



BAUDECK

MODULAR SLAB FORMWORK

NOVEMBER 2020

v1

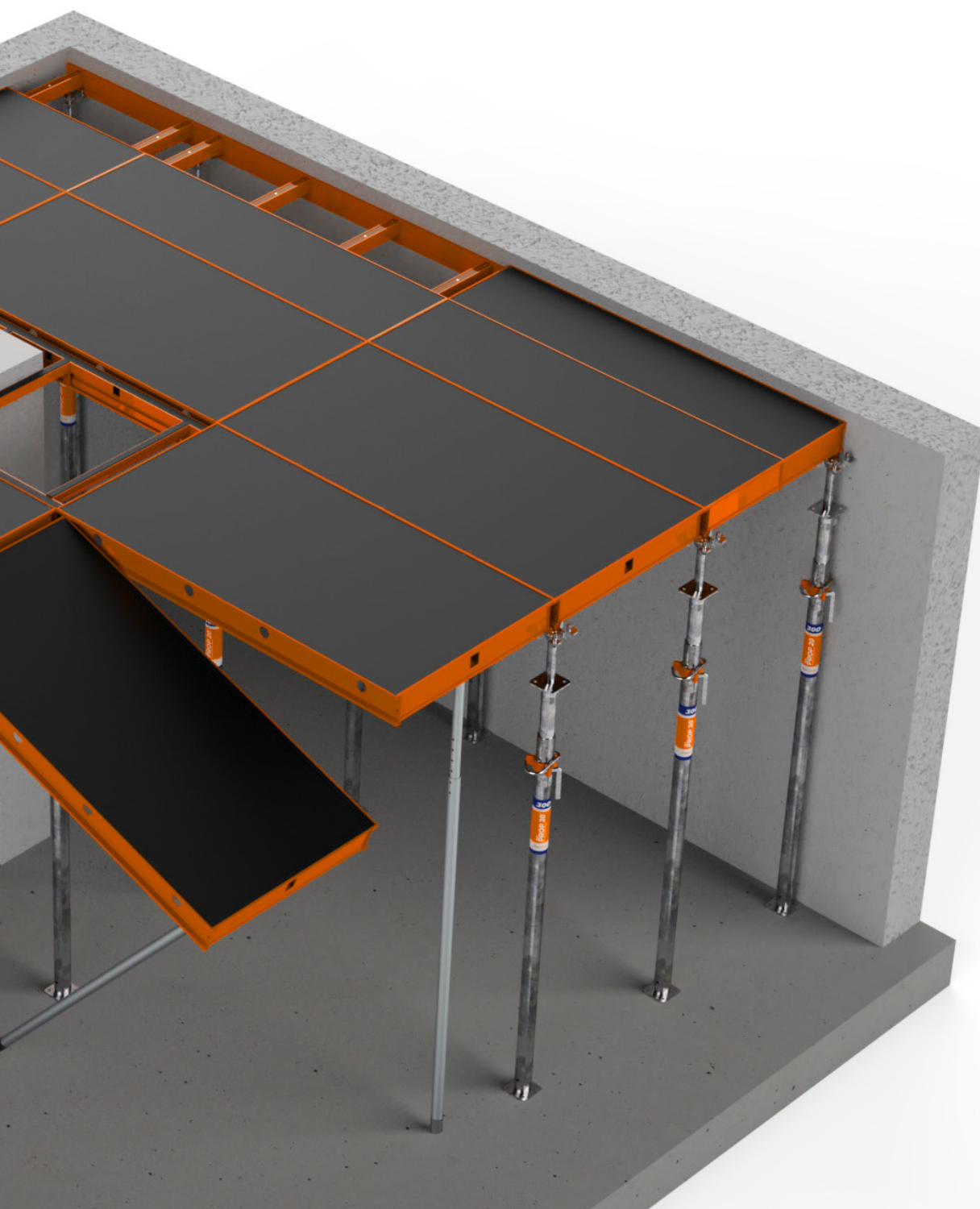
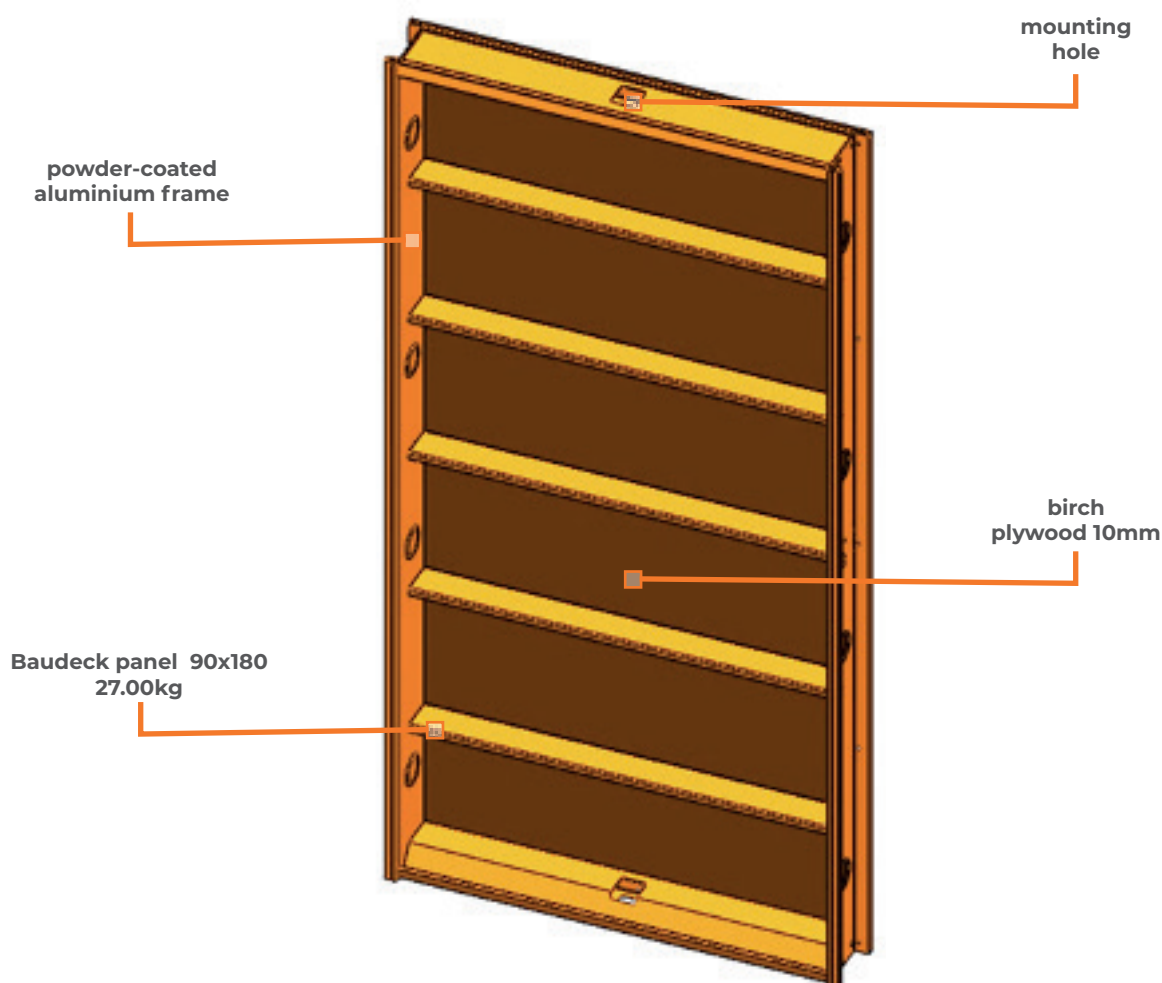


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1. PRODUCT PURPOSE

The Baudeck modular slab formwork is a lightweight and universal formwork, designed and manufactured by Baukrane for a wide variety of use, especially for large-scale constructions. The components of the system are very useful while erecting:

- residential buildings,
- multi-storey office buildings,
- large-area constructions,
- multi-storey car parks,
- shopping centres.

The system has been designed to meet all the technical and economic requirements of residential and industrial constructions. The size of the Baudeck elements makes the system useful for both smaller and more complicated slab floors. Thanks to its light and durable construction the system is easy and convenient to assembly manually.

2. CECHY PRODUKTU

The Baudeck modular slab formwork is an advanced and innovative frame formwork designed and manufactured with high quality components by Baukrane. The outer frame is made of 14cm thick aluminium profile. The inner profiles are formed with 73cm high and 2mm thick aluminium elements. Powder coating of the frame reduces concrete adhesion and facilitates cleaning. Every panel is integrated with high-quality 10mm thick birch plywood.

