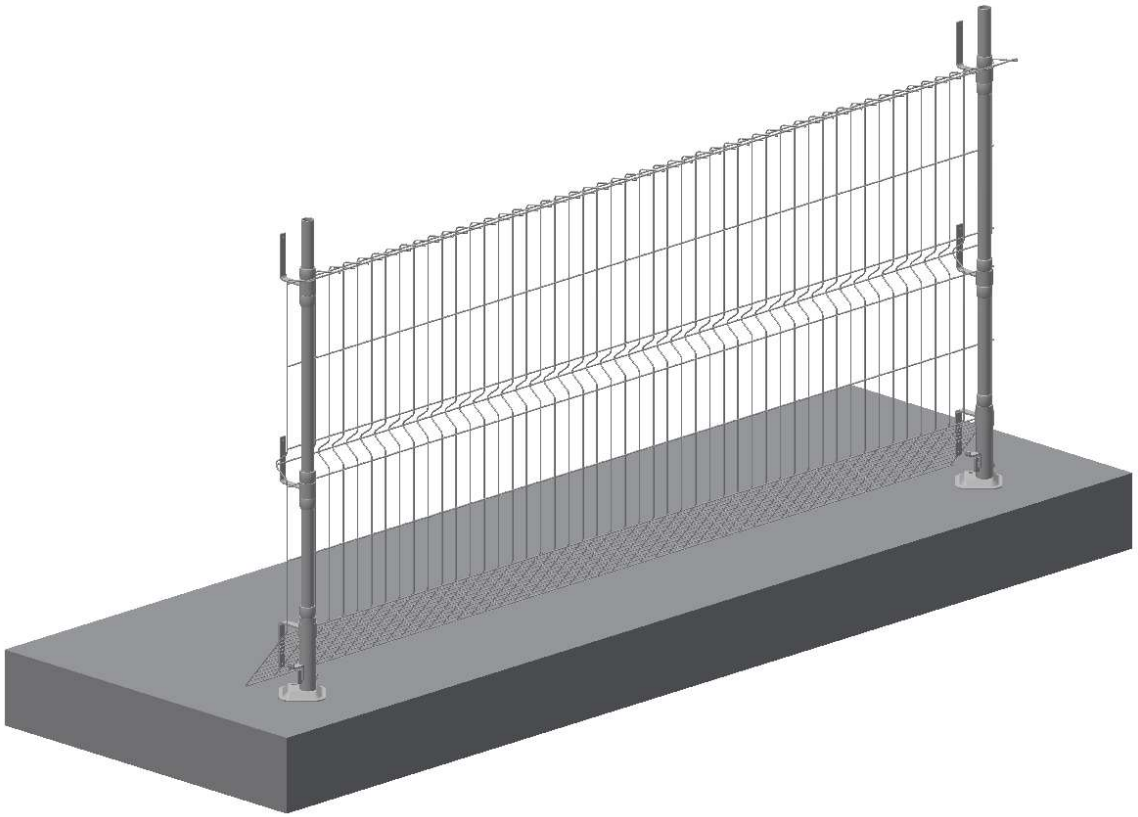
Appendix no. 1 to the Operation and Maintenance Manual

of the EPS system

Temporary building edge protection

Installation instructions for EPS components



Robert Cieśla

(Prepared by)

Piotr Abram

(Verified by)

Miłosz Muzyka

(Approved by)

Review 4.0, May 2024

TLC Sp. z o.o., zarejestrowana w: XII Wydział Gospodarczy
Krajowego Rejestru Sądowego w Sądzie Rejonowym dla Krakowa Śródmieścia;
kapitał zakładowy: 613 332,00 PLN wpłacony w całości.

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List of revisions

No.	FULL NAME	DEPARTMENT	REVISION DATE	SCOPE OF CHANGES	COMMENTS
1	Paweł Oleszkowicz	BR	18 September 2020	Stairs protection added	
2	Paweł Oleszkowicz	BR	12 February 2021	EPS-UUS and EPS-USP added	
3	Piotr Abram	BR	23 August 2021	Page 20.21	
4	Paweł Oleszkowicz	BR	19 October 2022	Manuals added:EPS-PRS190-V2, EPS-PRS-V2 and EPS-UW-V2,	
5	Piotr Abram	BR	16 June 2023	Installation: Horizontal stay-in-place clamp - EPS-UZH-V2	
6	Robert Cieśla	BR	17 May 2023	EPS-US2 added	
7	Miłosz Muzyka	BR	31 May 2023	Installation of grip clamps - supplement to the description	
8	Robert Cieśla	BR	05 June 2023	EPS-US2 installation graphic	
9	Piotr Abram	BR	15 March 2024	Footer and header changed, update	
10	Piotr Abram	BR	10 May 2024	Update toEPS-UUS	
11	Piotr Abram	BR	14 August 2024	Update to the description of anchoring	

12	Paweł Oleszkowicz	BR	29 January 2025	EPS-US3; EPS-UWB; EPS-SL-V4; EPS-L500, OT-ST17-P added	
13	Robert Cieśla	BR	18 March 2025	Components added: EPS-PAN-I, EPS-PAN-I-H	

Table of contents

1. Introduction

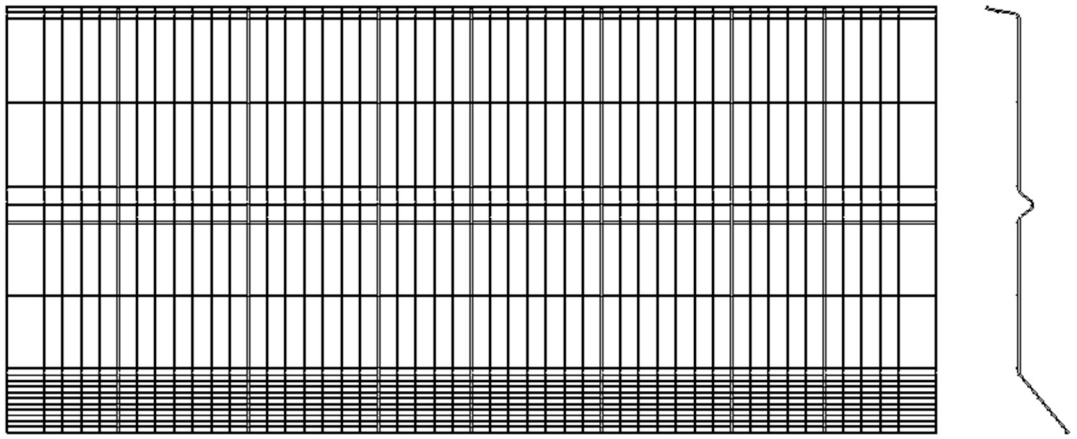
The installation manual is an appendix to the operation and maintenance manual of the EPS temporary building edge protection that presents the process of installation and removal of individual components of the EPS system and the principles of use.

The product is delivered as ordered, in the form of separate components, such as clamps, poles and railings. The components are assembled in a specific order.

The EPS system is based on the requirements of the Polish and European standard PN-EN 13374:2013 “Temporary edge protection systems - Product specification - Test methods”.

2. Components

The components of the edge protection system are presented in the table below:

Index	Description	Weight (kg)
EPS-PAN ^{x}	Mesh panel	10.77 2506x1147x223
		

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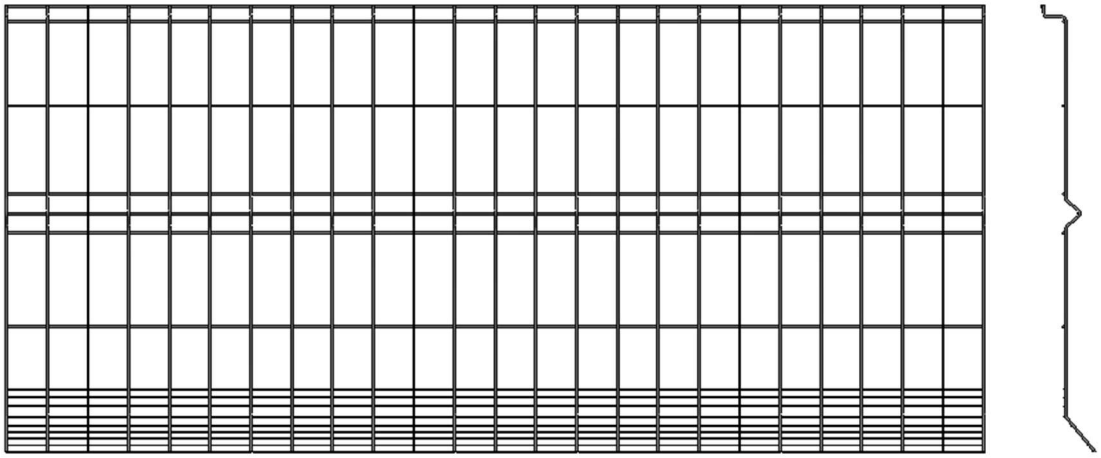
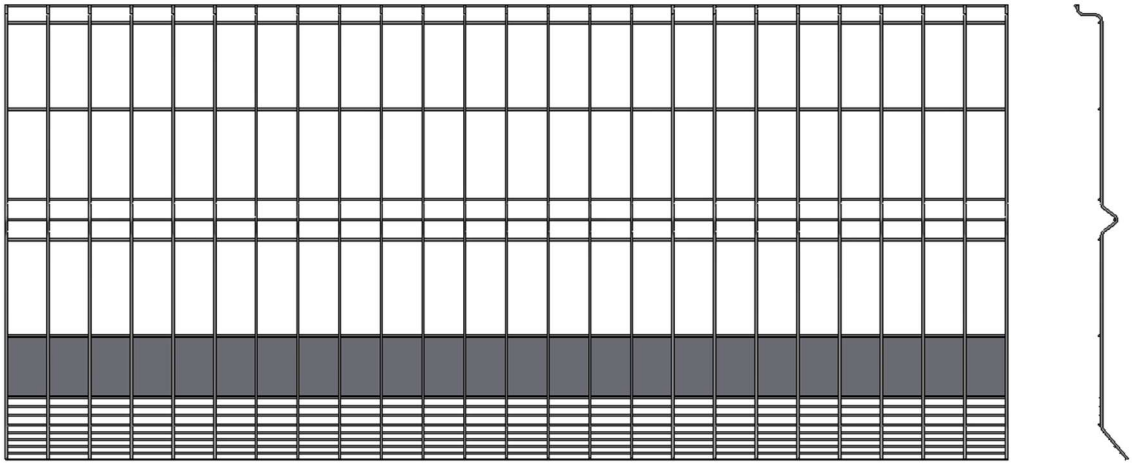
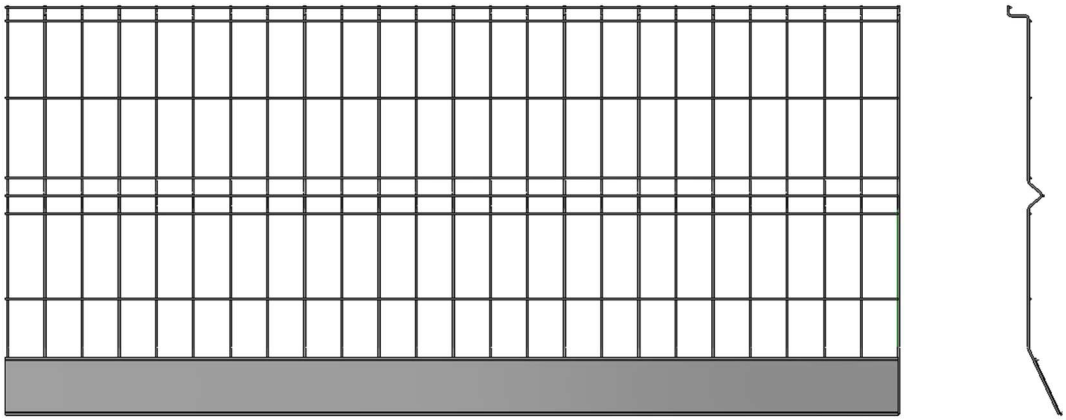
Index	Description	Weight (kg) Dimensions (mm)
EPS-PAN-ECO3	ECO3 mesh panel	12.42 2506x1135x136



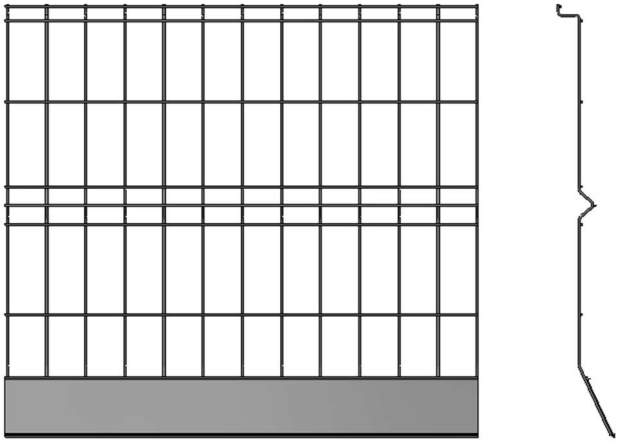
EPS-PAN-A	Mesh panel A	14.71 2506x1135x136



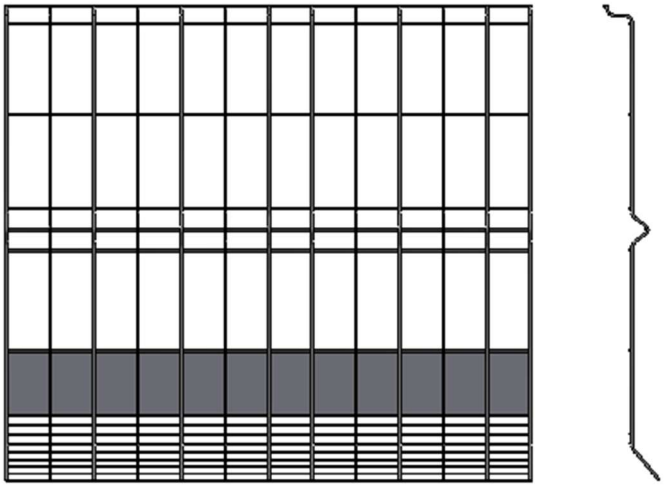
EPS-PAN-I	Mesh panel EPS I	14.66 2506x1147x156



EPS-PAN-I-H	Mesh panel EPS PAN-I Half	7.44 1257x1147x156



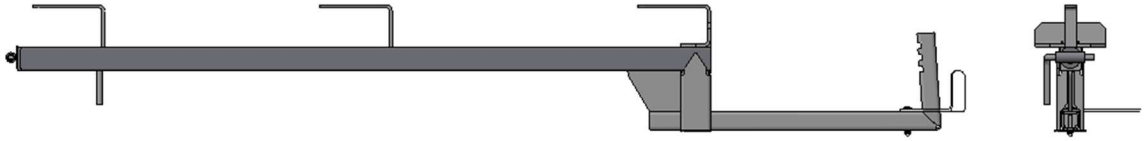
EPS-PAN-E	Mesh panel E	7.82 1257x1134x76

