ALTRAD

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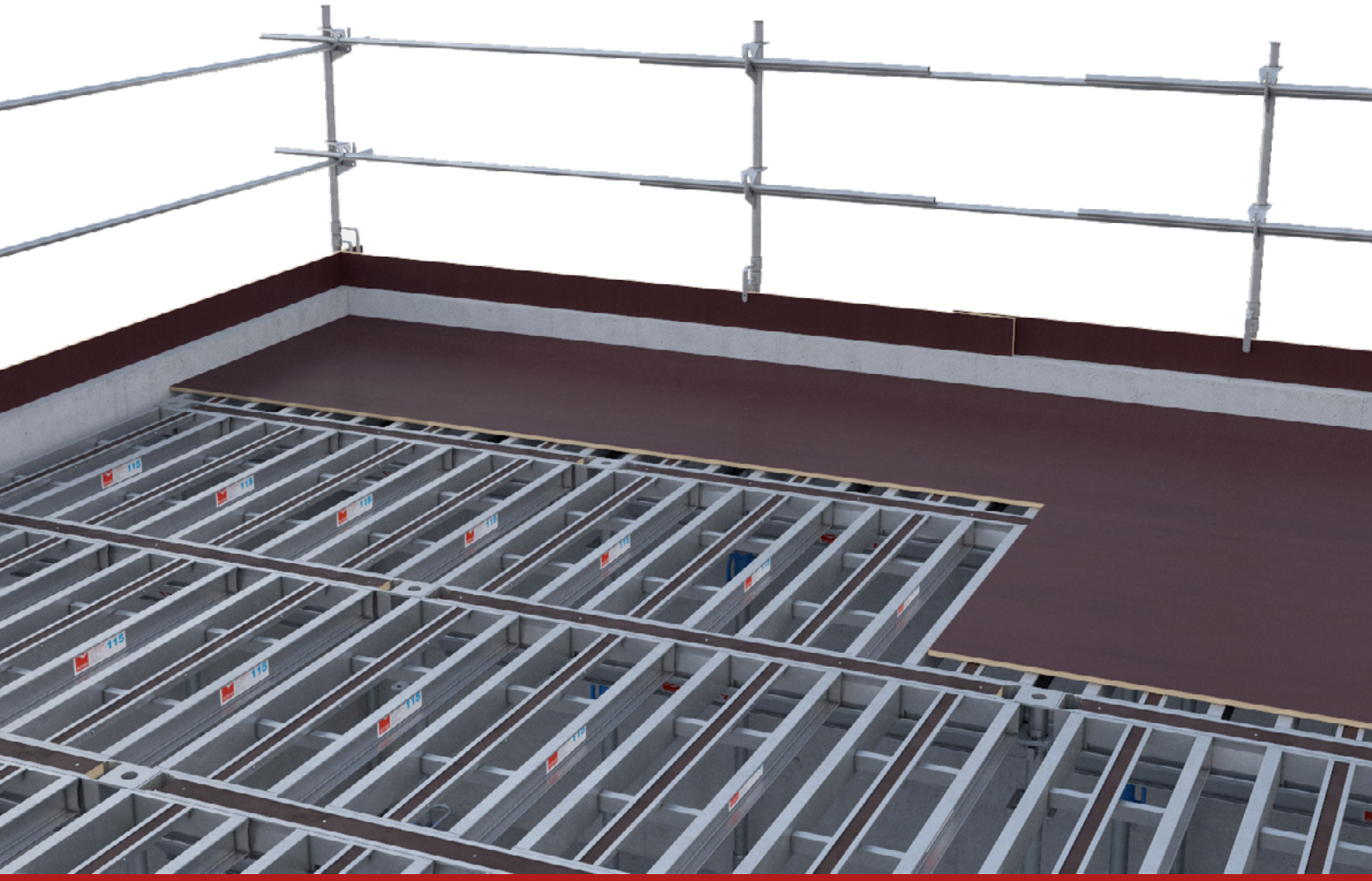

ALTRADAL
SLAB FORMWORK

INFORMATIONS

This document is intended for all persons working with the Altrad Formwork & Shoring product described and contains information on the installation and use of the system in accordance with the guidelines.

All persons who work with these various products must be fully familiar with the contents of these documents and their safety information. The use of our products is subject to compliance with the laws and regulations, in their current version, in France. The safety instructions and load specifications must be strictly adhered to. This document can also be used as generally applicable installation and operating instructions or as part of site-specific installation and operating instructions.

Altrad Coffrage & Etaiement reserves the right to make changes for the purpose of technical optimisation.

Edition : 02-2025
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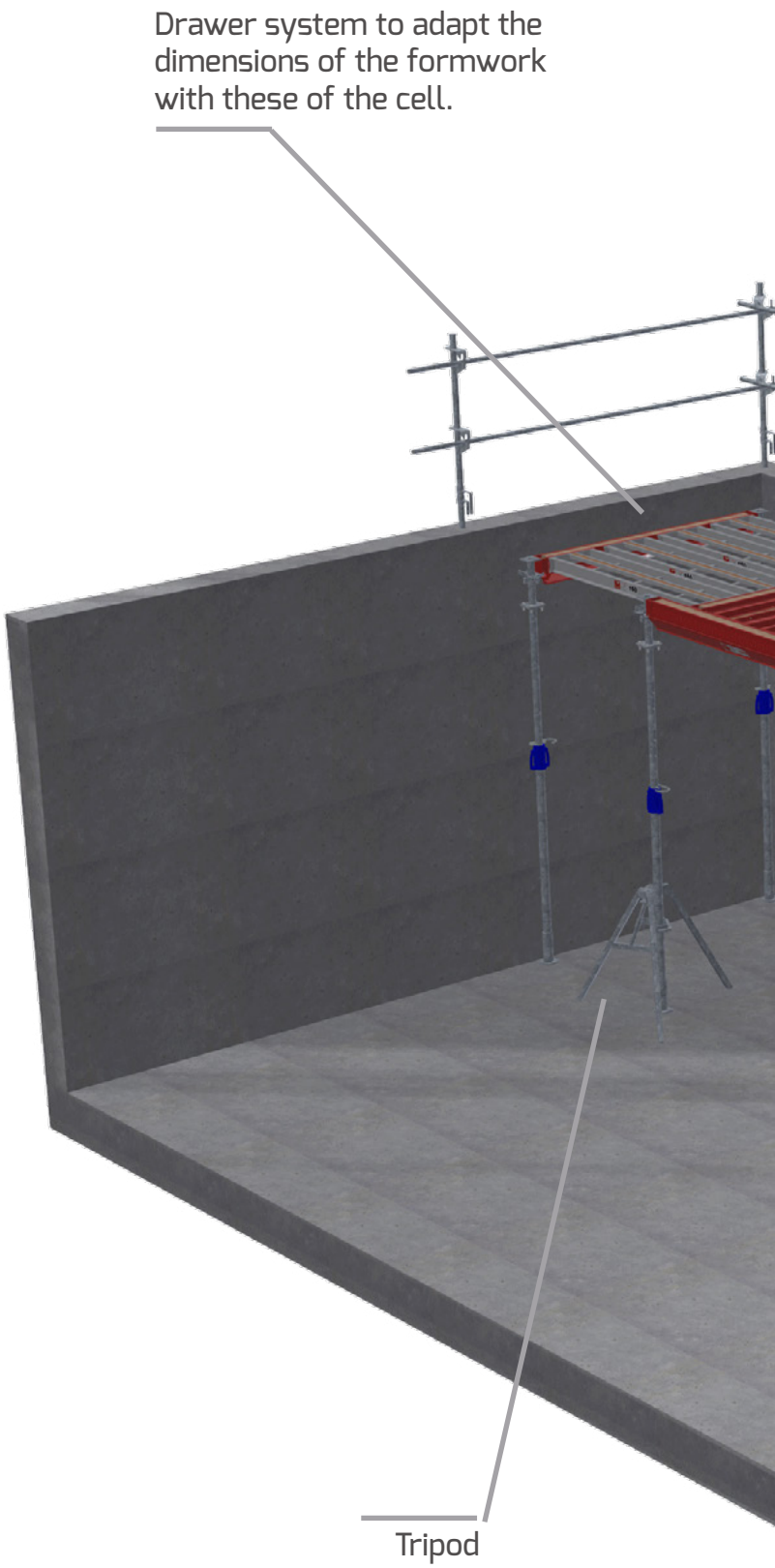
SUMMARY