Innovative technical solutions, accuracy of welds, high quality materials and extensive quality control provide safety and significantly extend the service life of formwork.

Thanks to the Baudeck heads, the system may be used with commonly applied props, from Class B upwards and in accordance with PN-EN-1065.

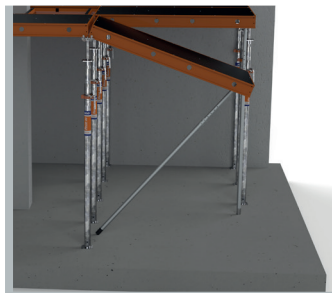
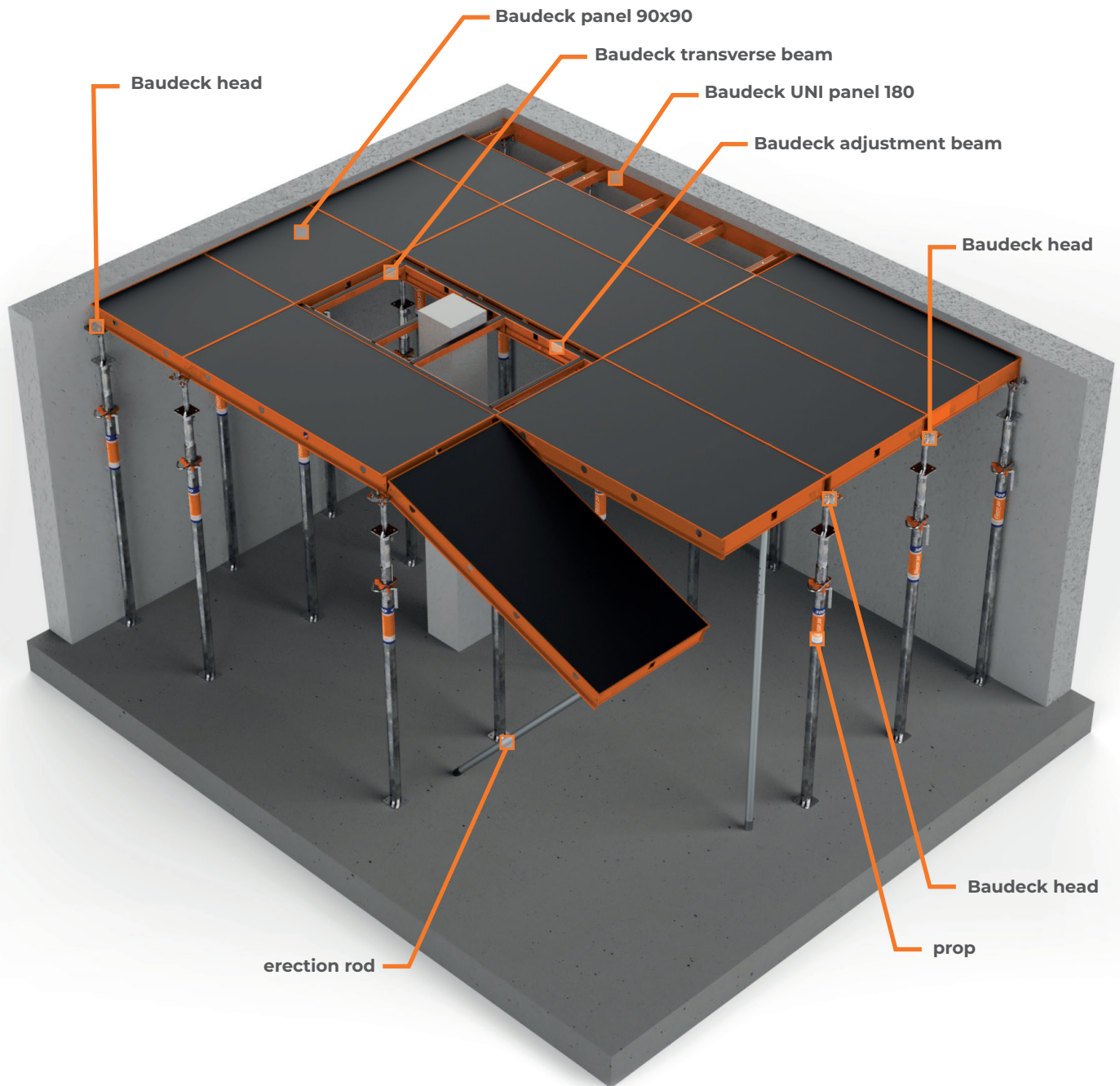
The aluminium framed panel is made of a lightweight and durable aluminium alloy. This allows to install the formwork

manually up to a maximum height of 3.5m. Above this height, mobile scaffolding or a lift must be used to assembly it. Shuttering skin of each panel is made of high-quality, waterproof birch plywood. It is attached to the frame with rivets, which makes it easy to replace it if damaged.

Wide variety of panel sizes, adjustment and transverse beams allow to fit the Baudeck formwork to every floor plan without the need for additional adjustments.

Contrary to traditional wooden formwork, the Baudeck slab formwork provides time and cost savings. It is possible to achieve stripping efficiency of 10m²/hour, thanks to dimensions and weight of the panels, as well as the simplicity of their installation.

3. OVERVIEW




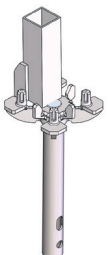
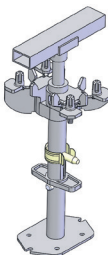
4. COMPONENTS

1. Panels


All types of shuttering work shall be carried out using the components of the basic equipment.

DRAWING OF ELEMENT	DESCRIPTION	INDEX	WEIGHT [kg]
	Baudeck panel 180x180	7140180180	53,14
	Forming area of the panel (3.24m ²) reduces the number of panels and props. It accelerates installation of the formwork and reduces costs. Due to the panel dimensions and weight, it should be mounted by two people.		
	Baudeck panel 90x180	7140090180	27,00
	Baudeck panel 75x180	7140075180	23,60
	Baudeck panel 60x180	7140060180	20,60
	Baudeck panel 45x180	7140045180	17,20
	These panels are designed for quick shuttering of large areas.		
Height: 180cm Widths: 45, 60, 75 and 90cm			
	Baudeck panel 90x90	7140090090	16,00
	Baudeck panel 75x90	7140075090	13,40
	Baudeck panel 60x90	7140060090	11,76
	Baudeck panel 45x90	7140045090	10,05
	These fine-size panels are designed to match the formwork to the floor plan easily.		
Heights: 90cm Widths: 45, 60, 75 and 90cm			
	Baudeck UNI panel 180	7140055180	24,50
	Baudeck UNI panel 90	7140005590	15,00
	The width of the panels can be extended continuously from 55 to 90cm. The 1-35cm wide shuttering skin can be made of 21mm plywood.		
Heights: 90, 180cm Width: 55-90cm			

2. Prop heads

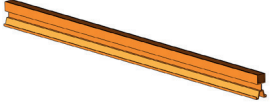
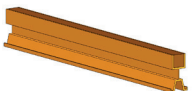
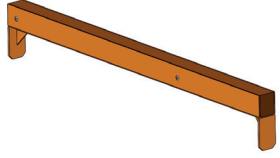
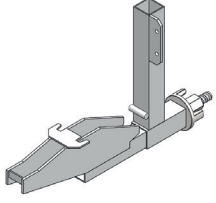

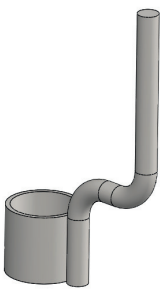
DRAWING OF ELEMENT	DESCRIPTION	INDEX	WEIGHT [kg]
	<p>Baudeck head</p> <p>Used to support the Baudeck panels securely.</p>	7140000010	2,50
	<p>Baudeck safety head</p> <p>Used to mount safety railing posts. It is placed along the edges of the Baudeck edge panels. Installed instead of the Baudeck head.</p>	7140000210	3,50
	<p>Baudeck drophead</p> <p>Enables fast and safe dismantling of Baudeck panels while supporting the freshly placed concrete slab at the same time. It is recommended to be used with the Baudeck bolt.</p>	7140000110	8,0

