



# FRAME SCAFFOLDING EURO+

Assembly instructions 



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# 1. SCAFFOLDING CHARACTERISTICS

The “EURO +” frame scaffolding is manufactured by OLAN Sp. z o.o. in the steel version. The system consists of basic components such as base jacks, frames, guardrails, braces, platforms and toe-boards. The system also includes a number of additional supplementary accessories, to facilitate later use.

The lifts between the successive levels of the scaffolding are determined by the frames, which have a height of 2.00 m and a width of 0.73 m or 1.09 m. The bay lengths of the system are 0.73 m, 1.09 m, 1.57 m, 2.07 m, 2.57 m and 3.07 m.

The load carrying capacity of the scaffold depends on its dimensions and on the length of the platforms used for the assembly of the scaffolding, and may range from 2 to 6 kN/m<sup>2</sup> (load classification according to the EN 12811-1:2004 standard)

The scaffolding bearing elements are the platforms, frames and base jacks, while diagonal and transverse braces serve to make the scaffolding more rigid. The safety features of the EURO + facade scaffolding are the guardrails, double guardrails, front guardrails and toe-boards, which, if the installation guidelines presented in these instructions are followed, allow for building a safe system.

These scaffolds can be used as working scaffolds or protective scaffolds, and also as supporting structures for roof structures (e.g. COVER DB 750 and DB 500 roof systems) manufactured and offered by OLAN Sp. z o.o., and widely used as temporary protection in difficult weather conditions.

The users may stray away from the guidelines and configuration variants shown in these instructions, but they must then use bespoke designs and carry out structural analysis.

The nominal load of a single bay of the “EURO +” scaffolding is:

- 3.0kN/m<sup>2</sup> for the 1.09m width
- 2.0kN/m<sup>2</sup> for the 0.73m width

The essential system elements in the structure of the scaffolding are the working steel platforms, which allow a free movement of users, and a possible transport of materials. Depending on the platforms used, the operational loads of these components are as follows:

- Steel platforms :
  - 6.0kN/m<sup>2</sup> for 0.73m
  - 6.0kN/m<sup>2</sup> for 1.09m
  - 6.0kN/m<sup>2</sup> for 1.57m
  - 6.0kN/m<sup>2</sup> for 2.07m
  - 4.5kN/m<sup>2</sup> for 2.57m
  - 3.0kN/m<sup>2</sup> for 3.07m

- Aluminum-plywood platforms

- 3.5kN/m<sup>2</sup> for 2.57m
- 2.0kN/m<sup>2</sup> for 3.07m

## 2. LIST OF STANDARDS AND REGULATIONS CONCERNING SCAFFOLDING

When designing, erecting, dismantling, and using “EURO +” scaffolds, it is necessary to observe the rules and requirements contained in:

- Ordinance of the Minister of Labor and Social Policy of 28 August 2003 on general health and occupational safety regulations. (Journal of Laws No. 169/03, item 1650).
- Ordinance of the Minister of Economy, Labor and Social Policy of 30 October 2002 (Journal of Laws No. 191/02, item 1596)
- These instructions
- Ordinance of the Minister of Infrastructure of 6 February 2003 on occupational safety and health during construction works. (Journal of Laws No. 47/03 item 401)
- Announcement of the Minister of Economy, Labor and Social Policy of 28 August 2003 on the publication of the uniform text of the Ordinance of the Minister of Labor and Social Policy on general provisions on occupational safety and health "(Journal of Laws No. 169/03 item 1650)
- PN-M-47900-1: 1996 "Standing metal working scaffolds. Definitions, classification and main parameters."
- PN-M-47900-2: 1996 " Standing metal working scaffolds. Tubular bricklayer’s scaffolds."
- PN-M-47900-3: 1996 " Standing metal working scaffolds. Frame scaffolds. "
- EN 12811-1: 2004 "Temporary works equipment. Scaffolds. Performance requirements and general design"
- PN-EN 12810-1: 2004 “Facade scaffolds made of prefabricated components. Product specifications"
- PN-EN 12810-2: 2004 "Facade scaffolds made of prefabricated components. Particular methods of structural design"
- PN-EN 74: 2002 Couplers, spigots and baseplates for use in falsework and scaffolds. Couplers for tubes. Requirements and test procedures"
- PN-EN 39: 2003 Loose steel tubes for tube and coupler scaffolds. Technical delivery conditions

## 3. GENERAL RULES FOR SCAFFOLDING ASSEMBLY

1. Become familiar with the assembly instructions, health and safety regulations, and generally applicable standards concerning scaffolding assembly.
2. Before proceeding with the scaffolding assembly, check the foundation, which should be capable of bearing the loads coming from the scaffolding structure and from the vertical forces that occur on the scaffolding. The bearing capacity of the ground on which the scaffold is to be erected cannot be less than 0.1 MPa. The ground bearing capacity should be determined in accordance with the PN-81/B-03020 standard. For structural foundations and in the case of ground reinforcement, the scaffolding foundation should meet the requirements of PN-M-47900-2, item 4.4.

3. Gather the tools needed for the assembly and proper leveling of the scaffolding, e.g.:
  - 500g hammer
  - Spirit level
  - 19/22 spanner
4. To protect the structure from sinking into the ground, place wooden sole boards on the ground, perpendicularly to the walls, and spaced to match the scaffolding sections to be erected
5. Place at least two base jacks on each sole board. The lengths of the screws on the jacks should be such, as to allow the tubes of the scaffold standards to slide onto them while providing an overlap of at least 150mm.
6. The scaffolding can only be installed by a qualified person, 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 operation of a commissioned scaffolding.

Basic technical and operational characteristics of “EURO+” facade scaffolding in standard configuration:

- *operational load – in the range 2-6kN/m<sup>2</sup>, (nominal values for the scaffolding according to the PN-EN 12811-1:2004 standard);*
- *number of platforms that can be simultaneously under load – one platform per each vertical row of scaffold bays;*
- *bay width: 0.73 m or 1.09 m;*
- *bay length: 0.73 m, 1.09 m, 1.57 m, 2.07 m, 2.57 m, or 3.07 m;*
- *scaffolding height (elevation of the top working platform): 40.5 m + 0.2 m.*
- *Maximum distance between the inner edge of scaffolding and the wall: 0,2m*
- *Minimum number of braces at each scaffolding level: 2*

The most commonly used scaffolding configurations are shown in Chapter 3. These include the installation of protective fans, scaffolding underpasses, installation of a hoist boom, protective meshes and fabric covers.

*Only genuine, undamaged parts of the “EURO+” facade scaffolding system should be used for the assembly.*

### *Criteria for evaluation of components*

*Items with visible signs of damage can not be used. In particular, it is not permissible to use:*

- *components showing signs of corrosion at the joint locations (welds),*
- *standards with visible damage in the form of a bending of the tube or deformation of its cross-section,*
- *steel platforms with damaged plating, or damaged and bent hooks,*
- *aluminum-plywood boards with plywood planking damage, such as delamination, cracks, swelling, cavities, and with curved platform transoms,*
- *base jacks with damaged thread, bent shafts, or hard-to-rotate nuts.*

*Damaged components should be replaced with defect-free ones, and the components damaged to the extent allowing for their repair should be sent to repair. Straightening of components is permissible only if deformations of circular cross-section are not present.*

*It is prohibited to repair support elements of the structure, i.e. standards, braces and base jacks.*

7. Correctly level the base scaffolding level, using a spirit level and a hammer.
8. The scaffolding should be erected in such a way that that the distance between the scaffolding structure and the facade of the building does not exceed 0.2m. If the distance from the building is greater than 0.2 m, additional guardrails and longitudinal toe-boards, to protect the working platform, should be installed.
9. The shaft of the base jack should enter the frame tube to a depth of at least 150mm.
10. During assembly, it is recommended to secure the frames with the RFS-00011 locking pins
11. The following rules apply to the loading of scaffolding:
  - *The load on the platform should be spread evenly over its entire surface;*
  - *Each person working on the scaffolding should be considered to weigh 80 kg (0.8 kN);*
  - *For the purposes of structural analysis, the weight of the materials transported by the hoist should be increased by 20%;*
  - *It is forbidden to dynamically load the platform, e.g. by jumping, throwing loads, etc.;*
  - *Platforms mounted on brackets must belong to the same load class as the main scaffolding platforms.*
12. Facade scaffold bracing is carried out in the outer plane of the scaffolding, parallel to the wall, using large plane or tower-like brace arrangement.

13. The extreme ends of the platforms must be secured with front guardrails and toe-boards.
14. The scaffolding should be equipped with ladder bays. The ladder bays should be assembled simultaneously with the erection of the scaffolding. The horizontal distance between the ladder bays must not exceed 40 m. The furthest distance of a work space from a ladder bay must not exceed 20 m.
15. In the bays with hatch-equipped access platforms, the base stair girder should be installed on the base jacks under the frame, and a plywood platform, serving as a ladder base support, should be mounted on it.
16. All connections of scaffold tubes should be made with the use of right-angle or swivel couplers conforming to the PN-EN 74:2002 standard. The coupler bolts should be tightened with a torque of 50 Nm.
17. The steel platforms should be placed in such a way that the gap between two platform elements belonging to the same level does not exceed 25 mm. When mounting brackets that extend the working platforms, a gap is produced, which needs to be filled with timber.
18. It is permitted to widen the scaffolding platforms using brackets and frames supported by vertical braces. The extension of platforms can be carried out on the outer side of the scaffold, on its top level, or at any platform level, provided the platform level with the installed extension, as well as one above and one below, are all anchored to the wall. If the extension of the working platform has been carried out with the use of 0.36 m brackets on the inner side of the scaffolding, the distance between the inner frame standard and the wall increases to 0.56 m.
19. The rules for facade configurations presented in this manual apply to scaffoldings with a maximum height of 40.5 m and a length of the structure greater than 10 m.
20. To protect persons from objects falling from the scaffolding, protective nets or fabric sheeting are used.
21. The scaffolding can be used in all wind load zones according to the PN-77/B-02011 standard. Scaffolds intended for use in the 3rd wind load zone and at elevations exceeding 1500 m above the sea level should undergo additional structural analysis for wind pressure.
22. If the scaffold is anchored, anchors should be installed as the scaffold assembly progresses. The natural attachment point of an anchor to the scaffold is the opening in the gusset plate. It is permissible to attach the anchor connector 30 cm under, or above, the opening in the gusset plate.
23. Dismantling of the scaffolding can take place after the completion of the work carried out from this scaffold, and after removal of all tools and materials from the working platforms. Partial dismantling, starting at the top, as the work progresses, is permitted. When dismantling, it is not permitted to drop items from the height. After dismantling, all scaffolding components should be cleaned, inspected and segregated into those suitable for further use, and those requiring repair or replacement.
24. If the scaffold is anchored, dismantling of the anchors should be done in parallel with the dismantling of the scaffolding. It is prohibited to dismantle more than one anchor level below the scaffold level being dismantled.

25. Storage and transport of the scaffolding components should be in accordance with the standard: PN-M-47900-2: 1996 "Metal standing working scaffolds. Tubular bricklayer's scaffolds".
26. Employees involved in the assembly and dismantling of scaffolding should be trained and qualified by a training center accredited by the Institute of Mechanised Construction and Rock Mining in Warsaw.
27. Personal protective equipment must be worn during assembly and disassembly.
28. During assembly and disassembly, a danger zone needs to be designated and secured with the use of markings and barriers of a height of at least 1.5 m. The danger zone size cannot be less than 1/10 of the height of the scaffold, and not less than 6 m, according to PN-M-47900-2:1996, item 4.10.4. In dense urban development, the size of the danger zone can be decreased, provided other safety measures are in place. The assembly, operation and dismantling of the scaffolding is forbidden:
  - *After dark, if no lighting, to ensure good visibility, has been provided;*
  - *In dense fog, rain and snow, and when black ice is present;*
  - *During storms or winds exceeding 10 m/s.*
29. The area where the scaffolding assembly or dismantling work is performed must be marked by placing warning signs in visible locations, at a height of up to 2.5 m above the ground level. The inscriptions on the warning signs should be visible from at least 10 m away.
30. Scaffolds located directly next to traffic should have protective fans, compliant with Section 22 of the Ordinance of the Minister of Infrastructure of 6 February 2003, "Dziennik Ustaw" (Journal of Laws of the Republic of Poland) No. 47, item. 401.
31. Frames located next to archways and underpasses through which traffic is moving should be protected with traffic separators, not connected to the scaffolding structure.
32. If during the assembly of the scaffolding traffic has been closed or obstructed (with permission from an appropriate local authority), a barrier and a red-colored sign with an inscription warning about the closure or obstruction should be placed at the location of the closure or obstruction, and at night a red light should be installed on the barrier.
33. It is not permissible to erect, dismantle or use scaffolds in the vicinity of overhead power lines if the distance of the scaffolding from the outer cables of the power line is less than:
  - *3 m for lines with rated voltage not exceeding 1kV;*
  - *5 m for lines with rated voltage exceeding 1 kV, but not exceeding 15kV;*
  - *10 m for lines with rated voltage exceeding 15 kV, but not exceeding 30kV;*
  - *15 m for lines with rated voltage exceeding 30 kV, but not exceeding 110kV;*
  - *30 m for lines with rated voltage exceeding 110 kV.*If the scaffolding is erected or dismantled underneath overhead electrical networks or at distances smaller than listed above, the power must be switched off during the assembly work.
34. The scaffolding structure should be equipped with lightning protection devices, in accordance with PN-M-47900-2: 1996 "Metal standing working scaffolds. Tubular bricklayer's scaffolds"