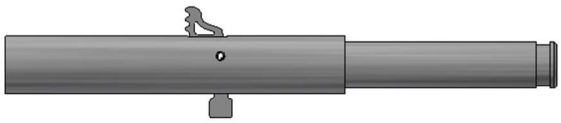
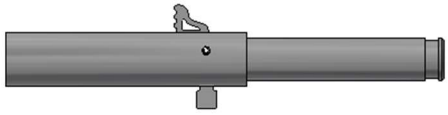
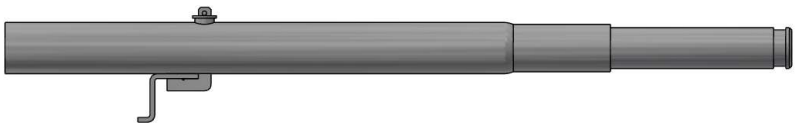
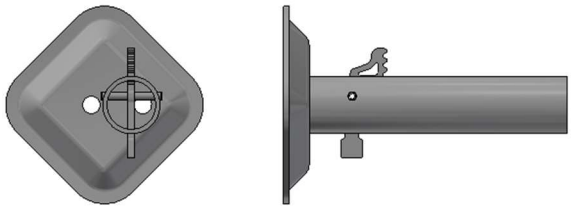


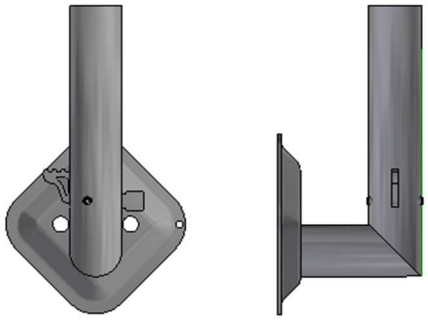
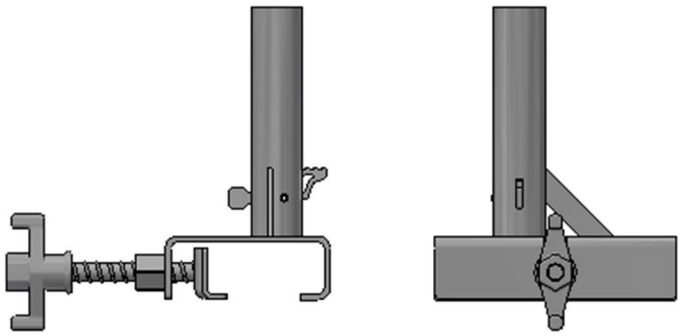
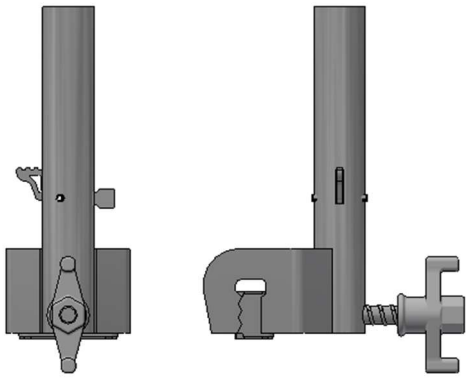
EPS-SL-V2 x	System pole V2	3.75 1200x112x42

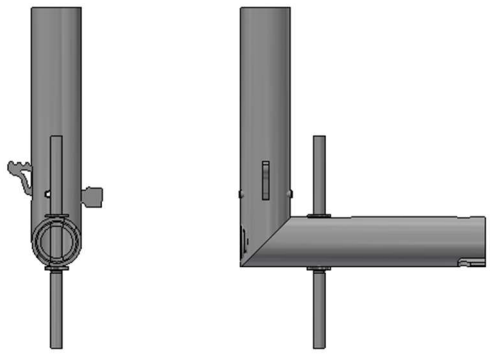
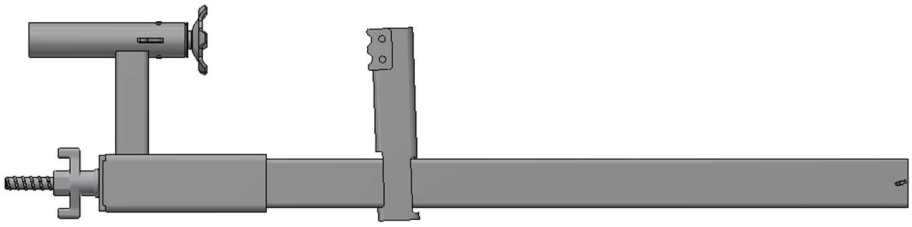
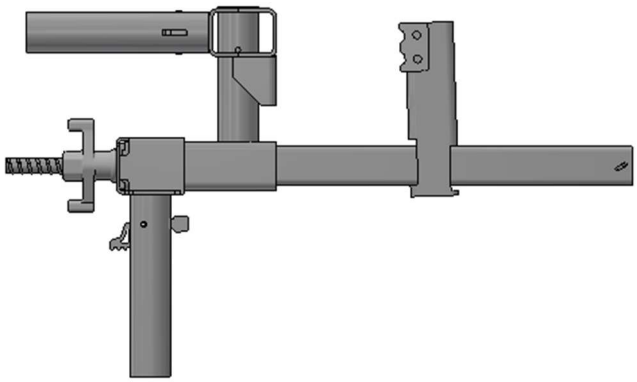
EPS-SL-V3	System pole V3	3.23 1200x109x42

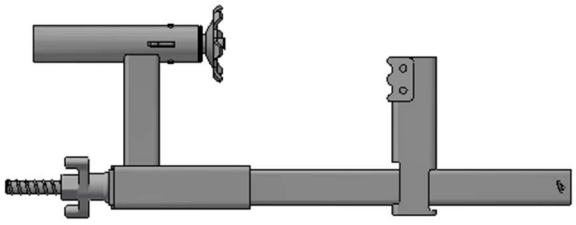
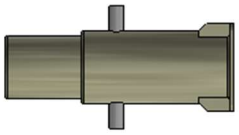
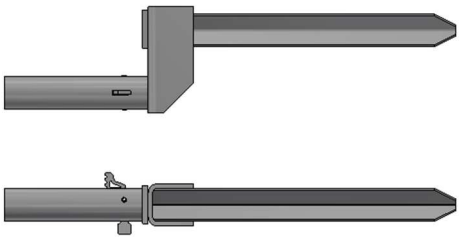
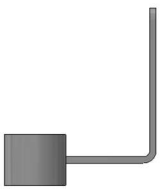
EPS-SL-V4 x	System pole V4	2.90 1200x111x40

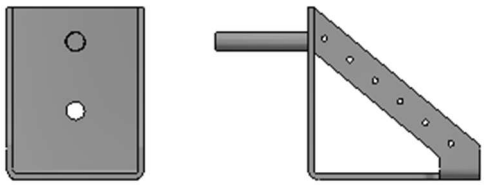
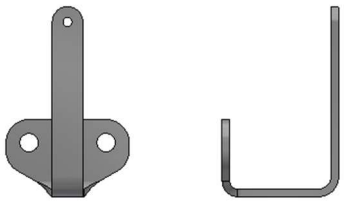
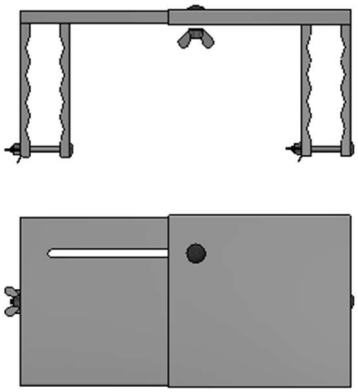
EPS-UUS	EPS clamp integrated in the post	6.72 1584x220x120
		
EPS-DKA x	Board	6.5 2500x150x32
		
EPS-R-500 x	Tube (adjustment: 500-700 mm)	1.9
		
EPS-R-700 x	Tube (adjustment: 700-1050 mm)	2.8
		
EPS-R-1050 x	Tube (adjustment: 1050-1750 mm)	5.3
		
EPS-R-1750 x	Tube (adjustment: 1750-3000 mm)	8.93
		

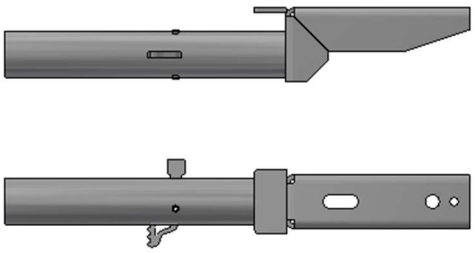
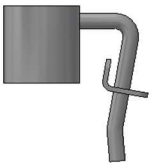
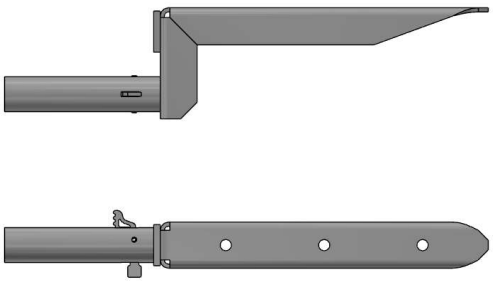
EPS-PRS-V2 [x]	Post extension 250 mm	1.39 400x42x81
		
EPS-PRS190-V2 [x]	Post extension 190 mm	1.12 346x42,81
		
EPS-PRS2 [x]	Post extension 500 mm	2.6 650x95x42,4
		
EPS-UPZ-V2 [x]	Horizontal screw-on clamp	1.3 209x120x120
		

EPS-UPN-V2 x	Vertical screw-on clamp	1.48 250x145x117
		
EPS-UDZ-V2 x	Girder clamp	3.40 243x207x200
		
EPS-UG-V2 x	Steel structure clamp	2.65 270x190x102
		

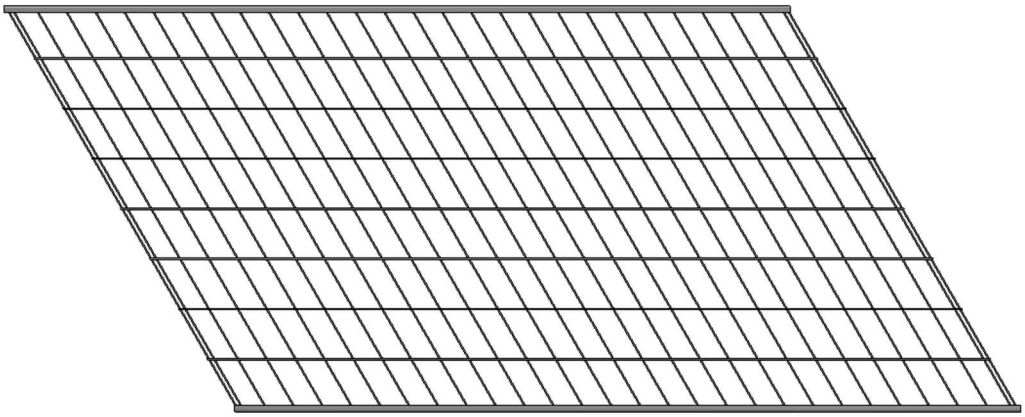
EPS-UZT-V2 [x]	Snap-on clamp	1.74 207x220x80
		
EPS-UUN-L800-V2 [x]	Clamp	8.46 1102x230x85
		
EPS-UUN-V4 [x]	Stair clamp	6.97 650x384x120
		

EPS-UUN-V2	Grip clamp L500	5.4 619x212x90
		
EPS-UZH-V2	Horizontal stay-in-place clamp	0.1 150x50x50
		
EPS-UZV-V2	Vertical stay-in-place clamp	0.115 150x80x50
		
EPS-UW-V3	Driven clamp	2.75 596x140x81
		
EPS-UDS x	Bottom board clamp	0.28 140x113x42
		

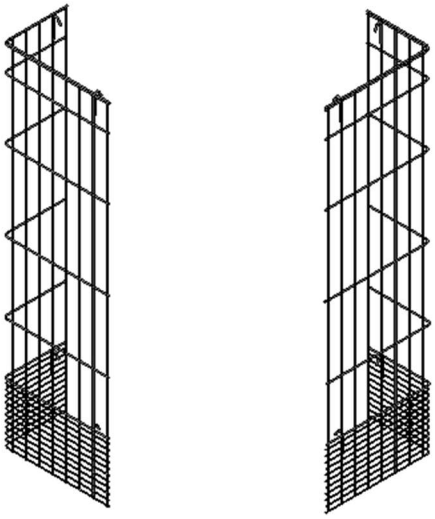
EPS-UPR	Work platform clamp	1.8 230x150x120
		
EPS-US x	Wall clamp	0.3 123x80x75
		
EPS-KR	Adjustable toeboard	3.63
		
EPS-KR2	Short adjustable toeboard	1.1
		

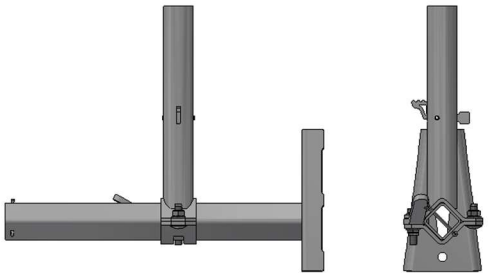
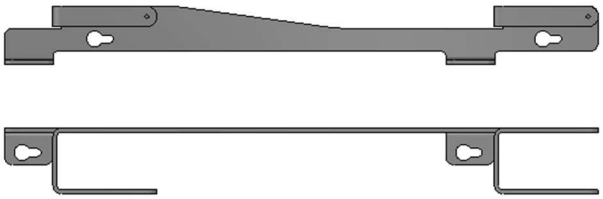
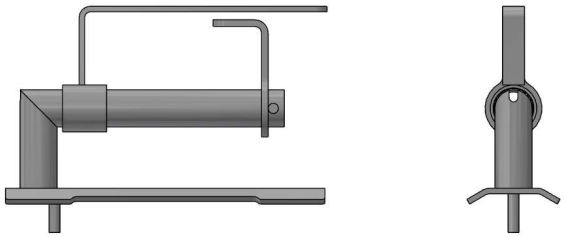
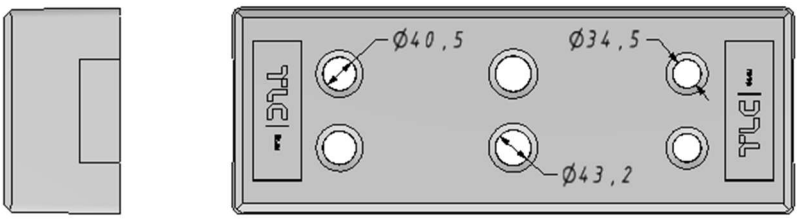
EPS-UBS	Side stair clamp	1.66 431x68x60
		
EPS-R2-380	Adjustable barrier	1.74
		
EPS-UK	Toeboard clamp	0.2 100x48
		
EPS-UWB	Driven clamp V3	2.97 590x135x56
		

EPS-PAN3	Stairs protection mesh	10 3162x1266x11



EPS-PAN2/EPS-PAN2 MIR	Corner mesh	2.67 1300x395x236

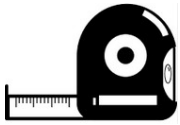


EPS-USP	Screw-on wall clamp	3.89 451x375x110
		
EPS-US2	Double wall clamp	1.74 729x90x71
		
EPS-US3	Shaft clamp	1.85 290x204x85
		
OT-ST17-P	Parking support PVC	11.8 kg 685x251x142
		

[x] - The components have been tested for conformity to EN 13374:2013-08 and have the certificate of conformity no. Z/02/003/18