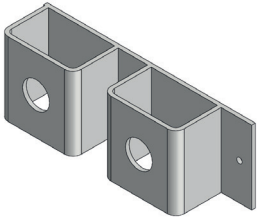
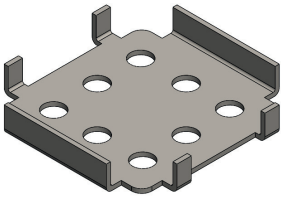

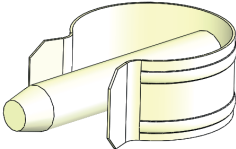

3. Props

DRAWING OF ELEMENT	DESCRIPTION	INDEX	WEIGHT [kg]
	Bauprop 20 – 300	7120B20300	16,80
	Bauprop 20 – 350	7120B20350	18,80
	Bauprop 20 – 400	7120B20400	22,50
	Bauprop 20 – 550	7120B20550	36,00
	<p>Widely used steel props of different heights and different classes, in accordance with EN-1065 norm, can be used in the Baudeck system. However, it is always advisable to pay attention to the permitted load capacity of a prop and resulting for it spacing constraints.</p>		

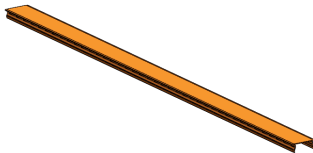

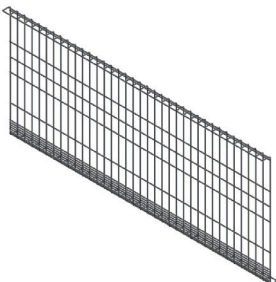
Heights: 300, 350, 400 i 550 cm

4. Additional equipment

DRAWING OF ELEMENT	DESCRIPTION	INDEX	WEIGHT [kg]
 	Adjustment beam 180	7214000180	7,20
	Adjustment beam 90	7214000090	3,60
	Mounted next to the panel on a standard Baudeck head, in a place where adjustment of formwork is needed. Equipped with a square timber. Supports 21 mm thick plywood in adjustment areas.		
	Baudeck transverse beam	7214000001	4,40
	This beam is positioned in cross direction, along with adjustment beams in places where adjusting formwork is needed. The beam ends are placed in specially shaped rails of the adjustment beam at width of 90 cm. Equipped with a square timber. Length: 67 cm		
	Support pillar grip	7400000021	3,90
	Fixed to the Baudeck panel from the underside, creates a grip for the railing post.		
	Railing post	7400000005	4,50
	This element is inserted into the Baudeck head or into the support pillar grip. It allows to erect safety barriers, securing the formwork edges.		
	Toe board attachment	7400000020	0,45
	Fixed at the bottom of the railing post in order to create a toe board.		

DRAWING OF ELEMENT	DESCRIPTION	INDEX	WEIGHT [kg]
	<p>Baudeck head support shoe</p> <p>Positioned on the Baudeck head or Baudeck safety head, allows to place an 8 cm square timber in adjustment areas.</p>	-	0,60
	<p>Baudeck corner head cover</p> <p>Positioned on the Baudeck head, allows to place the Baudeck panel against the wall of a building.</p>	7214000001	4,40
	<p>Erection rod 365 (2.05 - 3.65m)</p> <p>The telescopic aluminium rod allows to place Baudeck panels up to the height of 365 cm.</p>	7140000002	3,20
	<p>Baudeck bolt</p> <p>Used for secure locking of the Baudeck heads in the props. The diameter has been adjusted to the most commonly used props.</p>	7270000004	0,15
	<p>Stacking angle</p> <p>The stacking angle is used to store and transport the Baudeck panels.</p>	7214000000	8,70



DRAWING OF ELEMENT	DESCRIPTION	INDEX	WEIGHT [kg]
	Plastic infill 180	7214001180	0,4kg/mb
	Plastic infill 90	7214001090	
	This plastic infill closes 6 cm gap between the Baudeck panels which is created when using the Baudeck dropheads.		
	Tripod	7130000051	5,0
	It serves as a temporary facilitation during the installation of ceiling supports. Any commonly used racks can be used. Please note that its use does not provide the required stiffening when erecting load-bearing scaffolding.		
	Baudeck safety mesh	7400000220	20,00
	This element is used as an alternative to plank railings made with railing posts. Length: 240cm, height: 115 cm. A complete edge protection, easy to mount on the railing posts.		

5. PLANOWANIE PRACY I PRZYGOTOWANIE MONTAŻU

Before assembling the formwork, the layout of panels must be planned. It is advisable to use the biggest possible panel sizes. Load-bearing capacity of used props, depending on their extension, must also be known; as this determines the maximum spacing between points of support.

The slab area should be first formed with the basic panels. The UNI panels are recommended to be used in the far slab areas, when the adjustment of 55-90 cm width is required. Adjustments of smaller width should be formed with the use of adjustment beams or square timbers.

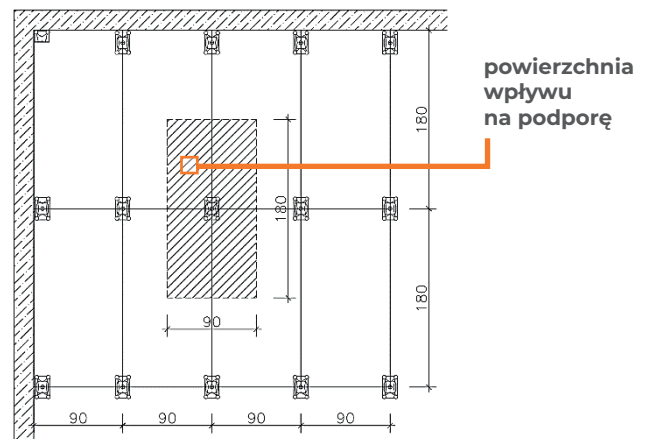
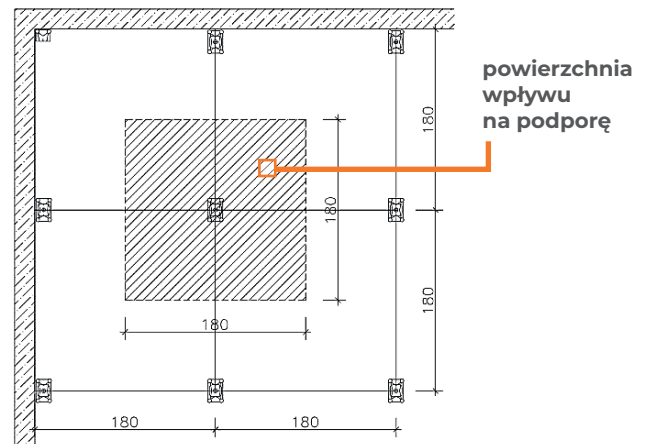
Relationship between monolithic slab thickness d [cm]] and its weight q (kN/m²)

d	10	12	14	16	18	20	22	24	26	28	30	35	40	45	50
q	4,35	4,87	5,39	5,91	6,43	6,95	7,47	7,99	8,51	9,03	9,61	11,22	12,73	14,43	15,58

Knowing the thickness and resulting from it slab panel weights, the maximum area of influence per prop must be determined. This, in turn, will allow to determine the maximum load which is imposed on the most stressed props.

Please note that the maximum load capacity per prop is always lower than the load capacity of a prop declared by the manufacturer.

If this condition is not met, changing the panels layout, using props with a higher load capacity class or introducing intermediate props should be considered.



6. MONTAŻ I DEMONTAŻ.

The formwork is assembled by two people from the ground. Up to 3.30 m no mobile scaffolding or lifts are required. The assembly procedure of the first panel takes place in four stages:

1. Placing props
2. Hanging the panel
3. Lifting the panel
4. Supporting the panel

1.



Assembling props in accordance with the planned support grid. Mounting in the props of Baudeck head.

2.



Hanging the Baudeck panels on heads

3.



Lifting the panel with the erection rod

4.

