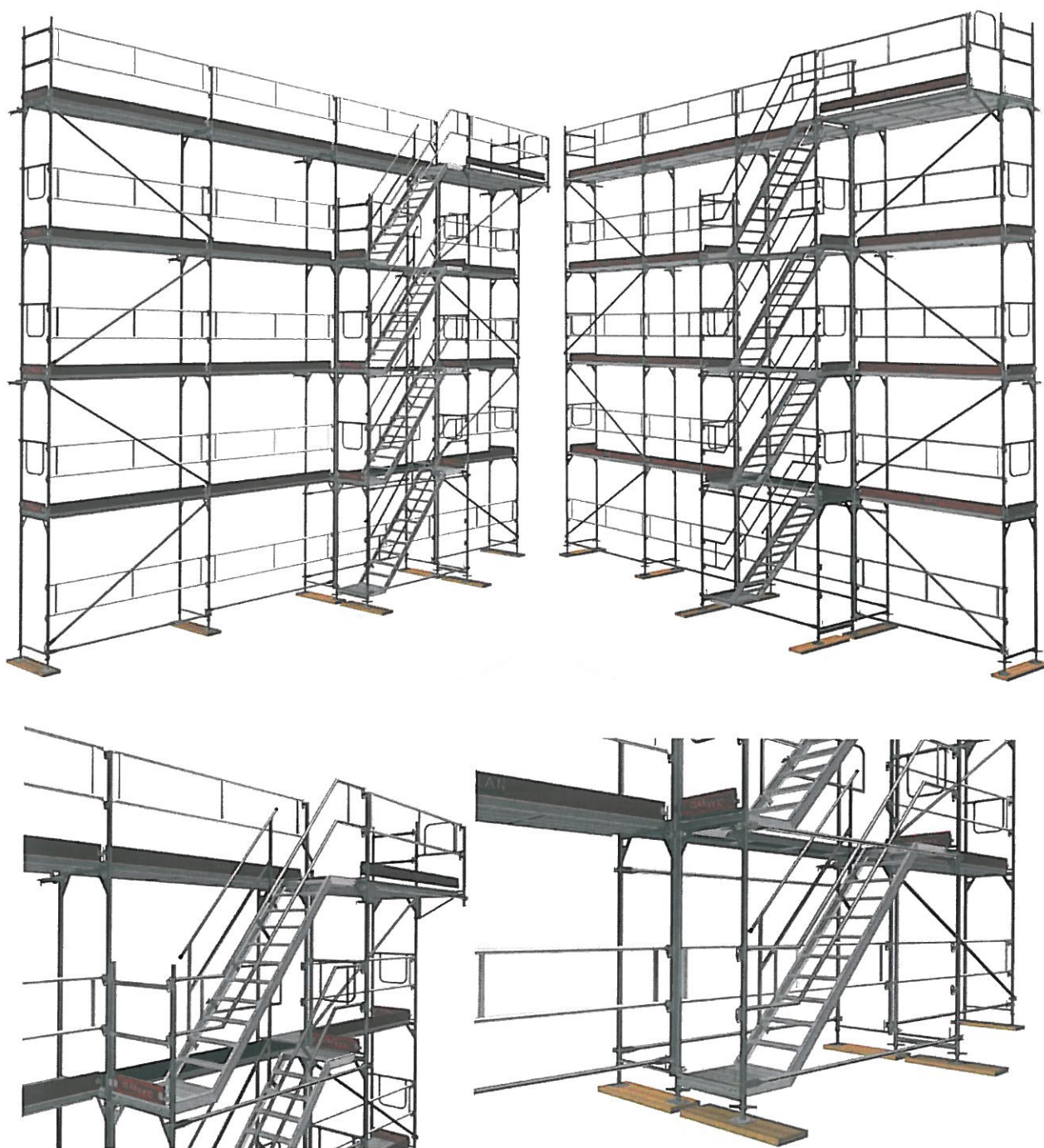
In order to ensure comfortable circulation between levels of the scaffolding, external staircases are installed. Typically, an external staircase is installed in a 3.07 m or 2.57 m bay according to one of the two diagrams shown. Additionally, the set frames are connected with the scaffolding every 4 m vertically, according the principle that the wall scaffolding nodes should be anchored at the connections. The connections are made using dia. 48.3 x 3.2 mm tubes and normal connectors. A staircase should be equipped with guard rails including a front guard rail, an inner guard rail, and an outer guard rail of the stairs.

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The second method of installation of an external scaffolding staircase is shown below.

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MATERIAL TRANSPORT FOR THE ALU EURO+ FACADE SCAFFOLDING

For transport of materials weighing not more than 150 kg, transport booms attached to the scaffolding with couplers should be made in designated places. The structure shall support a vertical static load of 1,4 times the nominal load and horizontal loads caused by cable tension. The position of the winch or the man pulling the line over the pulley shall be a minimum of 4.0 m from the vertical axis of the pulley. The scaffolding at the place of installation of the transport boom should be additionally anchored in at least two places. The distance between the booms should not exceed 30 m and the distance from the boom to the nearer end of the scaffolding should be 15 m. The height from the anchor point of the pulley to the platform level must not exceed 1.6 m. Where materials are to be transported, intermediate guard rails should be extended to a distance that allows the load to be pulled out onto the platform, but not

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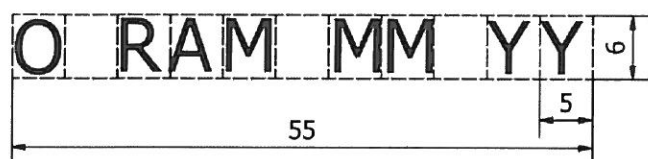
more than 0.74 m

NON-STANDARD ALU EURO+ FACADE SCAFFOLDING CONFIGURATIONS

For non-standard scaffolding set-ups, additional static calculations are required to determine the proper safety of the structure. Olan spółka z.o.o. can commission static calculations to design offices at the client's request. It is the responsibility of the user to perform calculations for unusual scaffolding set-ups.