35. The use of the scaffolding is permissible after it has been accepted for use by a technical supervisor or an authorized person. During acceptance proceedings, the scaffolding must be inspected in accordance with item 7.3. of the standard PN-M-47900-2: 1996. Acceptance of the scaffolding should be confirmed with a report.
36. A plate indicating the admissible platform load should be affixed to the scaffolding. rusztowaniu powinna być umieszczona tablica informująca o dopuszczalnej wielkości obciążenia pomostów. The loading of scaffolding platforms with materials beyond their carrying capacity, and the gathering of workers on platforms are forbidden.
37. For transporting materials, the scaffold can be equipped with hoists, in a form of booms mounted to the scaffolding. The booms can be constructed out of tubes attached with couplers to the scaffolding. The standard boom and pulley, offered by the manufacturer, can also be used. The maximum weight of the materials to be lifted can not exceed 150 kg. When using hoists with a higher lifting capacity, mounted to the scaffolding, structural analysis for such scaffolding must be carried out. The boom must be additionally anchored in at least two points. The distance between the booms should not exceed 30 m. The distance between the lifting axis and the outermost scaffold point in the lifting plane should not be greater than 0.5 m. The elevation difference between the pulley block attachment point and the platform level cannot be less than 1.6 m. For hoisting, it is recommended to use winches with fittings allowing for mounting on scaffolds. These devices should have approval certificates issued by the Office of Technical Inspection. The winches should be installed strictly according to the instructions provided by the winch manufacturer.
38. Each time, before using the scaffold, it is necessary to check if the structure is still sound and complete, and whether there are any environmental changes that might affect its safe use. In particular, it is important to check if the foundation hasn't been disturbed. The inspection should be carried out by the foreman using the scaffold.
39. Scaffolding inspection must be carried out: after strong winds, heavy precipitation, hail, lightning, and occurrences of other similar hazards, and after working breaks exceeding 10 days, but not less often than once a month. During inspections, check:
- *condition of the foundation on which the scaffold is seated,*
  - *condition of protective measures (guardrails, toe-boards),*
  - *condition of platforms (gaps between platforms, damage, manner of subjecting platforms to loads), ladder bays (fastening of ladders, correct way of opening and closing access hatches),*
  - *method of securing top platforms and bracket-supported platforms against falling out,*
  - *condition of swivel couplers,*
  - *soundness of anchors,*
  - *condition of winches and support structures,*
  - *condition of lighting protection devices.*
- The inspection is to be conducted by the site manager or other authorized person. After each inspection, a note, or possibly an entry in the construction site logbook, should be made.

40. In winter, remove snow from the scaffolding before starting work.

## 4. SCAFFOLDING ASSEMBLY.

### **ASSEMBLY OF BASIC ELEMENTS OF "EURO+" FACADE SCAFFOLDING (PARTIAL EXAMPLES).**

"EURO+" FACADE SCAFFOLDING CONNECTION NODES



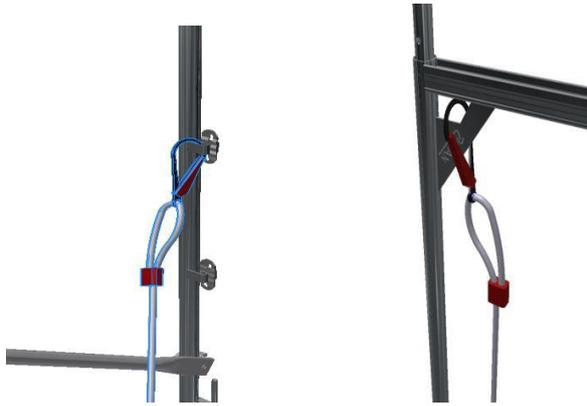
*[Fig. 1- "EURO+" system connection node.](#)*

EURO + facade scaffolding has three typical connection nodes:

- *Facade frame sockets for mounting guardrails, which serve as reinforcement and protection. Installation of the elements is carried out by inserting a single guardrail into the socket, and then driving a dedicated wedge in with a 500 g hammer.*
- *Opening between the gusset plate, U-profile, and vertical  $\text{\O} 48.3\text{mm}$  tube, for mounting diagonal braces of the scaffolding, which are equipped on the other end with a coupler for attaching to a  $\text{\O} 48.3\text{mm}$  facade frame tube*
- *$\text{\O} 12.5\text{mm}$  opening in the facade frame connection spigot and in the  $\text{\O} 48.3\text{mm}$  outer tube, which allows for securing connected frames with a RFS-0011 locking pin against a possibility of becoming disconnected.*

### **ASSEMBLY GUIDELINES FOR INCREASED OPERATION SAFETY.**

During assembly, disassembly, and use of the scaffolding, it is required to use personal protective equipment.  
For increased safety, some examples for personal protective equipment anchor points are given below.

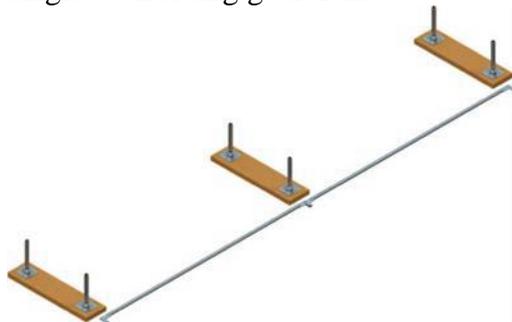


*Fig. 2-Personal protective equipment anchor points.*

When erecting the scaffold, a personal safety line should be anchored to the scaffolding elements. When fastening the safety line to the sheet metal elements of a connection node, this should be done at a frame located above the level one is standing on. This also applies to the joint sockets. If the frames of the level being assembled are not braced with guard rails, the safety line should be anchored to a wedge socket at a height of 1 m. Only if there is no other possibility, it is permissible to anchor the safety line to an element at the level one stands at. There are also ways of anchoring personal protective equipment directly to the structure accompanied by the scaffolding. The method of providing this protection will be specific for each site.

#### ASSEMBLY METHOD FOR EURO+ FACADE SCAFFOLDING

1. Assembly of the scaffolding should begin with the placement of wooden sole boards under the base jacks [min 2 base plates on one sole board] at the highest point of the ground, at a distance corresponding to the future position of the standards. That future spacing can be measured on the ground using single scaffolding guardrails.



2. Install scaffolding facade frames on the base jacks, and then connect them with single guardrails (at a height of 1.0 m), installed by inserting guardrail endings into facade frame sockets, and then level the scaffolding, by placing a spirit level on the top of a guardrail and adjusting the base jack nuts. After making sure the scaffolding has been preliminarily leveled, drive the wedges with a 500g hammer, securing this way the guardrails from becoming detached.



3. Install a brace, by inserting its profiled end into the opening between the gusset plate, U-profile, and tube, and use a coupler to attach the other end to the  $\varnothing$  48.3 mm tube of the facade frame.  
Caution: The brace should be placed in front of the guardrail, when viewed from the outside of the scaffolding.



4. In the prepared area, install two 0.32m platforms, by resting them on the u channel of the facade frame. Align the frames, by checking their position with a spirit level. For that, loosen the brace coupler, level the area, and tighten the brace again.



5. Then, starting with this assembled bay, continue the assembly of the first level, by installing: frames and guardrails (while checking the horizontal positioning of the guardrails in each bay, and possibly adjusting the position of the frames, by using the nuts on the base jacks), braces (in accordance with the bracing grid), and platforms, which serve also as plan bracing; in the places, where platforms are absent, plan bracing should be installed
6. In the bay where trapdoor-equipped platforms have been installed, a stair girder should be installed on supports under the frame, and on it a plywood platform should be mounted, on which the ladder will rest.



7. Upon completion of the first level of scaffolding, the correctness of its assembly should be checked [leveling, using all required components, correct guard-rails fitting]. A view of the first level of the scaffolding is shown below.



8. Anchor the scaffolding to the wall, following the rules described in the section "General rules for scaffolding assembly"



9. It is recommended to begin the assembly of the next level by mounting frames and guardrails in the ladder bay, while using personal protection equipment to prevent

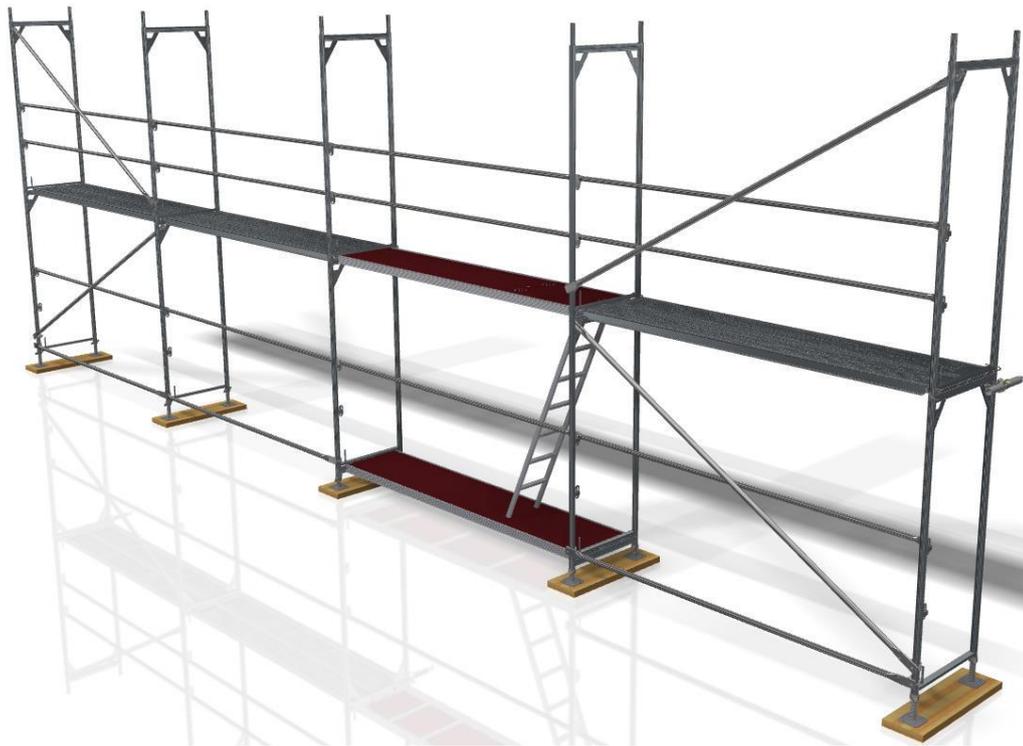


falls from the height.

10. Secure the “Euro+” system facade frames against a possibility of disconnection by using the RFS-00011 locking pin.



11. Starting with the ladder bay, proceed with mounting frames while moving in both directions, and next utilize facade frame sockets to mount two single guardrails, which not only will brace the scaffolding, but also will protect the workers from falling from the working platforms. Caution: Remember about securing all newly mounted frames with locking pins.
12. Install the diagonal braces, remembering to level the second scaffolding level before the final tightening of the braces.



13. Secure the working area on both opposite ends with the RFS-15073 front guardrail. The front guardrail is attached to a frame with a coupler on one side, and on the other side it is protected by a U-profile from being rotated.



14. All scaffolding levels from 2m up should be protected with toe-boards. The toe-boards should be attached to the rods of the facade frames. The platforms should be protected along the scaffolding with a longitudinal toe-board, and on the front with a transverse toe-board.
15. Rest platforms on the U-profiles of the facade frames on the second scaffolding level.  
 Note: Access platforms with ladders are positioned alternately in the ladder bay. The hatch has a safety feature preventing an unintentional opening. The hatch can be open only when a person is moving from one level of scaffolding to another. After entering a platform, or after leaving it, it is absolutely crucial that the hatch is closed.
16. Anchor the second scaffolding level to the wall, following the rules described in the section "General rules for scaffolding assembly"



17. To erect further scaffolding levels, repeat the earlier steps of these instructions.
18. When installing the last scaffolding level, mount guardrail posts in place of facade frames. Analogically, as for the other levels, begin the installation of the posts starting at the ladder bay.
19. Mount single guardrails using post sockets.
20. Secure the scaffolding at the front by installing a front frame.
21. Secure the scaffolding with the toe-boards. Attach the toe-boards to the front frame rods and to the guardrail posts. The platforms should be protected along the scaffolding with a longitudinal toe-board, and on the front with a transverse toe board



Note: When installing the scaffolding, the following rules must be observed:

- Every consecutive level of the scaffolding requires leveling with the use of a spirit level. Leveling should be carried out in the bays equipped with vertical braces. The leveling of the scaffolding is carried out by adjusting the position of the lower joint of the brace with respect to the vertical tube of the frame.
- Installation of the anchors should be carried out successively alongside the assembly of the entire scaffolding according to the anchor grid specified for the given configuration variant of the scaffolding.

Disassembly of the scaffolding is carried out in the reverse order.

### LEVELING OF EURO+ FACADE SCAFFOLDING

The assembly of the scaffolding should always be carried out starting with the highest level, with the nuts on the base jacks fully lowered. Align the frames by appropriately rotating the nuts on the base jacks. In the case of soil foundation, wooden sole boards must be used under the base plates, to spread the load throughout a larger surface area. Using sole boards is also recommended when erecting the scaffolding on a construction foundation. At least two base jacks should be placed on one wooden sole board. If the unevenness of the ground is significant, compensating frames of heights of 0.6m, 1m, or 1.5m should be used. If the slope of the terrain the scaffolding is to be erected on exceeds  $10^\circ$ , swivel base plates should be used and the scaffolding should be reinforced with tubes affixed to it with couplers. The tubes should be mounted 20cm above the ground surface, parallel to the slope.



### BRACING OF EURO+ FACADE SCAFFOLDING

The brace system of the scaffolding should ensure full stability of the structure, providing it with kinetic stability under external forces. The lowest node of the bracing should be located right above the ground.