3. List of tools

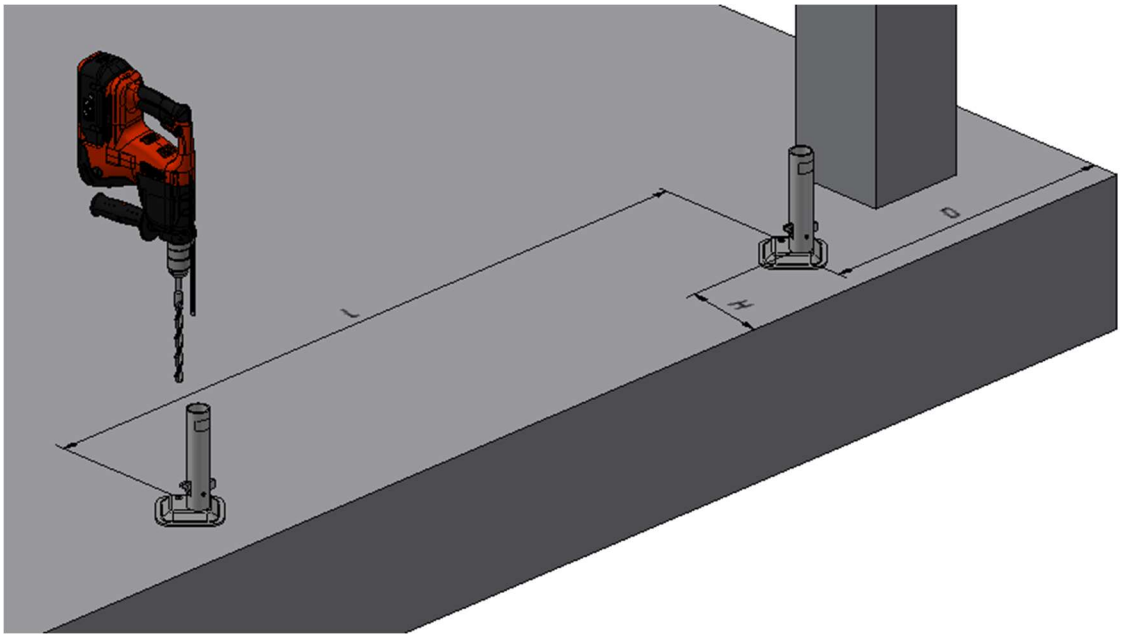
The list does not include the tools needed to install anchors, the list of tools for anchor installation should be provided by their respective manufacturer.

	Spirit level
	Wrenches: 19. 27
	Measuring tape

4. Installation process

Before the installation, prepare the installation site and designate the safe zone. A safety harness is required for work at height.

Installation: Horizontal clamp - EPS-UPZ-V2



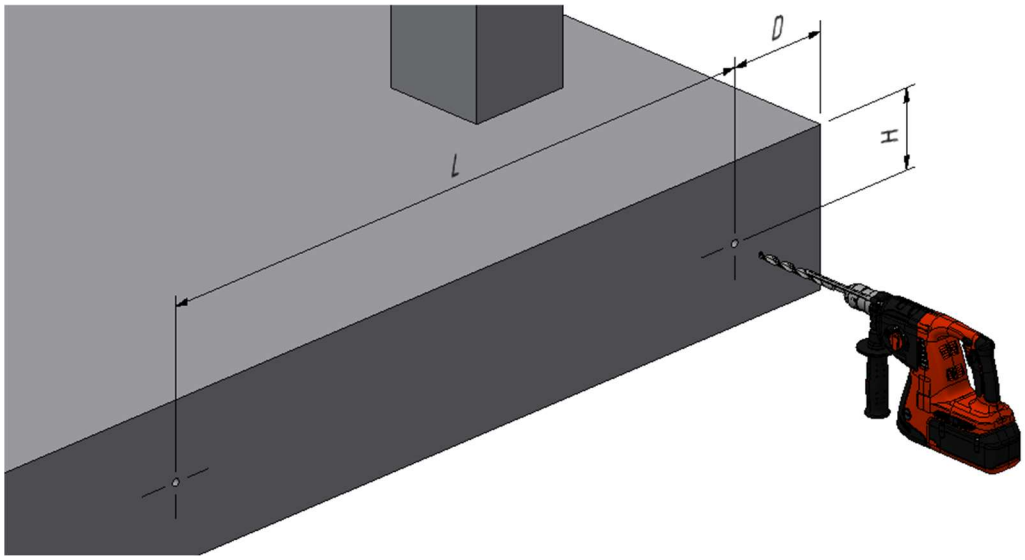
Clamp spacing L depending on the filling:

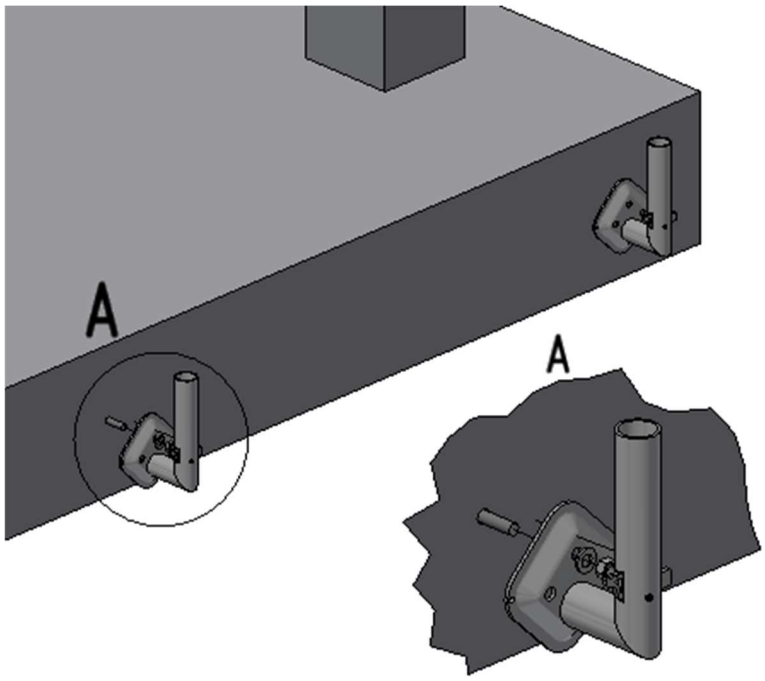
- 2800 mm for railing made of tubes,
- 2450 mm for railing made of system mesh,
- 2000 mm for railing made of system boards

Distance H = min 60 mm, D = min 60 mm

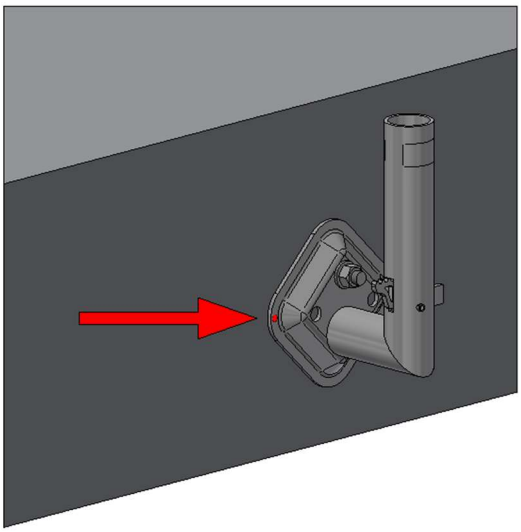
The structures, to which the brackets are anchored, should be made of C20/C25-class concrete (EN 206). The clamp is installed using an anchor, which must be mounted as commended by its respective manufacturer. The anchor should be capable of transferring the pulling load of 8.5 kN and the shearing load of 11.3 kN. It is recommended to use the Fischer EA II M12x50 anchor kit with ISO 4017 cl.8.8 M12x40 screw or the HILTI HUS4 12x80 concrete screw.

Installation: Vertical clamp - EPS-UPN-V2

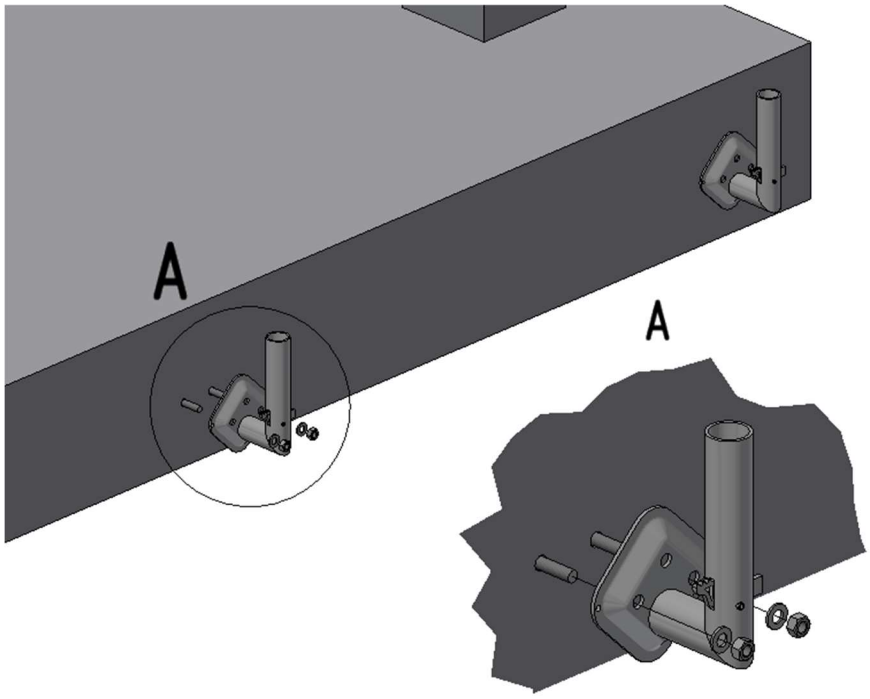




Route the openings, distance L, according to the selected filling, distance H = min 60 mm, D = min 60 mm.



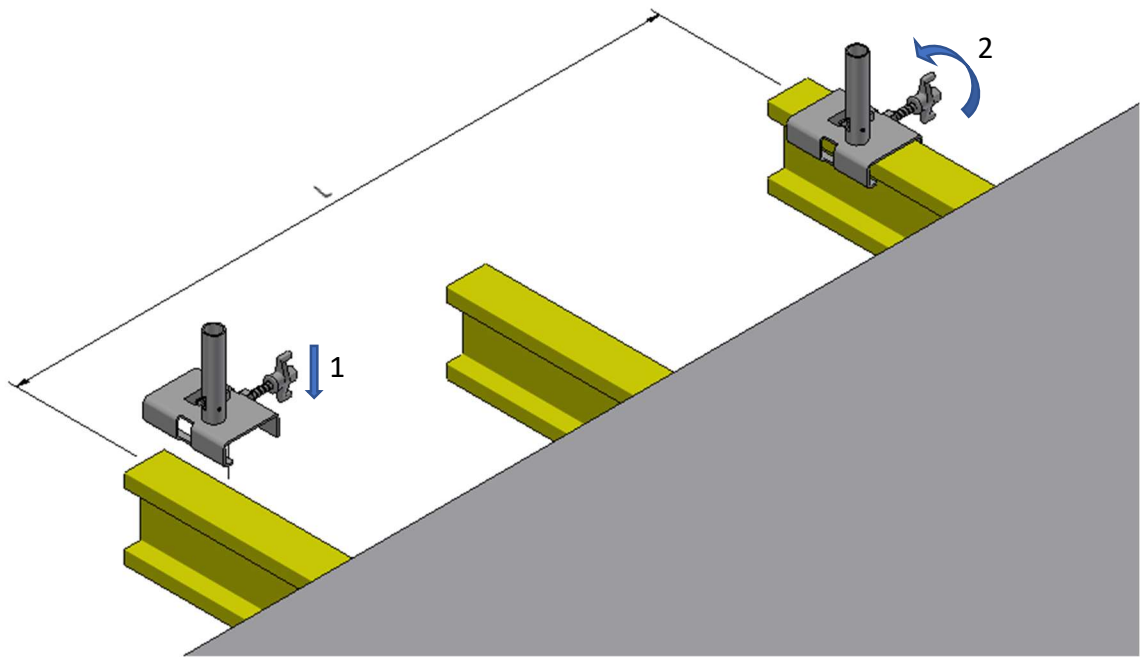
In addition, secure every 6th pole against rotation by installing an additional clamp pin. A 6 mm diameter quick-coupling pin may be used for this purpose.



It is possible to install the clamp on two M10 anchors.

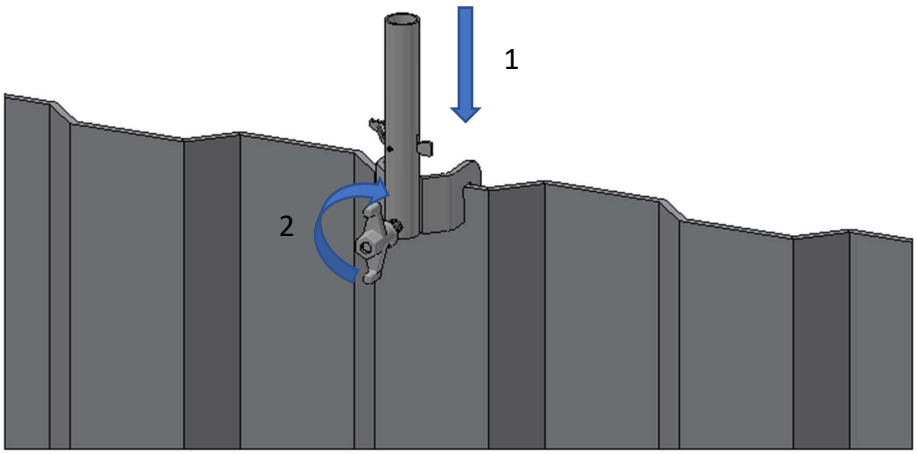
The structures, to which the brackets are anchored, should be made of C20/C25-class concrete (EN 206). The clamp is installed using an anchor, which must be mounted as commended by its respective manufacturer. The anchor should be capable of transferring the pulling load of 8.5 kN and the shearing load of 11.3 kN. It is recommended to use the Fischer EA II M12x50 anchor kit with ISO 4017 cl.8.8 M12x40 screw or the HILTI HUS4 12x80 concrete screw. For installation on two anchors, it is recommended to use the Fischer EA II M10x40 anchor kit with ISO 4017 cl.8.8 M10x40 screw.

Installation: Girder clamp - EPS-UDZ-V2



Spacing L depends on the filling type.
1 slide on the clamp, 2 tighten the nut with the torque of up to 70 Nm.