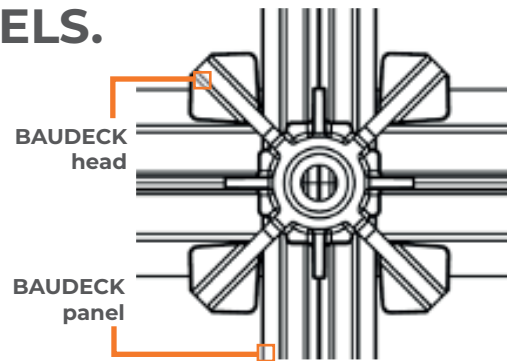


Supporting the panel

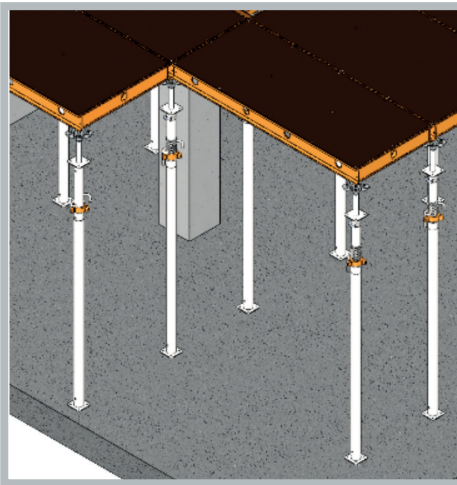
6.2 ASSEMBLING FURTHER PANELS.

Assembling further panels of the system is carried out in the same order as described above. Always make sure that the panels are properly supported and placed on the Baudeck heads.

Dismanteling the panels should be performed in reverse order, with all necessary safety measures.

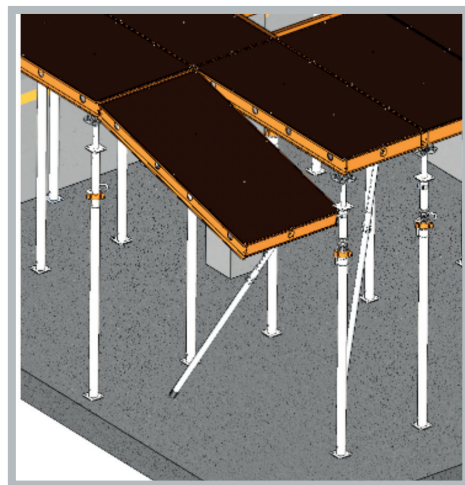


1.



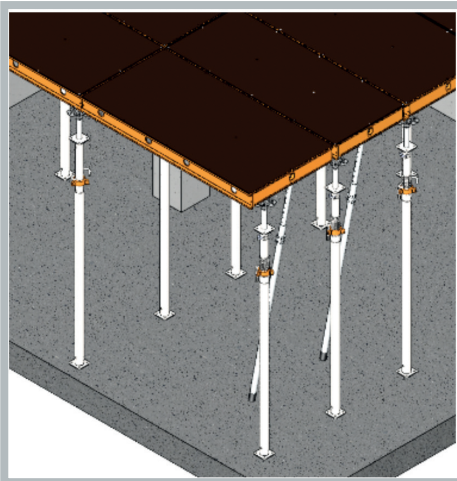
Preparing the props.

2.



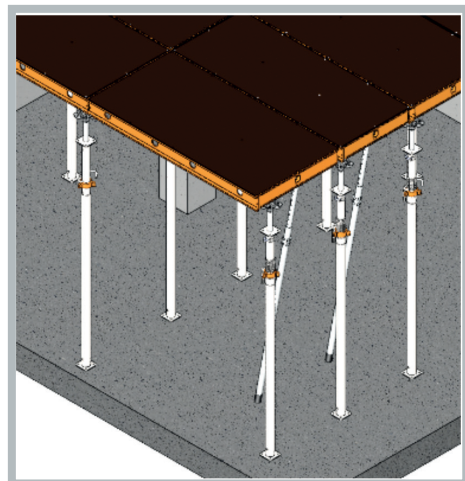
Hanging the Baudeck panels on heads

3.



Lifting the panel with the erection rod.

4.

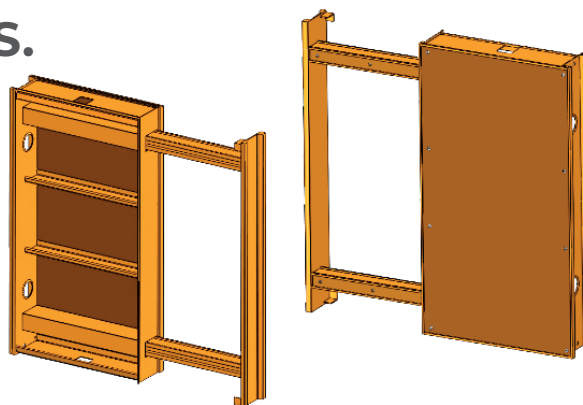


Supporting the panel.

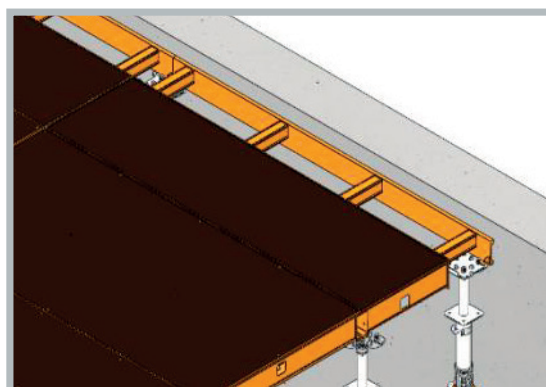
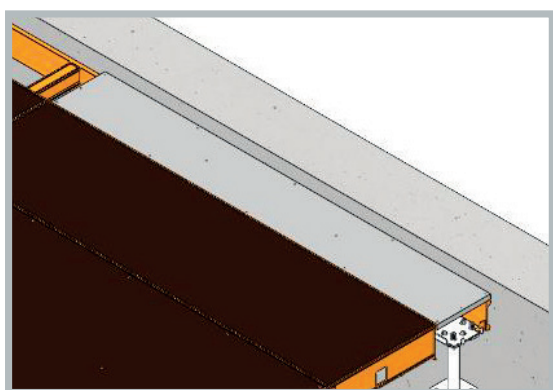
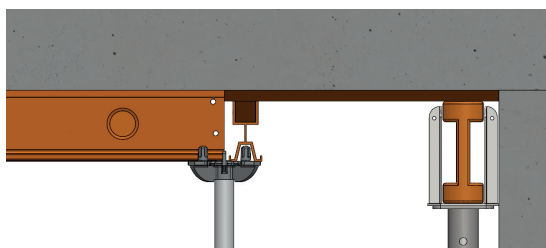
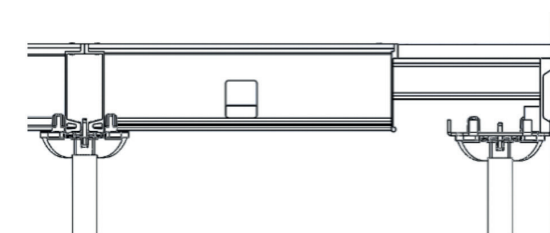
6.3. ADJUSTING THE LENGTH, INFILL AND ADJUSTMENT AREAS.

With a panel width module of 15 cm, the Baudeck formwork can be adapted to the most complex section of a building. Final adjustments are obtained by introducing adjustment areas.

Adjusting the formwork dimension can be achieved by using special UNI panels. They allow to create adjustments with the width of 55-90 cm and length of 90 or 180 cm, depending on the panel size used.



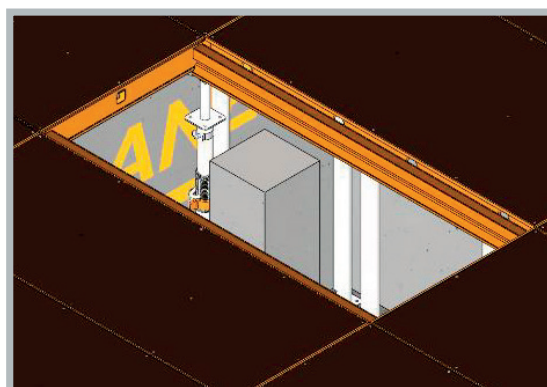
Using Uni Panels is the most economical solution as it reduces the number of supports and saves installation time.



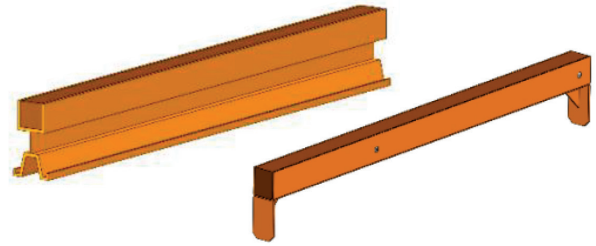
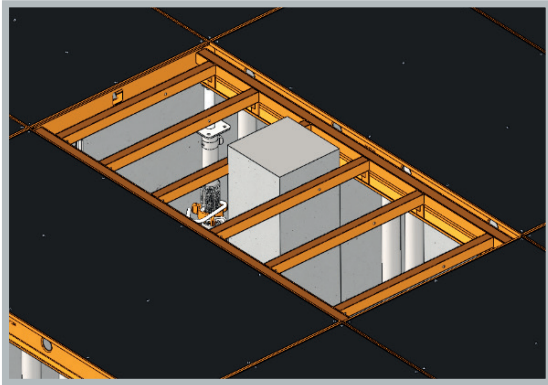
Assembling the UNI panel is carried out in the same way as the standard panels. After extending the panel to the desired width, the edges should be placed on the props, and then lifted with the erection rod and supported.