The diagonal braces should be placed symmetrically, and the number of the braces should not be lower than 2 per every lift of the scaffolding. The distance between the brace-equipped bays should not be greater than 10 m (for bays of length 3.07 m, braces may be located every fourth bay, at a maximum, while for bays of length 2.57 m – every fifth bay).

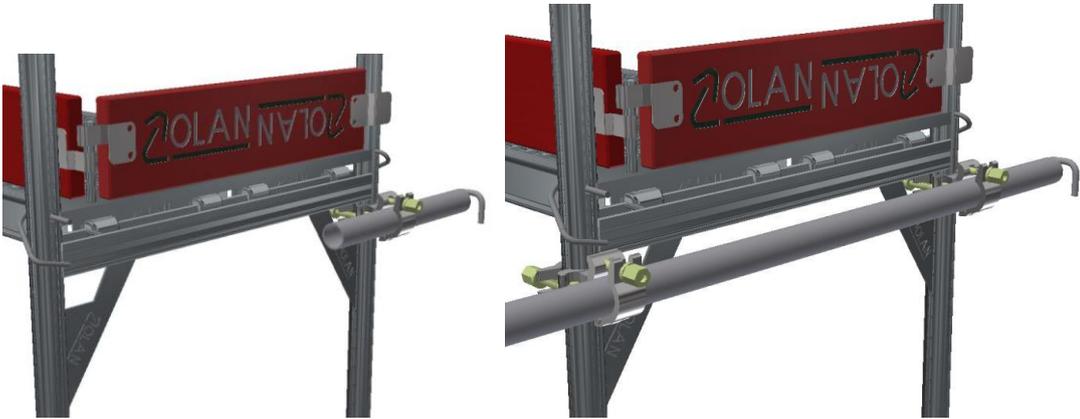
The braces are affixed to the scaffolding by inserting the press-formed end into the

opening between the gusset plate, U-profile, and tube, and using a coupler to attach the other end to the Ø 48.3mm tube of a facade frame. The braces should be located in front of the guardrails, when viewed from the outside of the scaffolding. A horizontal brace is to be affixed with two couplers to the Ø 48.3mm tube of the lower part of the facade frame on which no platforms are mounted.



**RULES FOR ANCHORING EURO+ FACADE SCAFFOLDING**

The anchoring of the “EURO +” frame scaffolds should be carried out by means of anchor connectors, attached to facade frame tubes inside the openings of the gusset plates with right-angle or swivel couplers. The hooks of the anchor connectors should be attached to the eyes of the anchor bolts installed in the wall of the building. The hooks of the anchor connectors should be positioned in such a way that only horizontal forces are transmitted, since anchor connectors cannot transmit vertical forces. It is allowed to use either short anchor connectors (e.g. 0.4 m long), fastened to the inner frame standards, or long ones (e.g. 1.3 m long), fastened to both frame standards, depending on the scaffolding configuration (e.g. presence of additional elements, such as brackets, passage frames, scaffold covering, e.g. with nets).



Below are some basic principles for anchoring the scaffold:

- Begin anchoring at the second level, using anchor connectors and right-angle couplers
- The anchors should be placed symmetrically, throughout the whole scaffolding area, and the horizontal distance between the anchors should not exceed 6 m (for sizes 2.57 m and 3.07 m, place an anchor every other bay)
- The vertical distance between the rows of anchors should not exceed 4 m (place the anchors every other level), and the anchors belonging to the same vertical row should be horizontally offset with respect to each other
- Each row of anchors should end at the edge of the scaffold,
- In the ladder bays, the bays should be additionally anchored on both sides in a given row of anchors
- Anchoring is permitted 30 cm below or above the opening in the gusset plate.

In the case of scaffolds with additional elements, such as tarpaulin or mesh screens, scaffolds with fitted archway girders, passage frames and protective fans, additional anchoring to the building wall is required. For scaffolds with 0.36 m bracket attached on the inner side of the scaffolding, when anchoring the scaffold by means of one connector to the internal standard, 20% of the total number of ties should be made as double ties. These ties should be evenly distributed over the entire surface, while maintaining the principle of fitting a minimum of two ties in V-configuration at each anchored level.



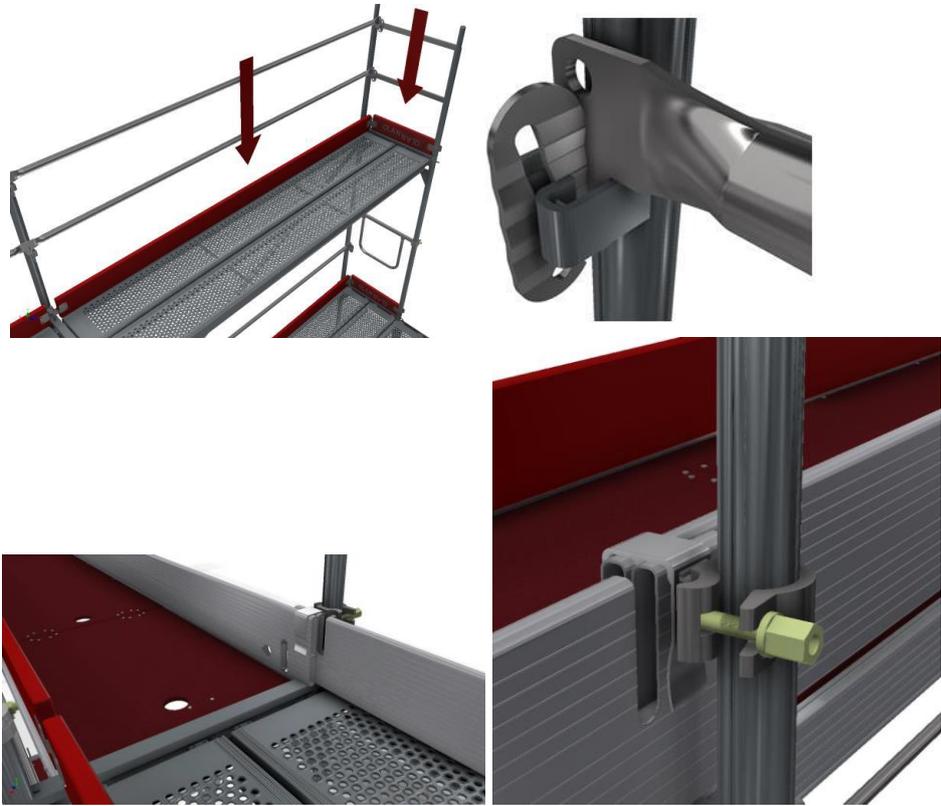
#### SIDE PROTECTION OF EURO+ FACADE SCAFFOLDING

“Euro+” frame scaffolding is equipped with the following side protection:

- Single guardrails
- Double guardrails
- Toe-boards
- Front frames
- Front guardrails

Each bay that is equipped with working platforms should be protected with toe-boards, the upper edge of which must be located at least 150 mm above the platform level.

Guardrails should be inserted into facade frame sockets, and then secured by driving wedges. If the distance between the work platforms and the wall is more than 0.2 m, a full set of protective measures must be used on the inner side of the scaffold. The wall-side toe-boards should be assembled from 150mm x 30mm boards, mounted with toe-board hooks, or by using ALUFOX system toe-boards, and 200-400mm overhangs beyond the span of the bay should be kept.



**FRONT PROTECTION OF EURO+ FACADE SCAFFOLDING**

Terminal frames of the scaffold should be protected on the opposite ends of the working area with RFS-15073 front guardrails. The front guardrail is attached to a frame with a coupler at one of its sides, and on the other side it is prevented from being rotated by a U-profile.





The upper edges of the scaffolding area should be protected with front frames. In the case of extending the working area with the use of brackets, protect the scaffolding with the front frame and front guardrail, or with four right-angle couplers and two  $\text{\O} 48.3$  mm tubes. Some methods of protecting a work area enlarged with the use of brackets are shown below.



#### STANDARD WAY OF MOVING BETWEEN THE LEVELS OF EURO+ FACADE SCAFFOLDING



For the purpose of movement of persons between the scaffolding levels, typically access bays equipped with ladders are used, but there is also a possibility of using a staircase, for better work ergonomics.

Note: It is absolutely crucial that the hatch is closed after each passage between the scaffolding levels, to prevent a person falling into the platform opening.

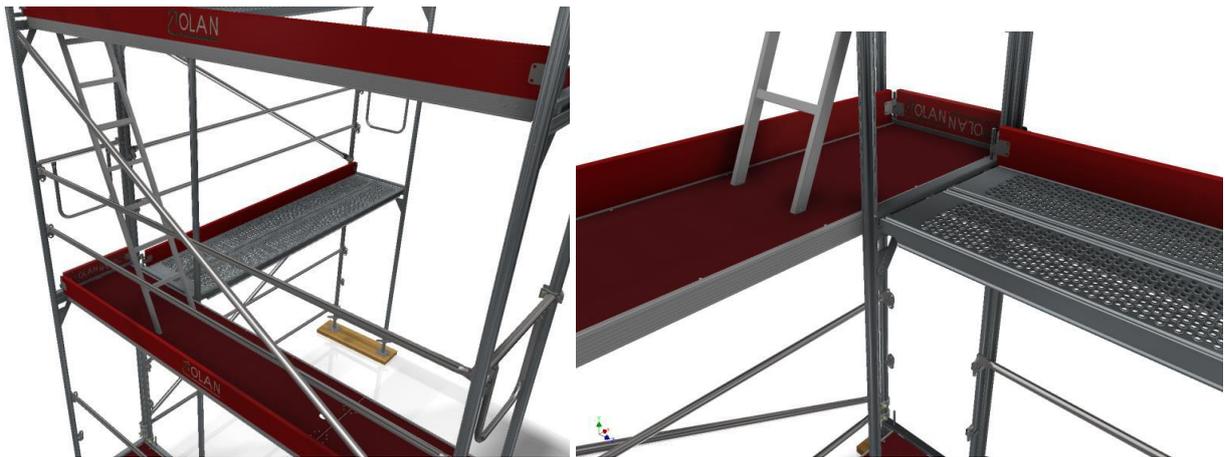
### CORNER CONNECTIONS OF EURO+ FACADE SCAFFOLDING

The corner of the scaffolding can be built in a few different ways. The most common solution uses right-angle couplers and  $\text{Ø } 48.3 \text{ mm}$  tubes. In order to construct this type of a corner, erect the scaffolds so that they meet at right angles at their ends, and then connect them using right-angle couplers and  $\text{Ø } 48.3 \text{ mm}$  tubes. Instead of the tubes, anchor connectors can be used. The gaps between the platforms of the connected scaffolds should be protected with supplementary plates. Note: the plates need to be secured against the possibility of becoming separated by wind.

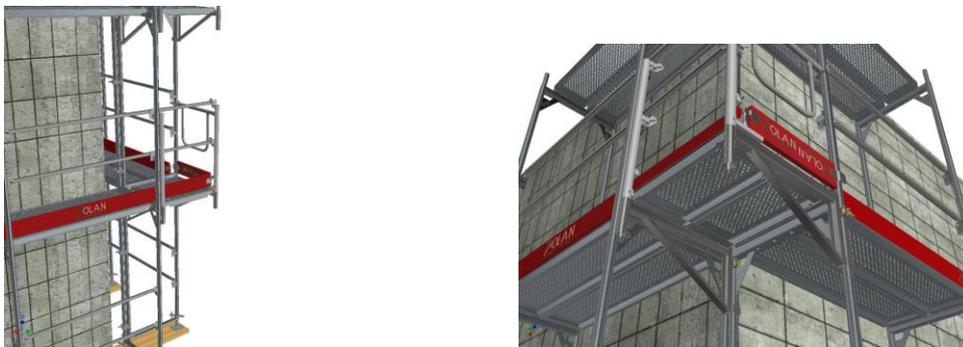


The scaffolds can be also joined by connecting two corner frames with swivel couplers. The scaffold corner connection obtained this way will be almost identical to the variant described above.

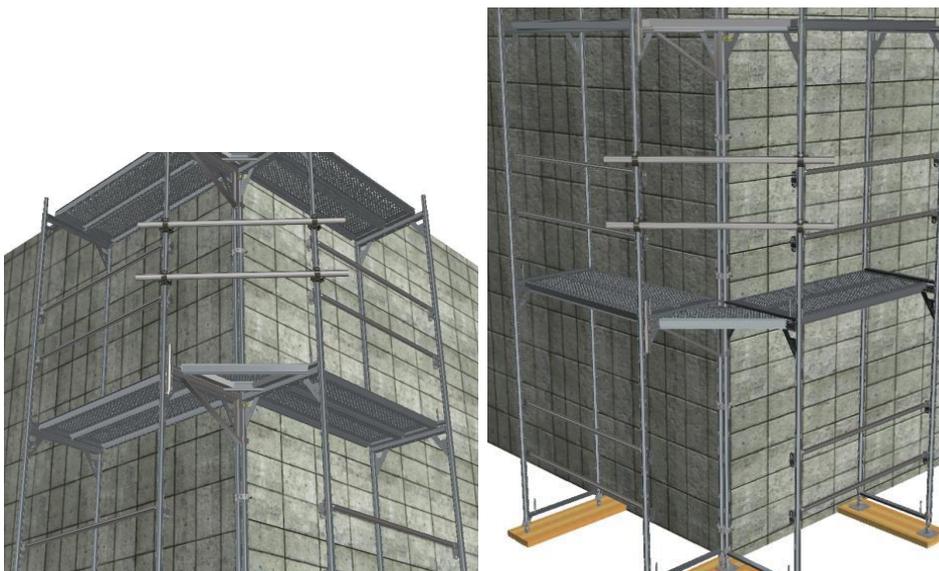




A scaffolding corner can be also constructed with the use of 0.73m brackets and 0.73 platforms, as shown below.



Scaffolds can be also connected with a 0.73m bracket and a corner platform, as shown below. Note: Construct guardrails, using two  $\text{\O} 48.3$  mm tubes and swivel couplers.