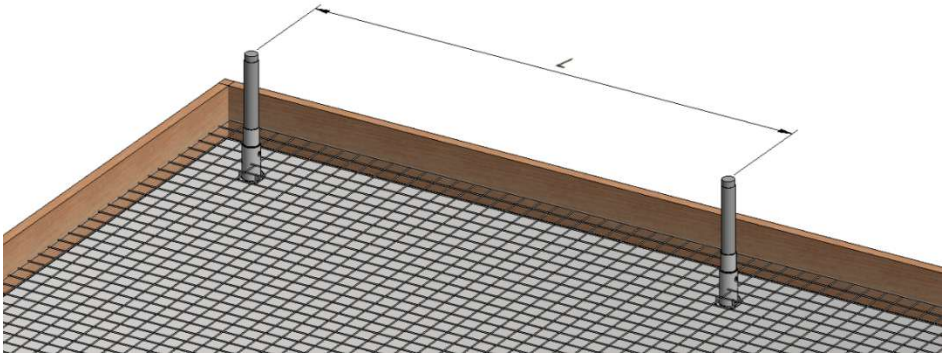
Installation: Steel structure clamp - EPS-UG-V2



Place the vertical structure component with the maximum thickness of 16 mm, then tighten the clamp bracket.

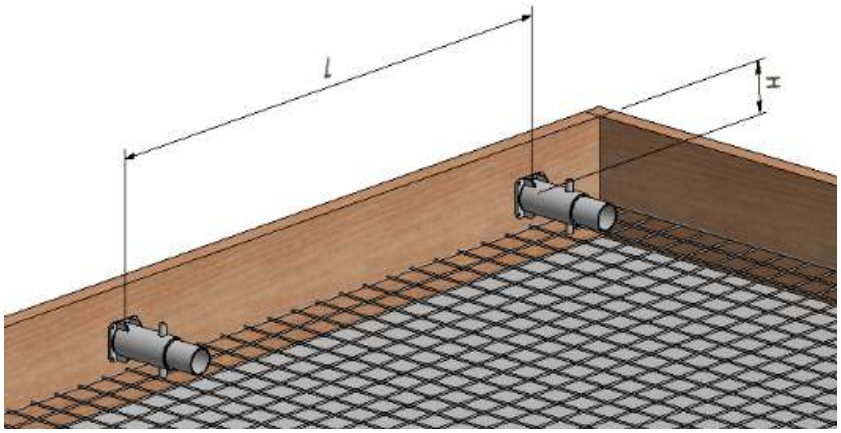
Step 1: Slide the clamp onto the steel structure
Step 2: Tighten the self-cleaning screw from the side

Installation: Horizontal stay-in-place clamp - EPS-UZH-V2



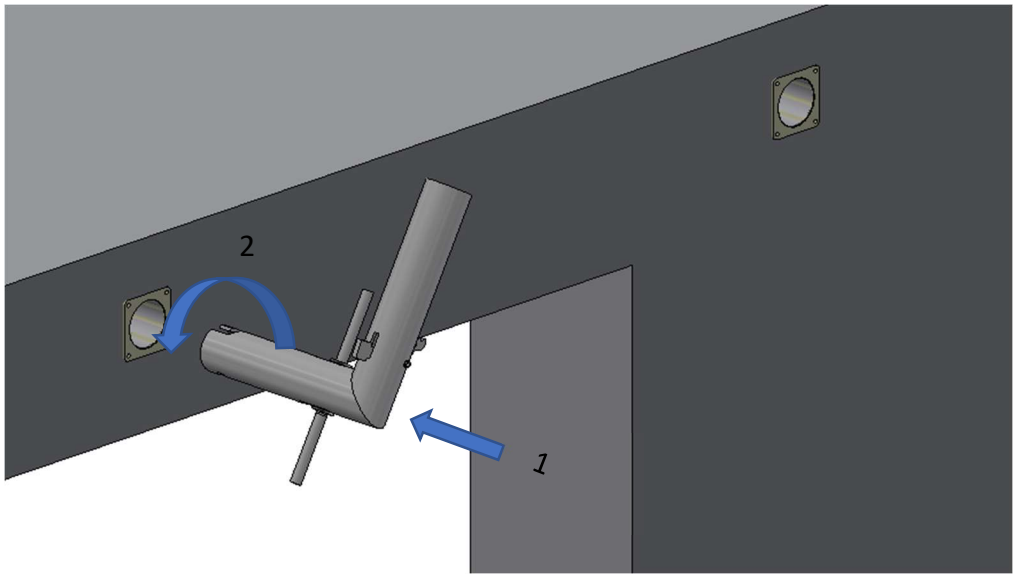
Nail the flange of the component to the horizontal surface of the formwork, insert a 37x35 PVC tube with the length suitable for the thickness of the ceiling and secure it with a cap. The minimum thickness of the ceiling is 150 mm and the maximum is 300 mm. The clamp is embedded in the formwork slab before concreting the structure, i.e. in the slab, binder or beams on their horizontal surface. Min. 120 mm distance from the formwork edge, distance L depending on the railing type.

Installation: Vertical stay-in-place clamp - EPS-UZV-V2



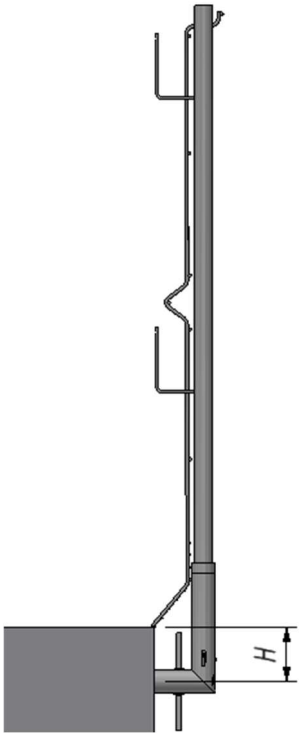
Nail the clamp to the formwork board using special openings in the flange and set it with the bar in vertical orientation. The clamp is embedded within the reinforcement before concreting to the structure, i.e. the slab, binder or beam, on the vertical surface. The distances from the top edge of the formwork, H - min. 80 mm, and from the side edge, L min. 120 mm, depend on the railing type

Installation: Snap-on clamp - EPS-UZT-V2

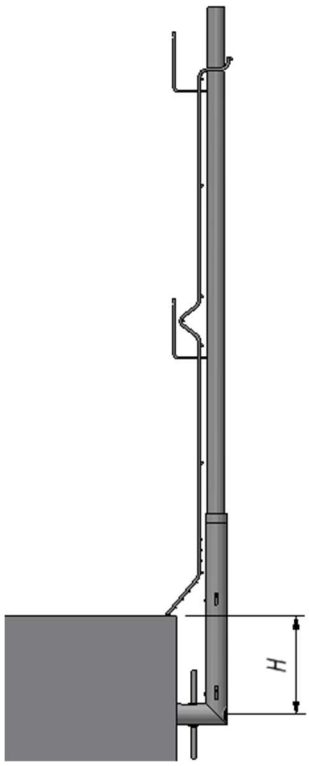


The clamp should be attached to the vertical stay-in-place clamp.
1 Insert the holder, 2 Turn it counterclockwise.

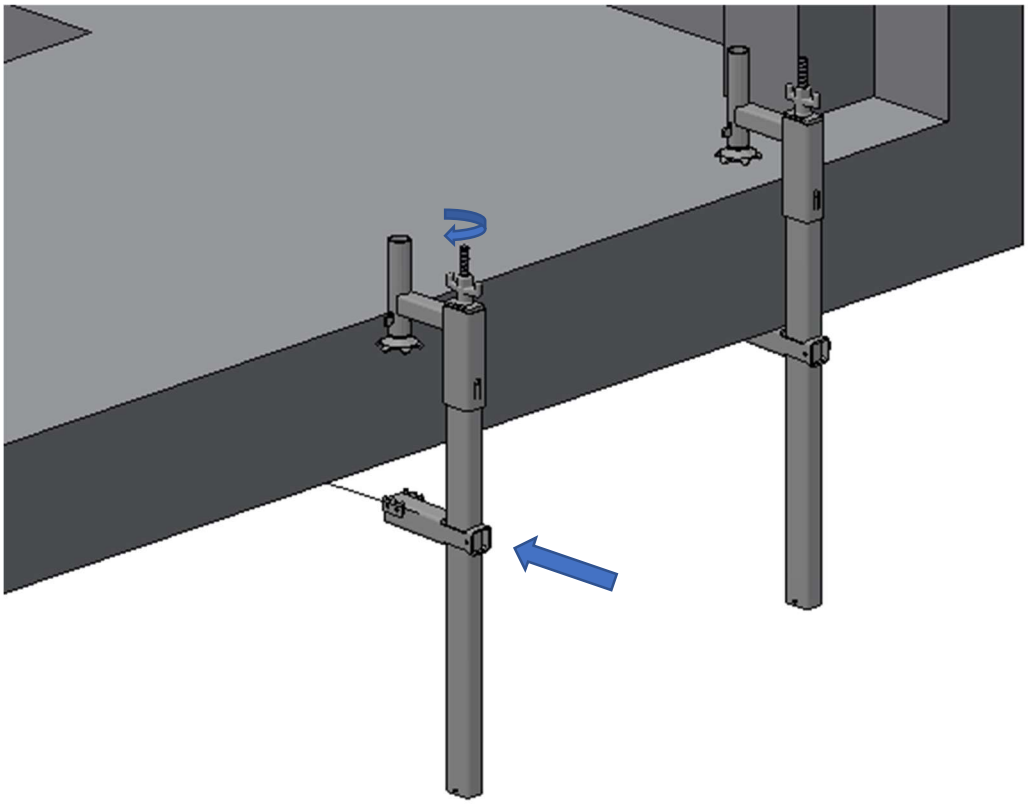
If the installation distance between the stay-in-place clamp and the floor H is from 80 mm to 120 mm, then the barrier can be installed without extension.



If the installation distance between the stay-in-place clamp and the floor H is greater than 120 mm, then the barrier should be installed using the extension EPS-PRS190-V2. The maximum installation distance between the stay-in-place clamp and the floor H is up to 250 mm.

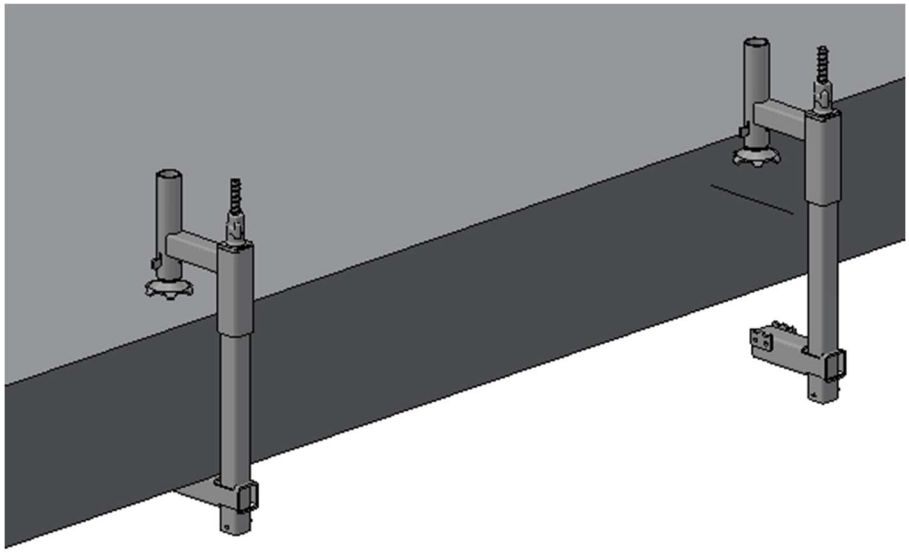


Installation: Grip clamp - EPS-UUN-L800-V2



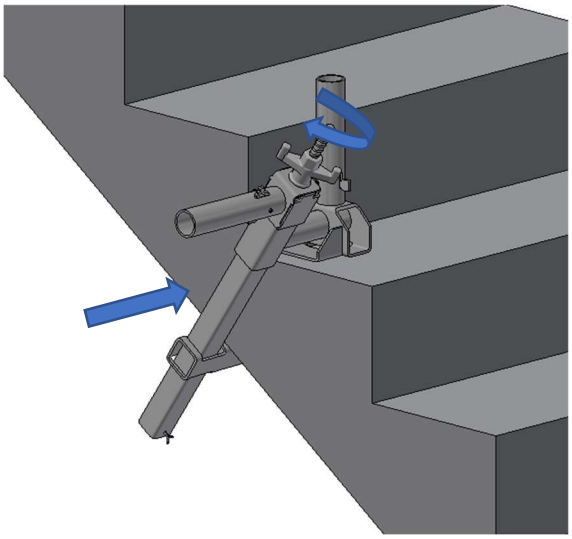
1. The grip clamp can be attached to concrete components or other difficult to compact surfaces with the maximum thickness of 800 mm.
2. Set the clamp opening according to the thickness of the component, on which the clamp will be installed.
3. Place the clamp on the component.
4. Tighten the clamp nut with the torque of 110 Nm.

Installation: Grip clamp L500 - EPS-UUN-V2

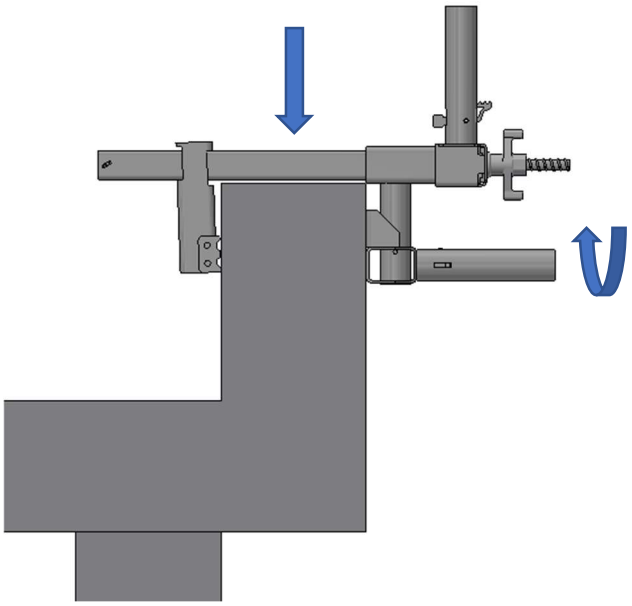


1. The grip clamp can be attached to concrete components or other difficult to compact surfaces with the maximum thickness of 370 mm.
2. Set the clamp opening according to the thickness of the component, on which the clamp will be installed.
3. Place the clamp on the component.
4. Tighten the clamp nut with the torque of 110 Nm.