Created in this way space should be filled with a cut-to-size 21 cm thick plywood. The extendable elements of the UNI panel are equipped with wooden plates which facilitate secure positioning of plywood strip.

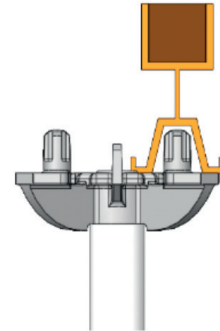
Dismantling of the UNI panels is performed in the same way as the standard panels.



In the case of 90 cm wide adjustments, in places where the standard and UNI panels cannot be used (for example in the vicinity of existing columns), to make infills transverse and adjustment beams are used.

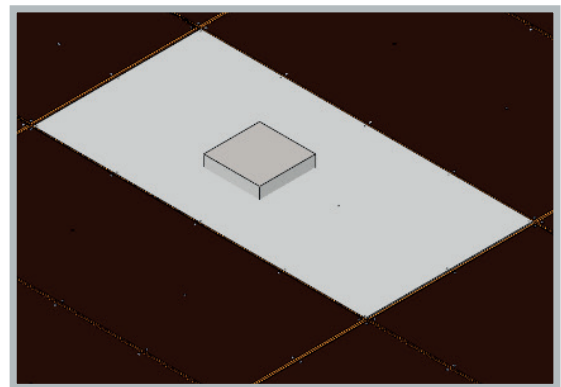


In the place of a missing panel, two 90 or 180 cm wide adjustment beams are mounted on the Baudeck heads.



The number of transverse beams required directly results from the size of area to be adjusted.

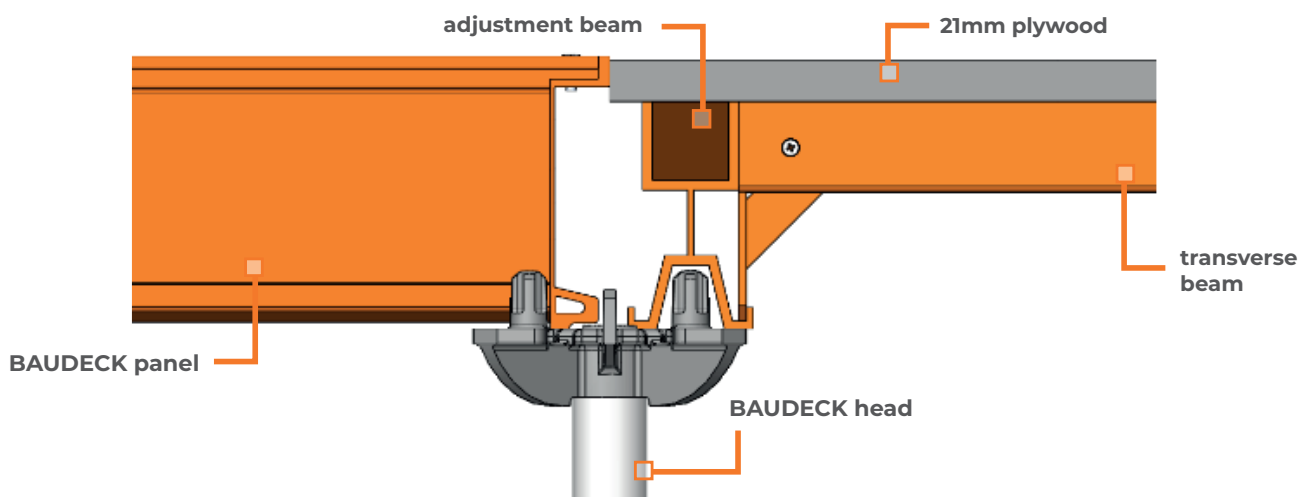
Both the adjustment and transverse beams are equipped with square timbers. They allow to securely position adjusting panels. The sizes of beams allow to use a typical 21 mm thick plywood as an infill. Disassembling this kind of adjustment is performed in the same way as the standard panels.



**Support load capacity
of adjustment beams:**

$$M_{\max} = 3,0 \text{ kNm},$$

$$Q_{\max} = 15,0 \text{ kN}.$$



7. EARLY STRIPPING

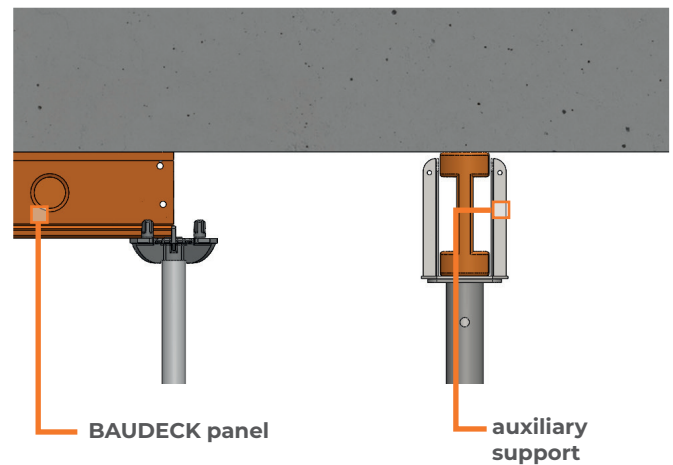
Under normal weather conditions (20°C), it is possible to consider early stripping of the slab, allowing the slab to support itself. Depending on the type of cement used and resulting from it early increase of concrete load bearing capacity, it is not advisable to do it earlier than after 3 to 5 days.

7.1. AUXILIARY SUPPORT

As stated in DIN-1045 norm, temporary auxiliary support must be installed immediately after stripping of the slab formwork. The aim of this is to activate the slab to support its own weight.

Recommendations of the above norm indicate that the temporary auxiliary supports should be provided in the same place on each floor. It is good practice to position the auxiliary supports in the middle, in the place where the Baudeck panel was removed from. In order to prevent the ceiling from puncturing and to transfer loads from its weight safely, it is recommended to place a slab H-20 beam or a square timber on the auxiliary support.

BAUKRANE shall not be held responsible for the design and method of early stripping. The building site manager, after consulting the constructor, should verify the local and overall load distributed in the construction. Only then should the early stripping be considered.