## WORKING AREA EXTENSION FOR EURO+ FACADE SCAFFOLDING

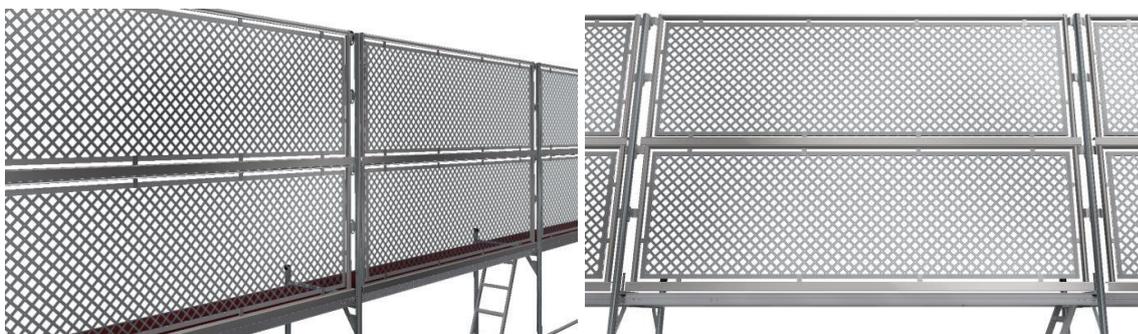
In cases where it is necessary to enlarge the working area, attach 0.76m or 0.36m brackets to the openings between the gusset plates and the facade frame tubes. When using the 0.76 brackets, it is necessary to support them with the RFS-54179 braces. [If proper braces are not available, swivel couplers and 48.3mm tubes can be used.]



The total load of the working area enlarged with the use of brackets must not exceed the maximal permissible load of the main platform. The 0.73m bracket can be installed at the top level of the scaffolding, on the outside of the scaffold, or at any level of the scaffolding, provided that additional anchoring to the wall has been performed for the bracket-equipped bay, and for the bays located directly above and below it.

## PROTECTION IN THE CASE OF ROOF WORK FOR EURO+ FACADE SCAFFOLDING

In order to provide protection to the works on the roof of the building, install brickguard posts on the top level of the scaffolding, and then attach mesh brickguards to them, using provided sockets. In this case, do not use toe-boards in the locations where brickguards are being used, since the brickguards protect the working area of the scaffolding.

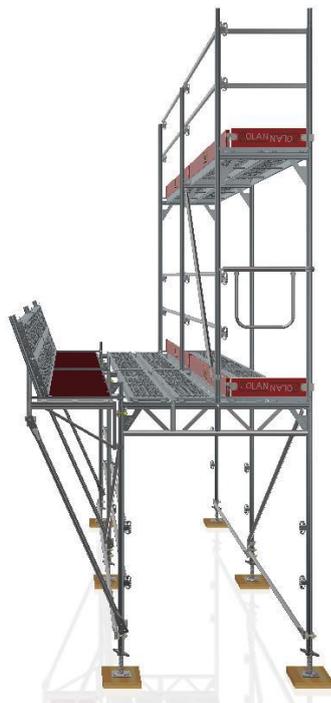


## PASSAGEWAY UNDER EURO+ FACADE SCAFFOLDING



In order to allow free passage under the scaffold, e.g. on sidewalks, passage frames are used at the lowest level. In this case, the assembly of the lowest level is as follows: Place the RFS-27220 passage frames on the base jacks, and mount guardrails and braces (on both the inner and outer sides of the scaffolding). Next, place platforms on the top of the passage frames. Provided that all the nodes of the first and second scaffolding levels are anchored to the wall, the maximum height of the scaffold constructed using passage frames is 34 m. The passage frames need to be braced on both sides of the frame (outer and inner). On the higher scaffolding levels, the frames are braced only at the outer side.

## PROTECTION FAN FOR EURO+ FACADE SCAFFOLDING



When performing renovation or construction work along city sidewalks, it is necessary to provide safe passage for pedestrians, including protection from objects falling from the scaffolding. For this purpose, a protective fan, mounted on 0.73m brackets, should be used. An example of such a solution is shown in the figure to the right. The fans can be additionally separated from the rest of the scaffolding with balustrades (guardrails and toe-boards), since they do not constitute a working area. It is forbidden to store materials on the protection fans. The fan construction conforms to the DIN-4420 standard.

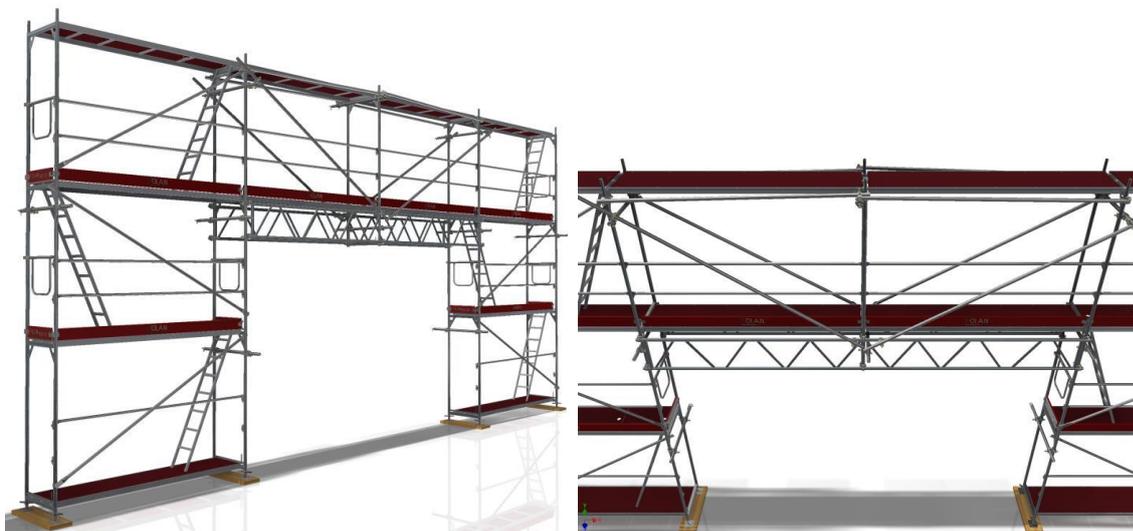


#### VEHICLE ARCHWAY FOR EURO+ FACADE SCAFFOLDING

There are times when it is necessary, during renovation work, to provide vehicle access to the interior of the building. The solution to this problem is shown in the figure below. In the figure, the protection fan, required when constructing a vehicle underpass, is not shown. The scaffolding must be necessarily anchored to the wall at the levels of platforms located below and above the protection fan.



To construct a scaffolding underpass as shown in the above figure, truss girders should be used to transfer the loads coming from the scaffolds resting on them. Begin the assembly of the structure by mounting the girders to the adjacent frames, on the outer sides, with right-angle couplers. In the case of a passage wider than 3.07m, the transom of the girder, or the 0,66m compensating frame RFS-07066 should be mounted in such a way, that the U-profiles of the frames are at the same level, which will allow for subsequent mounting platforms on them. The space between the compensating frame and the adjacent frames should be filled with 2.57 m or 3.07 m platforms, depending on the girder used. When constructing a scaffold underpass with the use of a truss girder, the girder should not replace more than two scaffold bays. For scaffolds with a height of more than 20 m and a width of 1.09 m, an additional reinforcement of the structure above the girder needs to be provided, and 6 m universal tubes need to be installed, to reinforce the frame standards in the passage area.



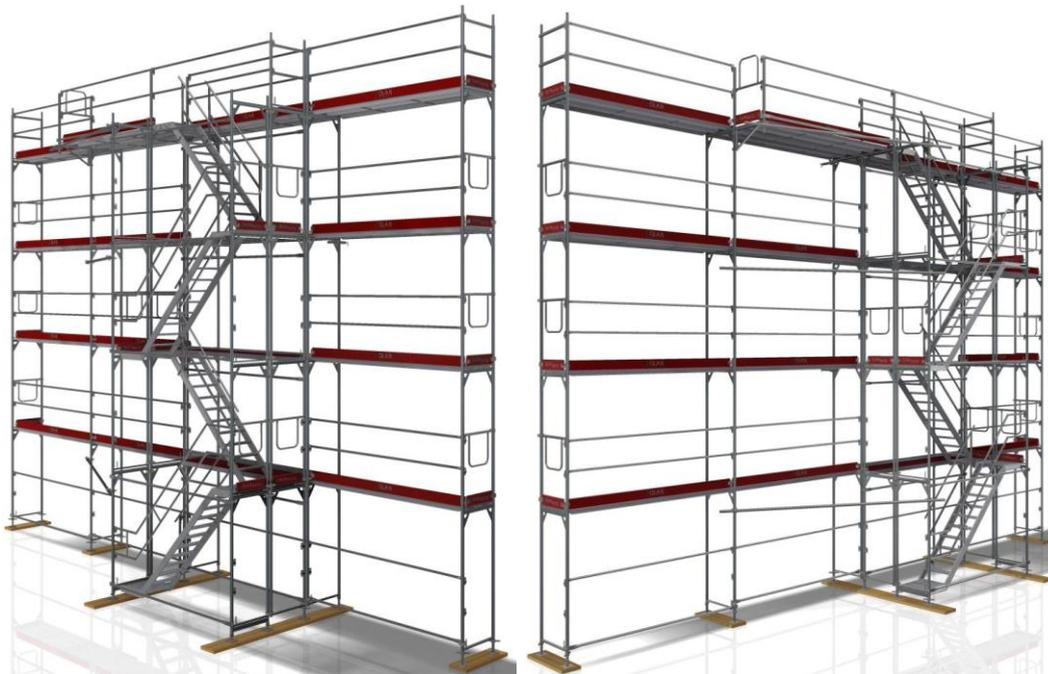
#### BYPASS FRAMES OF EURO+ FACADE SCAFFOLDING

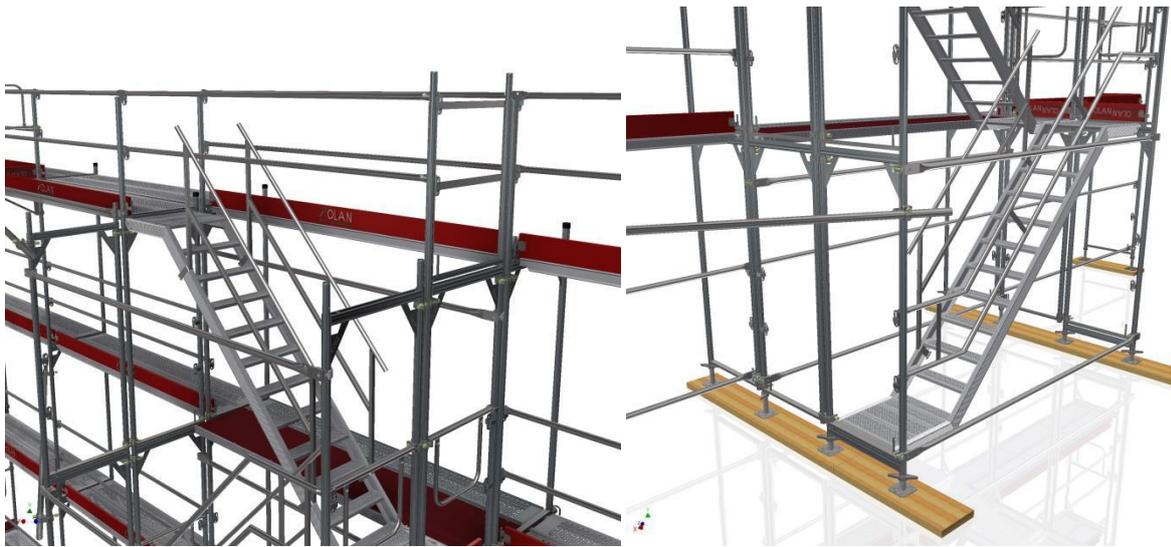
Bypass frames are used to bypass projections of the building, such as cornices and eaves. Using a bypass frame allows for a continuation of the assembly of the given level of the scaffolding, without a need to change the width of the platforms. When using a bypass frame, up to four levels of scaffolding can be erected above the installed bypass frame. The width of the passage between the frame standards is 367 mm, which allows for the use of the bypass frames for cornices protruding up to 480 mm from the wall, assuming that the distance of the scaffold from the wall is no greater than 20 cm. When using bypass frames, it is important to appropriately design the vertical arrangement of the scaffolding, that is, possibly use compensating frames of appropriate height, to align the bypass frames with the position of the cornices and eaves on the building.



#### EXTERNAL STAIRCASE OF EURO+ FACADE SCAFFOLDING

In order to provide convenient access between the levels of the scaffold, external staircases may be installed. Typically, an external staircase is mounted in a 3.07 m or 2.57 m bay, following one of the two configurations shown. The additional erected frames are connected to the scaffold every 4 m, vertically, while adhering to the principle of anchoring the nodes of the facade scaffolding at the joint locations. Connections are made with  $\text{Ø}48.3 \times 3.2$  mm tubes and right-angle couplers. The staircase should be fitted with a railing, consisting of front guardrails, and internal and external guardrails for the stairs.





Another method of installing an external staircase for scaffolding is shown below.



## TRANSPORT OF MATERIALS FOR EURO+ FACADE SCAFFOLDING

For transporting materials weighing no more than 150 kg, install scaffold hoist booms at designated locations, by attaching them to the scaffolding with couplers. The structure should be capable of carrying vertical static loads equal to 1.4 of the nominal load, and the horizontal loads caused by rope tension. The position of the winch, or of the man pulling the rope passing through the pulley block, should be at a minimum distance of 4.0m from the vertical axis of the pulley. At the hoist mounting locations, the scaffold should be additionally anchored to the wall in at least two points. The spacing between the hoists should not exceed 30m, and the distance from the hoist to the closer end of the scaffold – 15m. The height difference between the pulley block attachment point and the platform level cannot be greater than 1.6 m. At the material hoisting locations, the middle guardrails should be spread apart to allow the transfer of the load onto the platform, but not more than by 0.74m.