Installation: Stair clamp - EPS-UUN-V4



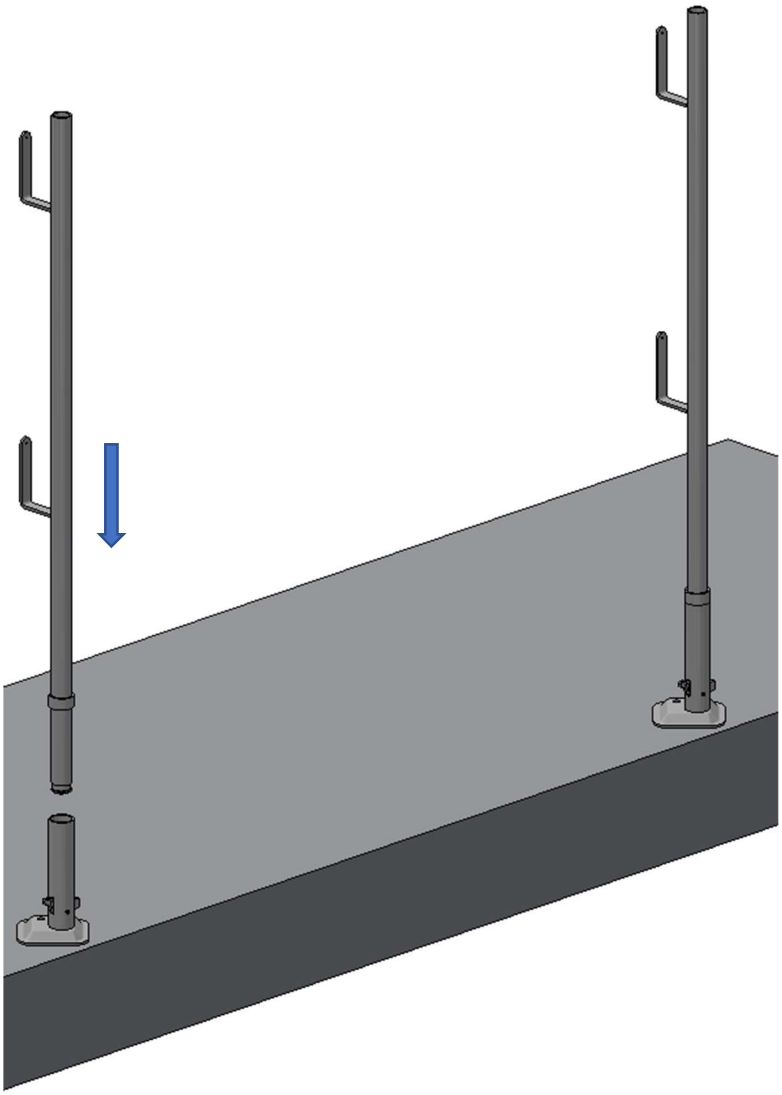
On stairs



On the wall

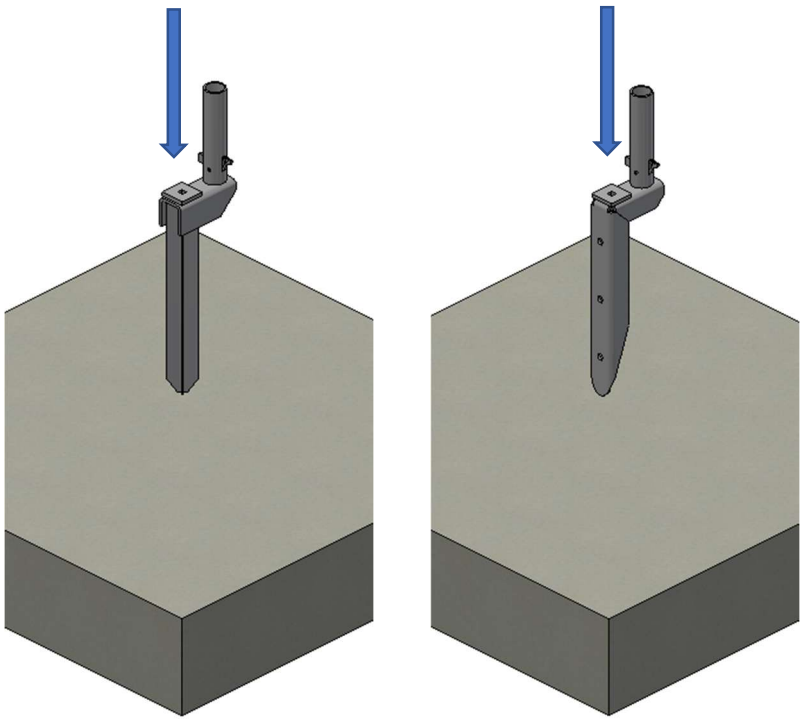
1. The grip clamp can be attached to concrete components or other difficult to compact surfaces with the maximum thickness of 330 mm.
2. Set the clamp opening according to the thickness of the component, on which the clamp will be installed.
3. Place the clamp on the component.
4. Tighten the clamp nut with the torque of 110 Nm.

Installation: Pole - EPS-SL-V2, EPS-SL-V3, EPS-SL-V4

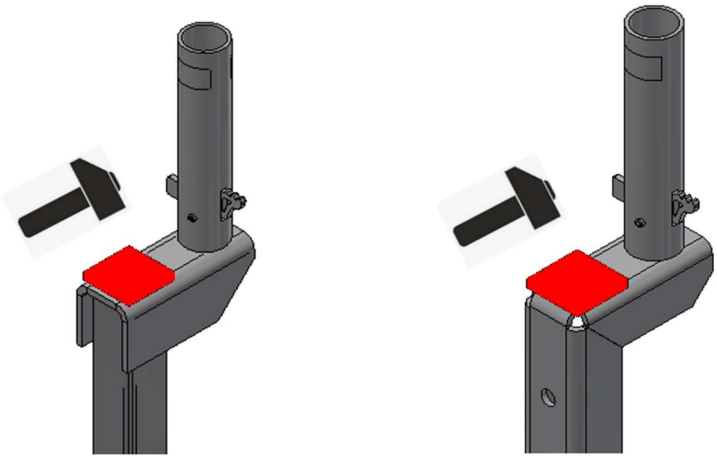


To attach the pole, slide it into the clamp, which latches the pin. To remove the pole, step the automatic pin and pull the pole out of the clamp, while pressing the pin. During the use, it is not allowed to apply a vertical force greater than 1.5 kN on the axis of the pole.

Installation: Driven clamp - EPS-UW-V3, EPS-UWB

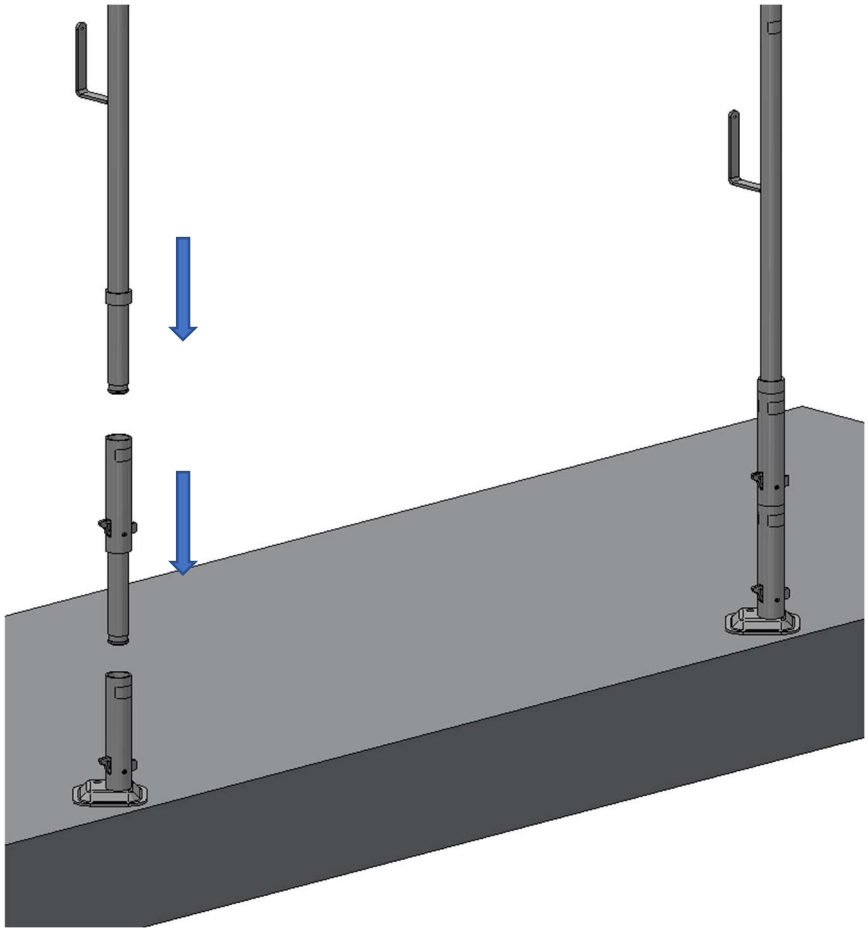


To attach the clamp, step on the sheet metal step and insert the clamp into the soil perpendicularly until the entire bracket length embedded in the soil. It is important for the soil to be sufficiently hardened and dried to ensure secure attachment. If the soil is harder, the component can be driven in by hammering. Hammer the strike plate welded into the clamp. **Do not use a barrier mounted on driven clamps as edge protection.**



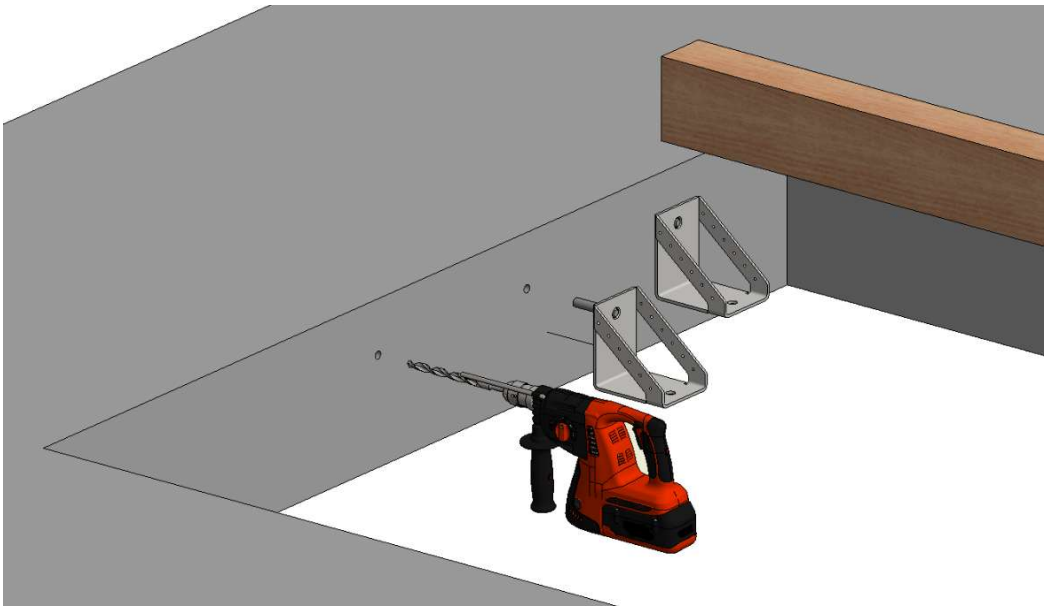
Installation: Pole extension 190 mm - EPS-PRS190-V2 [x]

Pole extension 250 mm - EPS-PRS-V2



The pole extension **190 mm and250 mm** are attached analogically to the pole. To attach the component, slide the extension into the component until the automatic pin is latched. Next, do the same with the pole. To remove the component, release the pin of the extension and pull the pole out of the attachment. Then, step on the automatic pin of the clamp and remove the extension itself. **Using dual extension is not allowed by the manufacturer!** (whether 2x190, or 2x250, or 190+250), for both strength and function purposes (double tube-in-tube attachment amplifies the wobbling of the pole).

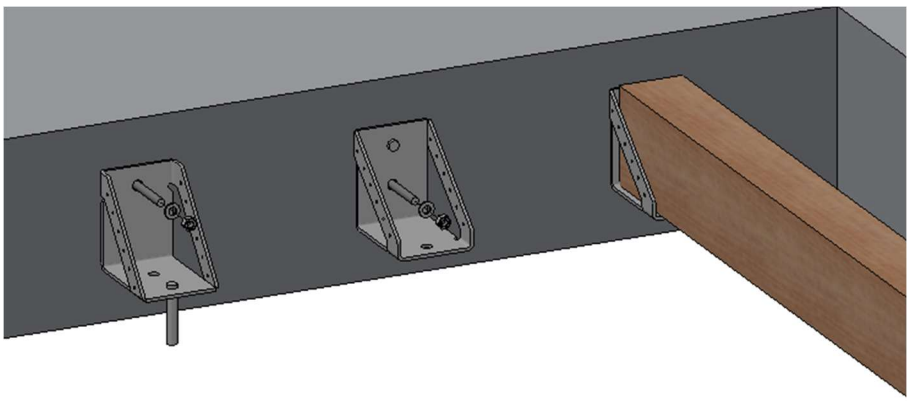
Installation: Work platform clamp - EPS-UPR



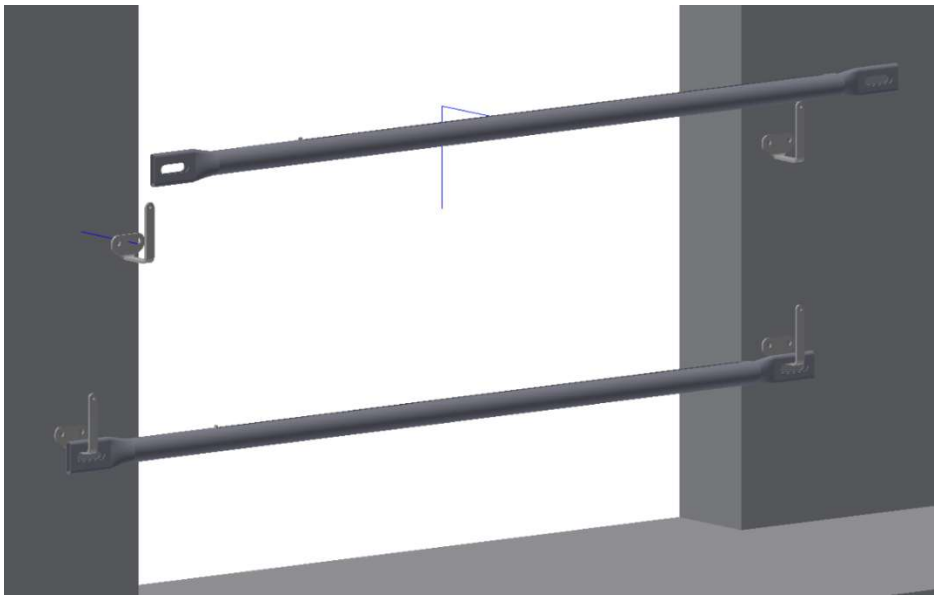
The openings for the installation of work platform clamps should have the diameter of 16 mm, depth d = min. 90 mm and distance from the top edge of min. 100 mm. The component is suitable for installation in concrete or solid brick walls.

After drilling the openings, insert the clamps into them on the opposite sides and then insert a beam max. 10 mm shorter than the clamp spacing with the width of 100 mm. The beam must be secured with nails or screws using the opening in the sides of the clamps. The clamps can be installed using mechanical or chemical anchors. The anchors used should be capable of transferring the required load and have a maximum diameter of up to 14 mm.