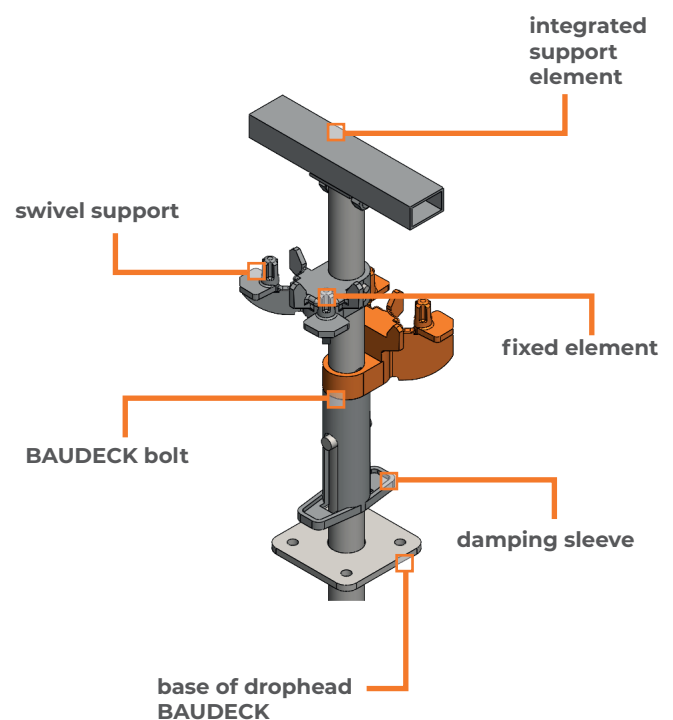


7.2. BAUDECK DROPHEAD

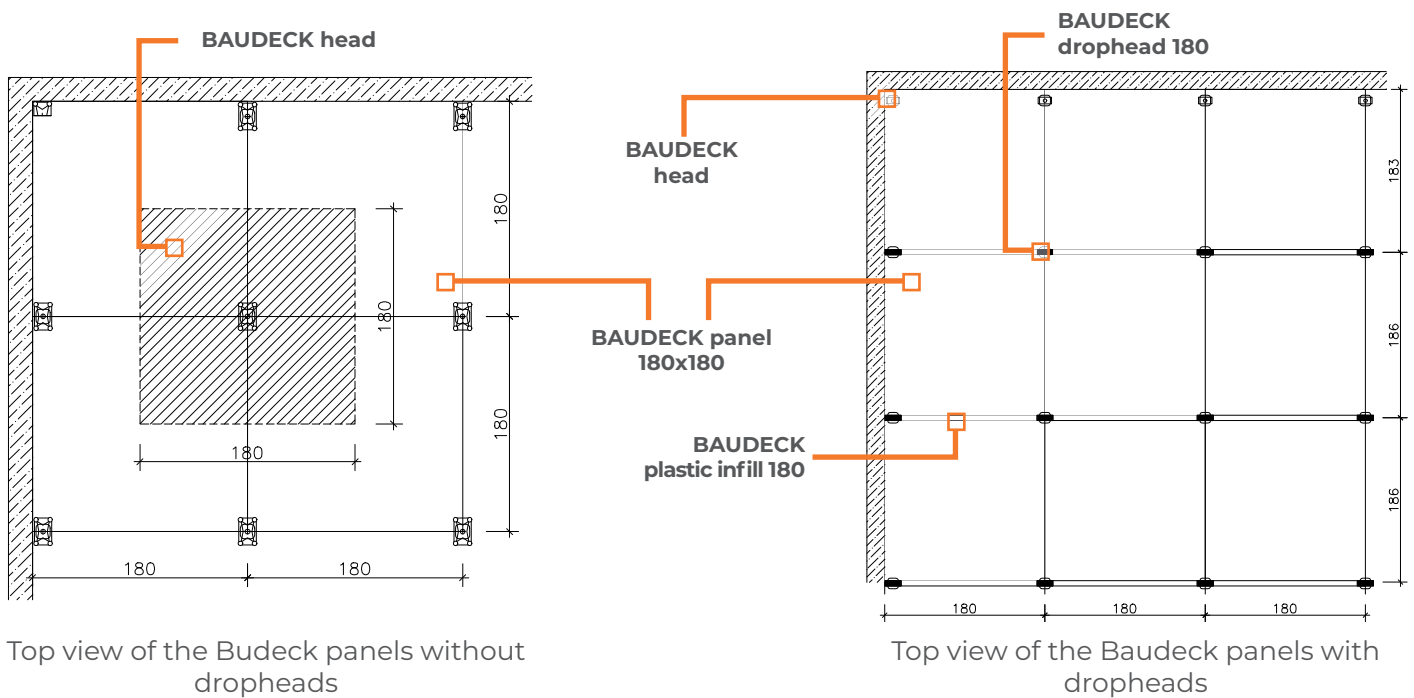
The Baudeck drophead system can be used as an alternative to the temporary auxiliary support, which was described in section 7.1. It is much quicker and convenient solution for the contractor.

The Baudeck drophead is equipped with an integrated element supporting the slab after dismantling the slab panel. This element also facilitates keeping the temporary support aligned, which has a positive effect on the stress distribution in the building.

The decision to use the dropheads in the slab formwork must be taken before its assembling, as it affects the grid of the Baudeck panels.



The decision on early stripping must be taken after considering the quality and class of the concrete, the reinforcement configuration and the quality of concrete works on site.



The height of the drophead, which is 518mm, should be taken into account when determining the height of the props extension. Using standard M20 nuts and mounting holes, attach the drophead to the prop head.

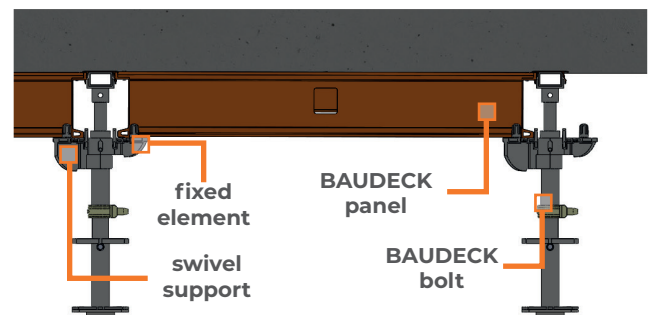
The construction of the base allows to connect the drophead to almost any prop, including aluminium props with high load-bearing capacity. The 6 cm wide spacing between the panels must be filled with the Baudeck plastic infills.

Make sure that swivel supports of the Baudeck drophead are always placed in one direction! Failure to do so will make panels disassembling difficult.

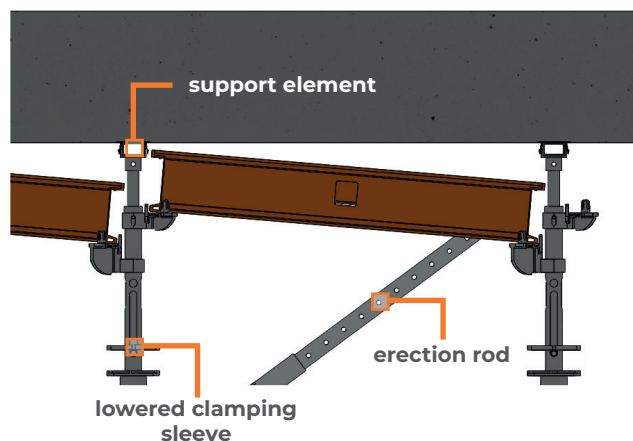
7.4 EARLY STRIPPING

Early stripping with the use of the Baudeck dropheads takes place in three steps.

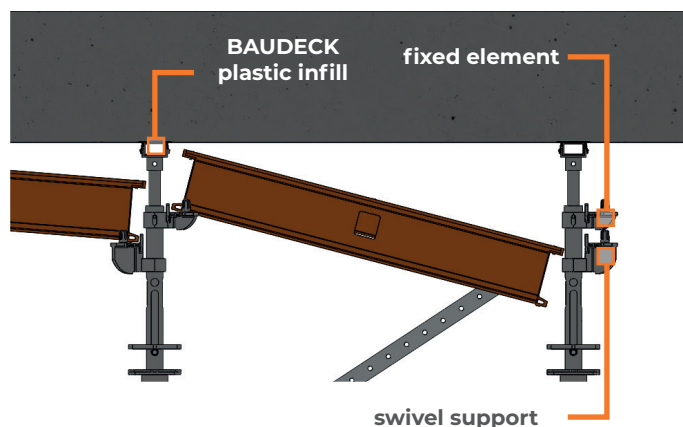
Step 1: In order to lower the swivel support of the drophead, first remove the Baudeck bolt. Then turn the clamping sleeve by 90°. This will cause the swivel support of the prop to drop by 10 cm and fixed element by 2 cm. The slab panel is still supported by the support element.



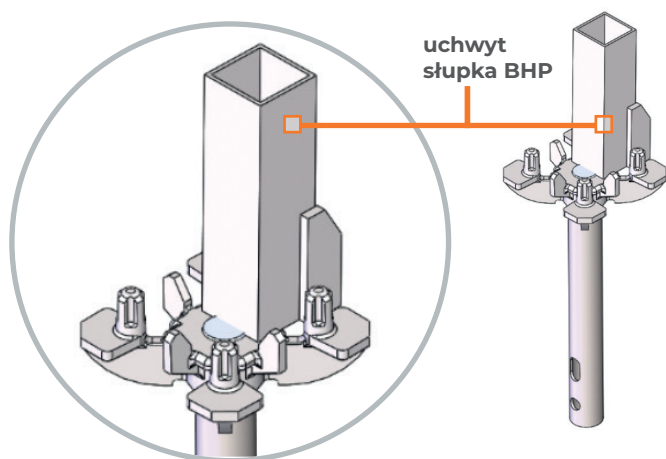
Step 2: Using the erection rod, lift the Baudeck panel and turn the swivel support by 180°. The swivel support is now directly under the fixed element.



Step 3: Lower the Baudeck panel in the same way as with the use of the Baudeck standard heads. Disassembling the panel does not interfere with repropping of the slab.