### NON-STANDARD CONFIGURATIONS OF EURO+ FACADE SCAFFOLDING

In the case of non-standard configurations of the scaffolding, additional structural analysis is required, to determine the safety of the structure. At customer's request, Olan Sp. z o.o. can commission an external design office to perform such structural analysis, at additional cost. It is the responsibility of the user to perform structural analysis for non-standard configurations of the scaffolding.

## 5. LABELING SYSTEM FOR "EURO+" FACADE SCAFFOLDING

For the purposes of identification during use, OLAN Sp. z o.o. permanently marks all manufactured products [by 0.7mm-deep stamping], and, additionally, manufacturer's or customer's labels are affixed to the products, according to individual agreements. The marking scheme is shown below.

"O" – manufacturer's identification: OLAN Sp. z o.o. in Žabokliki

"E+" – marking for the Euro+ modular scaffolding system.

"MM" – month number

"YY" – last two digits of the calendar year

## 6. LOADS AND CARRYING CAPACITIES

Maximum loads of platforms and base jacks as parts of scaffold structure.

Platform loads.

Platform load classification according to EN 12811						
Platform type	3.07m	2.57m	2.07m	1.57m	1.09m	0.73m
Steel platform 0.32	Class 4 3.0KN/m <sup>2</sup>	Class 5 4.5KN/m <sup>2</sup>	Class 6 6KN/m <sup>2</sup>	Class 6 6KN/m <sup>2</sup>	Class 6 6KN/m <sup>2</sup>	Class 6 6KN/m <sup>2</sup>
Aluminum-and-plywood platform 0.61	Class 3 2.0KN/m <sup>2</sup>					

Coupler working loads.

Symbol	Name	Admissible working load of the coupler
ZNN-ZB02CH	RIGHT-ANGLE COUPLER SET	F<9.1kN
ZNN-ZB01	SWIVEL COUPLER SET	F<9.9kN

Base jacks load-carrying capacities.

Admissible vertical load	Base jack height	Admissible nut-base plate distance				
		20cm	30cm	40cm	50cm	60cm
	0.4m	40kN	-	-	-	-
	0.6m	40kN	29kN	22kN	-	-
	0.8m	40kN	29kN	22kN	17kN	15kN

## 7.LIST OF PARTS OF “EURO+” SCAFFOLDING

Part Name	Symbol	Weight	
STEEL FRAME 2.00x0.73m - TUBE	RFS-07203	19.5	
STEEL FRAME 2.00x0.73m - SECTION	RFS-07202	16.5	
STEEL FRAME 1.50x0.73m - SECTION	RFS-07150	15.1	
STEEL FRAME 1.50x0.73m - TUBE	RFS-07151	16.6	
STEEL FRAME 1.00x0.73m - SECTION	RFS-07100	12.3	
STEEL FRAME 1.00x0.73m - TUBE	RFS-07101	13.1	
STEEL FRAME 0.66x0.73m - TUBE	RFS-07066	10.2	
STEEL FRAME 2.00x1.09m - TUBE	RFS-10200	25.6	
STEEL FRAME 1.50x1.09m - TUBE	RFS-10150	20.1	
STEEL FRAME 1.00x1.09m - TUBE	RFS-10100	17.6	
STEEL FRAME 0.66x1.09m - TUBE	RFS-10066	15.5	

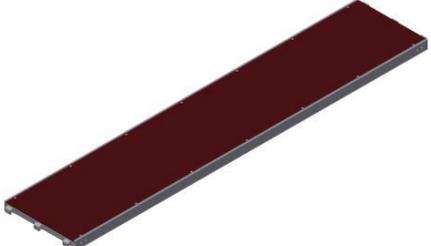
STEEL BYPASS FRAME 2.00x0.73m - TUBE	RFS-07211	20.51	
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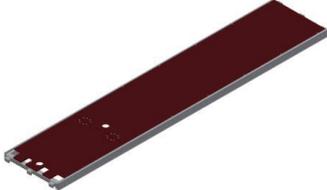
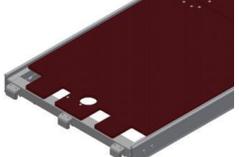
STEEL PASSAGE FRAME 1.5x2.2 FOUR ATTACHMENT POINTS	RFS-27220	34.5	
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STEEL PLATFORM 0.32x3.07m + TRANSOM	RFS-85307	18.9		
STEEL PLATFORM 0.32x2.57m + TRANSOM	RFS-85257	16		
STEEL PLATFORM 0.32x2.07m + TRANSOM	RFS-85207	13.8		
STEEL PLATFORM 0.32x1.57m + TRANSOM	RFS-85157	12.1		
STEEL PLATFORM 0.32x3.07m	RFS-84307	18.9		
STEEL PLATFORM 0.32x2.57m	RFS-84257	15.5		
STEEL PLATFORM 0.32x2.07m	RFS-84207	13.3		
STEEL PLATFORM 0.32x1.57m	RFS-84157	10.1		
STEEL PLATFORM 0.32x1.09m	RFS-84109	7.6		
STEEL PLATFORM 0.32x0.73m	RFS-84073	5.5		
				#1.2mm strip

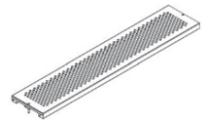
STEEL PLATFORM 0.32x3.07m + TRANSOM [1.5 sheet]	RFS-89307	22.2	
STEEL PLATFORM 0.32x2.57m + TRANSOM [1.5 sheet]	RFS-89257	18.9	
STEEL PLATFORM 0.32x2.07m + TRANSOM [1.5 sheet]	RFS-89207	15.5	
STEEL PLATFORM 0.32x1.57m + TRANSOM [1.5 sheet]	RFS-89157	12.1	
STEEL PLATFORM 0.32x3.07m [1.5 sheet]	RFS-88307	20.5	
STEEL PLATFORM 0.32x2.57m [1.5 sheet]	RFS-88257	18.5	
STEEL PLATFORM 0.32x2.07m [1.5 sheet]	RFS-88207	15.1	
STEEL PLATFORM 0.32x1.57m [1.5 sheet]	RFS-88157	11.7	
STEEL PLATFORM 0.32x1.09m [1.5 sheet]	RFS-88109	8.5	
STEEL PLATFORM 0.32x0.73m [1.5 sheet]	RFS-88073	6.0	

ALUMINUM-AND-PLYWOOD ACCESS PLATFORM WITH LADDER 3.07x0.61m	RFA-60307	29.7	
ALUMINUM-AND-PLYWOOD ACCESS PLATFORM WITH LADDER 2,57x0.61m	RFA-60257	26.8	

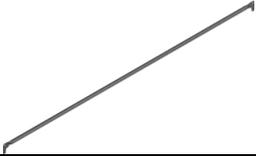
ALUMINUM PLATFORM WITH PLYWOOD 3.07x0.61m	RFA-61307	24	
ALUMINUM PLATFORM WITH PLYWOOD 2.57x0.61m	RFA-61257	20	
ALUMINUM PLATFORM WITH PLYWOOD 2.07x0.61m	RFA-61207	18.9	
ALUMINUM PLATFORM WITH PLYWOOD 1.57x0.61m	RFA-61157	15.2	
ALUMINUM PLATFORM WITH PLYWOOD 1.09x0.61m	RFA-61109	14	
ALUMINUM PLATFORM WITH PLYWOOD 0.73x0.61m	RFA-61073	8	

ALUMINUM-AND-PLYWOOD ACCESS PLATFORM WITHOUT LADDER 3.07x0.61m	RFA-62307	25.4	 
ALUMINUM-AND-PLYWOOD ACCESS PLATFORM WITHOUT LADDER 2.57x0.61m	RFA-62257	22.4	
ALUMINUM-AND-PLYWOOD ACCESS PLATFORM WITHOUT LADDER 2.07x0.61m	RFA-62207	19.5	
ALUMINUM-AND-PLYWOOD ACCESS PLATFORM WITHOUT LADDER 1.57x0.61m	RFA-62157	16.3	

STEEL LADDER 2.15m (perf. steps)	RFS-01021	11.8	
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STEEL PLATFORM 0.30x1.0m SUPPLEM. BRAZE WELD.	RFS-30100	5.4	
STEEL PLATFORM 0.30x1.5m SUPPLEM. BRAZE WELD.	RFS-30150	7.8	
STEEL PLATFORM 0.30x2.0m SUPPLEM. BRAZE WELD.	RFS-30200	9.9	

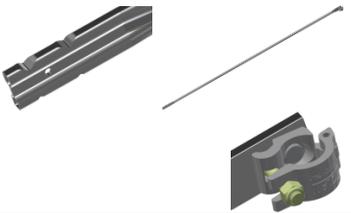
BASE JACK 0.6m st1003	RFS-12160	5.26	
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SINGLE GUARDRAIL 3.07m	RFS-01307	5.6	
SINGLE GUARDRAIL 2.57m	RFS-01257	4.7	
SINGLE GUARDRAIL 2.07m	RFS-01207	3.8	
SINGLE GUARDRAIL 1.57m	RFS-01157	3.0	
SINGLE GUARDRAIL 1.09m	RFS-01109	2.0	
SINGLE GUARDRAIL 0.73m	RFS-01073	1.5	

FRONT GUARDRAIL 0.73m	RFS-15073	3.7	
FRONT GUARDRAIL 1.09m	RFS-15109	4.6	

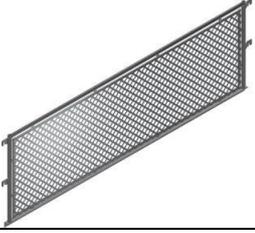
FRONT FRAME 0.73m - TUBE	RFS-00073	13.4	
FRONT FRAME 1.09m - TUBE	RFS-00109	15.4	

MESH BRICKGUARD POST 0.73m 5-SOCKET	RFS-11073		
MESH BRICKGUARD POST 1.09m 5-SOCKET	RFS-11109		
STEEL GUARDRAIL POST WITH PLATFORM PROTECTION 0.73m TUBE	RFS-40073		
STEEL GUARDRAIL POST WITH PLATFORM PROTECTION 1.09m TUBE	RFS-40109		
STEEL GUARDRAIL POST 0.73m TUBE	RFS-04073		

DIAGONAL BRACE FOR 3.07m BAY	RFS-50307	8.3	
DIAGONAL BRACE FOR 2.57m BAY	RFS-50257	7.3	
DIAGONAL BRACE FOR 2.07m BAY	RFS-50207	6.6	

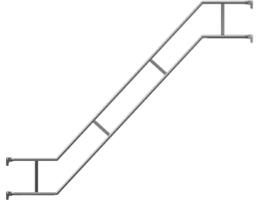
WOODEN TOE-BOARD 3.07m	RFS-20307	7.8	
WOODEN TOE-BOARD 2.57m	RFS-20257	6.7	
WOODEN TOE-BOARD 2.07m	RFS-20207	5.4	
WOODEN TOE-BOARD 1.57m	RFS-20157	4.2	
WOODEN TOE-BOARD 1.09m	RFS-20109	2.7	
WOODEN TOE-BOARD 0.73m	RFS-20073	1.8	

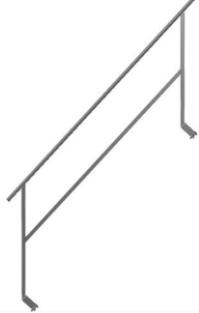
Protective roof bracket 0.73m	RFS-14073	5.9	
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MESH BRICKGUARD 3.07m	RFS-13307	28.6	
MESH BRICKGUARD 2.57m	RFS-13257	25.2	
MESH BRICKGUARD 2.07m	RFS-13207	21.7	
MESH BRICKGUARD 1.57m	RFS-13157	16.8	

U-SECTION TRANSOM 0.73m	RFS-22073	3.1	
U-SECTION TRANSOM 1.09m	RFS-22109	6.1	
BASE U-SECTION TRANSOM OF STAIRS	RFS-22730	3.0	

PERF. ALUMINUM STAIRS TRP 3.07x0.63	RFA-30307	31.5	
PERF. ALUMINUM STAIRS TRP 2.57x0.64	RFA-30257	27	
ALUMINUM PROF. STAIRS TRP 3.07x0.63	RFA-35307	30.0	
ALUMINUM PROF. STAIRS TRP 2.57x0.63	RFA-35257	25.3	

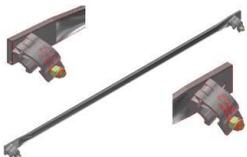
ALUMINUM STAIRWAY GUARDRAIL TRP 3.07x2.0 B= 0.64	RFA-31307	17.8	
ALUMINUM STAIRWAY GUARDRAIL TRP 2.57x2.0 B= 0.64	RFA-31257	16.1	

INTERNAL STAIRWAY GUARDRAIL	RFS-32001	12.0	
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BRACKET WITH CLAMP 1.09m WITH COUPLER	RFS-12109	10.5	
BRACKET WITH CLAMP 0.73m WITH COUPLER	RFS-12073	6.5	
BRACKET WITH CLAMP 0.73m WITH COUPLER (LONG)	RFS-12074	19.4	
BRACKET WITH CLAMP 0.36m WITH COUPLER	RFS-12036	3.3	

GALVANIZED STEEL LOCKING PIN	RFS-00011		
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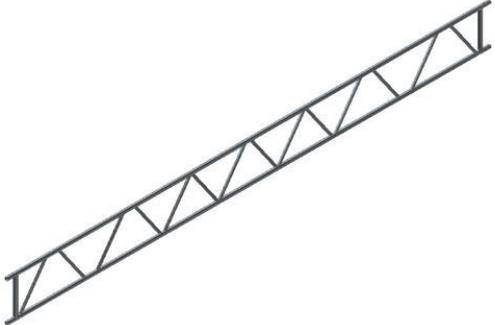
ANCHOR CONNECTOR WITH HOOK 3.0m	RFS-17300	9.3	
ANCHOR CONNECTOR WITH HOOK 1.30m	RFS-17130	4.1	
ANCHOR CONNECTOR WITH HOOK 0.85m	RFS-17085	2.8	
ANCHOR CONNECTOR WITH HOOK 0.40m	RFS-17040	1.45	

CROSS-BRACE FOR 1.95m BAY	RFS-54195	8.3	
CROSS-BRACE FOR 1.79m BAY	RFS-54179	7.2	

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

CHASSIS BEAM 0.73x1.9m	RFS-03073	26.3	
CHASSIS BEAM 1.09x2.6m	RFS-03109		

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

STEEL TRUSS GIRDER 0.4x6.24m	RFS-04624	60	
STEEL TRUSS GIRDER 0.4x6.00m	RFS-04600	57	
STEEL TRUSS GIRDER 0.4x5.24m	RFS-04524	55	
STEEL TRUSS GIRDER 0.4x5.00m	RFS-04500	53	
STEEL TRUSS GIRDER 0.4x4.24m	RFS-04424	45	
STEEL TRUSS GIRDER 0.4x4.00m	RFS-04400	39	
STEEL TRUSS GIRDER 0.4x3.24m	RFS-04324	36	
STEEL TRUSS GIRDER 0.4x3.00m	RFS-04300	29	
STEEL TRUSS GIRDER 0.4x2.00m	RFS-04200	20	
STEEL TRUSS GIRDER 0.5x6.24m	RFS-05624	65	
STEEL TRUSS GIRDER 0.5x5.24m	RFS-05524	55	
STEEL TRUSS GIRDER 0.5x4.24m	RFS-05424	46	
STEEL TRUSS GIRDER 0.5x3.24m	RFS-05324	33	

GIRDER CONNECTOR L=0.4M	RFS-05001	2.1	
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ALUMINUM PLATFORM CROSS-BEAM 6.0M	RFA-21600	15	
ALUMINUM PLATFORM CROSS-BEAM 5.0M	RFA-21500	13	
ALUMINUM PLATFORM CROSS-BEAM 4.0M	RFA-21400	10	
ALUMINUM PLATFORM CROSS-BEAM 3.0M	RFA-21300	8.5	
ALUMINUM PLATFORM CROSS-BEAM 1.92M	RFA-21192	5.8	
ALUMINUM PLATFORM CROSS-BEAM 1.60M	RFA-21160	5	
ALUMINUM PLATFORM CROSS-BEAM 1.20M	RFA-21120	3.8	
ALUMINUM PLATFORM CROSS-BEAM 0.90M	RFA-21090	3	
ALUMINUM PLATFORM CROSS-BEAM 0.64M	RFA-21064	2.5	

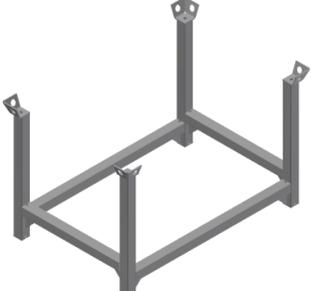
HOIST	RFS-25080	7.7	
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STEEL PLATFORM 0.32x0.73m Triangular	RFS-84001	6.6	
STEEL PLATFORM 0.73m Triangular	RFS-84010	9	

GUARDRAIL COUPLER WITH WEDGE	ZNN-07048	0.9	
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RIGHT-ANGLE COUPLER - SET	ZNN-ZB02CH	0.8	
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SWIVEL COUPLER - SET	ZNN-ZB01CH	1.0	
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STORAGE PALLET 0.8 x 1.2m	RFS-61280	38	
STORAGE PALLET 0.8 x 1.2m WITH MESH	RFS-61281		
MESH BIN WITH WOODEN FLOOR	RFS-60567		
STORAGE PALLET 1.5x0.8x0.75m FOR SUPPORTS	RFS-61580		
STORAGE PALLET 1.5x0.8x0.75m FOR SUPPORTS LIGHT	RFS-61581		

## 8.SCAFFOLDING ACCEPTANCE REPORT

.....  
place, date

### SCAFFOLDING ACCEPTANCE REPORT

Scaffolding specification			
Scaffolding type:			
Construction site address:		Scaffolding location:	
Scaffolding dimensions:			
Scaffolding purpose:			
Admissible load of scaffolding working platforms [kN/m <sup>2</sup> ]			
Scaffolding user:			
Scaffolding assembly			
Name of company performing installation:			
Installer's name and surname:			
Installer's license number:		Installer's phone number:	
Installation performed in accordance with:	<input type="checkbox"/> Operation and Maintenance Manual	<input type="checkbox"/> Bespoke design	
Earthing test results			
Acceptance and commissioning			
Name and surname of the person authorized to give acceptance:			
Company:		Chamber of Civil Engineers membership number:	
Scaffolding commissioning date:			

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

Installer	Accepting person



# 9. ASSEMBLY DIAGRAM OF "EURO+" SCAFFOLDING

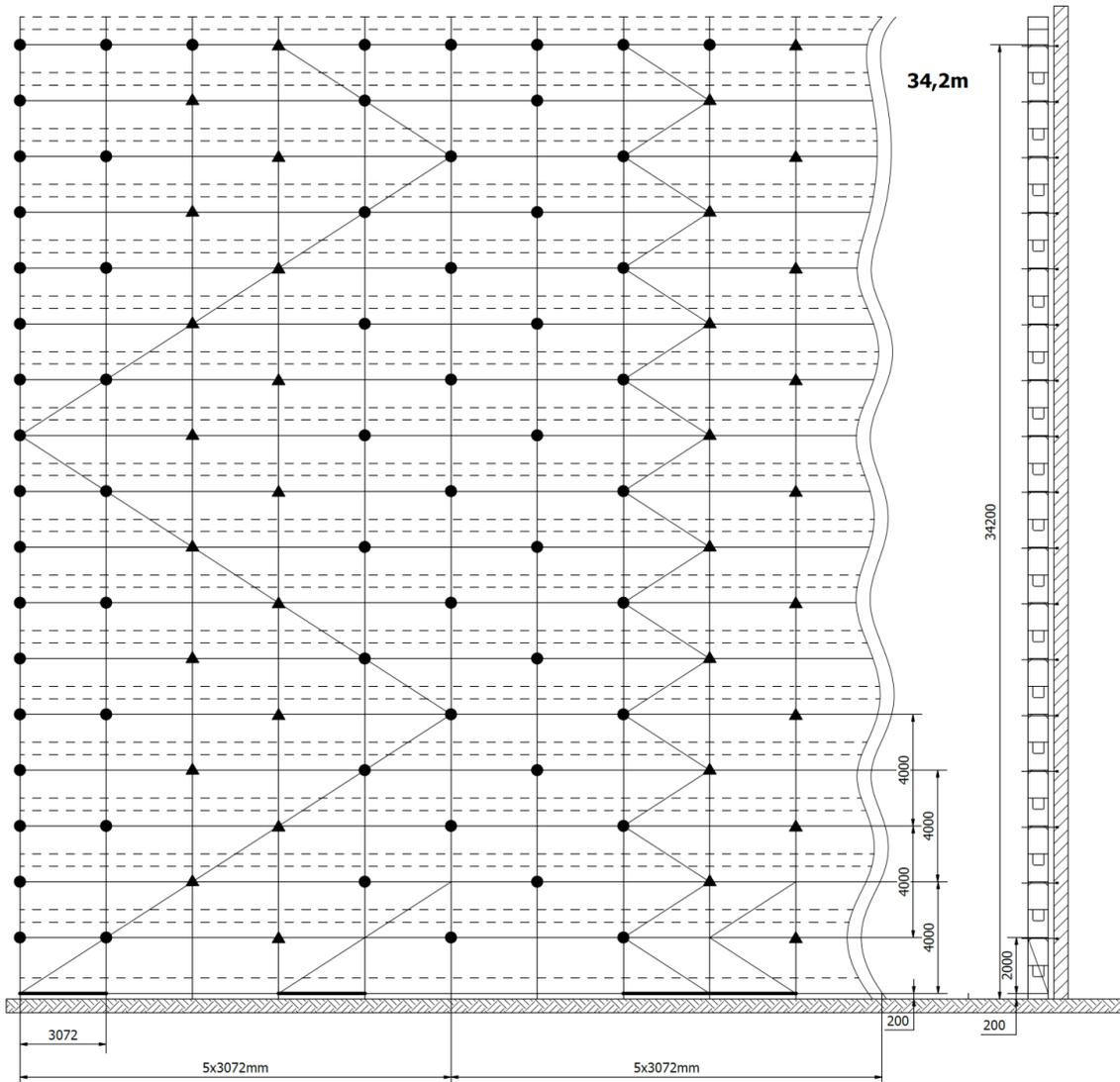
## ANCHOR AND BRACE CONFIGURATION FOR EURO+ FACADE SCAFFOLDING, NON-COVERED, UP TO 34 M HIGH.

Type of facade fill	Closed facade < 20%		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		2.8	1
	⊥	4.8	
Maximum force at foot	Inner standard	16.3	1
	Outer standard	51.1	

Non-covered scaffold, closed facade\*  
 Base variant  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>

- Single anchor
- Double anchor in V config.
- Anchor connected to two frame tubes
- Vertical brace
- Anchor connected to one frame tube
- Wall-side vertical brace
- Horizontal brace
- Double anchor in V configuration
- Single guardrail

\* facade is considered closed if openings constitute less than 20% of facade area



- Single anchor

- Double anchor in V config.

Type of facade fill	Partially open facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		2.8	2
	⊥	4.8	
Maximum force at foot	Inner standard	17.1	2
	Outer standard	55.1	

Non-covered scaffold, partially open facade\*  
 Base variant  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>

- Anchor connected to two frame tubes

- Vertical brace

- Anchor connected to one frame tube

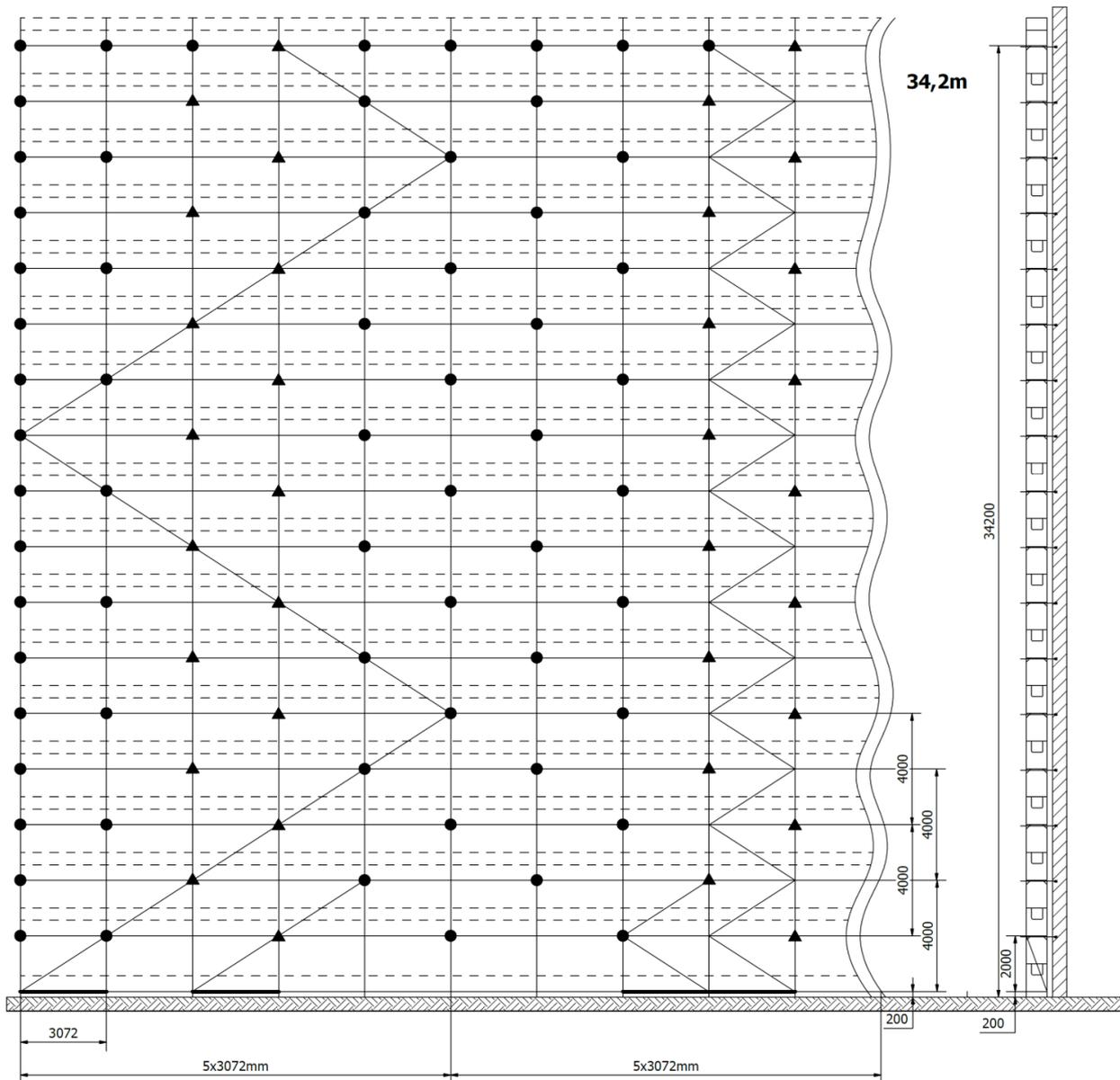
- Wall-side vertical brace

- Double anchor in V configuration

- Horizontal brace

- Single guardrail

\* facade is considered partially open if openings constitute between 20% and 60% of facade area