5. MARKING SYSTEM FOR THE ALU EURO+ SCAFFOLDING

OLAN marks all its products in a permanent way in order to identify the product at the stage of use (the mark is imprinted to the depth of about 0.7 mm); in addition, the manufacturer's or customer's labels are attached to the products according to individual agreements. The marking scheme is presented below.



'O' - permanent marking of OLAN Spółka z.o.o in Żabokliki as the manufacturer

'RAM' - marking of the ALU EURO+ scaffolding system

'MM' - subsequent number of the month

'YY' - the last two digits of the calendar year

The Alu Euro+ façade scaffolding system has been qualified in accordance with the PN EN 12810-1:2010 standard. The classification designations assigned are shown in the table.

Bay	Without cover	With protective cover
2.57 m	EN 12810-3D-SW06/257-H1-B-LS	EN 12810-3D-SW06/257-H1-A-LS
3.07 m	EN 12810-3D-SW06/307-H1-B-LS	EN 12810-3D-SW06/307-H1-A-LS

6. LOADS AND USEFUL LOAD

Maximum loads for platforms and bases in the spatial structure of the scaffolding.

Load on the platforms.

Load class of the platforms according to EN 12811						
Platform type	3.07 m	2.57 m	2.07 m	1.57 m	1.09 m	0.73 m
Steel platform 0.32	Cl. 4 3.0 kN/m ²	Cl. 5 4.5 kN/m ²	Cl. 6 6 kN/m ²	Cl. 6 6 kN/m ²	Cl. 6 6 kN/m ²	Cl. 6 6 kN/m ²
Aluminium and plywood platform 0.61	Cl. 3 2.0 kN/m ²	Cl. 3 2.0 kN/m ²	Cl. 3 2.0 kN/m ²	Cl. 3 2.0 kN/m ²	Cl. 3 2.0 kN/m ²	Cl. 3 2.0 kN/m ²

Connector useful loads.

Index	Name	Permissible useful load of connectors
ZNN-ZB02CH	CROSS CONNECTOR SET	F<9.1 kN
ZNN-ZB01	PIVOT CONNECTOR SET	F<5.9 kN


Load capacity of adjustable bases.


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Permissible vertical load	Base height	Permissible distance of unscrewed nut from the sheet metal of the base				
		20 cm	30 cm	40 cm	50 cm	60 cm
	0.4 m	40 kN	-	-	-	-
	0.6 m	40 kN	29 kN	22 kN	-	-
	0.8 m	40 kN	29 kN	22 kN	17 kN	15 kN

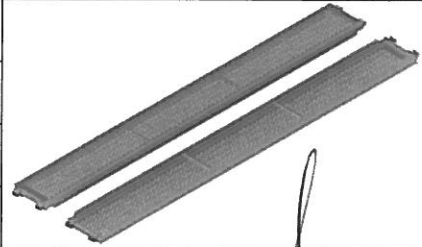
7. COMPONENTS LIST OF THE ALU EURO+ SCAFFOLDING

Component name	Index	Weight
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ALU. FRAME 2.00 x 0.73 m	RFA-07200	8.8		Aluminium
ALU. FRAME 1.50 x 0.73 m	RFA-07150	7.5		
ALU. FRAME 1.00 x 0.73 m	RFA-07100	5.4		
ALU. FRAME 0.66 x 0.73 m	RFA-07066	4.1		

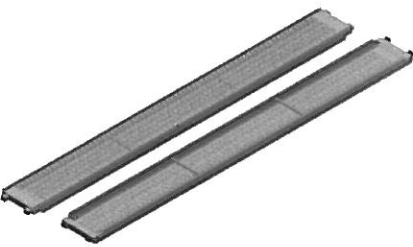
STEEL BYPASS FRAME 2.00 x 0.73 m - TUBE	RFS-07211	22.51		Steel
ALU. BYPASS FRAME 2,00 x 0.73 m	RFA-07211	11.35		Aluminium

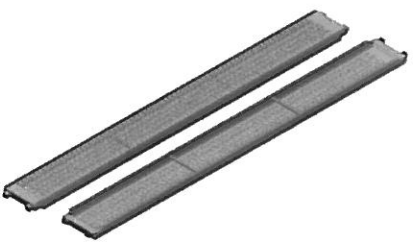
STEEL PASSAGE FRAME 1.5x2.2 FOUR FIXING POINTS	RFS-27220	34.5		Steel
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ALUMINUM PLATFORM + HOOK (N) 0.32 x 3.07 m + CROSS BAR	RFA-32307N/2,5	10.5	
ALUMINUM PLATFORM + HOOK (N) 0.32 x 2.57 m + CROSS BAR	RFA-32257N/2,5	9.2	
ALUMINUM PLATFORM + HOOK (N) 0.32 x 2.07 m + CROSS BAR	RFA-32207N/2,5	7.8	
ALUMINUM PLATFORM + HOOK (N) 0.32 x 1.57 m + CROSS BAR	RFA-32157N/2,5	6.5	

ALUMINUM PLATFORM + HOOK (N) 0.32 x 1.09 m + CROSS BAR	RFA-32109N/2,5	5.2
ALUMINUM PLATFORM + HOOK (N) 0.32 x 0.73 m + CROSS BAR	RFA-32073N/2,5	4.7


Alu. tape #2.5 mm


STEEL PLATFORM 0.32 x 3.07 m + CROSS BAR	RFS-85307	18.9	
STEEL PLATFORM 0.32 x 2.57 m + CROSS BAR	RFS-85257	16	
STEEL PLATFORM 0.32 x 2.07 m + CROSS BAR	RFS-85207	13.8	
STEEL PLATFORM 0.32 x 1.57 m + CROSS BAR	RFS-85157	12.1	
STEEL PLATFORM 0.32 x 3.07 m	RFS-84307	18.9	
STEEL PLATFORM 0.32 x 2.57 m	RFS-85257	15.5	
STEEL PLATFORM 0.32 x 2.07 m	RFS-84207	13.3	
STEEL PLATFORM 0.32 x 1.57 m	RFS-84157	10.1	
STEEL PLATFORM 0.32 x 1.09 m	RFS-84109	7.6	
STEEL PLATFORM 0.32 x 0.73 m	RFS-84073	5.5	
			Steel tape #1.3 mm


STEEL PLATFORM 0.32 x 3.07 m + CROSS BAR [BI 1.5]	RFS-89307	22.2	
STEEL PLATFORM 0.32 x 2.57 m + CROSS BAR [BI 1.5]	RFS-89257	18.9	
STEEL PLATFORM 0.32 x 2.07 m + CROSS BAR [BI 1.5]	RFS-89207	15.5	
STEEL PLATFORM 0.32 x 1.57 m + CROSS BAR [BI 1.5]	RFS-89157	12.1	
STEEL PLATFORM 0.32 x 3.07 m [BI 1.5]	RFS-88307	20.5	
STEEL PLATFORM 0.32 x 2.57 m [BI 1.5]	RFS-88257	18.5	
STEEL PLATFORM 0.32 x 2.07 m [BI 1.5]	RFS-88207	15.1	
STEEL PLATFORM 0.32 x 1.57 m [BI 1.5]	RFS-88157	11.7	
STEEL PLATFORM 0.32 x 1.09 m [BI 1.5]	RFS-88109	8.5	
STEEL PLATFORM 0.32 x 0.73 m [BI 1.5]	RFS-88073	6.0	
			Steel cable 1.5mm


ALU. AND PLYWOOD PASSAGE PLATFORM (N) WITH LADDER 3.07 x 0.61 m	RFA-60307N	26.5		Aluminium/Plywood
ALU.-COMPOSITE AND PLYWOOD PASSAGE PLATFORM (N) WITH LADDER 3.07 x 0.61 m	RFA-60307L	29.5		
ALU. AND PLYWOOD PASSAGE PLATFORM (N) WITH LADDER 2.57 x 0.61 m	RFA-60257N	23.5		
ALU.-COMPOSITE AND PLYWOOD PASSAGE PLATFORM (N) WITH LADDER 2.57 x 0.61 m	RFA-60257L	26.5		

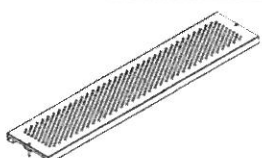
ALUMINIUM PLATFORM (N) WITH PLYWOOD 3.07 x 0.61m	RFA-61307N	22	Aluminium/Plywood
ALU.-COMPOSITE PLATFORM (N) WITH PLYWOOD 3.07 x 0.61 m	RFA-61307L	24	


ALUMINIUM PLATFORM (N) WITH PLYWOOD 2.57 x 0.61 m	RFA-61257N	18.8		
ALU.-COMPOSITE PLATFORM (N) WITH PLYWOOD 2.57 x 0.61 m	RFA-61257L	19.8		
ALUMINIUM PLATFORM (N) WITH PLYWOOD 2.07 x 0.61m	RFA-61207N	18.6		

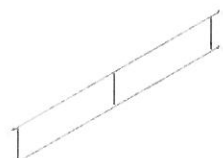
ALU.-COMPOSITE PLATFORM (N) WITH PLYWOOD 2.07 x 0.61 m	RFA-61207L	19.5		Aluminium/Plywood
ALUMINIUM PLATFORM (N) WITH PLYWOOD 1.57 x 0.61 m	RFA-61157N	12		
ALU.-COMPOSITE PLATFORM (N) WITH PLYWOOD 1.57 x 0.61m	RFA-61157L	13		
ALUMINIUM PLATFORM (N) WITH PLYWOOD 1.09 x 0.61 m	RFA-61109N	8.75		
ALU.-COMPOSITE PLATFORM (N) WITH PLYWOOD 1.09 x 0.61 m	RFA-61109L	9.5		
ALUMINIUM PLATFORM (N) WITH PLYWOOD 0.73 x 0.61 m	RFA-61073N	6.28		
ALU.-COMPOSITE PLATFORM (N) WITH PLYWOOD 0.73 x 0.61 m	RFA-61073L	7		

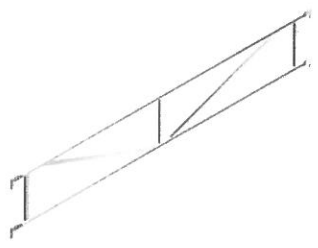
ALU. AND PLYWOOD PASSAGE PLATFORM (N) WITHOUT LADDER 3.07 x 0.61 m	RFA-62307N	25.4		Aluminium/Plywood
ALU.-COMPOSITE PLYWOOD PASSAGE PLATFORM (N) WITHOUT LADDER 3.07 x 0.61 m	RFA-62307L	28.6		
ALU. AND PLYWOOD PASSAGE PLATFORM (N) WITHOUT LADDER 2.57 x 0.61 m	RFA-62257N	22.85		
ALU.-COMPOSITE PLYWOOD PASSAGE PLATFORM (N) WITHOUT LADDER 2.57 x 0.61 m	RFA-62257L	25.5		
ALU. AND PLYWOOD PASSAGE PLATFORM (N) WITHOUT LADDER 2.07 x 0.61 m	RFA-62207N	19.5		
ALU. AND PLYWOOD PASSAGE PLATFORM (N) WITHOUT LADDER 2.07 x 0.61 m	RFA-62157N	16.3		



STEEL LADDER 2.15 m (perf. rungs)	RNS-01021	11.8		Steel
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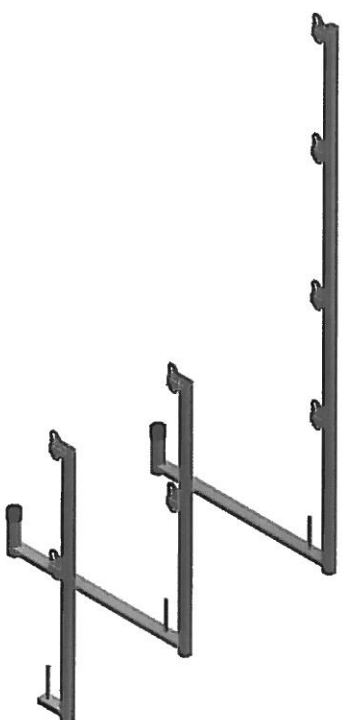
STEEL PLATFORM 0.30 x 1.0 m SUPPL. BRAZING	RFS-30100	5.4		Steel
STEEL PLATFORM 0.30 x 1.5 m SUPPL. BRAZING	RFS-30150	7.8		
STEEL PLATFORM 0.30 x 2.0 m SUPPL. BRAZING	RFS-30200	9.9		

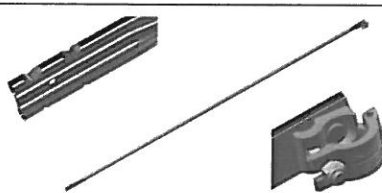
ADJUSTABLE BASE 0.6 m (hot dip galvanized)	RFS-12160	5.26		Steel
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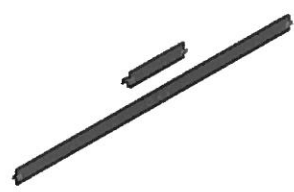
DOUBLE ALU. GUARD RAIL 3.07 m	RFA-01307	6.9		Aluminium
DOUBLE ALU. GUARD RAIL 2.57 m	RFA-01257	5.9		
DOUBLE ALU. GUARD RAIL 2.07 m	RFA-01207	5.0		
DOUBLE ALU. GUARD RAIL 1.57 m	RFA-01157	4.0		
DOUBLE ALU. GUARD RAIL 1.09 m	RFA-01109	3.5		
DOUBLE ALU. GUARD RAIL 0.73 m	RFA-01073	2.5		


BRACED DOUBLE ALU. GUARD RAIL 3.07 m	RFA-02307	8.9		Aluminium
BRACED DOUBLE ALU. GUARD RAIL 2.57 m	RFA-02257	7.9		
BRACED DOUBLE ALU. GUARD RAIL 2.07 m	RFA-02207	7.0		
BRACED DOUBLE ALU. GUARD RAIL 1.57 m	RFA-02157	6.0		
BRACED DOUBLE ALU. GUARD RAIL 1.09 m	RFA-02109	5.5		
BRACED DOUBLE ALU. GUARD RAIL 0.73 m	RFA-02073	4.5		

FRONT GUARD RAIL 0.73 m	RFS-15073	3.7		Steel
FRONT GUARD RAIL 1.09 m	RFS-15109	4.6		
FRONT ALUMINIUM FRAME 0.73 m	RFA-00073	7		Aluminium
FRONT ALUMINIUM FRAME 1.09 m	RFA-00109	8.7		

NET COVER POST 0.73 m WITH ALU. PROTECTION 4 KASSETTES	RFA-11073	5.2		Aluminium
NET COVER POST 1.09 m WITH PROTECTION ALU. 4 KASSETTES	RFA-11109	5.9		
ALU. GUARD RAIL POST WITH ALU. PROTECTION 0.73 m	RFA-40073	3.4		
ALU. GUARD RAIL POST WITH ALU. PROTECTION 1.09 m	RFA-40109	4		
ALUMINIUM GUARD RAIL POST	RFA-04073	2.4		

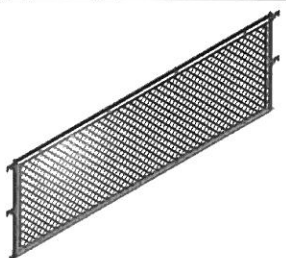
HORIZONTAL BRACING FOR A 3.07 m BAY	RFS-50307	8.3		Steel
HORIZONTAL BRACING FOR BAY 2.57 m	RFS-50257	7.3		
HORIZONTAL BRACING FOR BAY 2.07 m	RFS-50207	6.6		

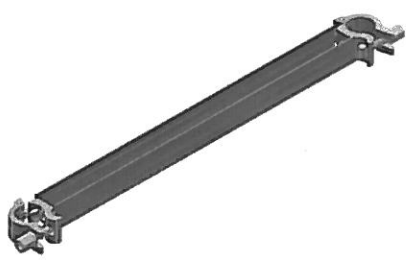
WOOD SIDE BOARD 3.07 m	RFS-20307	7.8		Wood/steel
WOOD SIDE BOARD 2.57 m	RFS-20257	6.7		
WOOD SIDE BOARD 2.07 m	RFS-20207	5.4		
WOOD SIDE BOARD 1.57 m	RFS-20157	4.2		
WOOD SIDE BOARD 1.09 m	RFS-20109	2.7		
WOOD SIDE BOARD 0.73 m	RFS-20073	1.8		


Roof protection console 0.73 m	RFS-14073	5.9		Steel
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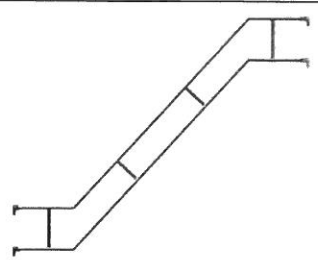
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NET COVER 3.07 m	RFS-13307	28.6		Steel
NET COVER 2.57 m	RFS-13257	25.2		
NET COVER 2.07 m	RFS-13207	21.7		
NET COVER 1.57 m	RFS-13157	16.8		

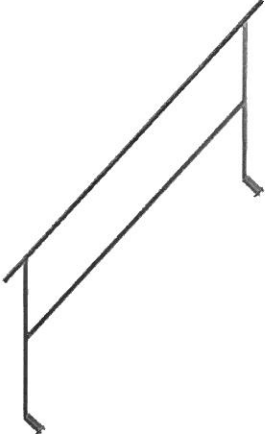
TRANSFERSE U-BOLT 0.73 m	RFS-22073	3.1		Steel
TRANSFERSE U-BOLT 1.09 m	RFS-22109	6.1		
STAIRCASE START U-BOLT	RFS-22730	3.0		

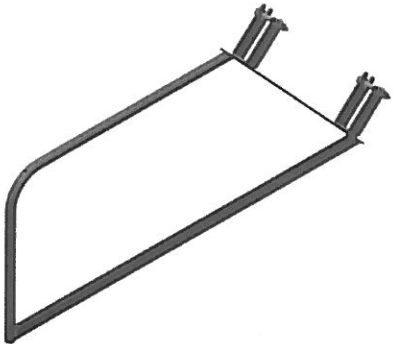
PERF. ALU. STAIRS TRP 3.07 x 0.63	RFA-30307SK	31.5		Aluminium
PERF. ALU. STAIRS TRP 2.57 x 0.64	RFA-30257SK	27		
ALU. STAIRS WITH PROF. TRP 3.07 x 0.63	RFA-35307SK	30.0		
ALU. STAIRS WITH PROF. TRP 2.57x0,63	RFA-35257SK	25.3		


ALU. STAIR GUARD RAIL TRP 3.07 x 2.0 B=0.64	RFA-31307	17.8		Aluminium
ALU. STAIR GUARD RAIL TRP 2.57 x 2.0 B=0.64	RFA-31257	16.1		

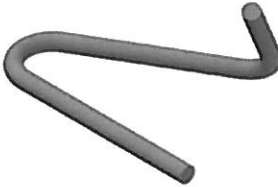
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INNER GUARD RAIL STAIRS	RFS-32001	12.0		Steel
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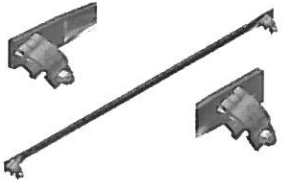
STAIRS INNER GUARD RAIL	RFS-32002	5.5		Steel
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BRACE WITH CLAMP 1.09 m WITH CONNECTOR	RFS-12109	10.5		Steel
BRACE WITH CLAMP 0.73 m WITH CONNECTOR	RFS-12073	6.5		
BRACE WITH CLAMP 0.73 m WITH CONNECTOR (LONG)	RFS-12074	19.4		
BRACE WITH CLAMP 0.36 m WITH CONNECTOR	RFS-12036	3.3		

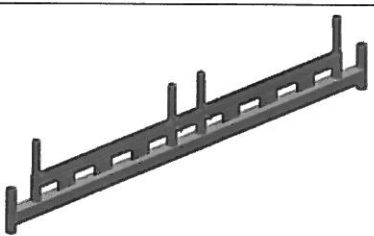
SAFETY PIN ST-ZINC	RFS-00011			Steel
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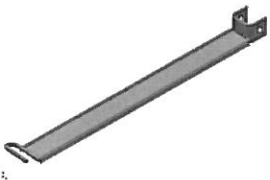
ANCHORING CONNECTOR WITH HOOK 3.0 m	RFS-17300	9.3		Steel
ANCHORING CONNECTOR WITH HOOK 1.30 m	RFS-17130	4.1		

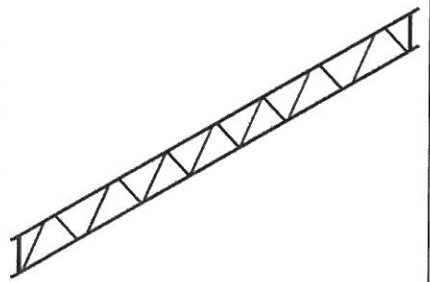
ANCHORING CONNECTOR WITH HOOK 0.85 m	RFS-17085	2.8		
ANCHORING CONNECTOR WITH HOOK 0.40 m	RFS-17040	1.45		

TRANSVERSE BRACING FOR A 1.95 m BAY	RFS-54195	8.3		Steel
TRANSVERSE BRACING FOR A 1.79 m BAY	RFS-54179	7.2		

HORIZONTAL STEEL BRACING FOR A 3.07 m BAY	RFS-55307	11.4		Steel
HORIZONTAL STEEL BRACING FOR A 2.57 m BAY	RFS-55257	9.7		
HORIZONTAL STEEL BRACING FOR A 2.07 m BAY	RFS-55207	8.2		

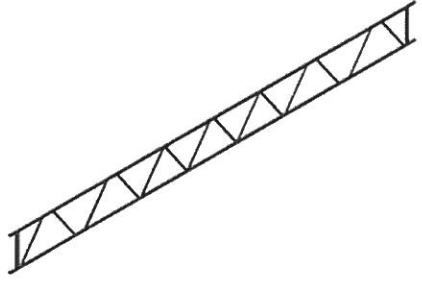
TRAVEL BEAM 0.73 x 1.9 m	RFS-03073	26.3		Steel
TRAVEL BEAM 1.09 x 2.6 m	RFS-03109			

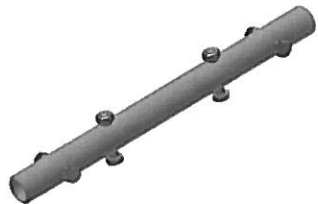
PLATORM PROTECTION 1.09 m	RFS-16109	2.4		Steel
PLATORM PROTECTION 0.73 m	RFS-16073	1.8		
PLATORM PROTECTION 0.36 m	RFS-16036	1.0		


STEEL LATTICE GIRDER 0.4 x 6.24 m	RFS-04624	60		Steel
STEEL LATTICE GIRDER 0.4 x 6.00 m	RFS-04600	57		
STEEL LATTICE GIRDER 0.4 x 5.24 m	RFS-04524	55		
STEEL LATTICE GIRDER 0.4 x 5.00 m	RFS-04500	53		
STEEL LATTICE GIRDER 0.4 x 4.24 m	RFS-04424	45		
STEEL LATTICE GIRDER 0.4 x 4.00 m	RFS-04400	39		
STEEL LATTICE GIRDER 0.4 x 3.24 m	RFS-04324	36		
STEEL LATTICE GIRDER 0.4 x 3.00 m	RFS-04300	29		
STEEL LATTICE GIRDER 0.4 x 2.00 m	RFS-04200	20		

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STEEL LATTICE GIRDER 0.5 x 6.24 m	RFS-05624	65		Steel
STEEL LATTICE GIRDER 0.5 x 5.24 m	RFS-05524	55		
STEEL LATTICE GIRDER 0.5 x 4.24 m	RFS-05424	46		
STEEL LATTICE GIRDER 0.5 x 3.24 m	RFS-05324	33		
ALU. LATTICE GIRDER 0.4 x 6.24 m	RFA-04624	26.5		Aluminium
ALU. LATTICE GIRDER 0.4 x 6.00 m	RFA-04600	24.5		
ALU. LATTICE GIRDER 0.4 x 5.24 m	RFA-04524	20.9		
ALU. LATTICE GIRDER 0.4 x 5.00 m	RFA-04500	20		
ALU. LATTICE GIRDER 0.4 x 4.24 m	RFA-04424	17.8		
ALU. LATTICE GIRDER 0.4 x 4.00 m	RFA-04400	17		
ALU. LATTICE GIRDER 0.4 x 3.24 m	RFA-04324	14.8		
ALU. LATTICE GIRDER 0.4 x 3.00 m	RFA-04300	14		
ALU. LATTICE GIRDER 0.4 x 2.24 m	RFA-04224	13.2		
ALU. LATTICE GIRDER 0.4 x 2.00 m	RFA-04200	12.7		
ALU. LATTICE GIRDER 0.5 x 8.24 m	RFA-05824	34.4		
ALU. LATTICE GIRDER 0.5 x 6.24 m	RFA-05624	26.5		
ALU. LATTICE GIRDER 0.5 x 5.24 m	RFA-05524	22.5		
ALU. LATTICE GIRDER 0.5 x 4.24 m	RFA-05424	18.8		
ALU. LATTICE GIRDER 0.5 x 3.24 m	RFA-05324	15		
ALU. LATTICE GIRDER 0.5 x 2.24 m	RFA-05224	13.4		

GIRDER CONNECTOR	RFA-05000	2.2		Steel
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ALUMINIUM PLATFORM CROSS BEAM 6.0 M	RFA-21600	15		Aluminium
ALUMINIUM PLATFORM CROSS BEAM 5.0 M	RFA-21500	13		
ALUMINIUM PLATFORM CROSS BEAM 4.0 M	RFA-21400	10		
ALUMINIUM PLATFORM CROSS BEAM 3.0 M	RFA-21300	8.5		
ALUMINIUM PLATFORM CROSS BEAM 1.92 M	RFA-21192	5.8		
ALUMINIUM PLATFORM CROSS BEAM 1.60 M	RFA-21160	5		
ALUMINIUM PLATFORM CROSS BEAM 1.20 M	RFA-21120	3.8		
ALUMINIUM PLATFORM CROSS BEAM 0.90 M	RFA-21090	3		
ALUMINIUM PLATFORM CROSS BEAM 0.64 M	RFA-21064	2.5		

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BOOM TO SUSPEND A PULLEY	RFS-25080	7.7		Steel
STEEL PLATFORM 0.32 x 0.73 m Triangular	RFS-84001	6.6		Steel
STEEL PLATFORM 0.73 m Triangular	RFS-84010	9		
GUARD RAIL CONNECTOR WITH A WEDGE	ZNN-07048	0.9		Steel
CROSS CONNECTOR SET	ZNN-ZB02CH	0.8		Steel
PIVOT CONNECTOR SET	ZNN- ZB01CH	1.0		Steel
WAREHOUSE PALLET 0.8 x 1.2m	RFS-61280	38		Steel
WAREHOUSE PALLET 0.8 x 1.2 m WITH A NET	RFS-61281			
NET BASKET WITH A WOODEN FLOOR	RFS-60567			
WAREHOUSE PALLET 1.5 x 0.8 x 0.75 m FOR SUPPORTS	RFS-61580			
WAREHOUSE PALLET 1.5 x 0.8 x 0.75 m FOR LIGHT SUPPORTS	RFS-61581			

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8. SCAFFOLDING ACCEPTANCE REPORT

.....
place, date

Scaffolding characteristics			
Scaffolding type:			
Construction site address:		Scaffolding location:	
Scaffolding dimensions:			
Scaffolding purpose:			
Permissible load on the scaffolding working platforms [kN/m ²]			
Scaffolding user:			
Scaffolding assembly			
Installer company name:			
Full name of the installer:			
Installer's license no.:		Installer's telephone no.:	
Installation was done in accordance with:	<input type="checkbox"/> The Operation and Maintenance Manual	<input type="checkbox"/> An individual design	
Earth electrode measurement results			
Scaffolding acceptance and permission to use			
Full name of the person authorized to accept the scaffolding			
Company:		Membership number of the Chamber of Civil Engineers:	
Date of scaffolding handover for use:			

The undersigned confirm that the scaffolding has been assembled in accordance with all legal requirements and Polish Standards

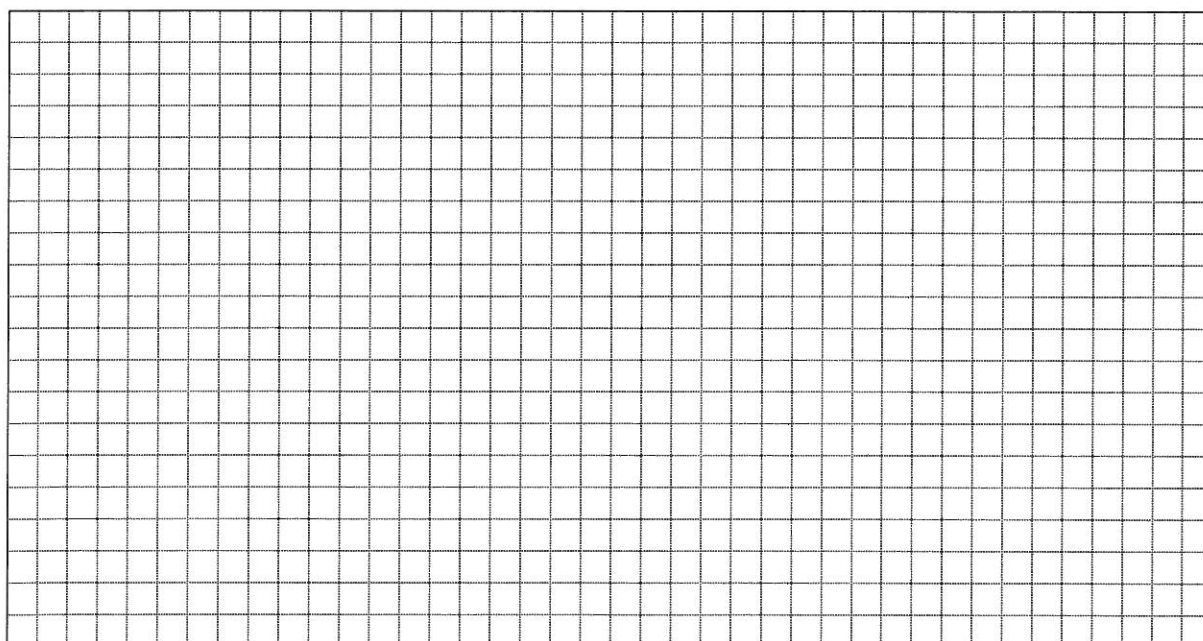
Assembler	Person making the acceptance:

Scaffolding inspection table*:

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No.	Date	Inspection type	Signature

Scaffolding location sketch:



*Regulation of the Minister of Infrastructure of 6 February 2003 on occupational safety and health during execution of construction works, § 127. 1. Scaffolding and movable platforms should be inspected each time by the construction site manager or an authorised person after a strong wind, precipitation, and other factors that pose a threat to the safety of the work, and after breaks in work longer than 10 days, as well as periodically, at least once a month. 2. The scope of activities to be checked, referred to in paragraph 1, is specified in the manufacturer's instructions or in the individual design.

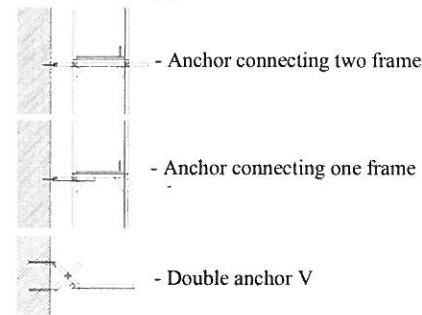
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9. ASSEMBLY DIAGRAM FOR THE ALU EURO+ SCAFFOLDING IN A TYPICAL ARRANGEMENT

ANCHORING AND BRACING ARRANGEMENT FOR THE ALU EURO+ FACADE
SCAFFOLDING UNCOVERED UP TO THE HEIGHT OF 24.2 M.

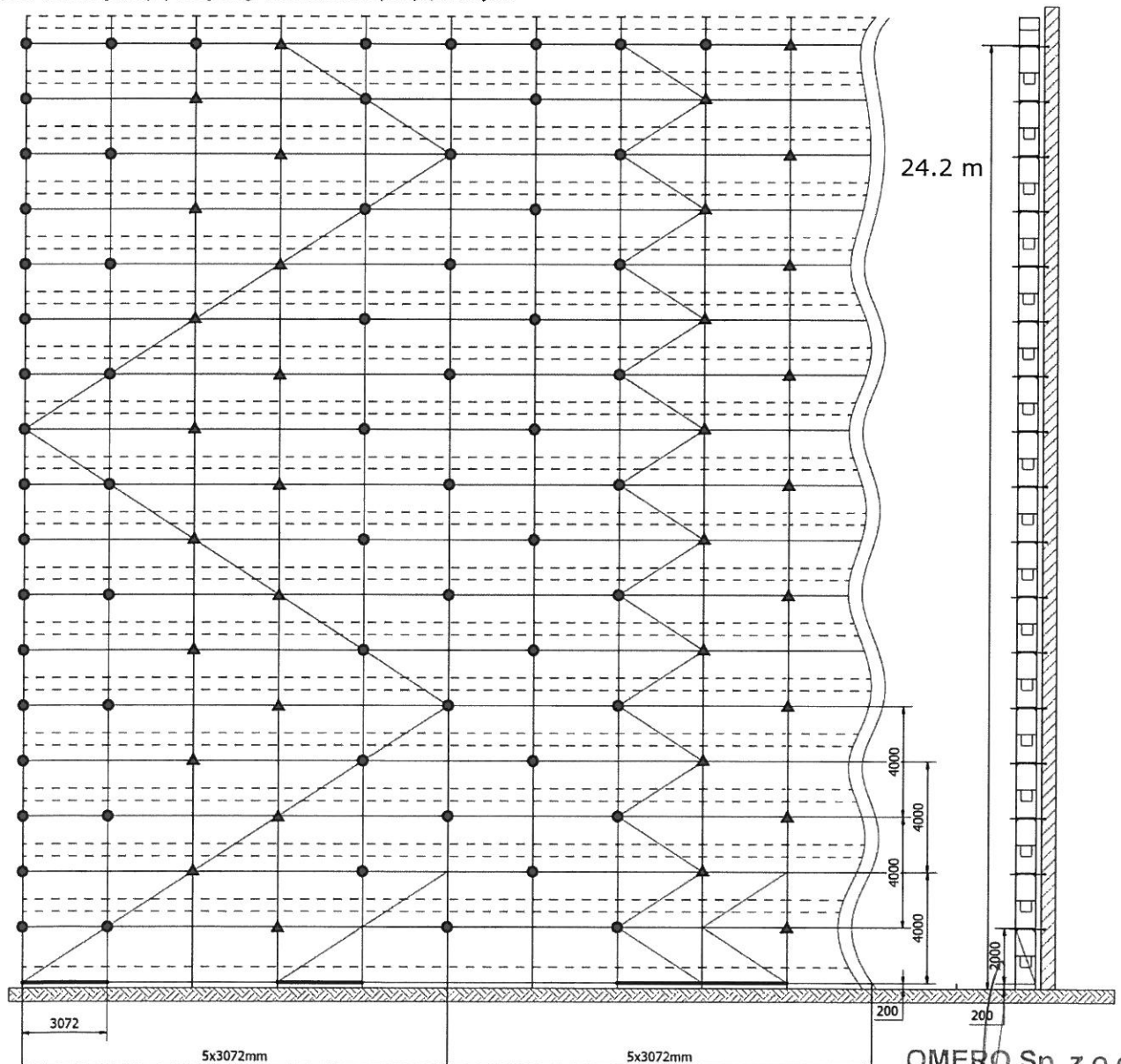
Façade filling type	Closed façade < 20%		
Vertical anchor spacing	4 m		
Horizontal anchor spacing	max. 6.14 m (every other bay)		
Maximum force in the anchor	II	1.8 kN	
	I	2.5 kN	
Maximum force in the foot	Inner post	16 kN	1
	Outer post	16 kN	

Scaffolding without cover, closed façade*
Basic version
Load on the working platform 2 kN/m²
Load on the safety platform 1 kN/m²



- - Single anchor
- ▲ - Double anchor V
- - Vertical bracing
- - - Vertical bracing from the
- - Horizontal bracing
- - - Single guard rail

* closed façade, when the quantity of the openings is less than 20% of the façade surface



Typical configuration for bays 3.07, 2.57, and 2.07

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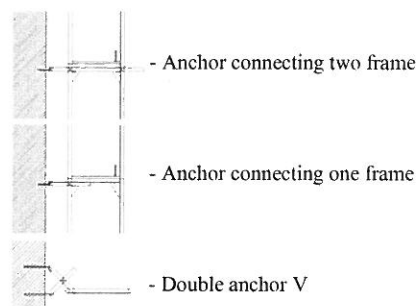
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ANCHORING AND BRACING ARRANGEMENT FOR THE ALU EURO+ FACADE SCAFFOLDING COVERED UP TO THE HEIGHT OF 24.2 M.

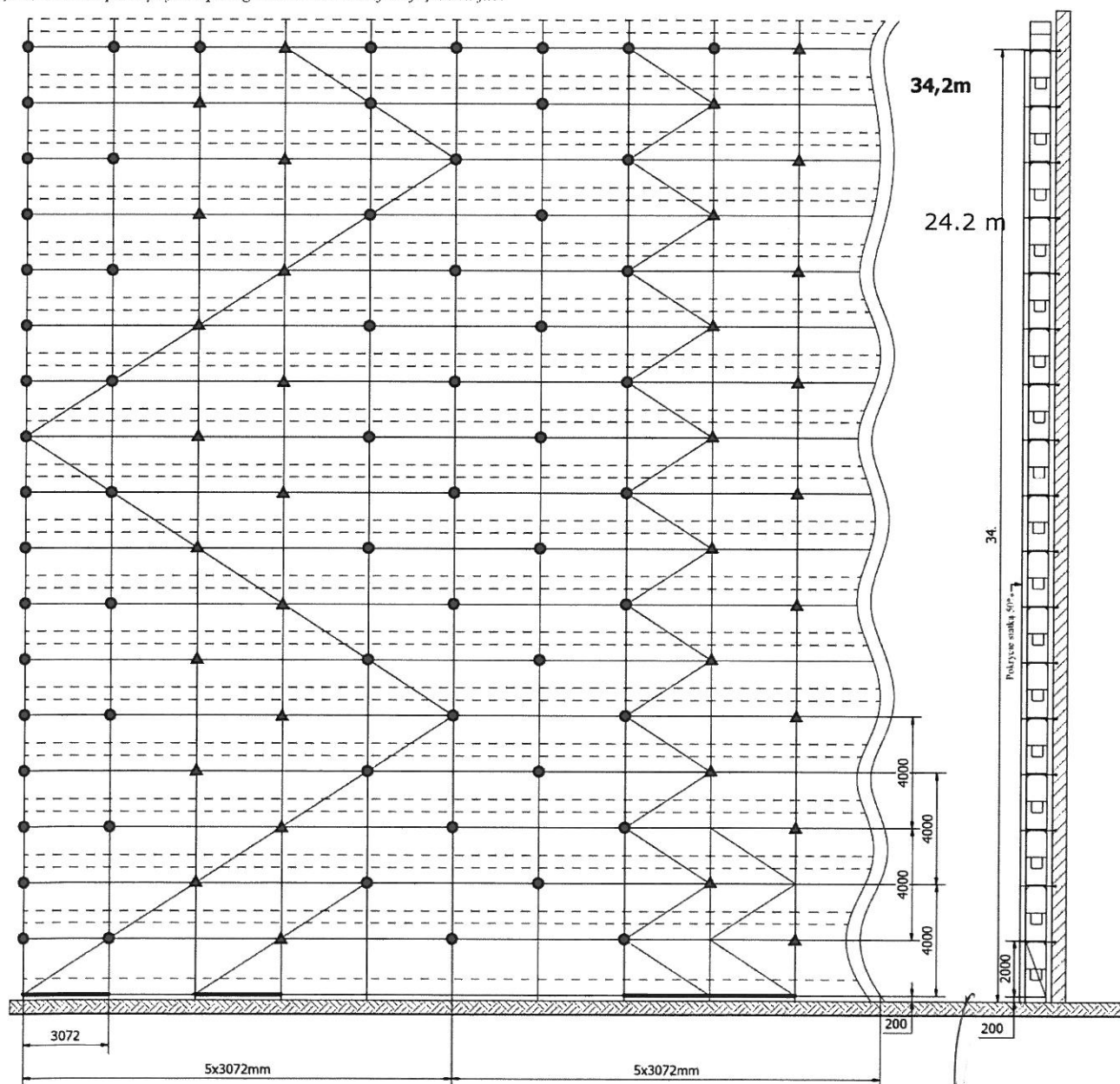
Façade filling type	Closed façade < 20%		
Vertical anchor spacing	4 m		
Horizontal anchor spacing	max. 6.14 m (every other bay)		
Maximum force in the anchor	II	2.3 kN	I
	I	4.5 kN	
Maximum force in the foot	Inner post	16 kN	I
	Outer post	16 kN	

Net-covered scaffolding, closed façade*
Basic version
Load on the working platform 2 kN/m²
Load on the safety platform 1 kN/m²



- - Single anchor
- ▲ - Double anchor V
- - Vertical bracing
- - - Vertical bracing from the
- - Horizontal bracing
- - - Single guard rail

* closed façade, when the quantity of the openings is less than 20% of the façade surface



Typical configuration for bays 3.07, 2.57, and 2.07

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KRS: 0000388745, NIP: 7123251944
REGON: 060778320

Notes

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OMERO Sp. z o.o.

20-315 Lublin, al. W. Witosa 3

KRS: 0000388745, NIP: 7123251944

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