The maximum load capacity of a properly seated clamp is 10 kN. The number of clamps used to form the platform should be selected according to the maximum load of a single clamp.

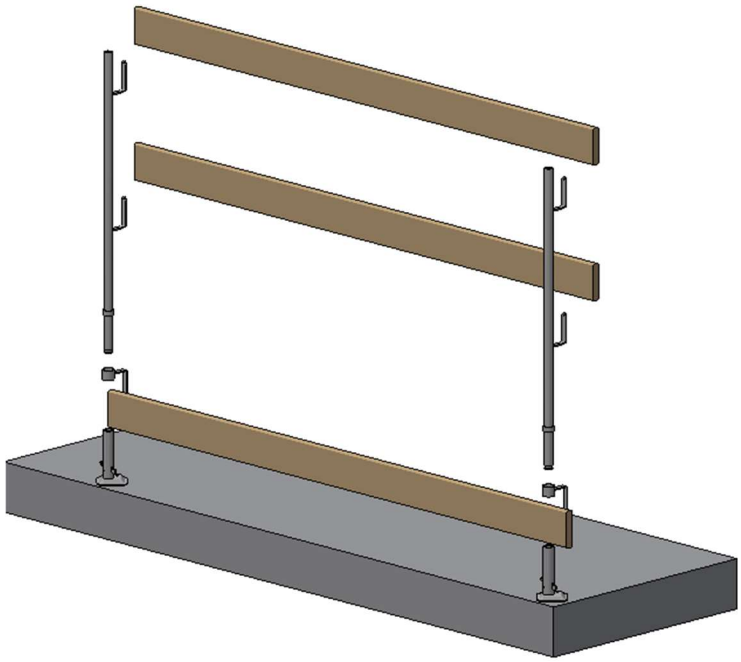


Installation: Wall clamp - EPS-US



A single clamp should be seated on two M10 anchors. The anchors should transfer a vertical load of 1500 N. It is recommended to use a Fischer EA II M10x50 anchor.

Installation:
panels - EPS-PAN / Boards - EPS-DKA / Tubes - EPS-R-500; EPS-R-700; EPS-R-1050; EPS-R-1750
/ EPS-PAN2, EPS-PAN3



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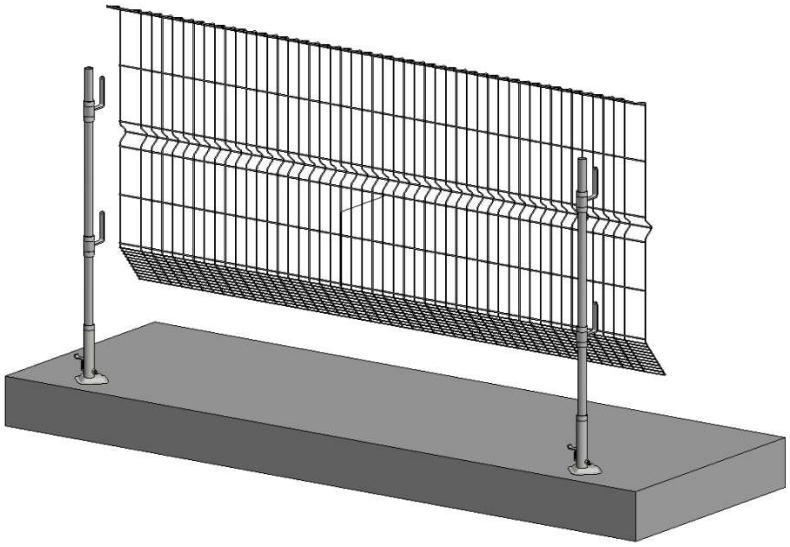
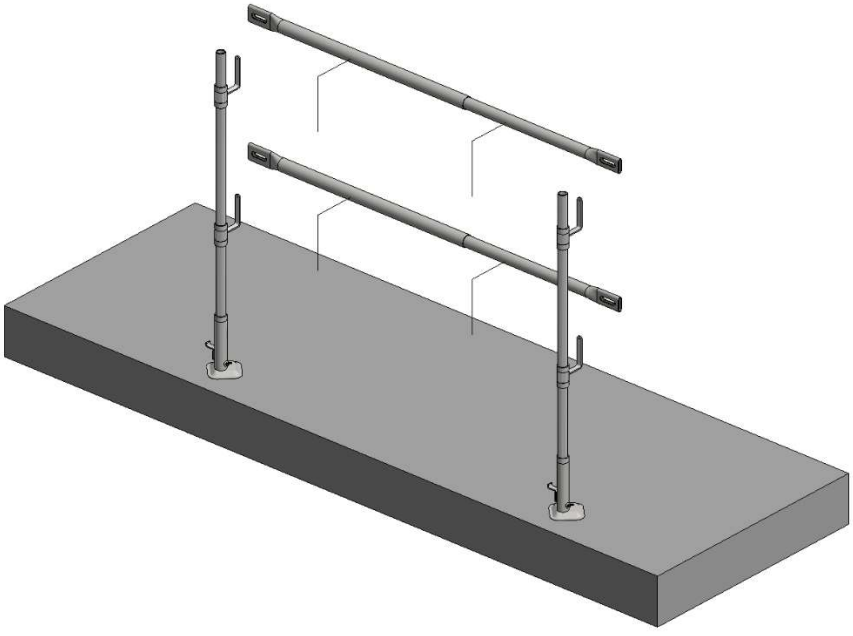
Installation of boards

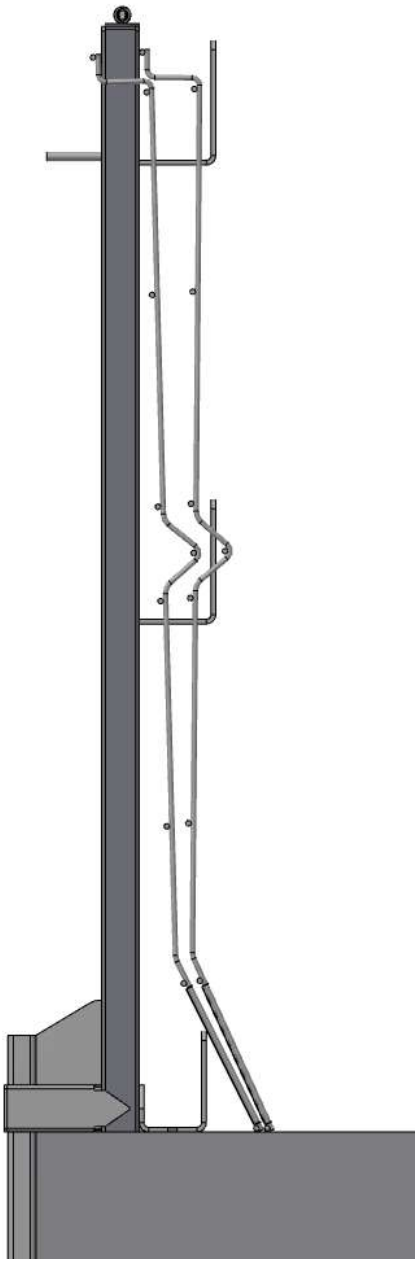


CAUTION!!! The mesh should contact the substrate on its entire length.

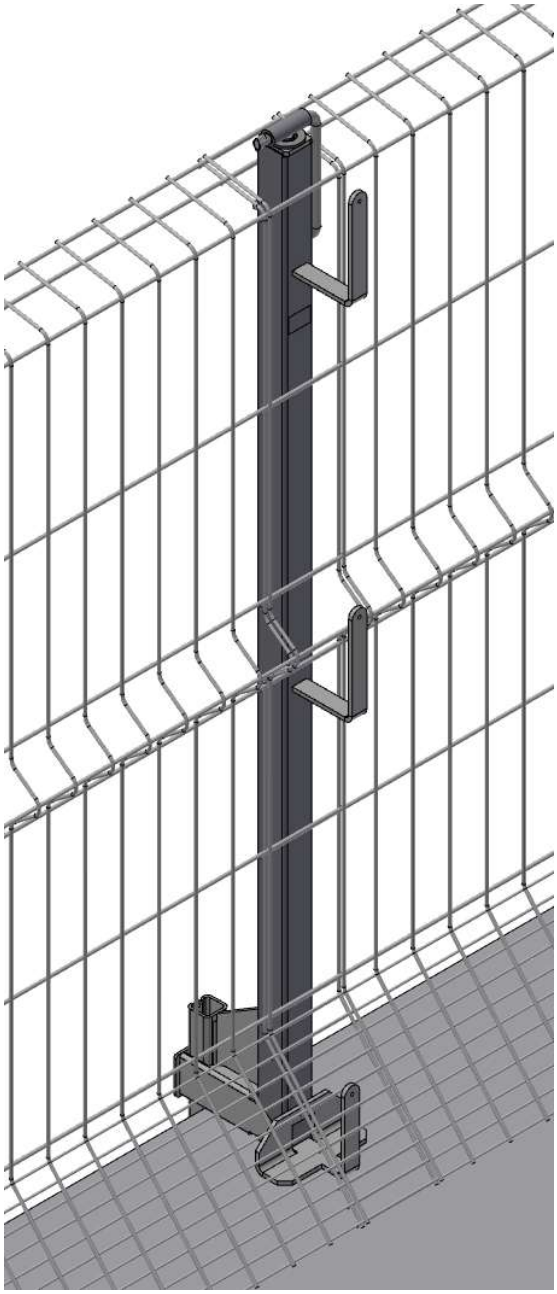
Installation of mesh panels



Installation of tubes



Installation of EPS-PAN-I on UUS poles



The installation of EPS-PAN on UUS poles is only possible using the enlarged ultimate eyelets

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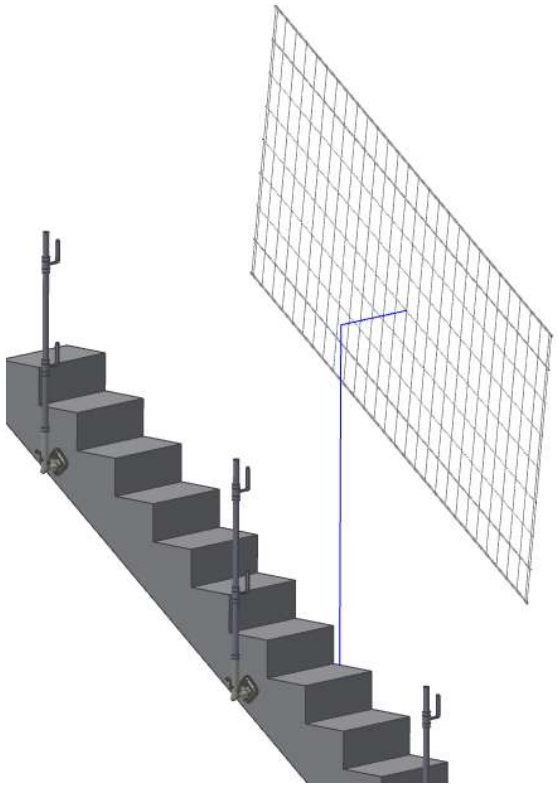
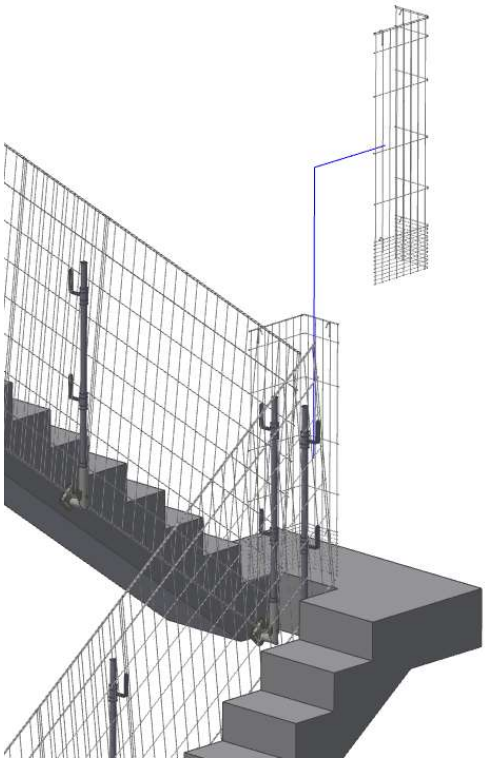
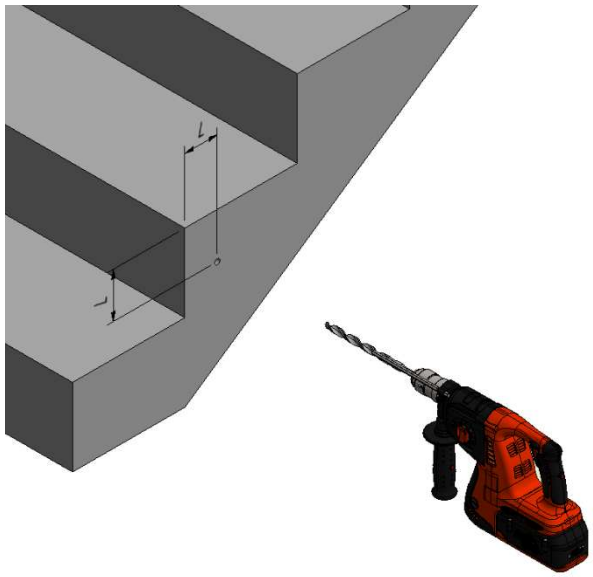


Installation of the mesh panel for stairs

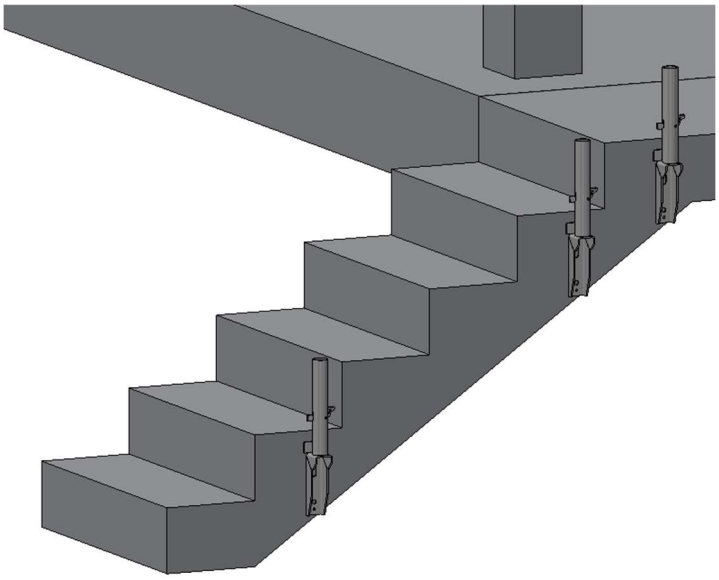


Installation of the mesh panel for corners

Installation: Stair clamp - EPS-UBS

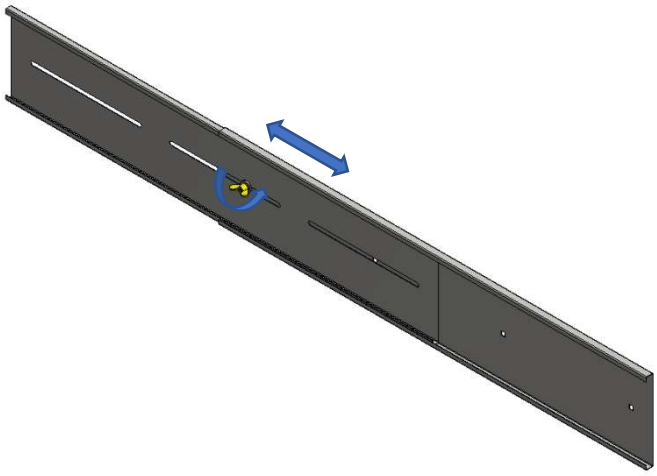


The minimum distance from the edge L = 60 mm

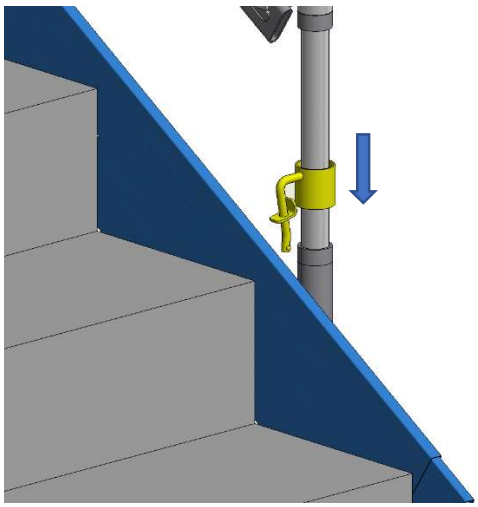


The clamp should be installed using an anchor as recommended by its respective manufacturer. Provide the pull-out strength of 8.5 kN and shear strength of 11.3 kN. It is recommended to use the Fischer EA II M12x50 anchor kit with ISO 4017 cl.8.8 M12x40 screw or the HILTI HUS4 12x80 concrete screw. The structures, to which the brackets are anchored, should be made of C20/C25-class concrete (EN 206). The clamps at the beginning and at the end of a single flight of stairs must be additionally secured against rotation by installing an additional pin.