Type of facade fill	Closed facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		2.1	
	⊥	4.7	
Maximum force at foot	Inner standard	29.4	3
	Outer standard	62.4	

Non-covered scaffold, closed facade.\*  
 Variant: 0.73m brackets on the top level, on the outer side, and 0.36m brackets on the inner side, on all scaffolding levels  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>

- Single anchor
- Double anchor in V config.
- Vertical brace

- Anchor connected to two frame tubes

- Anchor connected to one frame tube

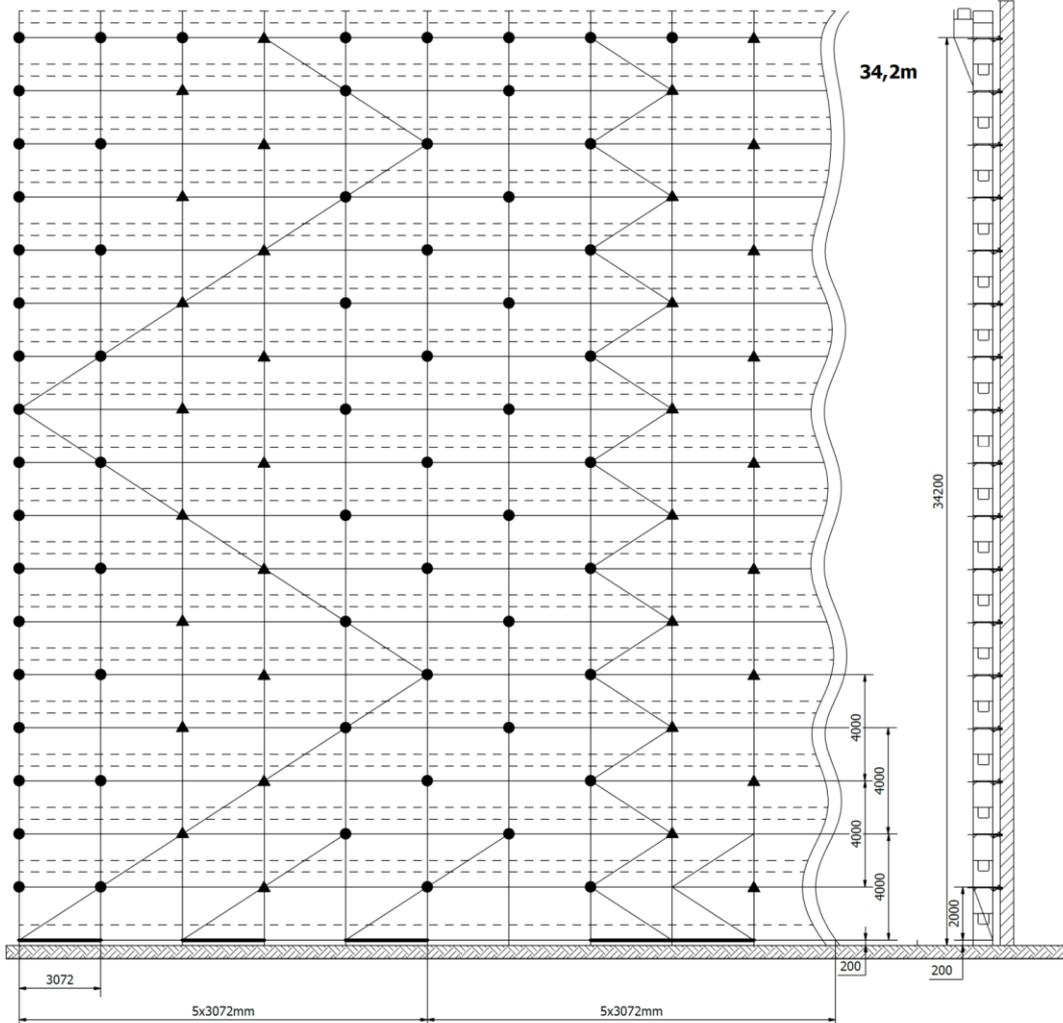
- Double anchor in V configuration

- Wall-side vertical brace

- Horizontal brace

- Single guardrail

\* facade is considered closed if openings constitute less than 20% of facade area



Type of facade fill	Partially open facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		2.1	4
	⊥	4.7	
Maximum force at foot	Inner standard	30.2	4
	Outer standard	62.4	

Non-covered scaffold, partially open facade.\*  
 Variant: 0.73m brackets on the top level, on the outer side, and 0.36m brackets on the inner side, on all scaffolding levels  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>

- Single anchor
- Double anchor in V config.
- Vertical brace

- Anchor connected to two frame tubes

- Anchor connected to one frame tube

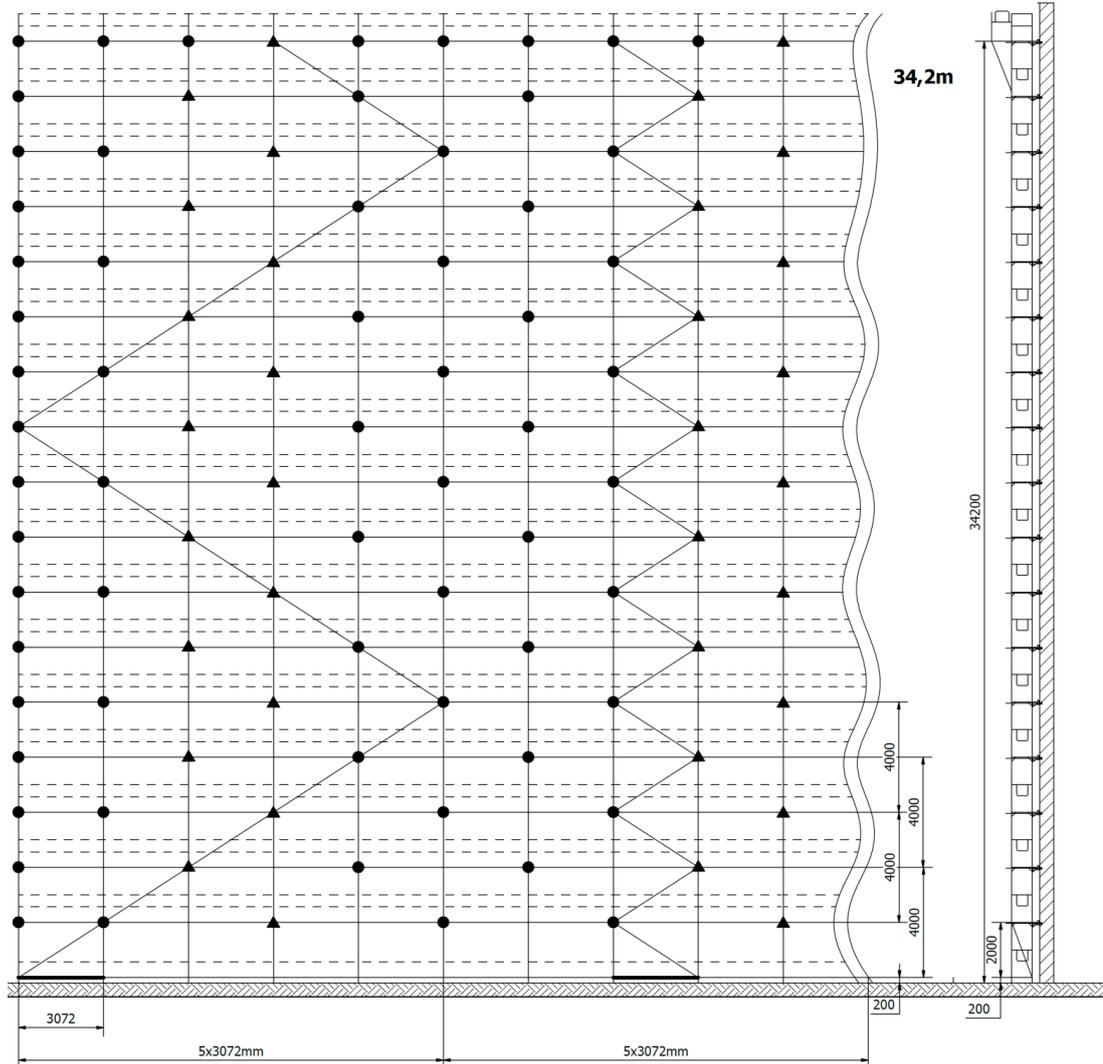
- Double anchor in V configuration

- Wall-side vertical brace

- Horizontal brace

- Single guardrail

\* facade is considered partially open if openings constitute between 20% and 60% of facade area



Type of facade fill	Closed facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		2.3	5
	⊥	4.8	
Maximum force at foot	Inner standard	25.1	5
	Outer standard	49.7	

Non-covered scaffold, closed facade.\*  
 Variant: Passage frame  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>  
 Vertical braces on two scaffolding levels, 2 for every 5 bays

- Single anchor
- Double anchor in V config.
- Anchor connected to two frame tubes
- Vertical brace

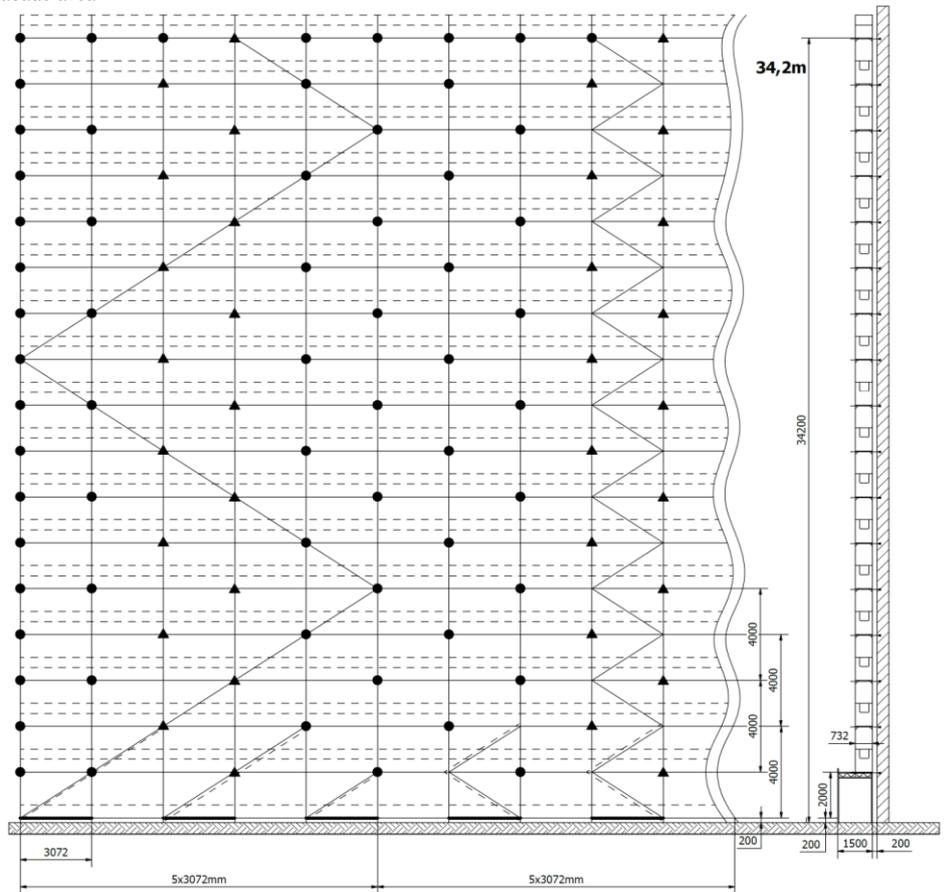
- Anchor connected to one frame tube
- Wall-side vertical brace
- Double anchor in V configuration
- Horizontal brace
- Single guardrail

\* facade is considered closed if openings constitute less than 20% of facade area

Type of facade fill	Partially open facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		2.3	6
	⊥	4.8	
Maximum force at foot	Inner standard	25.5	6
	Outer standard	49.1	

Non-covered scaffold, partially open facade.\*  
 Variant: Passage frame  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>  
 Vertical braces on two scaffolding levels, 2 for every 5 bays

\* facade is considered partially open if openings constitute between 20% and 60% of facade area



Type of facade fill	Closed facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		1.9	
	⊥	4.8	
Maximum force at foot	Inner standard	23.4	7
	Outer standard	52.2	

Non-covered scaffold, closed facade.\*  
 Variant: Vehicle underpass  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>

- Single anchor
- Double anchor in V config.
- Anchor connected to two frame tubes
- Vertical brace

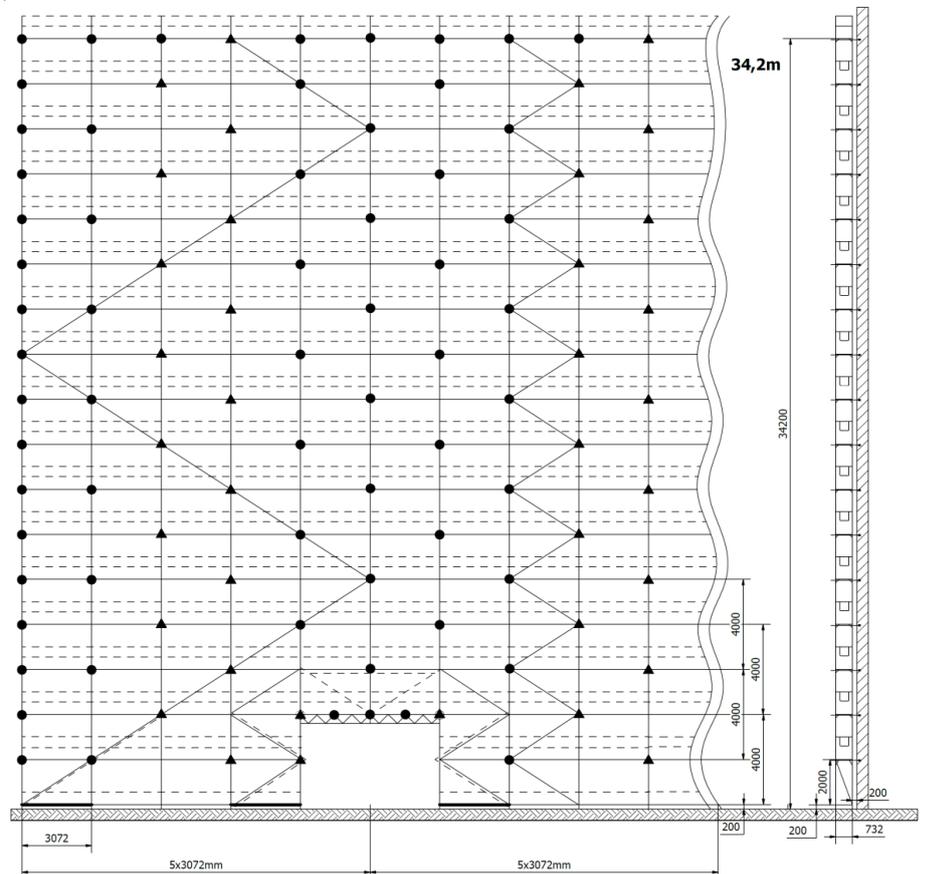
- Anchor connected to one frame tube
- Wall-side vertical brace
- Double anchor in V configuration
- Horizontal brace
- Single guardrail

\* facade is considered closed if openings constitute less than 20% of facade area

Type of facade fill	Partially open facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		1.9	
	⊥	4.8	
Maximum force at foot	Inner standard	23.4	8
	Outer standard	52.1	

Non-covered scaffold, partially open facade.\*  
 Variant: Vehicle underpass  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>

\* facade is considered partially open if openings constitute between 20% and 60% of facade area



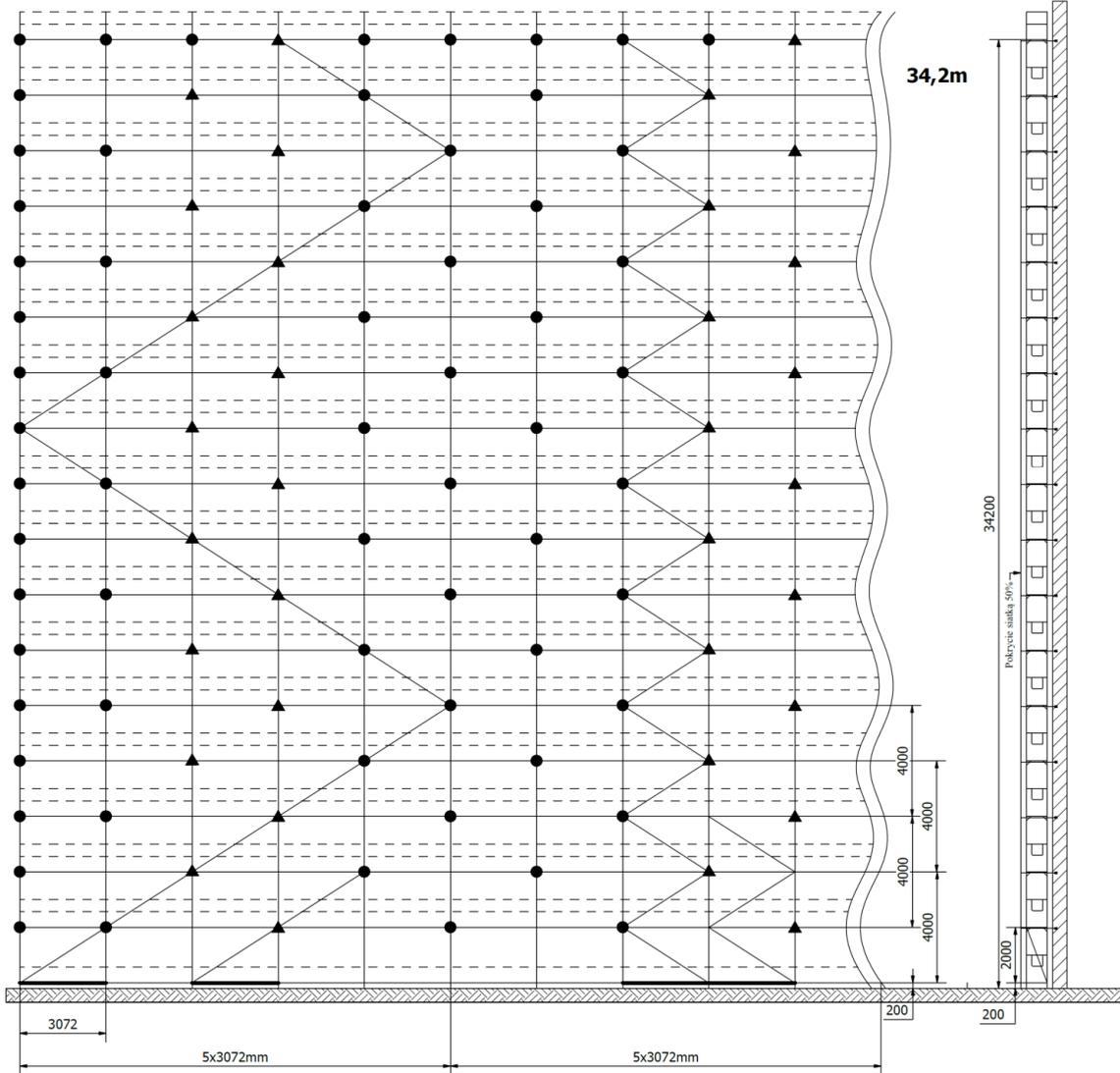
# ANCHOR AND BRACE CONFIGURATION FOR EURO+ FACADE SCAFFOLDING, COVERED, UP TO 34 M HIGH.

Type of facade fill	Closed facade < 20%		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		3.9	9
	⊥	3.0	
Maximum force at foot	Inner standard	16.3	9
	Outer standard	53.7	

- Mesh-covered scaffold, closed facade\*  
 Base variant  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>
- Anchor connected to two frame tubes
  - Vertical brace
  - Anchor connected to one frame tube
  - Wall-side vertical brace
  - Double anchor in V configuration

- Single anchor
- Double anchor in V config.
- Horizontal brace
- Single guardrail

\* facade is considered closed if openings constitute less than 20% of facade area



Type of facade fill	Closed facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		3.1	
	⊥	3.0	
Maximum force at foot	Inner standard	29.4	10
	Outer standard	61.2	

Mesh-covered scaffold, closed facade.\*  
 Variant: 0.73m brackets on the top level, on the outer side, and 0.36m brackets on the inner side, on all scaffolding levels  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>

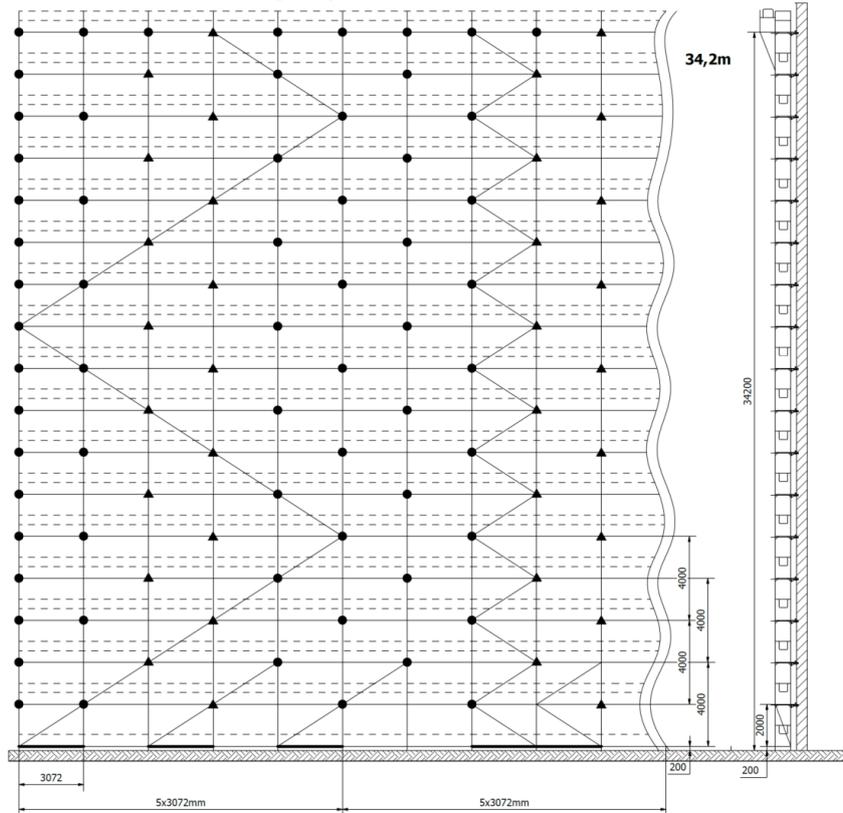
- Single anchor
- Double anchor in V config.
- Vertical brace

- Anchor connected to two frame tubes

- Anchor connected to one frame tube
- Double anchor in V configuration

- Wall-side vertical brace
- Horizontal brace
- Single guardrail

\* facade is considered closed if openings constitute less than 20% of facade area



Type of facade fill	Closed facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		5.1	11
	⊥	3.7	
Maximum force at foot	Inner standard	25.5	11
	Outer standard	32.7	

Mesh-covered scaffold, closed facade.\*  
 Variant: Passage frame  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>  
 Vertical braces on two scaffolding levels, 2 for every 5 bays

- Single anchor
- Double anchor in V config.
- Vertical brace

- Anchor connected to two frame tubes

- Anchor connected to one frame tube

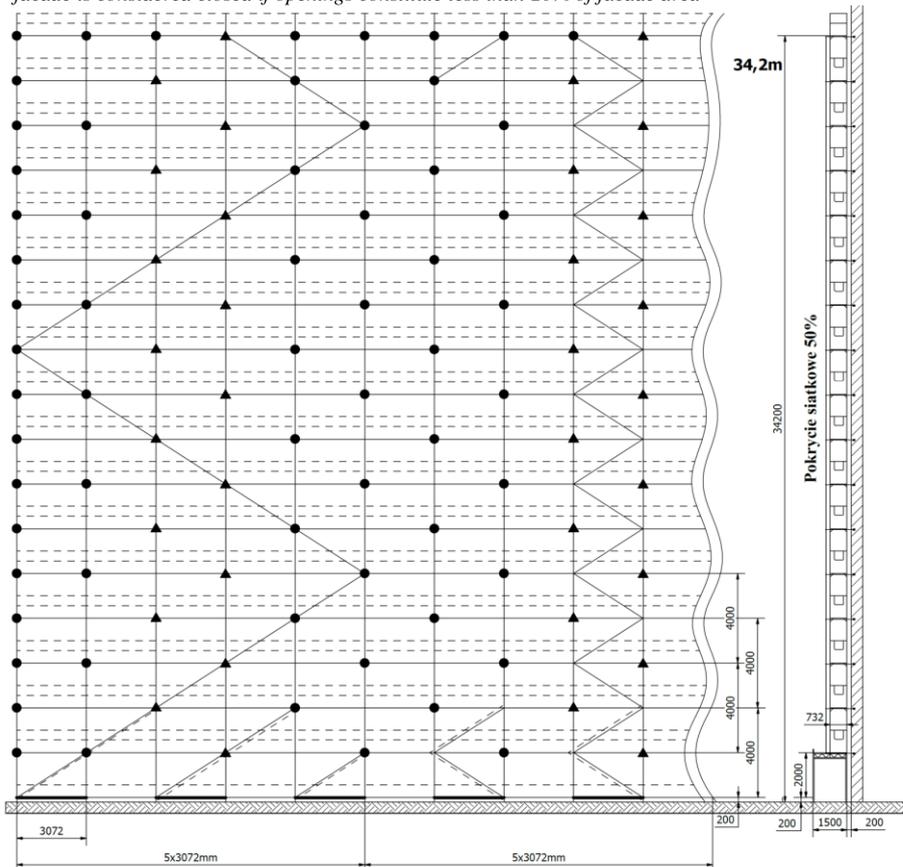
- Double anchor in V configuration

- Wall-side vertical brace

- Horizontal brace

- Single guardrail

\* facade is considered closed if openings constitute less than 20% of facade area



50% mesh covering

Type of facade fill	Closed facade		
Vertical spacing of anchors	4m		
Horizontal spacing of anchors	Every other bay		
Maximum force at anchor		2.2	7
	⊥	3.0	
Maximum force at foot	Inner standard	22.0	7
	Outer standard	53.2	

Mesh-covered scaffold, closed facade.\*  
 Variant: Vehicle underpass  
 Working platform load: 2 kN/m<sup>2</sup>  
 Protection platform load: 1 kN/m<sup>2</sup>

- Single anchor
- Double anchor in V config.
- Vertical brace

- Anchor connected to two frame tubes

- Anchor connected to one frame tube

- Double anchor in V configuration

- Wall-side vertical brace
- Horizontal brace
- Single guardrail

\* facade is considered closed if openings constitute less than 20% of facade area



50% mesh covering





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