8. SAFETY BARRIERS



8.1. BARRIER PILLAR GRIP

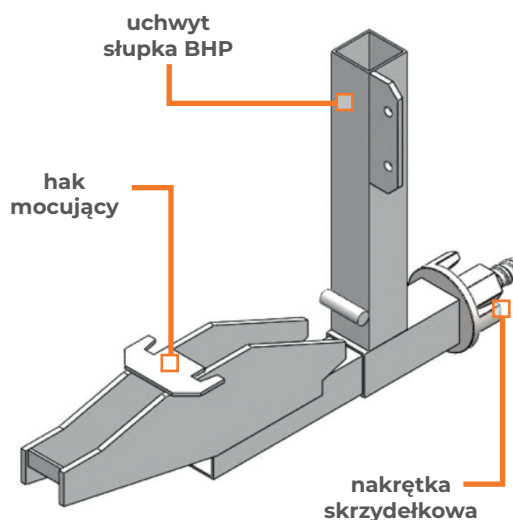
The barrier pillar grip is used as an alternative method of mounting barrier pillars when it is not possible to apply the safety heads, or when the panels are supported by cantilevers.

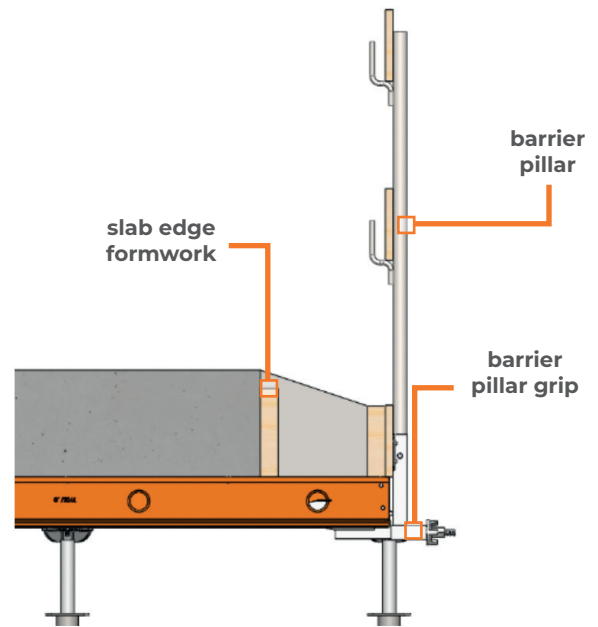
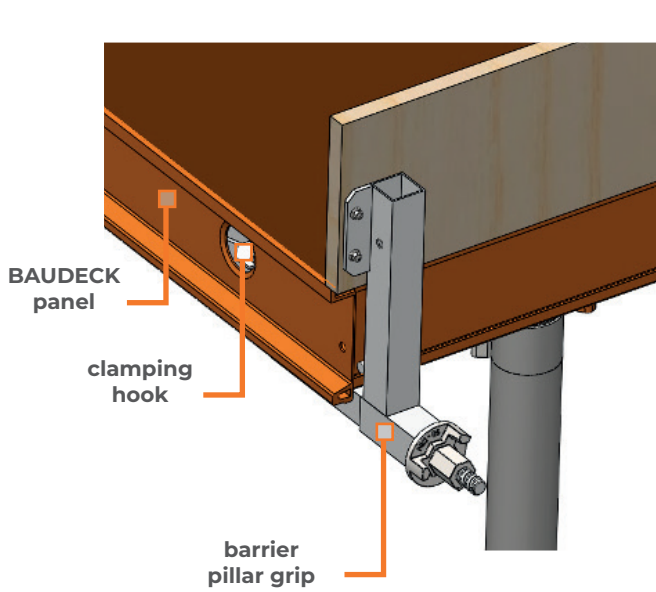
It is mounted before lifting and supporting the panel, by placing one of the clamping hooks in the side hole of the frame.

8.1. BAUDECK SAFETY HEADS

Using the Baudeck safety heads is the easiest way to erect safety fencing.

These safety heads are mounted interchangeably with the standard heads on the edge props holding the Baudeck panels.



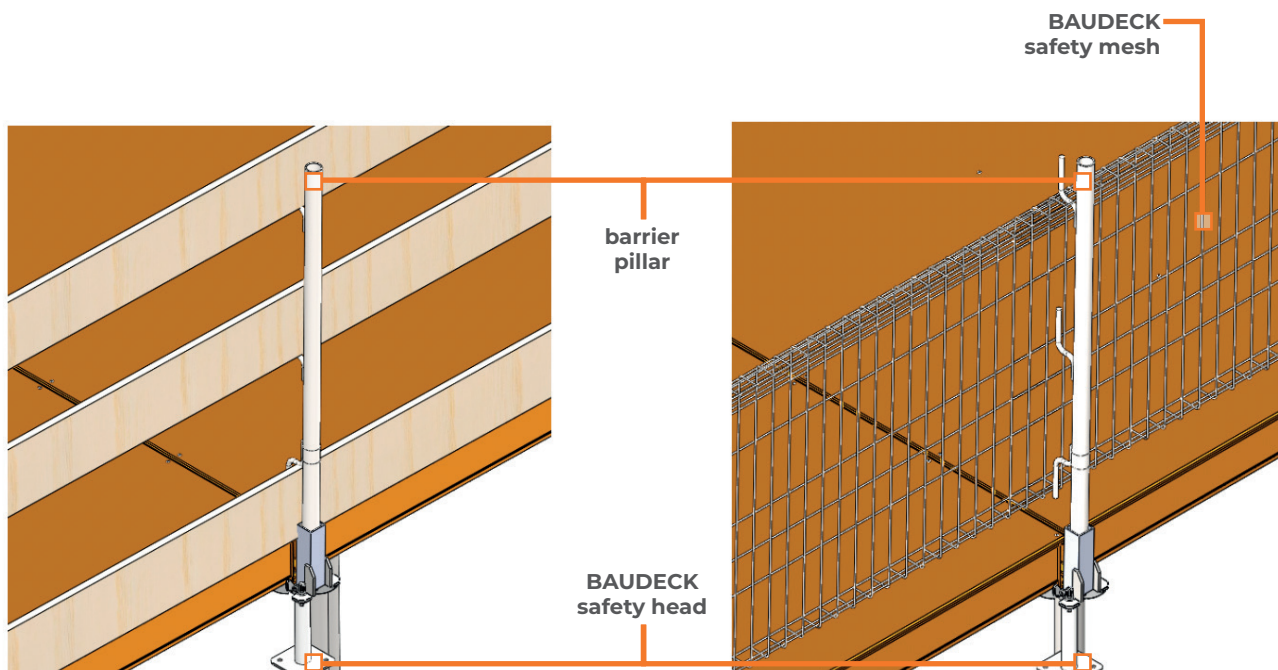


8.3 SAFETY FENCING

The Baudeck safety heads are installed at the edges of the formwork, in the same way as the standard heads are installed. Every safety head must be secured against falling out with the Baudeck bolt.

The railing post must be inserted into the Baudeck safety heads and into the support pillar grip. It is possible then to erect safety fencing with at least 2 cm thick boards. A 3-level barrier of 100 cm height is formed in this way. Alternatively, safety fencing may be made with the Baudeck safety mesh.

Remember to secure every free edge of the slab with safety barriers!



9. CLEANING AND SERVICE

9.1. CONCRETE IMPRESSION

The Baudeck panels were designed in such way that the concrete impression meets the highest quality requirements. Since the Baudeck panels are available in large sizes, the visible surface of concrete has very few joints, and these joints are really clean.

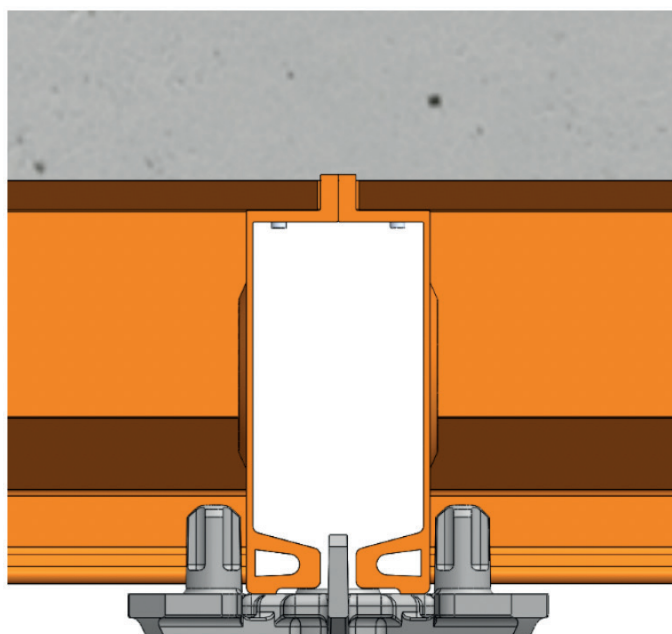
Grooves created at the joints of the panels meet the most stringent requirements of category BA3(SB 3), as defined by the German Society for Concrete and Construction Technology (DBV) and approved by the German DIN regulations.