Installation: toeboard - EPS-KR; toeboard clamp - EPS-UK



Length setting



After positioning, the toeboards are locked using the clamp EPS-UK sled from the top. The clamp features a lock used to press the toeboard against the pole to prevent it from moving.

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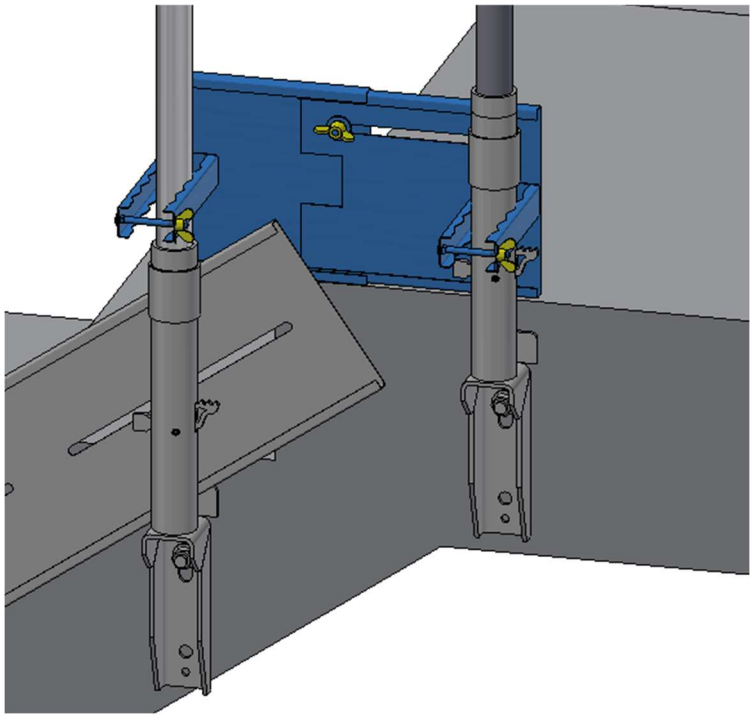
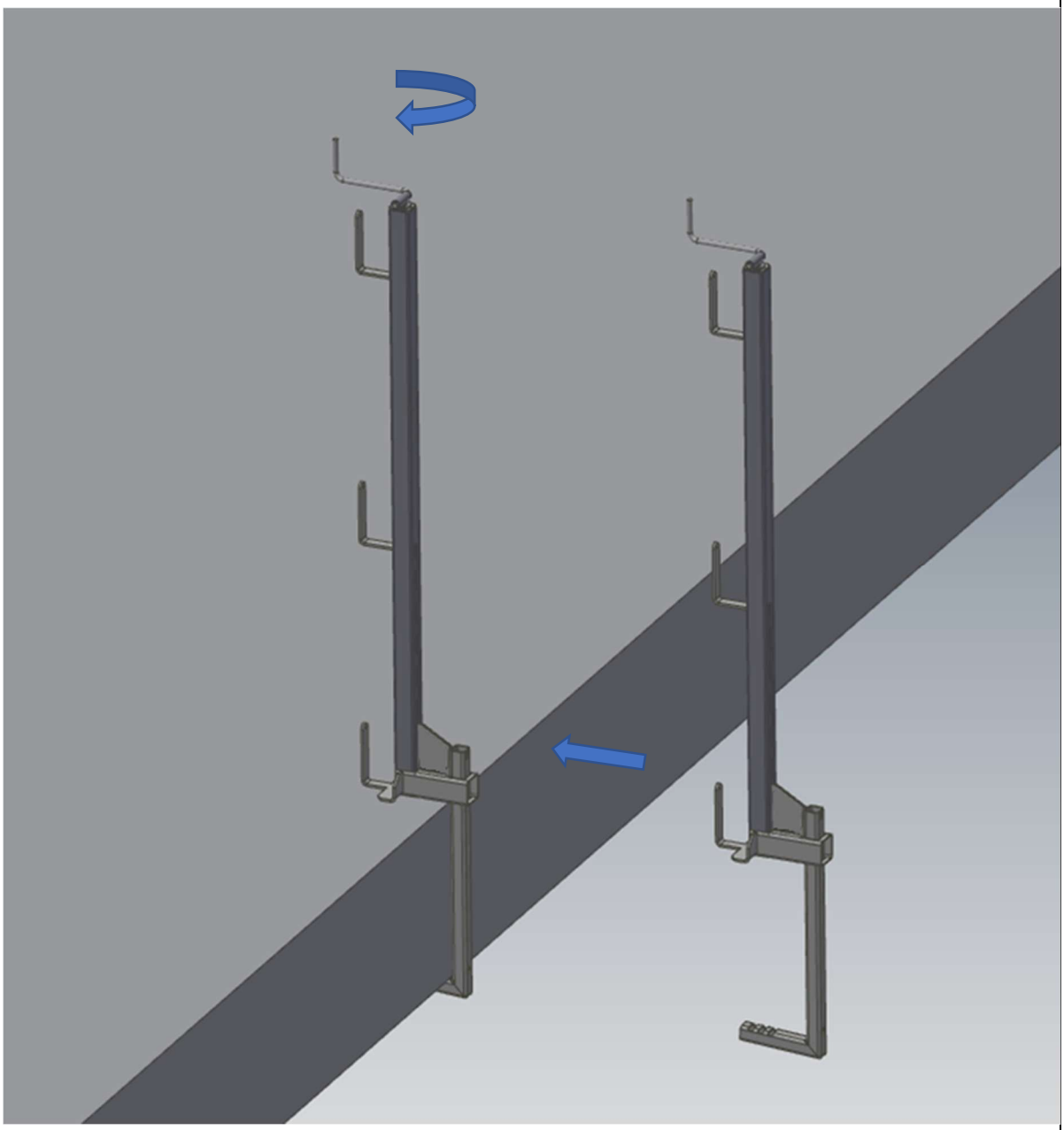
Installation: short adjustable toeboard - EPS-KR2



Install the toeboards on landing between the subsequent flights of stairs by screwing them to the fixed components, such as poles, clamps etc.

Installation: Adjustable barrier - EPS-R2-380

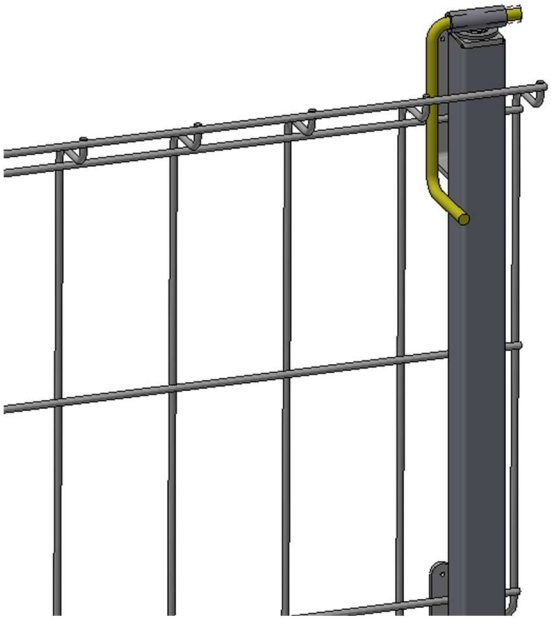
Installation: Integrated clamp - EPS-UUS

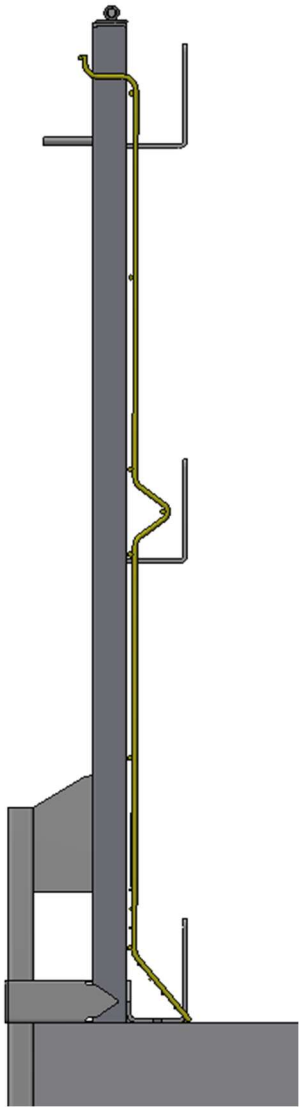


1. The integrated clamp can be attached to concrete components or other difficult to compact surfaces with the maximum thickness of 350 mm.
2. Set the clamp opening according to the thickness of the concrete component.
3. Place the clamp on the concrete component.
4. Tighten the crank of the clamp with the torque of 70 Nm - a force of approx. 43 kg, applied to the crank of the clamp.

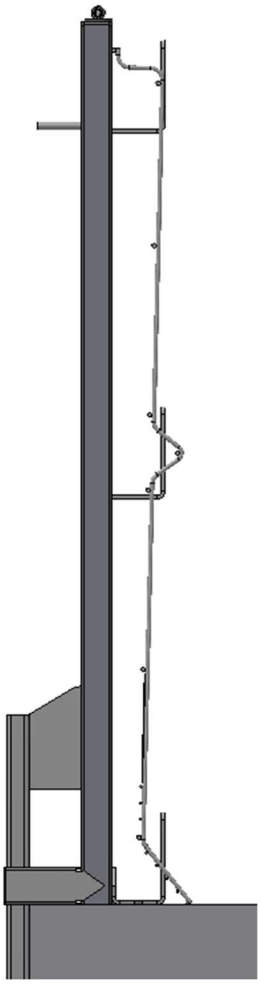
The crank of the clamp should be set along the pole to install the mesh directly on the pole.

CAUTION!!! The mesh should contact the substrate on its entire length.

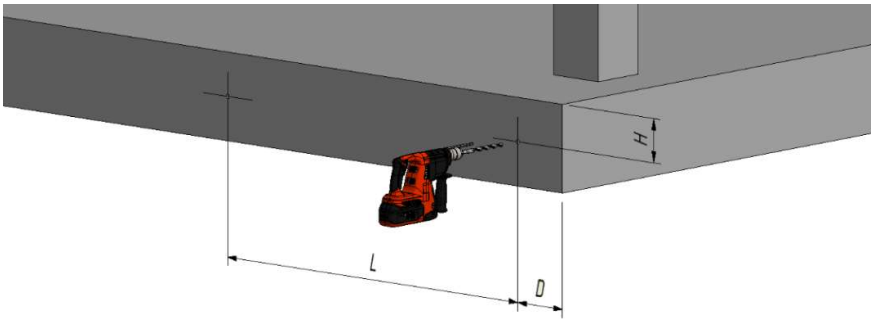


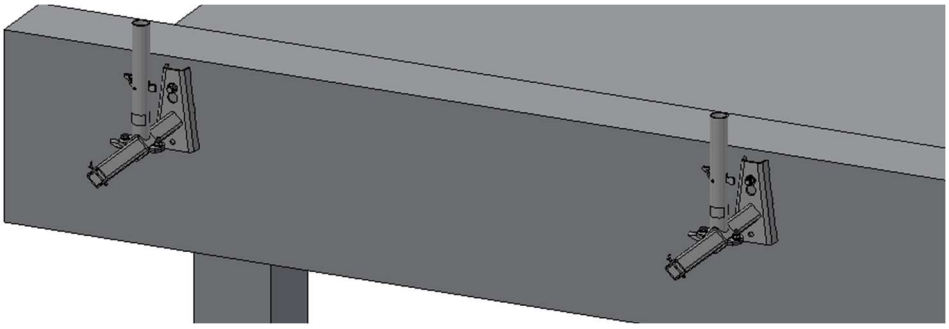


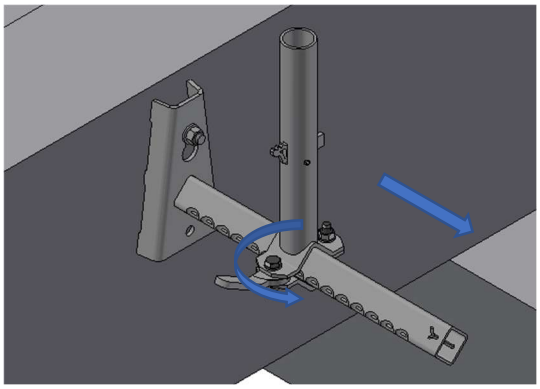
If the crank of the component cannot be set along the pole, the mesh can be installed without placing it on the clamp.

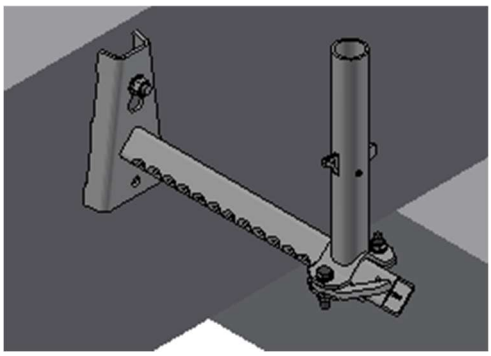


Installation: façade clamp - EPS-USP





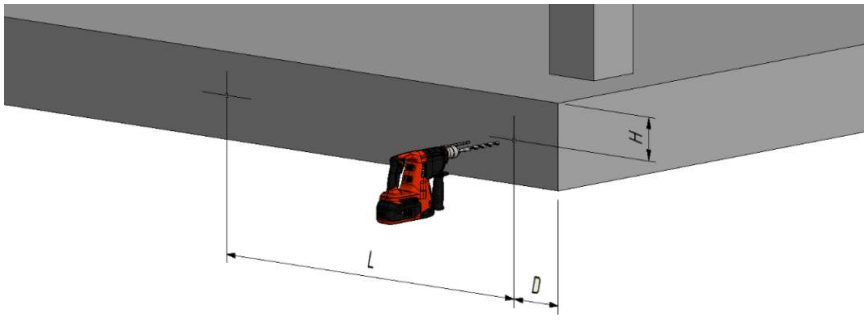


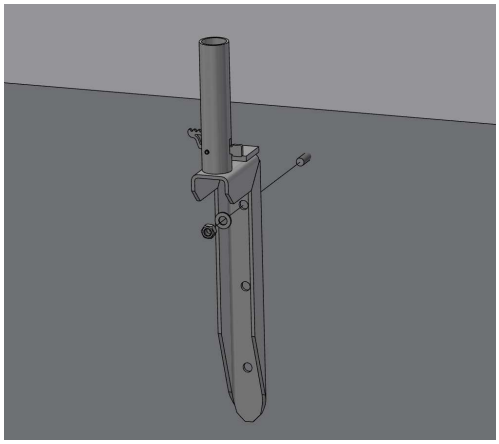


The structures, to which the brackets are anchored, should be made of C20/C25-class concrete (EN 206). The clamp is installed using an anchor, which must be mounted as commended by its respective manufacturer. The anchor should be capable of transferring the pulling load of 8.5 kN and the shearing load of 11.3 kN. It is recommended to use the Fischer EA II M12x50 anchor kit with ISO 4017 cl.8.8 M12x50 screw or the HILTI HUS4 12x100 concrete screw.

Route the openings, distance L, according to the selected filling, distance H = min 60 mm, D = min 60 mm. A keyhole-shaped cut-out enables attaching the clamp to an already inserted anchor. In addition, secure every 6th clamp against rotation by installing an additional clamp pin. Adjust the clamp by sliding it to position and turning the eccentric arm to stop.

Installation: façade clamp - EPS-UWB



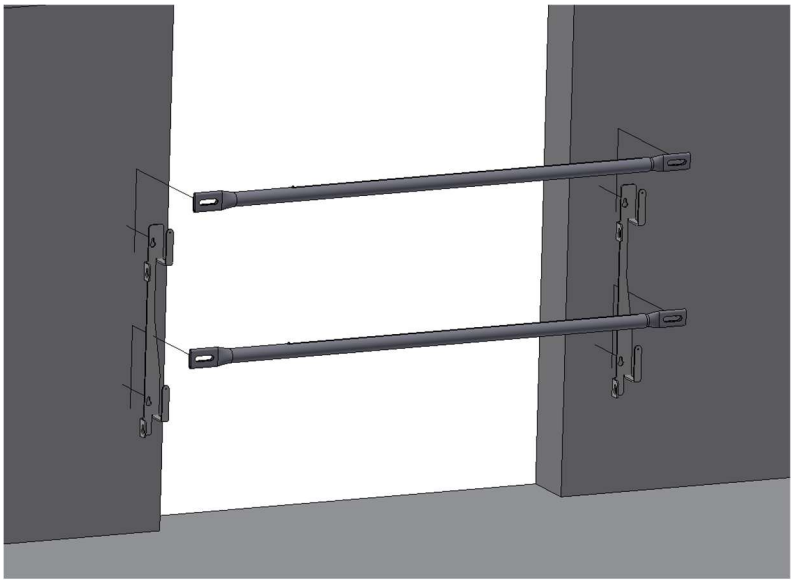


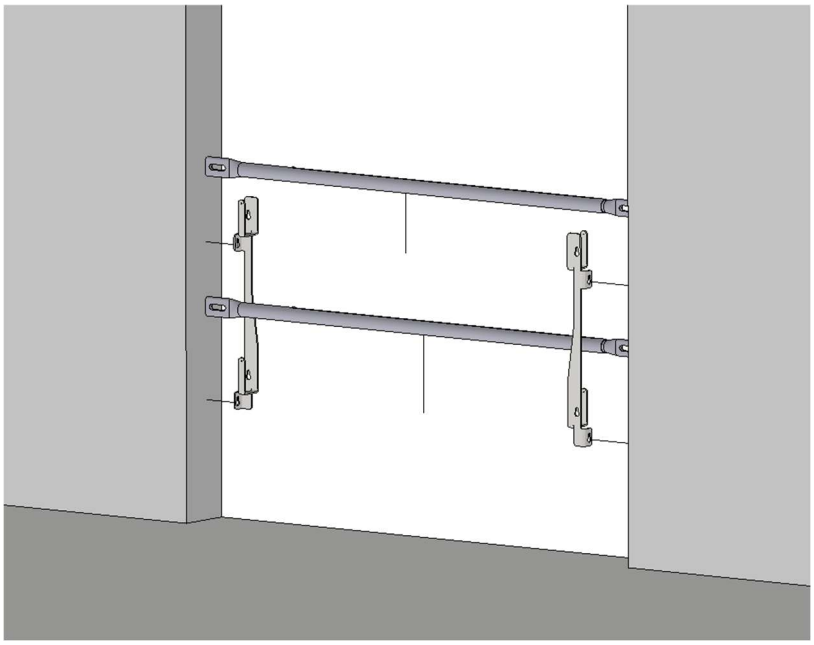
Route the openings, distance L, according to the selected filling, distance H = min 60 mm, D = min 60 mm.

In addition, secure every 6th post against rotation by installing an additional pin in any of the two lower openings on the clamp. A 10 mm diameter quick-coupling pin may be used for this purpose.

The structures, to which the brackets are anchored, should be made of C20/C25-class concrete (EN 206). The clamp is installed using an anchor, which must be mounted as commended by its respective manufacturer. The anchor should be capable of transferring the pulling load of 8.5 kN and the shearing load of 11.3 kN. It is recommended to use the Fischer EA II M12x50 anchor kit with ISO 4017 cl.8.8 M12x50 screw or the HILTI HUS4 12x100 concrete screw.

Installation: Wall clamp - EPS-US2

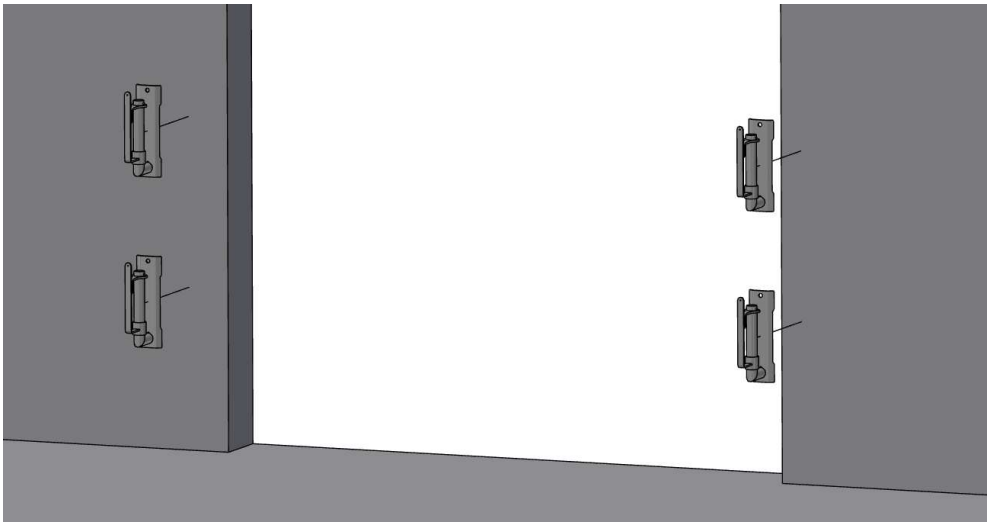


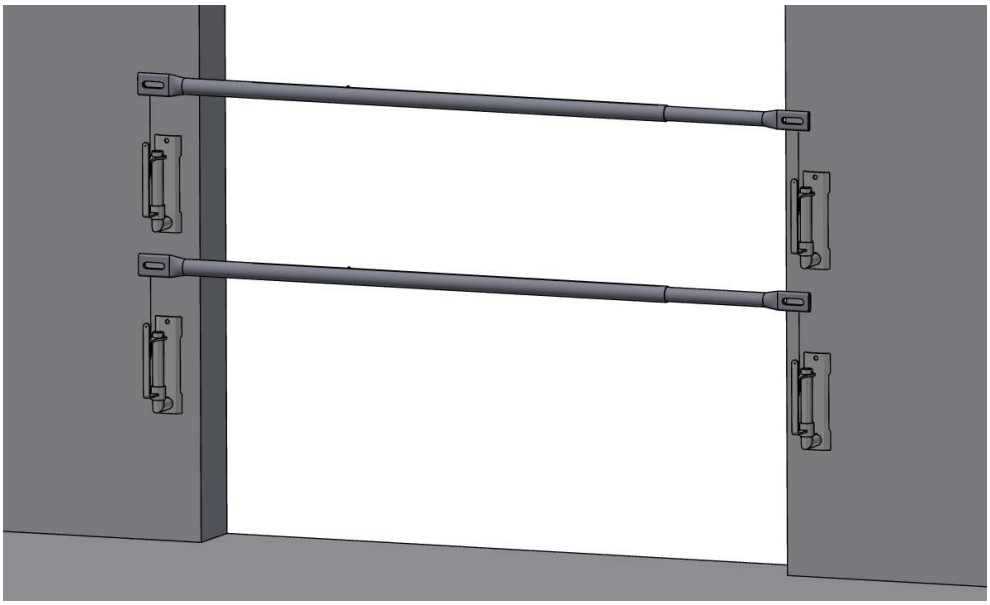


A clamp should be seated on two M10 anchors. The anchors should transfer a vertical load of 1500 N.

The structures, to which the brackets are anchored, should be made of C20/C25-class concrete (EN 206). The clamp is installed using an anchor, which must be mounted as commended by its respective manufacturer. It is recommended to use the Fischer EA II M10x50 anchor kit with ISO 4017 cl.8.8 M10x40 screw or the HILTI HUS4 10x80 concrete screw.

Installation: Wall clamp - EPS-US3

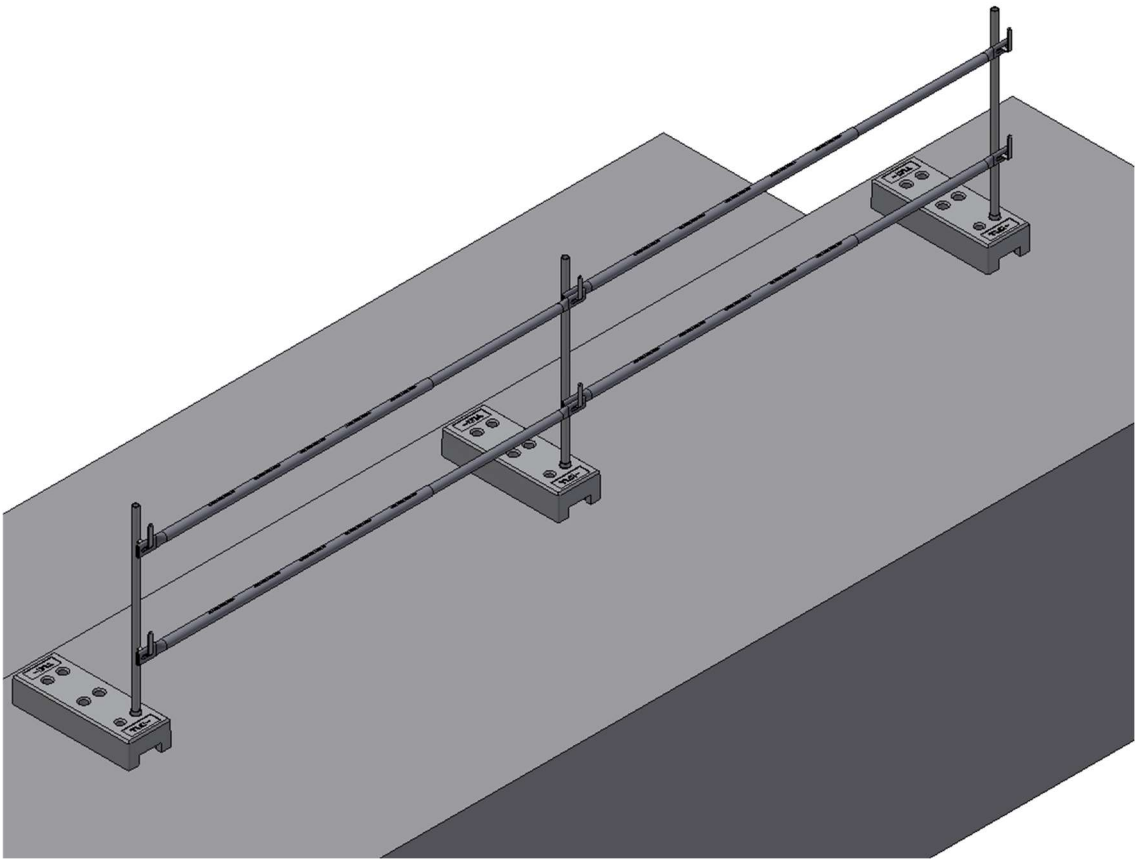




Seat each clamp in a drilled Ø12 opening for the Ø10 clamp pin and the M12 anchor. The anchors should transfer a vertical load of 1500 N.

The structures, to which the brackets are anchored, should be made of C20/C25-class concrete (EN 206). The clamp is installed using an anchor, which must be mounted as commended by its respective manufacturer. It is recommended to use the Fischer EA II M12x50 anchor kit with ISO 4017 cl.8.8 M12x40 screw or the HILTI HUS4 12x80 concrete screw.

Installation: PVC foot



Spread the PVC feet on an even surface, with the spacing corresponding to the length of the barrier segment. A barrier installed using PVC feet can only be used as zone partition; **do not use the barrier in this configuration as edge protection**. A barrier on PVC feet can be installed near excavation edges. In such case, the barrier should be installed minimum 1.5 m from the excavation edge, starting from the pole.

5. Health and safety guidelines

The EPS edge protection system must be installed by personnel approved to work at height by a physician, in good health condition, aged above 18. The personnel must be sober and rested, wear work clothing and use approved safety equipment, such as harnesses, ropes, etc. Special care must be taken during the transport, installation and operation.

The area around the installation zone must be properly designated, secured and marked.

Before installation, check the metal components for excessive corrosion and mechanical damage.

6. Dismantling

The personnel involved in the dismantling must used approved safety harnesses.

The dismantling process is the installation in reverse order.

Before the dismantling, the safety zone must be properly designated.