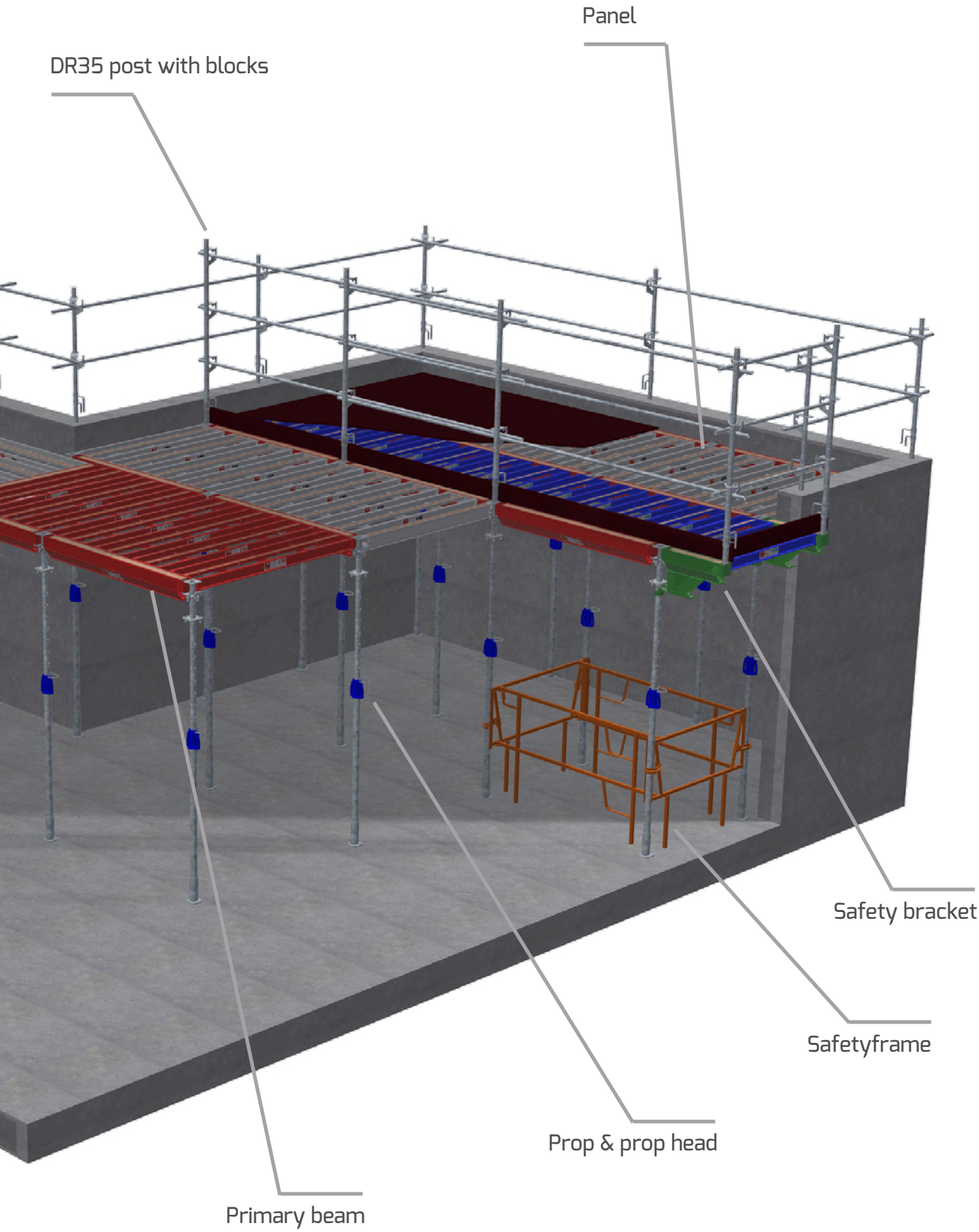
PRESENTATION

Goals & advantages

ALTRADAL is a modular formwork system for aluminum slabs. It is made up of a set of beams and panels making up the formwork support. This solution offers greater flexibility in the implementation of the formwork.

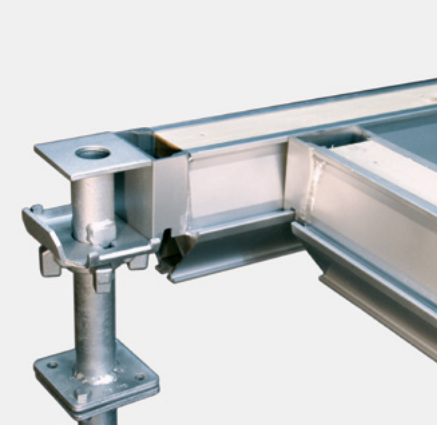
- An increased c**omfort and safety** during the handling of equipment thanks to the low weight of beams and panels, the installation of these elements being done by below.
- A team of **2 workers** is enough to implement.
- The providing of rotation and useful layout drawings for laying formwork avoids errors of implementation.
- Reuse of the common equipment with fast striking to achieve the same production of slab with less equipment than any other system.
- **Autonomy of the workers** team relative to the lifting equipment, crane being used only to move from one floor to another.
- The packaging of equipment, facilitated by use of **baskets for props and baskets on wheels**, reduces the stocking volume on site and the costs of handling and transport.



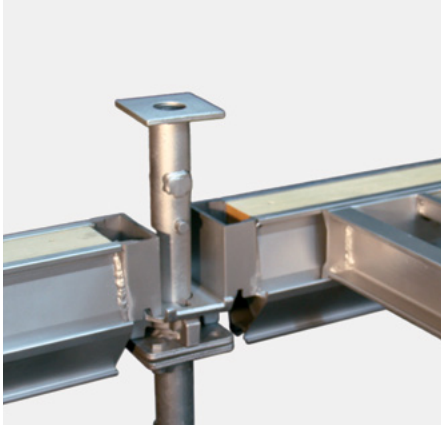

Panel
DR35 post with blocks
Safety bracket
Safetyframe
Prop & prop head
Primary beam

Principle of operation

Aluminum beams stay on the movable part of the shuttering head through primary beams which receive the secondary beams or panels.



The primary beams can also receive other primary beams. This solution allows a greater flexibility in the implementation of the formwork.



The movable part of the shuttering head allows for all beams and panels to fall in demoulding position while the head is always in supporting on the slab.

Find the ALTRADAL assembly instruction on video on our YouTube channel.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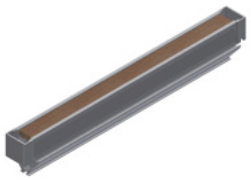
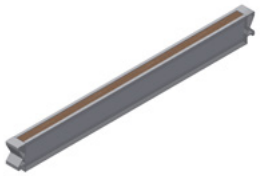
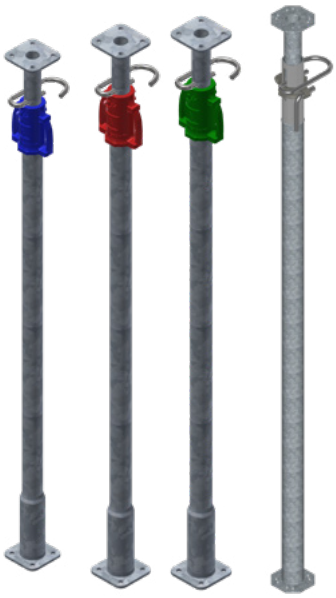
Components

Item. ref.	Weight (Kg)	Désignation	Characteristics	Item
BASE COMPONENTS				
138-7055 **138-2090** **138-2115** **138-2150** **138-2170** **138-2200**	4 7 8,80 11,60 13,20 14,50	**PRIMARY BEAM**	L 62,5 cm L 90 cm L 115 cm L 150 cm L 170 cm L 200 cm	
L13G-3115 **L13G-3150** **L13G-3170**	4,20 5,40 6,10	**SECONDARY BEAM**	L 115 cm L 150 cm L 170 cm	
138-4115 **138-4150** **138-4170**	6,80 7,40 9	**ATRADAL PANEL**	L 115 cm L 150 cm L 170 cm	
138-1300 **138-1360** **138-1400** **111-2455**	18.50 21.50 21,70 28,50	**PROP SE300 SL.TH4MM 170/300** **PROP SE360 SL.TH4MM 210/360** **PROP SE400 SL.TH4MM 220/400** **RAS 455 255/455 CM**	GV BLUE NUT GV RED NUT GV GREEN NUT	
138-1830	4,60	**PROP HEAD GV**	H 30 cm	

Item. ref.	Weight (Kg)	Désignation	Characteristics	Item
138-7034 **138-7035**	6.1 11.3	**POST DR35 HEIGHT**	H 1.10m 2 blocks H1.50 m 3 blocks	
CANTILEVER COMPONENTS				
138-7050	1.20	**PRIMARY CLAMPING**	Reversible item for locking under props and/or under primary beam	
138-7049	0.90	**PRIMARY SUPPORT FIXING FOR PROPS**	M12 screw (hexagonal head) Circular tube Ø33.7mm	
138-7057	6	**EDGE BRACKET**	These brackets are fitted with a safety cable.	
138-7058	6	**EDGE BRACKET 2D + FIX**		

Item. ref.	Weight (Kg)	Désignation	Characteristics	Item
138-5060	3.5	TRAPEZE CORNER PANEL	-	
138-7038	0.60	BEAM END SAFETY SUPPORT	Fitted with an M6x25mm captive bolt	
STABILITY COMPONENTS				
119-0037	1.8	PROP FLANGE	Suitable for Ø57, Ø60, Ø76 mm prop inner tube	
138-1840	10,50	PROP HEAD GV 30	Galvanised	
138-8000 13F-1212 13F-1216 13F-1616 13F-1618 13F-1818A	50 28 28 30 30 30	PROP SECURITY FRAME 1.25X1.80 GV PROP SECURITY FRAME 1.25X1.25 GV PROP SECURITY FRAME 1.25X1.60 GV PROP SECURITY FRAME 1.60X1.60 GV PROP SECURITY FRAME 1.60X1.80 GV PROP SECURITY FRAME 1.80X1.80 GV	L-shaped folding frame, clamping on Ø55 to 76mm props	

Item. ref.	Weight (Kg)	Désignation	Characteristics	Item
138-8020	55	**PANEL A.L.T.D BASKET GV MOSTO**	Capacity: 30 panels SWL: 1500 daN	
138-8010	48	**SFM PROP BASKET 50 U GV MOS**	Capacity : 50 étais type SE SWL : 1500 daN	
138-8016	42	**HANDLING BASKET STACKABLE WITH WHEELS**	SWL : 1500 daN	
138-7045	5	**FORKHEAD SUPPORT ALTRADAL PANEL**	-	
341-0066 **341-0088** **341-0110** **341-0132** **341-0154** **341-0176** **341-0198** **341-0210**	34 35,50 37,50 39,00 41 47 49,50 51	**INDIVIDUAL PLATEFORM WITH WHEELS**	3 steps 4 steps 5 steps 6 steps 7 steps 8 steps 9 steps 10 steps	

Schedule panels loads

Choice of panels and primary beams according to slab thickness.

	PRIM 90	PRIM 115	PRIM 150	PRIM 170	PRIM 200
PAN 115	117 cm	107 cm	74 cm	57 cm	38 cm
PAN 150	53 cm	53 cm	43 cm	36 cm	26 cm
PAN 170	36 cm	36 cm	32 cm	28 cm	21 cm

Limit of use to obtain a neat facing in accordance with DTU 21 with a maximum spacing between panels of 11 cm and subject to standard use of the ALTRADAL formwork. The assumptions considered are as follows:

- concrete density p_b = 2500 daN/m³
- overload* Q = 250 daN /m²

Example :
For a slab of thickness **37 cm** :

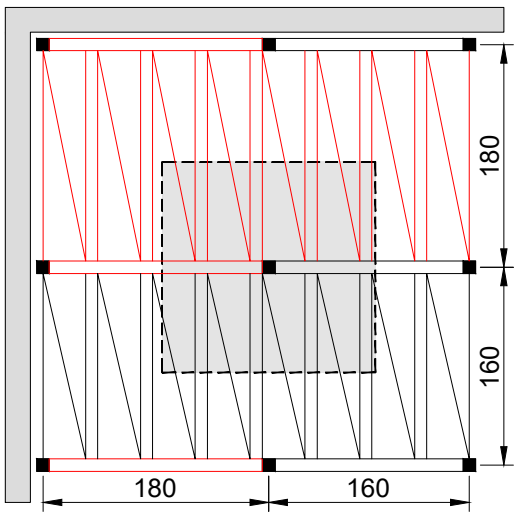
- The **115 cm** panel works with all lengths of primary beam,
- The **150 cm** panel works up to a primary beam length of 150 cm,
- The **170 cm** panel is not included in the abacus and should therefore be avoided.

*The altradal formwork system can be used freely - without a layout plan - up to a slab thickness of **21 cm with 200 mm beams and up to 28 cm with 170 mm beams**.*

Mechanical characteristics

Primary beams	Panels	Secondary beams
Mfadm.. = 9,34 kN.m Tadm. = 31.25 kN Ix = 691,3 cm4 E = 70 000 MPa	Mfadm = 3,95 kN.m Tadm. = 22.25 kN Ix = 149 cm4 E = 70 000 MPa	Mfadm = 3,6 kN.m Tadm. = 19,8 kN Ix = 177,9 cm4 E = 70 000 MPa

Choice of prop based on maximum load and height under slab



Example :
For a slab of thickness e = 25 cm, with a height under slab of 280 cm, and with the following assumptions :

- weight of concrete **G = e . pb = 625 daN/m²**
- overload* **Q = 250 daN/m²**
- load strip on prop **A = 2.89m²**

We have a prop load **F = (G + Q)A = 2529 daN**

In our case, with a slab height of 280 cm, all the SE C4 props worked.

**This package includes 75 daN/m² operating load, 150 daN/m² concrete surcharge and 25 daN/m² formwork dead weight.*

		138-1300A	138-1360A	138-1400A	111-2455A
		SE 300 C4	SE 360 C4	SE 400 C4	RAS 455
Permissible loads on props in kN as developed (1) in cm	**170**	46,0			
	180	45,3			
	190	44,6			
	200	44,0			
	210	43,0	47,0		
	220	42,0	43,5	47,0	
	230	40,0	40,0	42,0	
	240	38,0	38,0	40,5	
	250	36,0	36,0	39,0	
	255				40,0
	260	34,0	35,5	38,0	40,0
	270	33,5	35,0	37,5	40,0
	280	33,0	34,6	37,0	40,0
	290	32,5	34,3	36,5	40,0
	300	32,0	34,0	36,0	40,0
	310		33,3	34,5	40,0
	320		32,6	33,0	40,0
	330		32,0	32,6	40,0
	340		31,3	32,3	40,0
	350		30,6	32,0	40,0
	360		30,0	30,0	38,2
	370			27,5	36,4
	380			25,0	34,6
	390			23,0	32,8
	400			21,0	31,0
	410				30,5
	420				30,0
	430				29,5
	440				29,0
	450				28,5
	455				28,0

(1) N.B. the prop strokes given in this table do not take into account the 30 cm of the ALTRADAL head.

SE 300 C4 - SE 360 C4 - SE 400 C4

- **Outer tube :**

Ø57 x 2.7 mm

- **Inner tube :**

Ø48.3 x 4 mm

- **Sleeve :**

Galvanized cast iron

- **Unloosable steel pin :**

Ø 14 mm galvanized

- **Permanent device against disengagment of the inner tube**
- **Plates :**

120 x 120 x 8 mm

- **Reinforced base**
- **Anti-hand-trap system**
- **Finishing :**

Galvanized

RAS 455

- **Outer tube :**

Ø 76.1 x 2.7 mm

- **Inner tube :**

Ø 60.3 x 3.6 mm

- **Thread :**

Cast iron nut Ø 76 mm bichromatd with handle Ø 18 mm

- **Unloosable steel pin :**

Ø 16 mm galvanized

- **Permanent device against disengagment of the inner tube**
- **Plates :**

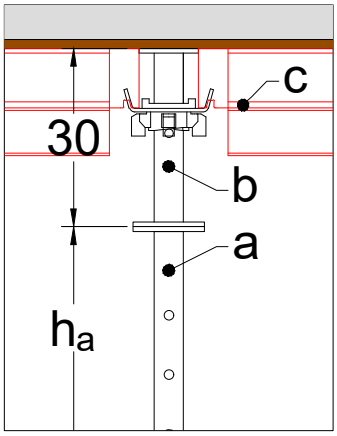
140 x 140 x 8 mm

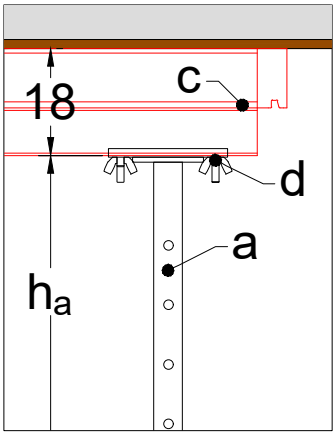
- **Anti-hand-trap system**
- **Finishing :**

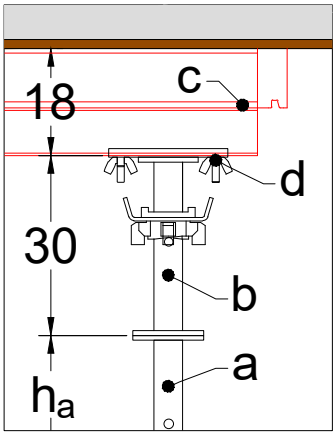
Galvanized

Bracket mounting detail

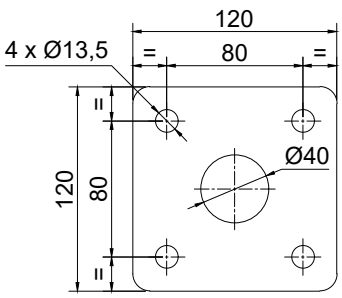
The following image shows the total formwork height, which is the sum of the development of the prop (a), the mounted altradal head (b) and the plywood. The ALTRADAL beams and panels (c) have no impact on the slab height.
A prop fitted with a primary beam support (d) is fixed directly under the primary beam. A prop with an altradal head can also be fitted under a primary beam support. In this case, check the travel of the prop so that the formwork can be removed.







Detail of ALTRADAL plate



The head is fixed to the bracket with at least 2 M12x20 bolts mounted opposite each other.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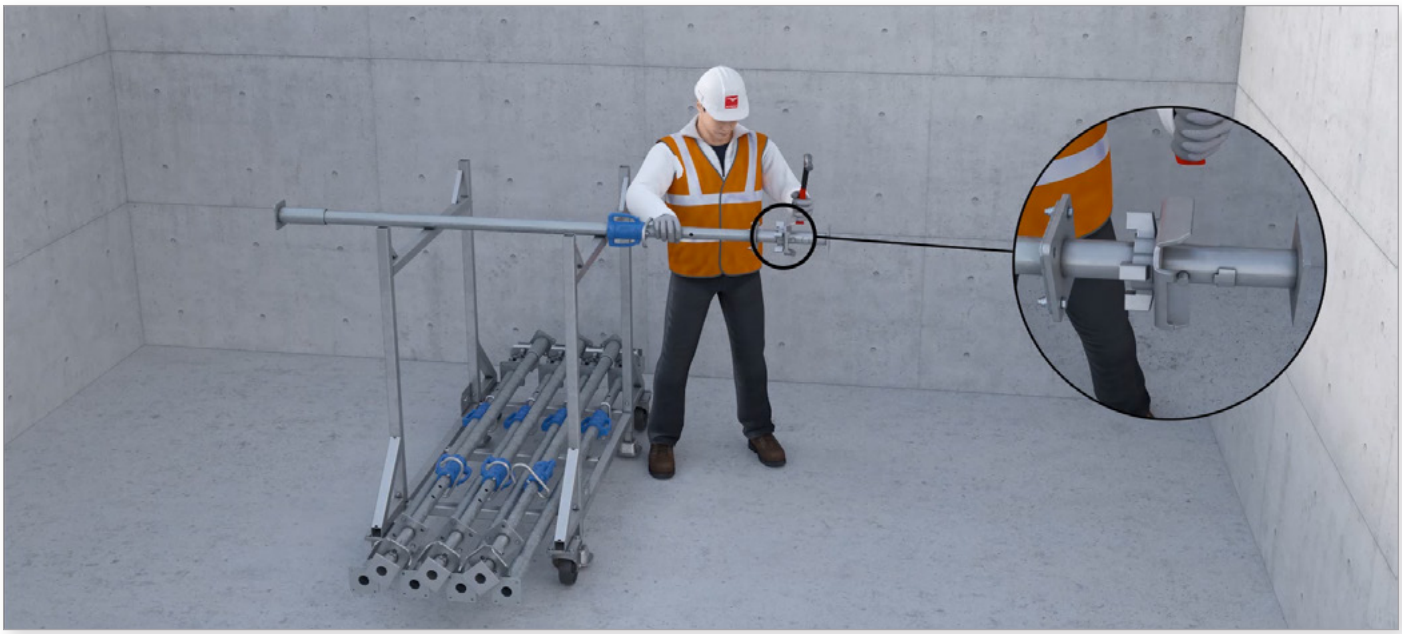
ASSEMBLY INSTRUCTION

Preparation

- Placing safety equipment on the walls and the edge of slab.
- Closing of all shafts.
- Do the level line at +1.00m of the previous level at least in 2 points for checking.
- Cleaning of the working surface to allow the wheeling of baskets.
- Receipt of equipment on the site, checking of quantities and quality.
- Distribution of the equipment in areas as method drawings.
- All workers must be equiped with the necassary individual protection equipments (helmet, glasses, safety shoes...).



1 **Block the prop head in high position**, formworking position. The locking of the prop head is essential. It is done with a hammer.

Adjust all props to the right hight in pinning the inner tube (spacing of holes : 10cm).

Formwork

2 From one angle of the building or the cell, **begin the setting up of props with tripods or safetyframes**. (The beginning point of the set up is symbolised on the methods drawings).

From an indivudual platform, put the **primary beams on the stabilised props** and check the right linking between the head and the beam.

3 **Start the laying of panels against the wall and be sure the correct engagement of these on the primary beam**. (see detail)

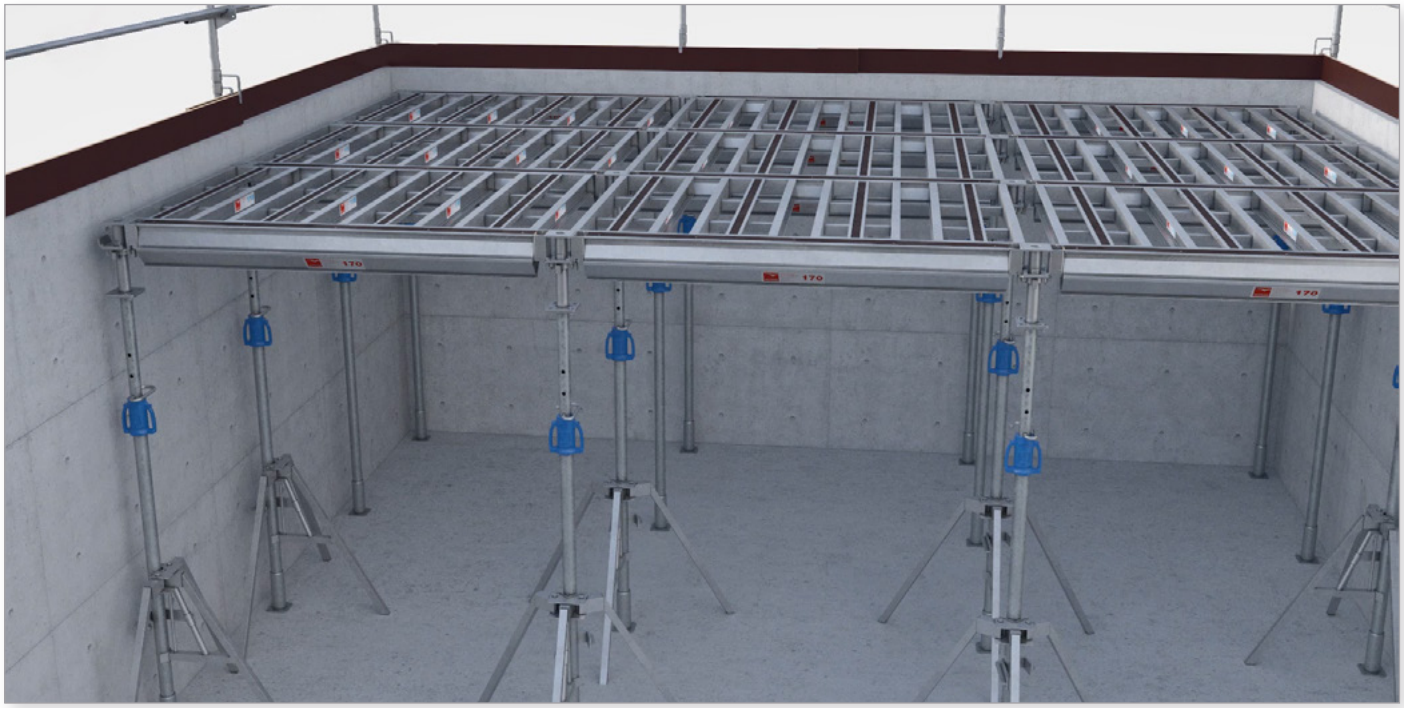
The positioning of the panels is done with the aluminium fork or from an individual platform in accordance with height of th shoring.

Progress the installation of the panels step by step to complete the mesh and create a structure providing satety against the falls from height.

4 Position the **primary beams** of the next mesh.
Put on the primary beam on the prop head already positioned.
Using a **prop, raise up the primary beam and put the prop upright**.

5 Position the **panels** to complete the mesh.

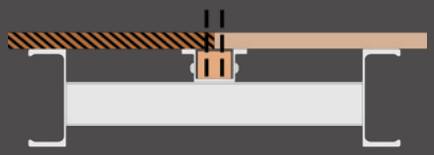
6 Repeat the step 2 to create a new mesh.
Repeat the step 3 to position the panels in this new mesh.
Repeat the step 4.



7 Finish the positioning of the panels, then repeat the steps 2/3/4/5 and 6 as many times as necessary to complete the area.
Nota : Except for the first mesh, the tripods can be moved for the stabilisation of mesh in progress.

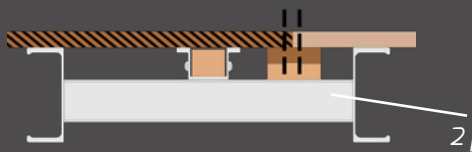
8 **Do a fine adjustment of the level using a laser** (or similar tool) and prop after prop methodically so as not to forget one.
Do a last control on the locking of heads in high position for each prop.

Junction of plywood panels on batten in the middle of an Altradal panel



Installation on fur panel

Eccentric junction of plywood panels on Altradal panel



Laying on plywood wedge

9 Once the equipment is **mounted, adjusted and equiped** with the safety posts, access to the deck for the implementation of the plywood panels.

Nailing of the plywood panels with Ø40mm nails max. If the position of the plywood panels junction does not correspond with the position of beams or panels battens, it is possible to put a secondary beam where is located the junction of plywood panels or two pieces of 15mm plywood to avoid some unnecessary cuts.
According to the required finishing of the under-slab, ensure a sealing of joints and the periphery like a conventional formwork (foam, adhesive...).

WARNING ! The Altradal deck is not an area for circulation. The access is strictly reserved to the formworkers during the positioning of plywood panels (only for trained and authorized workers).

Striking

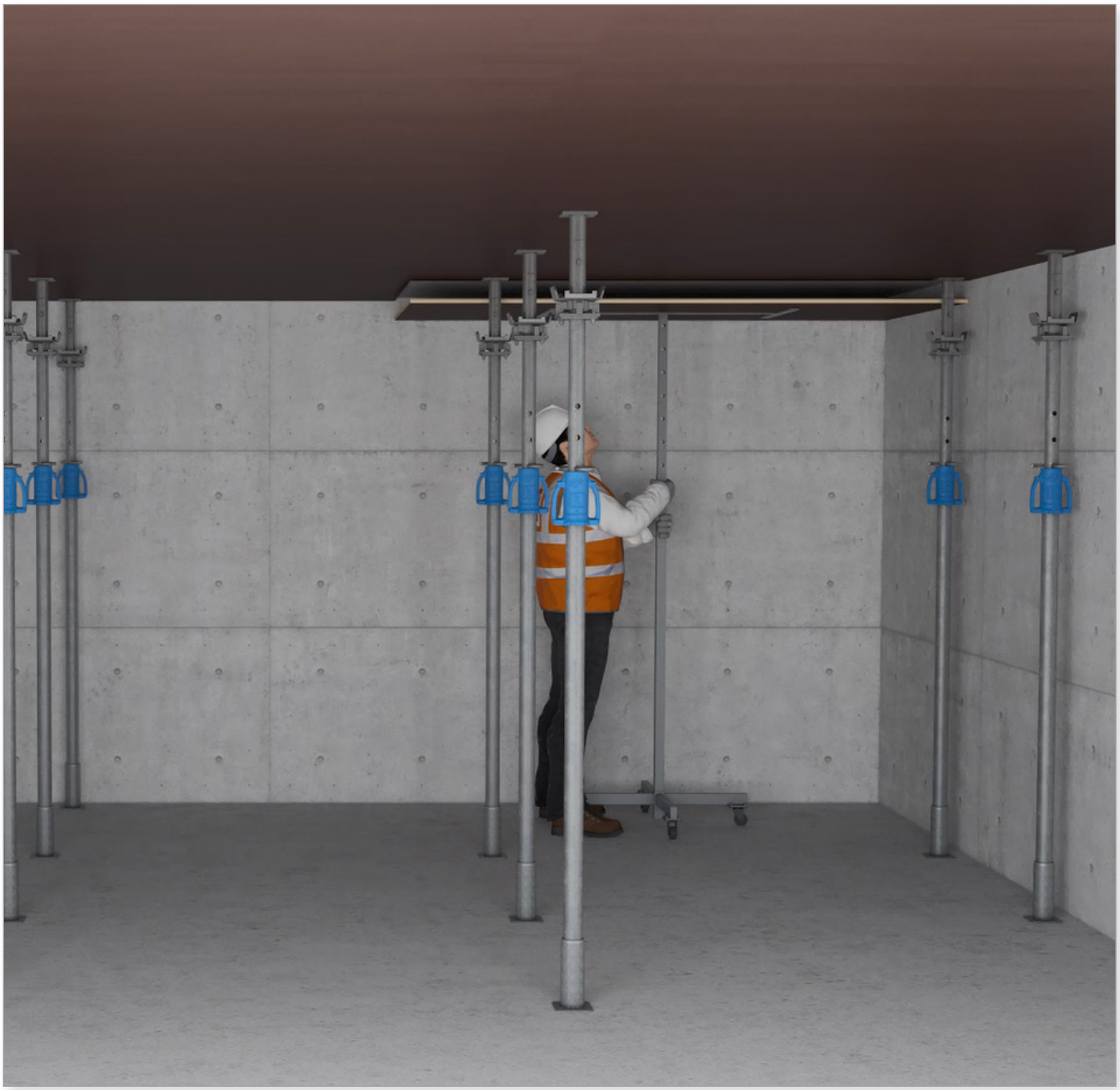
PREPARATION

- Be sure there is no load put on the slab during the striking phase.
- Be sure that the required concrete resistance is reached.

1 **Unlock** the prop heads following the progress of works.
The **primary beams and the secondary panels go down from 14 cm**.
At striking stage, be sure that all props are under pressure.

If this is not the case, it is mandatory to put back the prop under pressure after unlocking the prop heads and before removing secondary panels and primary beams.

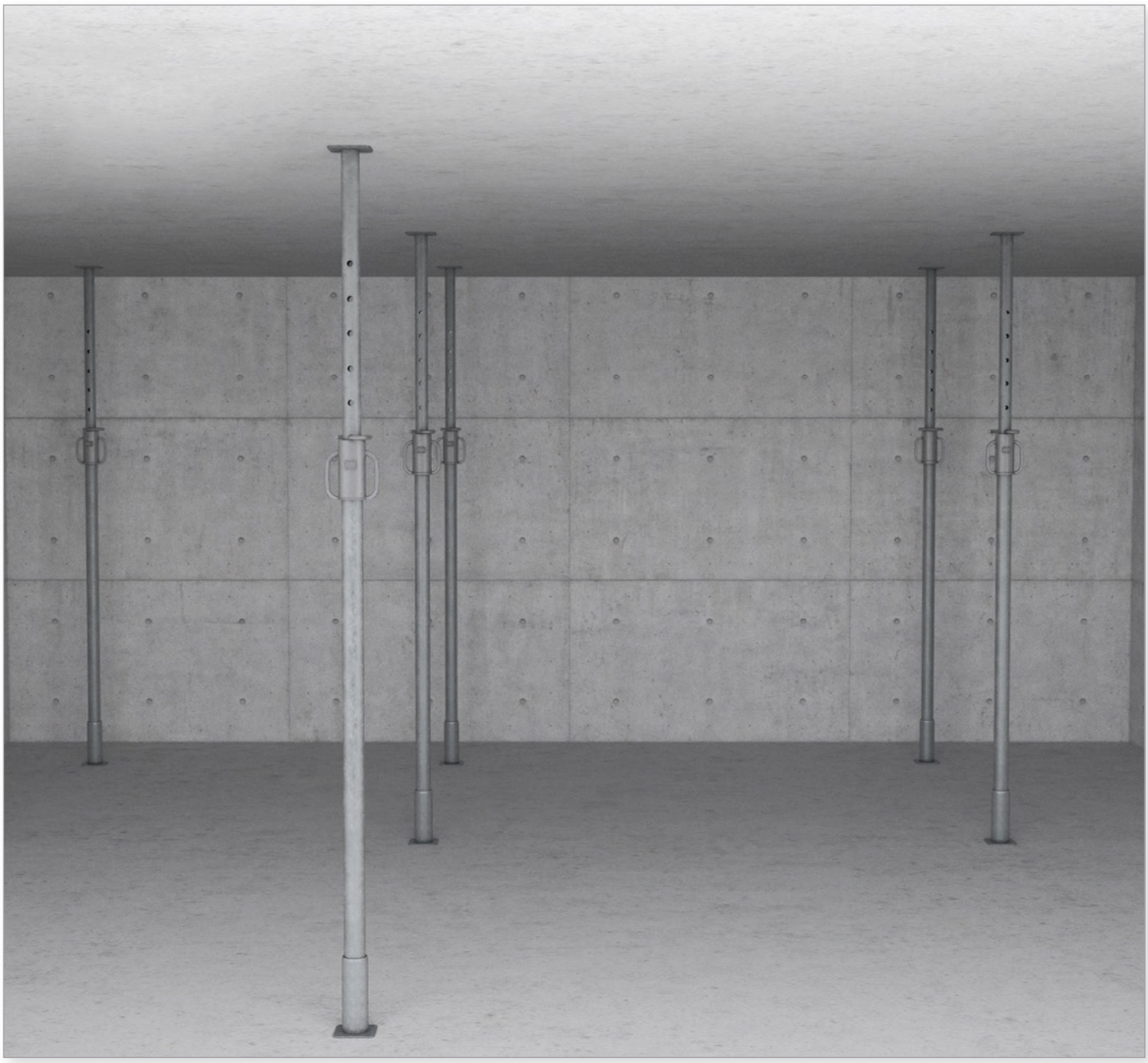
2 Deposit following progress the **secondary panels** and primary beams, then put them in the baskets.



3 **Deposit** and **put** away the props being immediatly close to the supports of the slab (walls, columns...) only.

Before puting away the props, be sure that the **plywood panel** is retained to avoid all falls.

4 Get down the plywood panel carefully (with help of a specific tool if necessary) one per one.



5 Position the **back propping in accordance with the slab resistance**.
(Typical case : 1 prop for 5m^2). To validate with the authorities in charge of the works.
Repeat the steps 4 and 5.

6 **Take away the equipment** from the back propping area and repeat the shuttering steps in the next areas.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CANTILEVER COMPONENTS

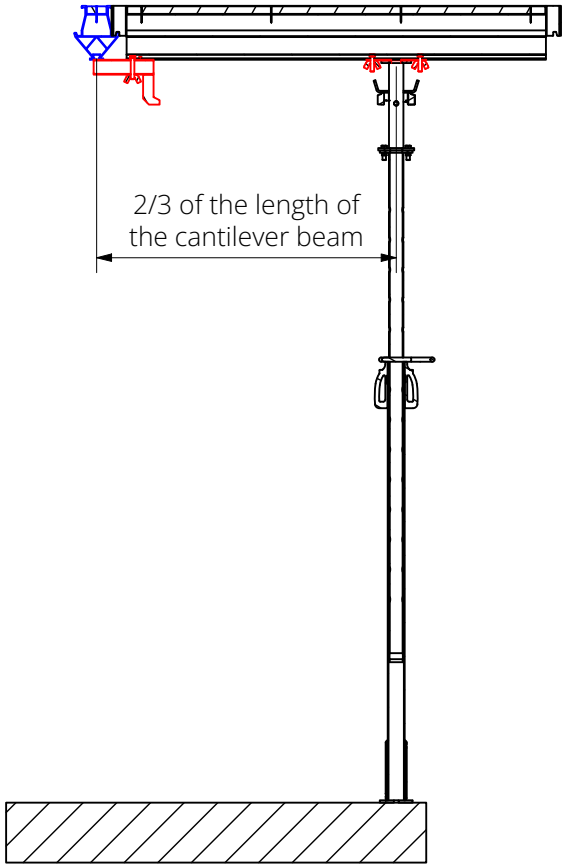
Primary clamping & primary support

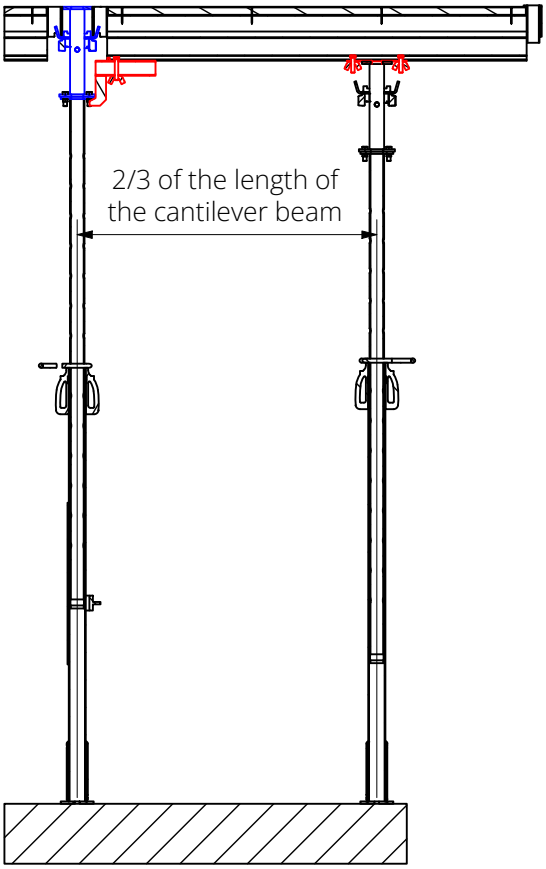
1 Place the primary clamping & primary support upstream on the joist. To do this, insert the screw heads into the groove in the primary beam, then tighten the wings nuts.

2 Set up the Altradal tool.

3 Make sure that the last prop is correctly positioned. If you need to adjust its position, loosen the wings nuts and then retighten it to its final position. (See drawing below).

4 Make sure that the priary beam is correctly positioned so that it grips the locking element (blue element). If necessary, adjust its position by loosening the wings nuts, then retighten to its final position. (See drawing below).

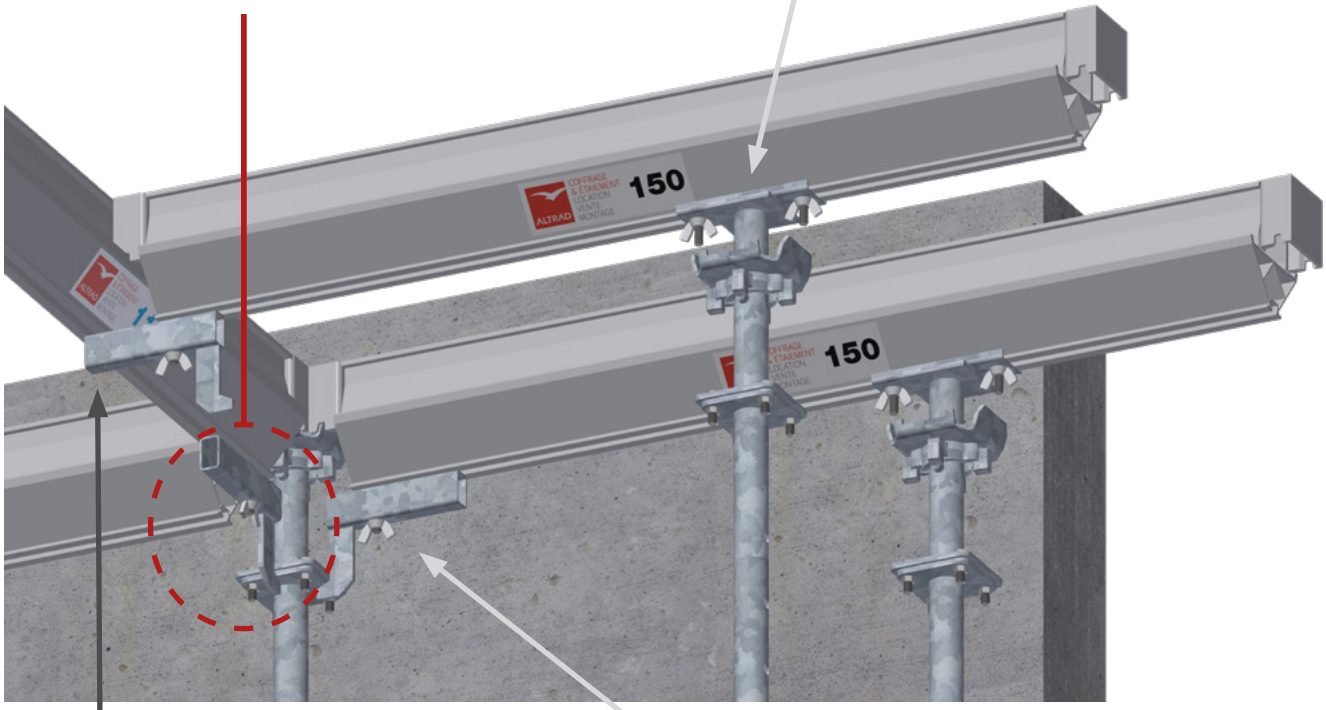




Cantilever application with brackets and primary support.

WARNING
to clamp under a primary, it is imperative that this same primary is also clamped at its 2 ends to prop heads.

PRIMARY SUPPORT FIXING FOR PROPS
Ref : 138-7049
Weight : 0.90kg



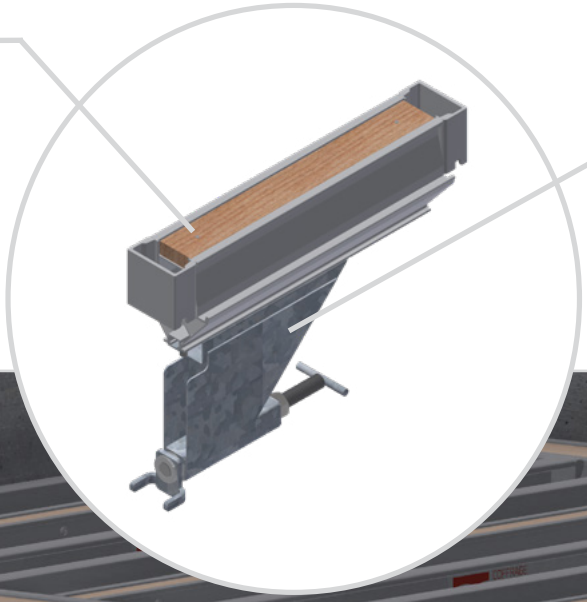
By turning the primary clamping, it is possible to restrain yourself under a primary.

PRIMARY CLAMPING
Ref : 138-7050
Weight : 1.20kg

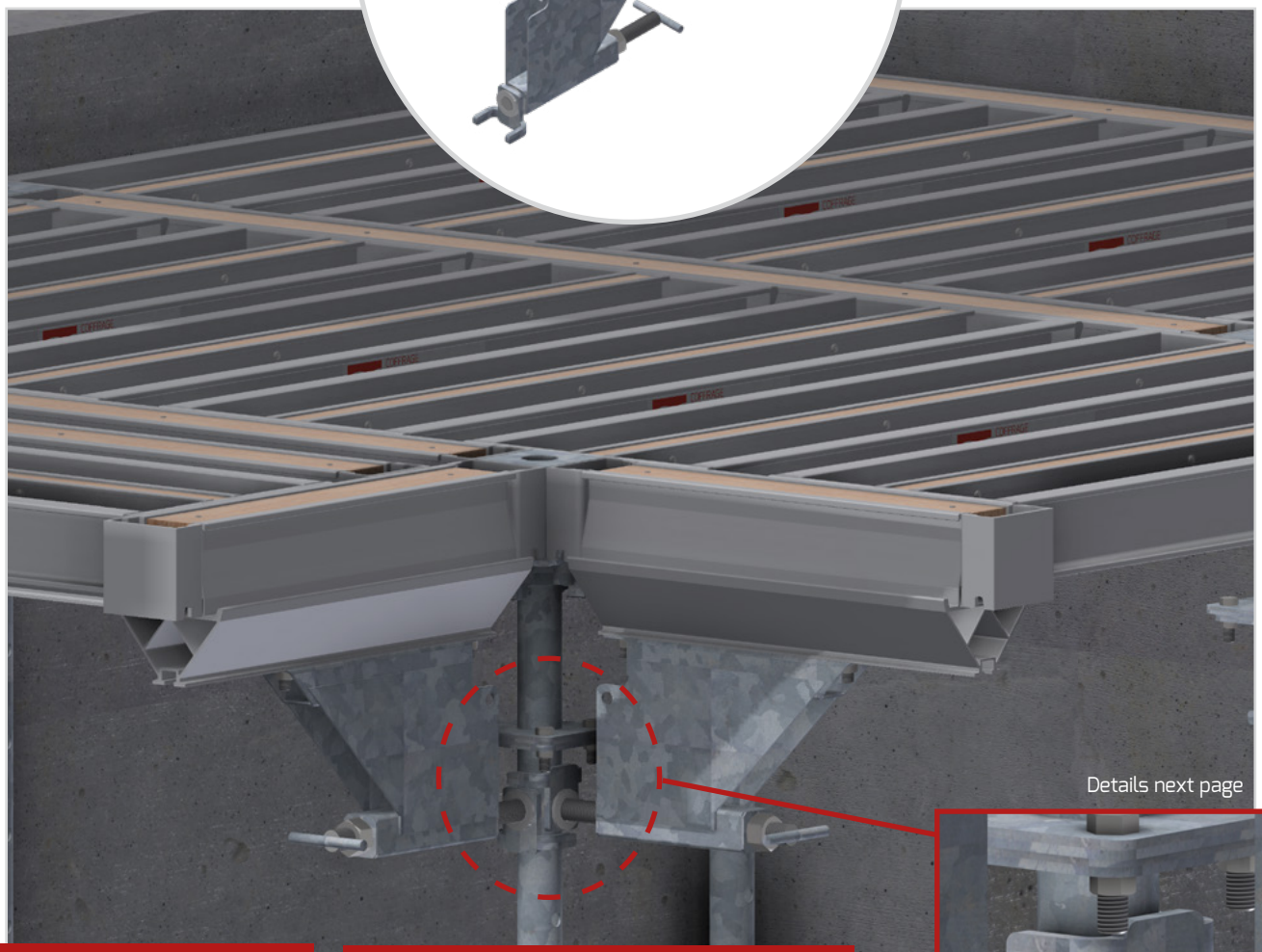
Edge bracket

The double edge bracket allows two edge bracket to be installed on the same prop in order to create angles depending on the formwork situation.

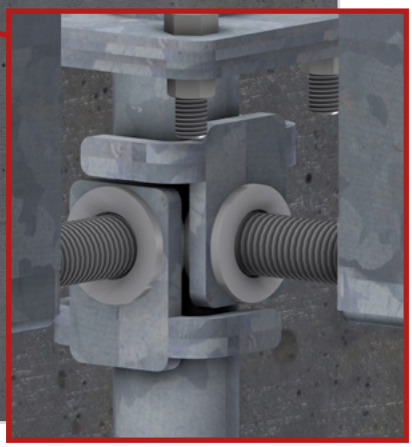
BEAM PRIMARY
Ref : 138-7055
Lenght : 62,5 cm
Weight : 4kg



EDGE BRACKET
Ref : 138-7058
Weight : 6kg



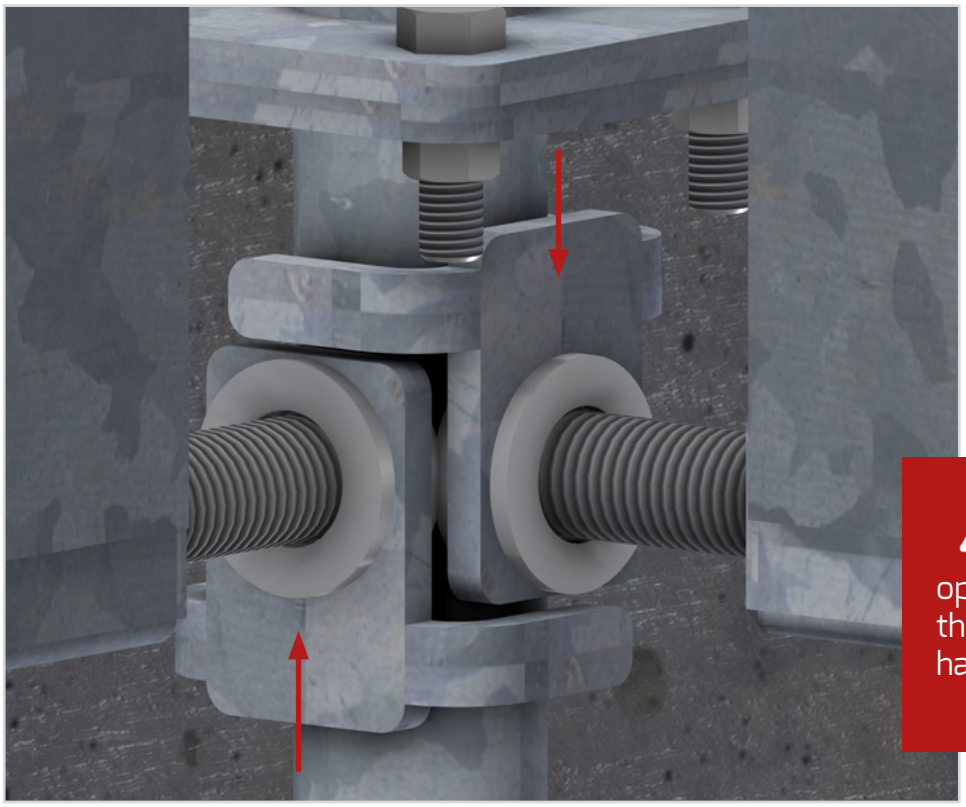
Details next page



Non-contractual visual - Collective safety is not present to best show the edge bracket in situation.

WARNING
This edge bracket showing operating loads only (excluding concrete load).

WARNING
The prop on which the primary clamping is placed must be stabilized and forced to the ground (possible use of tubes/ collars/tubes + shoes/TP..)

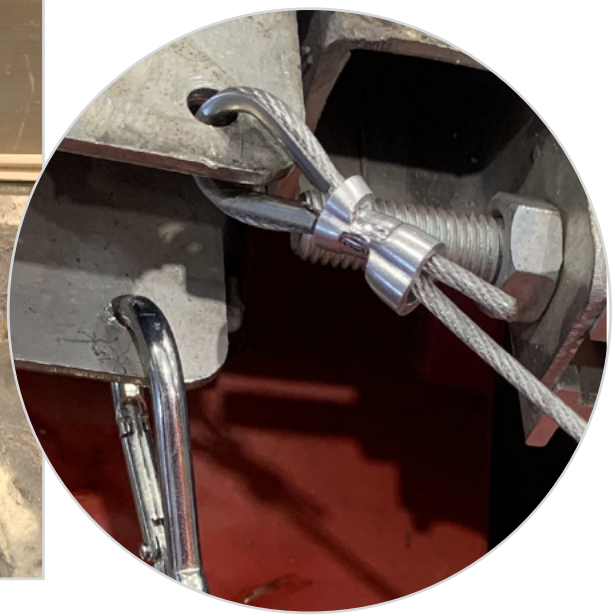


The edge bracket fits in a staggered manner on the same prop.

WARNING
Ensure that the operator is safe when installing this console (equipped with a harness if necessary)

The safety cables must be positioned around the stripping head.

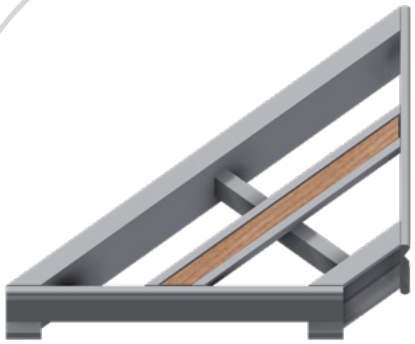
WARNING
Do not put the cable around the slide.

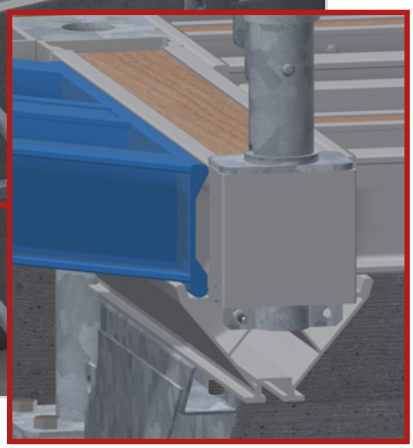


Trapeze corner panel

The trapeze corner panel is developed to fill the space between two edge bracket in corner parts. The panel is positioned like standard altradal panels.

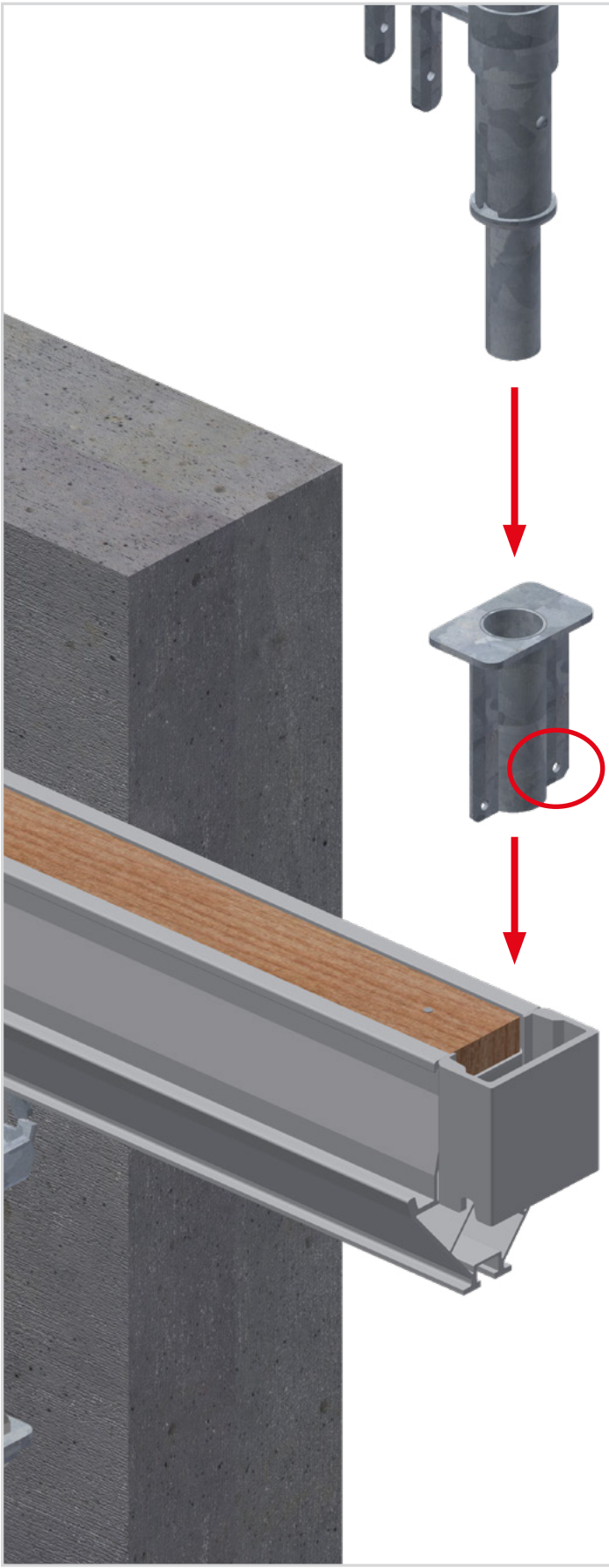
TRAPEZE CORNER PANEL
Ref : 138-5060
Weight : 3.5kg





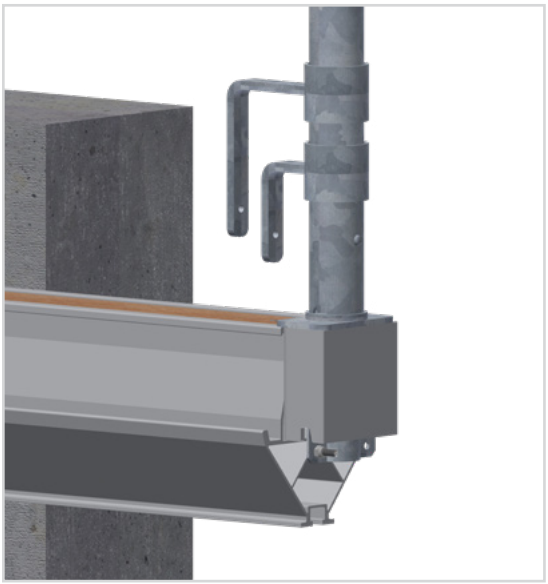
WARNING
Ensure that the operator is safe when installing this console (equipped with a harness if necessary)

Beam and safety support



BEAM END SAFETY SUPPORT
Ref : 138-7038
Weight : 0.60kg

Unscrew the bolt to insert the safety support in the primary beam



Primary end reservation in the final position with the captive screw in place.

Prop key flange

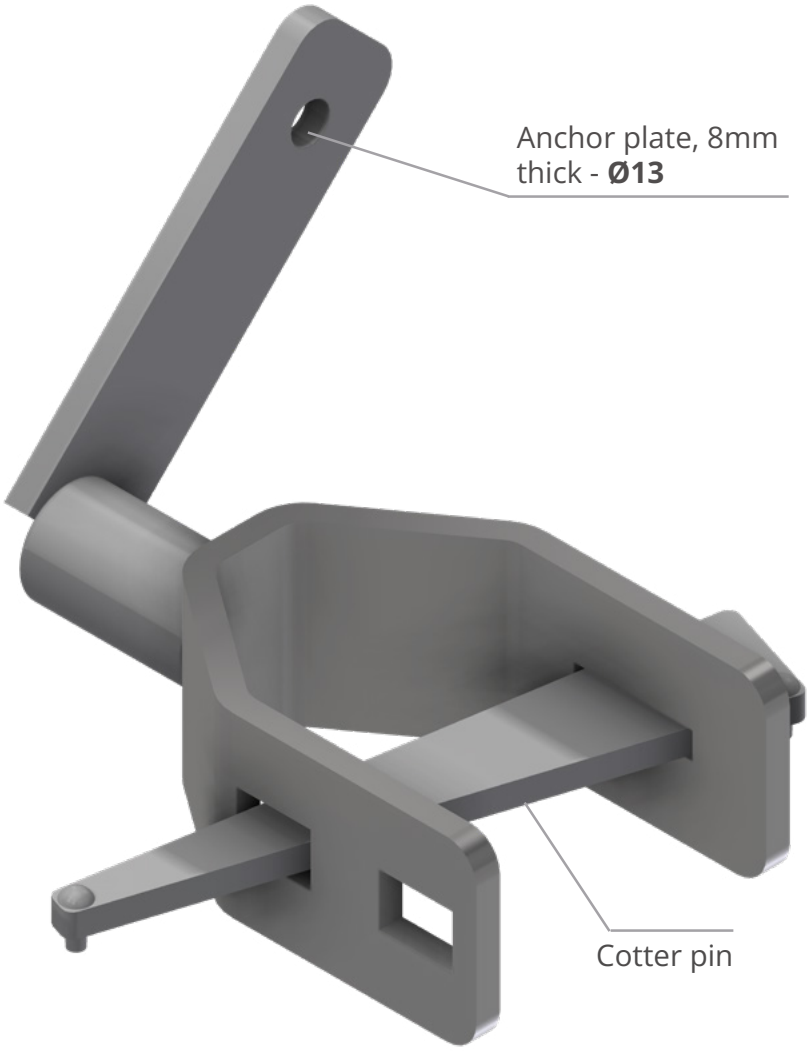
CHARACTERISTIQUES

References : 119-0037B
PROP KEY FLANGE

The prop key flange holds props against a wall or column, eliminating the need for tripods at the edge of a cell. The prop flange can also be used to hold props in staircases.

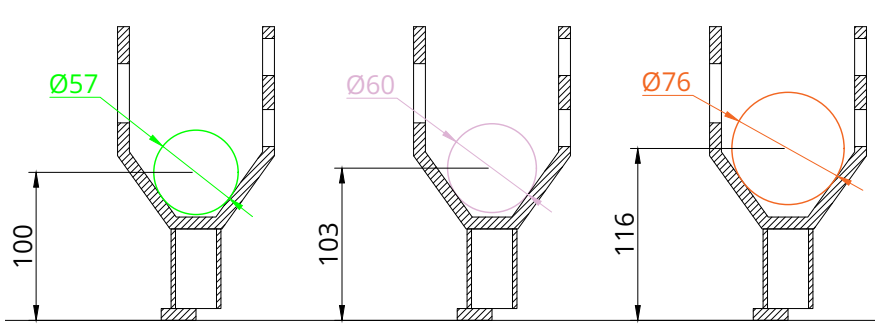
- **Weight :** 1.8kg

- **Saves time :** less material handling,
- The cotter pin can be fitted before or after the prop has been positioned,
- **Takes up little space and improves circulation**, particularly in corridors or stairwells,
- Galvanised or painted flange for improved signage.



- Suitable for **Ø57**, **Ø60** **and Ø76 mm** prop inner tube,
- Flange positioned 15cm below the prop nut, The prop can be positioned according to the diameter of the inner tube.

Positioning the prop in relation to the wall




ALTRAD
B6
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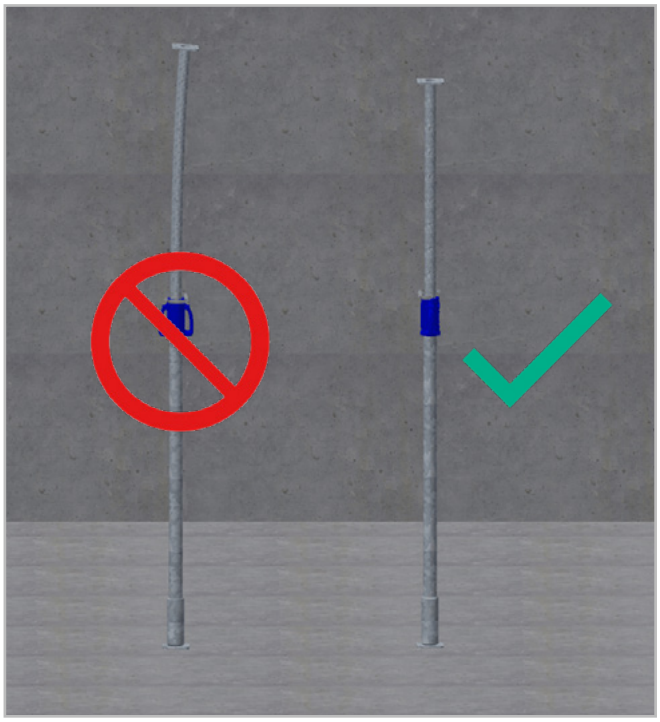
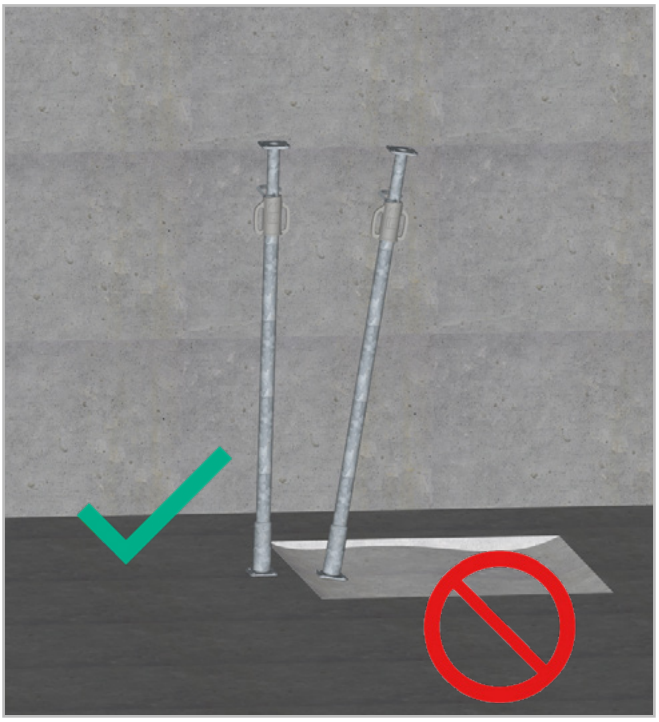
SAFETY, STORAGE, TRANSPORT & MAINTENANCE

Safety

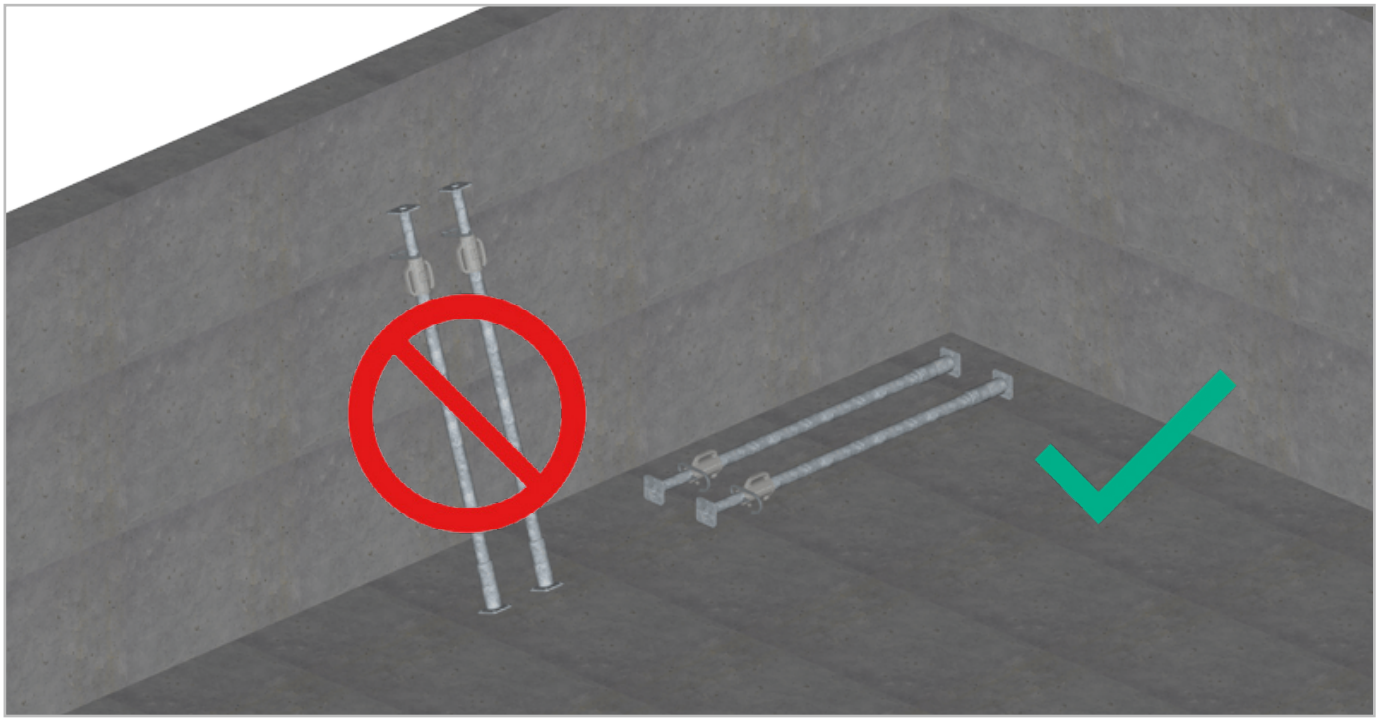
WARNING !

- The elements presented in this documentation correspond to the characteristics of the material on the date of publication of the document. We reserve the right to make any changes in a new edition.
- The uses are not without risks and require specific control.
- Before starting to assemble a prop, the work area must be secured.
- To facilitate the handling of the props inside buildings, the use of baskets is strongly recommended

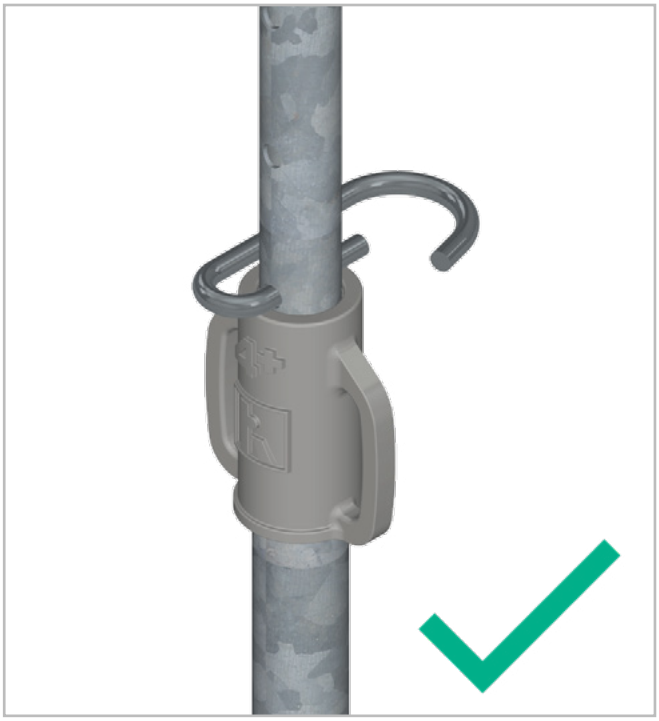




- Verification of quantities and validation of the delivery slip once the props are received on the site.
- Material control: do not use any deformed or damaged material.
- Check the area to be supported before placing the material (soil deformation, hole, etc.)



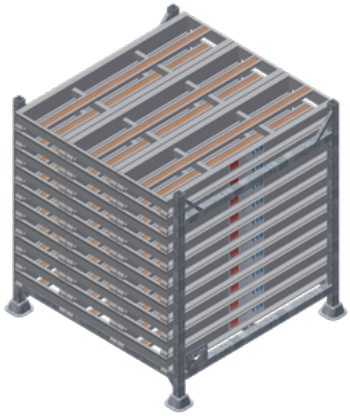
- It is forbidden to position the stays in the middle of the sails.



- The pin must be inserted all the way so that it rests on the washer.

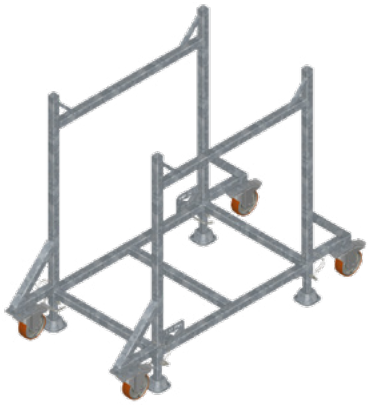
Storage

The specific conditions of the transport and storage procedures for each component must be respected. For example, name the appropriate lifting system to be used.



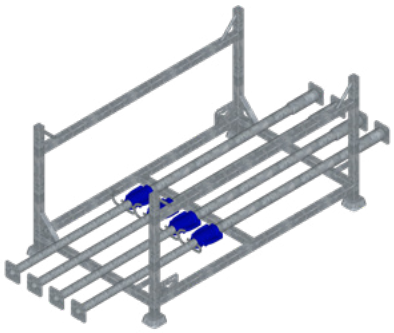
Ref. : 138-8020 - Multi accessories basket (standard)
Ref. 138-8022 - Panier multi accessoires (retractable option)

- Galvanized steel
- Top lift system
- **SWT per basket** : 1,5T
- **Dimensions** : base 109 x 105 cm - height 120 cm
- **Storage capacity** :
  30 panels - Ref : 138-4115, 138-4150, 138-4170
  or 40 primary beams - Ref : 138-2115 - 138-2150 - 138-2170 - 138-2200
  or 20 aluminium trapdoor platform - Ref : 131-3913 - 131-3916 - 131-3921



Ref. : 138-8016 - Handling basket

- Galvanized steel
- Top lift system
- **SWT per basket** : 1,5T
- **Dimensions** : base 105 x 73 cm - height 138 cm
- **Storage capacity** :
  30 primary beams - Ref : 138-2115 - 138-2150 - 138-2170 - 138-2200
  Other accessories can also be stored. Consult our sales managers for more information.



Ref. : 138-8010 - Sfm prop basket8

- Galvanized steel
- Top lift system
- **SWT per basket** : 1,5T evenly distributed on the side rail.
- **Dimensions** : base 155 x 90 cm - height 85 cm
- **Storage capacity** : 50 props Ø57

Consult the technical documentation for storage baskets

Transport

A minimum spacing of 0.30 m between baskets is recommended to facilitate access to lifting rings during crane handling operations.

All equipment must be securely strapped down to prevent any risk of spillage during transport.

Levage des paniers

We recommend stacking storage baskets in 2-high stacks for lifting purposes. To facilitate handling, secure the loading area.

Storage baskets must be lifted using 4 slings of equal length.

Maintenance

PROP HEAD
Check :

- The plates are not deformed
- The nut tighten well the support plate of the beam
- The welds are not cracked

BEAMS & PANELS
Check :

- The welds are not cracked
- There is no deformation upper to L/1000
- There is no shock
- There is no rip
- There is always the wooden batten and in good state

PROPS
Check :

- The prop is upright
- There is no deformation
- There is no holes of inner tube in oval form
- There is no deformation on the nut and the pin
- The presence of the anti-disengagement system
- The welds are not cracked
- The movement of the nut on the outer tube is free

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