9.1. MAINTENANCE OF PANEL EDGES

Proper use of the formwork panels influences the quality of the impression on the slab surface. Therefore it is vital to keep the edges of the panels clean and well-maintained.

Before starting concrete works, cover the plywood of the panels with a special release agent which facilitates efficient stripping of the formwork. The cleaning process is simplified by using a layer of the adhesive agent, as well as the powder coating of the

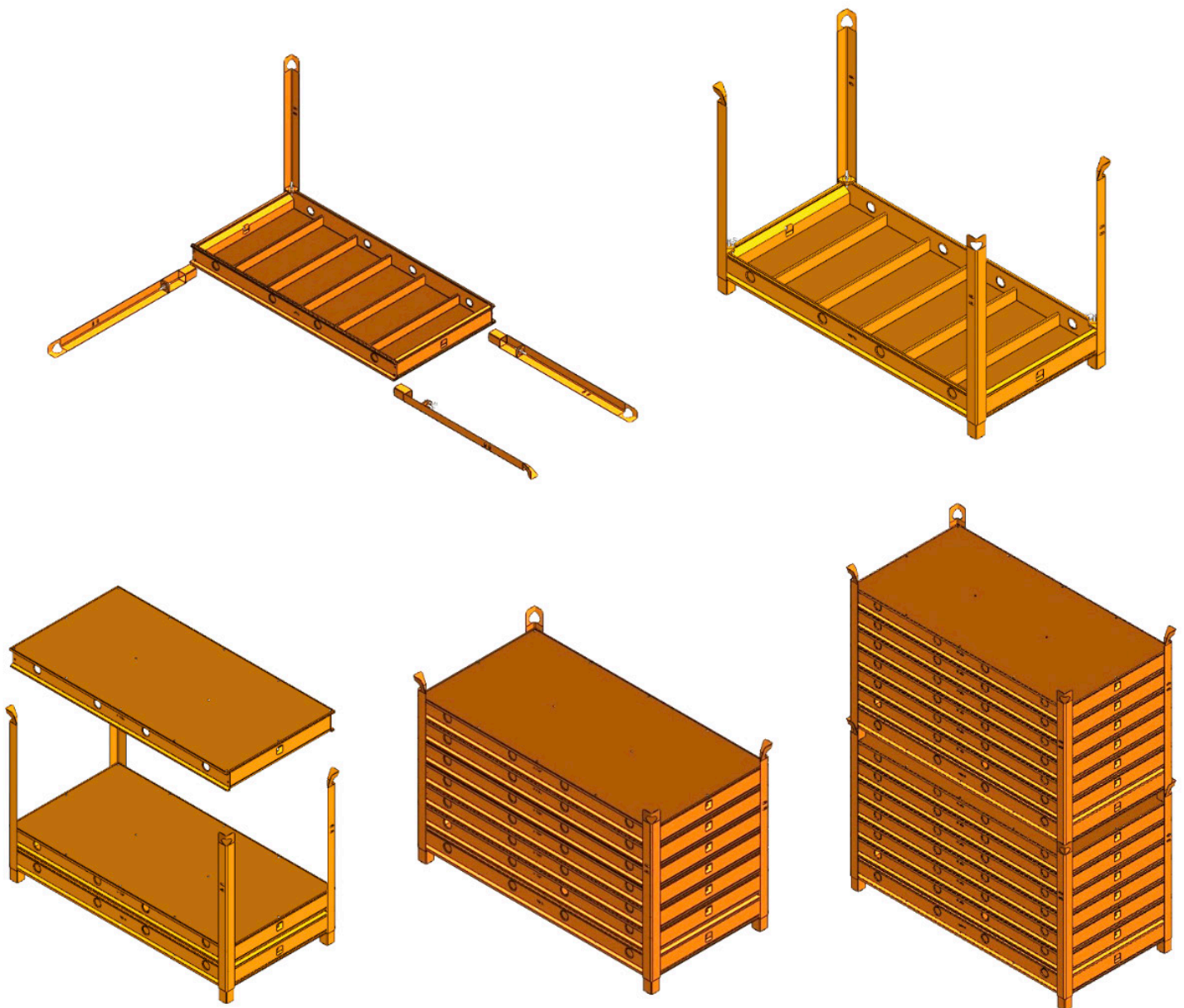


9.3. STORAGE AND TRANSPORT

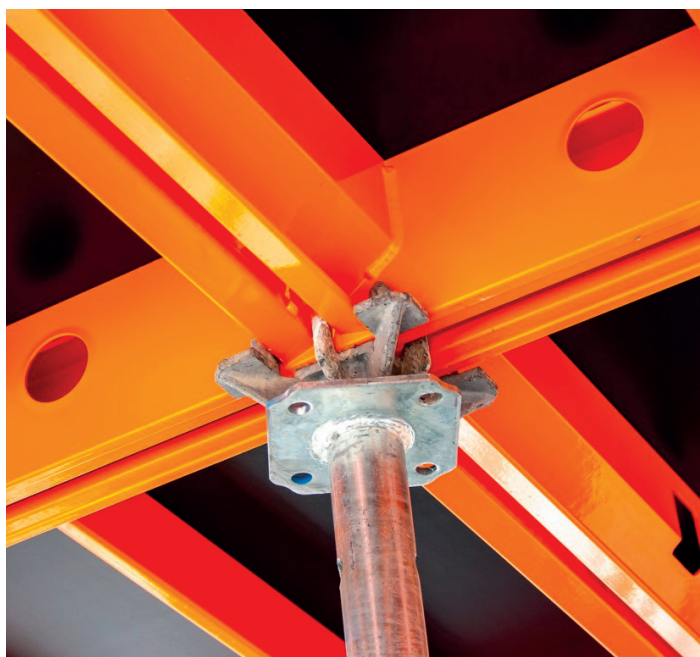
Using the stacking angles makes storing and transporting the Baudeck panels easy and convenient. In order to prepare the panels for storing or transport, simply turn one of the panels with plywood facing the ground, place the stacking angle at every corner of the panel and secure it from falling out with an integrated bolt. A ready-to-use pallet, which may comprise 7 Baudeck panels, is now formed.

It is important to remember to place every panel, apart from the one at the bottom, with plywood facing upwards. Every stacking angle is equipped with an integrated handle which allows to move the pallet with the Baudeck panels by a crane or forklift.

Permissible load for every stacking angle equals 20kN. Do not store more than two pallets on top of each other.



10. APPLICATION ON SITE



11. OCCUPATIONAL HEALTH AND SAFETY

It is extremely important for safety reasons to comply with the occupational health and safety regulations and the operating instructions when assembling and disassembling the formwork.

The formwork may only be assembled and disassembled by the employees (fitters) who have been properly trained and who are familiar with the assembly instructions and parameters of the given type of formwork. Assembling and disassembling of the formwork shall be carried out according to the procedure included in the instructions for assembly and use. The user of the formwork should contact the manufacturer in case of any doubts. Improper or inconsistent with the operating instructions use may result in defects, damages or accident hazard on site.

The formwork fitters should be provided with the following personal protective equipment: protective helmet, anti-slip shoes with steel toe cap and protective gloves and, depending on the requirements, equipment designed for work at a height.

The equipment should be unloaded with a mechanical appliance or manually.

It is strictly forbidden, however, to drop the formwork elements from a vehicle on the ground! It is also recommended to unload the formwork close to the place of its application and to place its elements in the order it is to be assembled. Stored elements must not be crossed and stored in piles as it may result in damage or accident hazard.

Safety requirements for both assembling and disassembling the formwork are the same. The disassembling procedure should be performed in the reverse order to the assembling procedure. Dropping dismantled elements is strictly forbidden. These elements should be segregated in accordance with their intended use and placed where they can be easily loaded without unnecessary handling.

The user of the formwork is obliged to inspect and maintain the formwork after each use. Damaged elements should be stored separately and the manufacturer should be contacted in order to repair or replace these elements. Before using the formwork elements, their technical condition must also be checked.





NOTES:

