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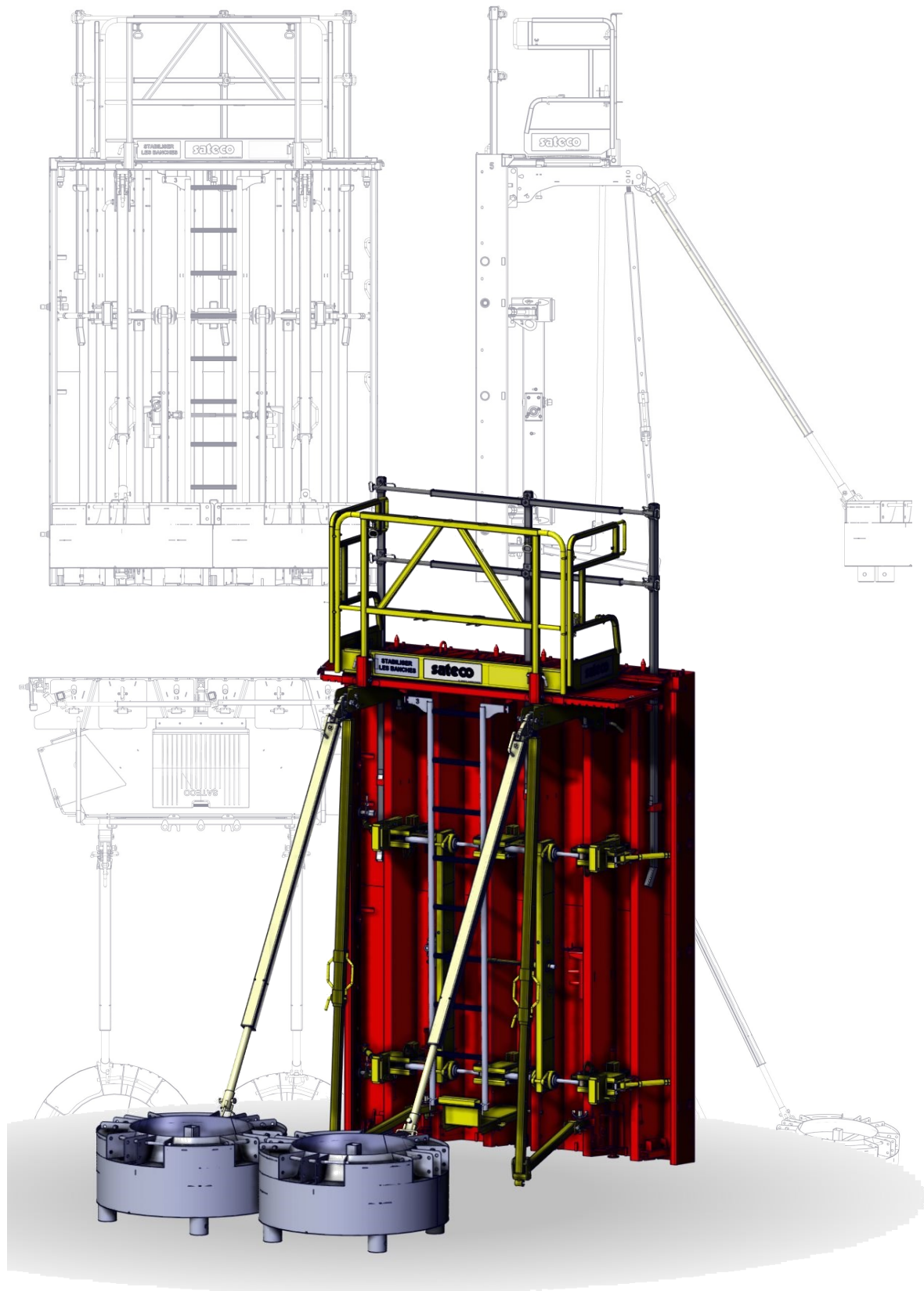
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CTR 4010 Shutter

Technical Book



Soucieux de la qualité de ses produits, SAFECO se réserve le droit d'en modifier sans préavis les caractéristiques



DT. 34.01.02
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34.00 CTR 4010

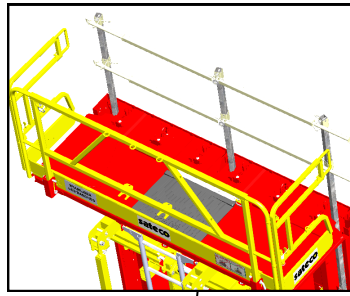
General overview



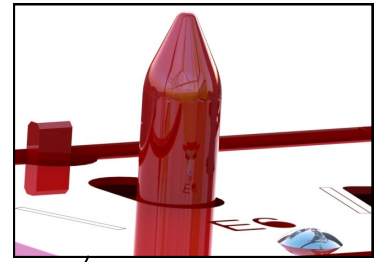
Some of the pictures are represented without stability for a better understanding.



Working board lock
Gate



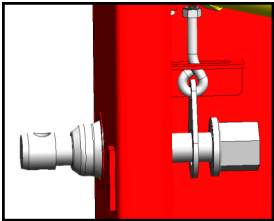
Working board with access trap
Gateway



4 upper centering
devices

Front safety guard rail

Upper assembling for superposition



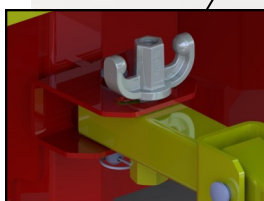
Juxtaposition assembling with two tools



Tie rods storage



Superposition low support

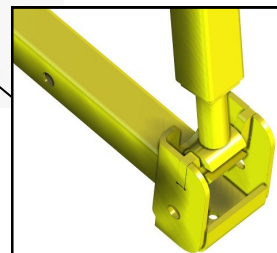


Lug for low stabiliser

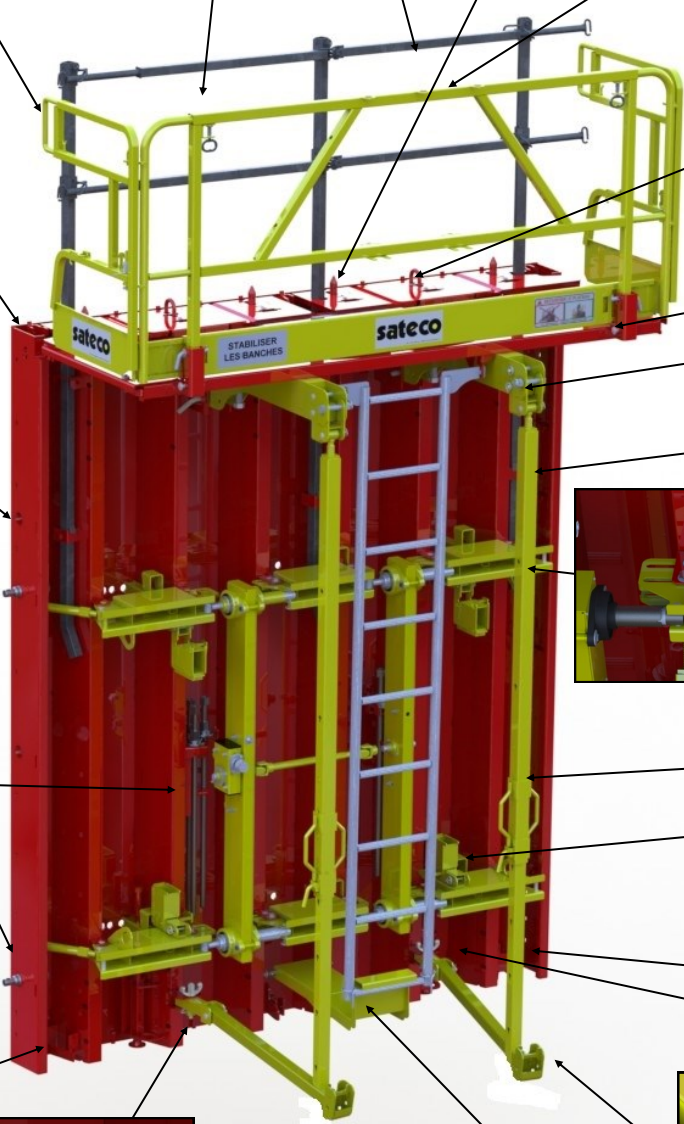


Box

Ladder and ladder
step

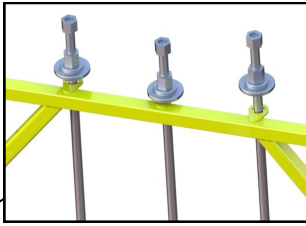


Block of the low part of the crutch

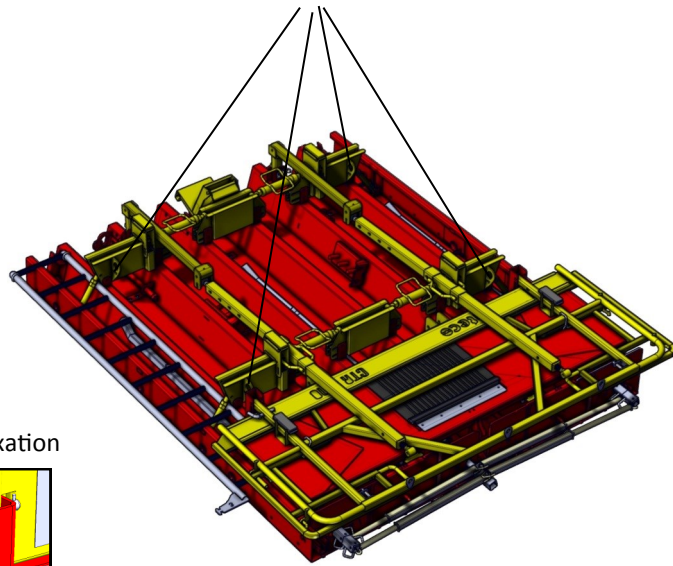


CTR 4010 Overview

D.T. CTR 4010



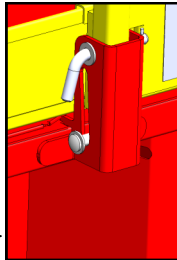
Upper storage for tie rods



Lifting ring

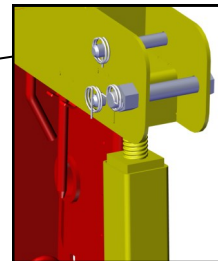


Guard rail fixation



Lifting from the floor

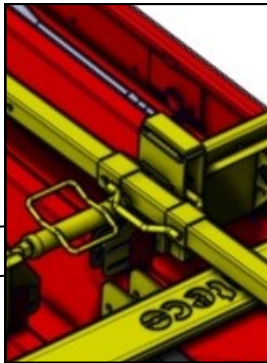
4 rings



Crutch fixation



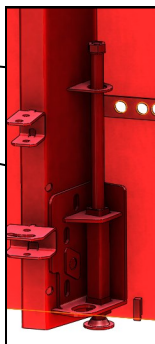
Assembling pin



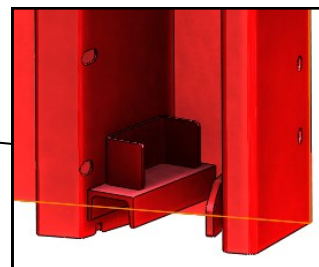
Piling pad



Sliding handle of the crutch



Upper-extended screw jack



Crow bar support



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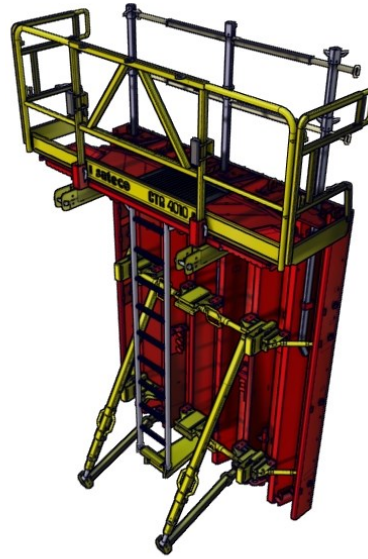
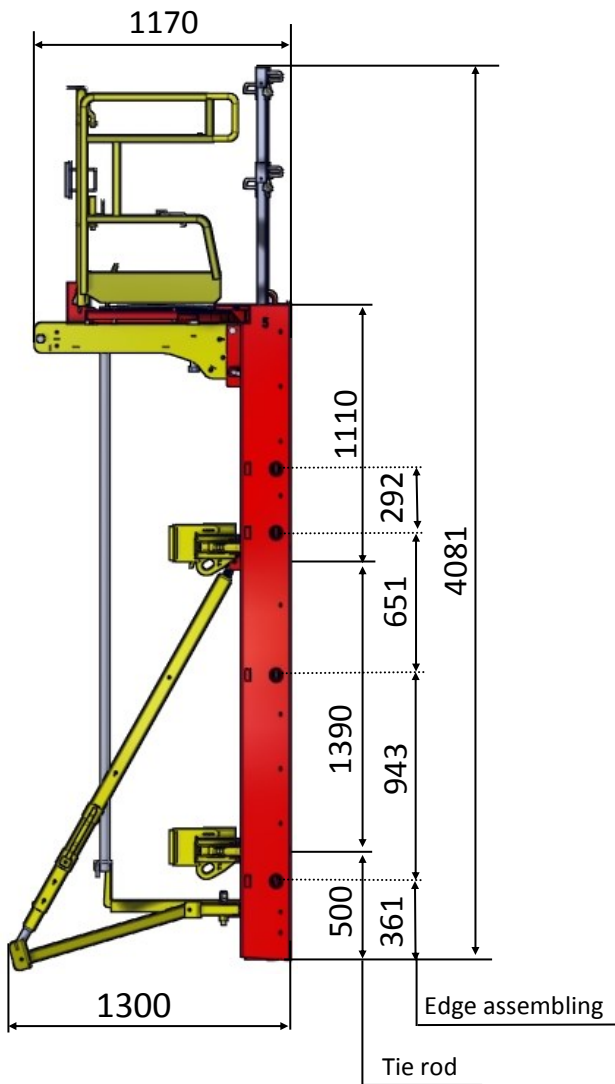
NOUS AVONS UN MONDE À BÂTIR

Main dimensions features

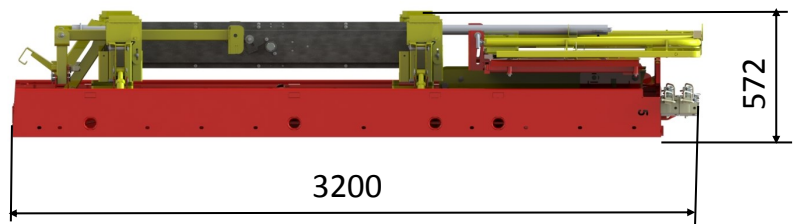
D.T. CTR 4010



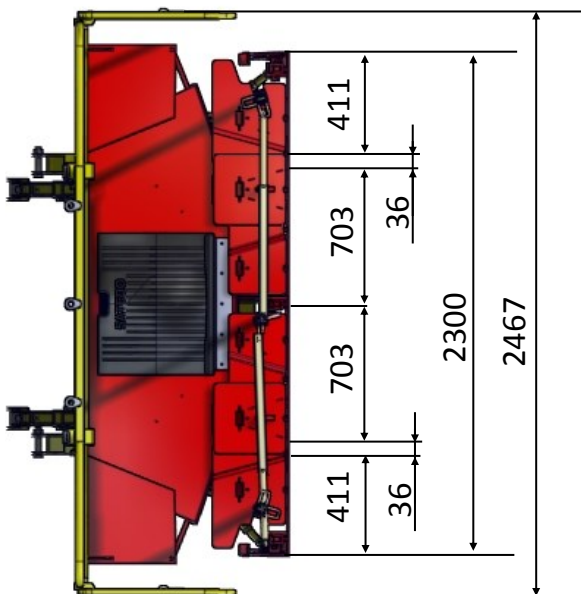
Panel height 3000:



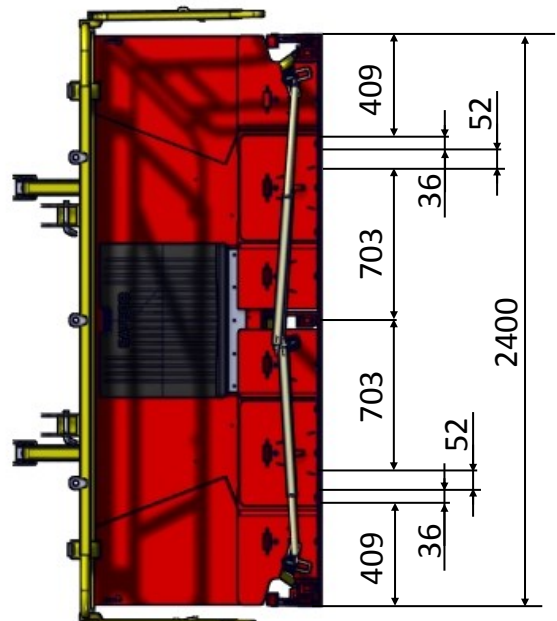
Lifting from the floor



Width 2300



Width 2400



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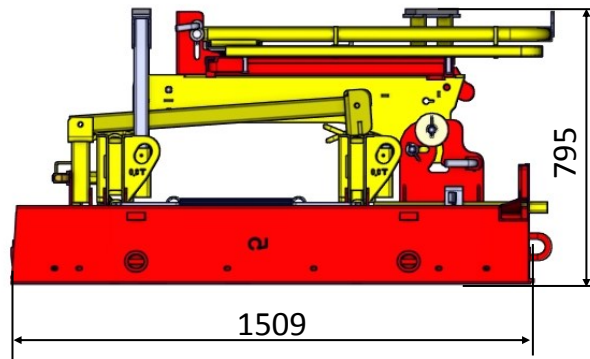
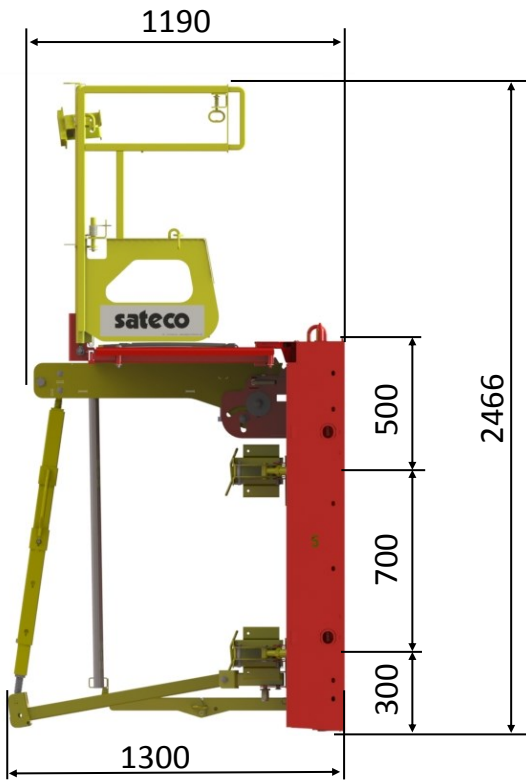
NOUS AVONS UN MONDE À BÂTIR

Main dimensions features

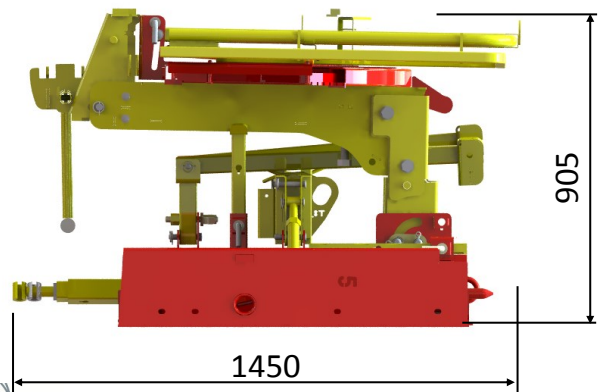
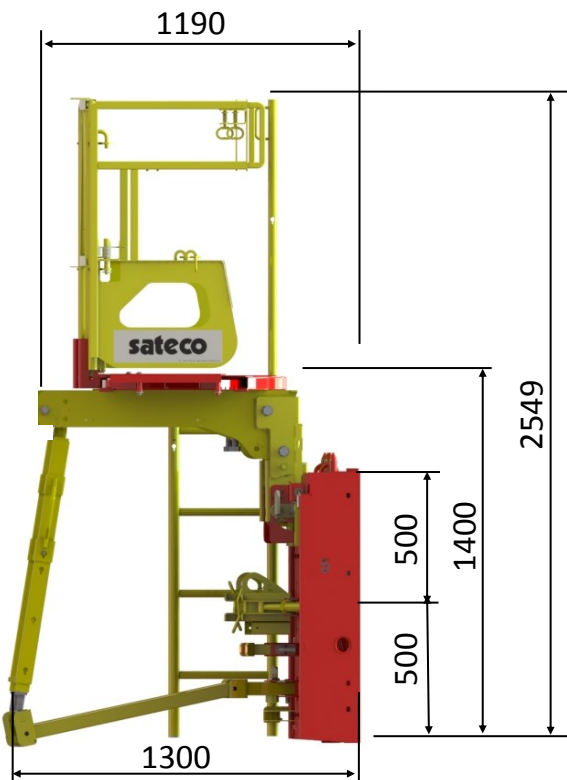
D.T. CTR 4010



Lower extension height 1500:



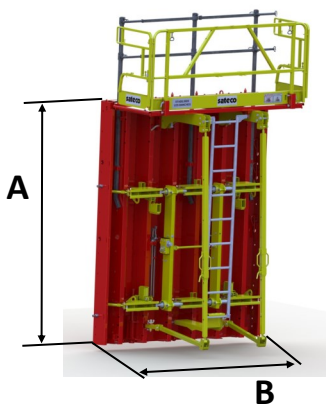
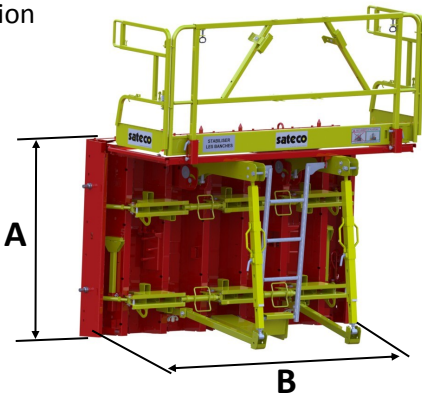
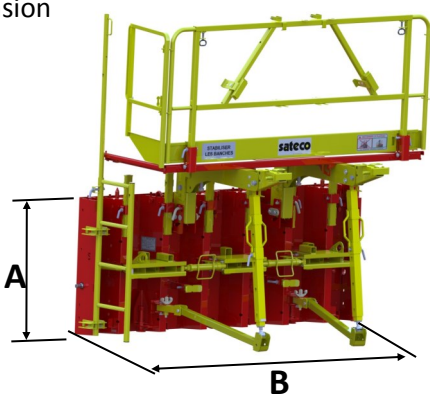
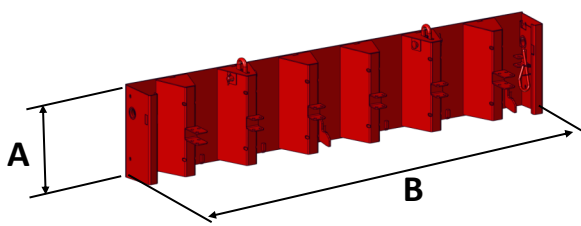
Lower extension height 1000:



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Panels range

Type	A (in mm)	B (in mm)	Weight-sheet metal thickness 5mm (in Kg)
Panel 	3000	2400	1083
	3000	2300	1006
	3000	1656	823
	3000	1518	777
Lower extension 	1500	2400	643
	1500	2300	607
	1500	1656	512
	1500	1518	471
Lower extension 	1000	2400	454
	1000	2300	428
	1000	1656	413
	1000	1518	363
Upper extension 	500	2400	216
	500	2300	210
	500	1656	168
	500	1518	165



34.10 UNLOADING

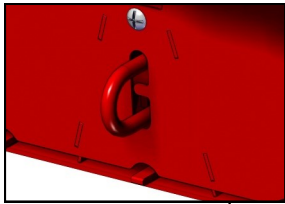
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STORAGE



Some of the pictures are represented without stability for a better understanding.





Upper slinging point



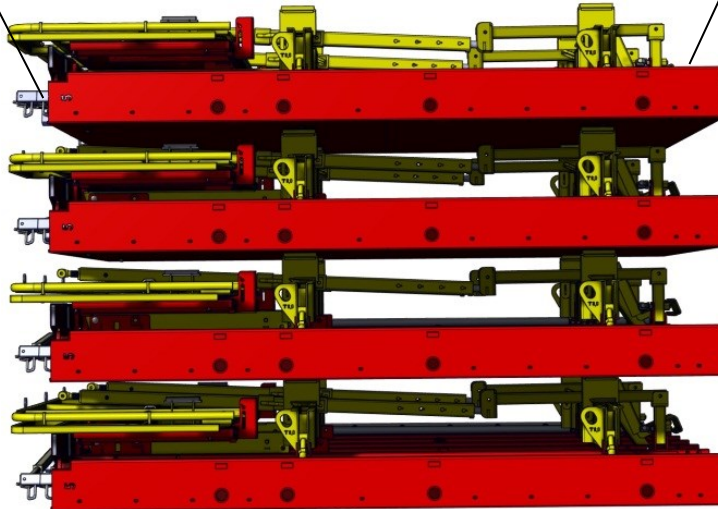
CTR with a minimum radius of 10m for packing:

Check that **NOTHING IS IN CONTACT** with the formworking surface



Low slinging point

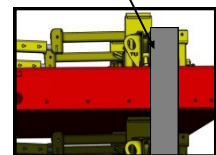
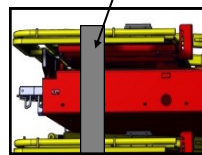
MAX. WEIGHT USED : 2T



Panels type	Max nb of panels to be transported
3000 x 2400 / 2300	4
3000 x 1656 / 1518	4
1500 x 2400 / 2300	2
1500 x 1656 / 1518	2
1000 x 2400 / 2300	2
1000 x 1656 / 1518	2

Straps on the lorry:

Straps positioned closest to the piling pads



The shutters must lay on timber battens .

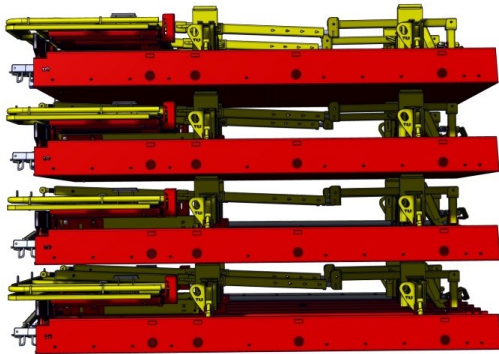
*Make sure that the formworking surface is **NOT** in contact with the floor and/or any vegetation.*



Storage

D.T. CTR 4010

Storage height



Panels type	Max nb of panels to be stored
3000 x 2400 / 2300	8
3000 x 1656 / 1518	8
1500 x 2400 / 2300	4
1500 x 1656 / 1518	4
1000 x 2400 / 2300	3
1000 x 1656 / 1518	3



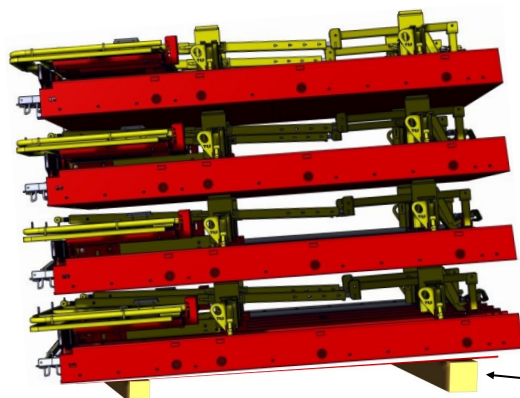
The shutters must lay on timber battens .

Make sure that the formworking surface is NOT in contact with the floor and/or any vegetation.

-> Lifting one panel at once with a lifing point on the box



In order to drain the standing water after a long storage period outside, we suggest you lay the panels on 2 battens of a different height



Difference in height : 50mm MAX



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34.20 UNFOLDING

-

PROCEEDINGS



Some of the pictures are represented without stability for a better understanding.



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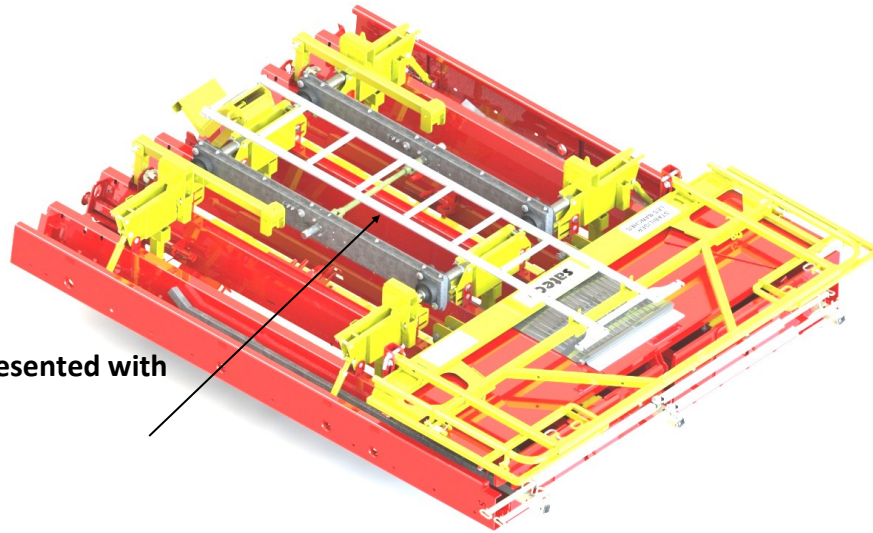
NOUS AVONS UN MONDE À BÂTIR



Step 0 : Positioning the shutter

Lay the panel on the battens on the floor in order to protect the formworking surface

Make sure that the formworking surface is NOT in contact with the floor and /or any vegetation.



Nota: CTR panels are now presented with the ladder on the guard rail.

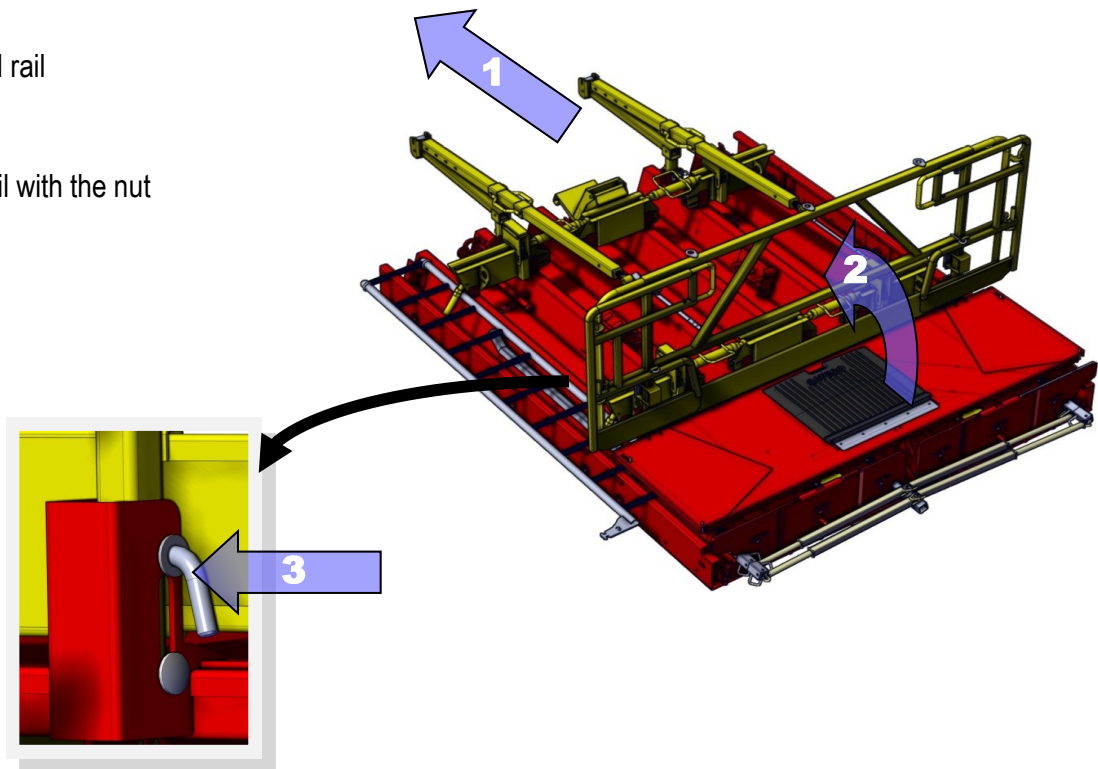
Dismount it during this step.

Step 1 : Raising the guard rail

1 - Retract the crutches

2 - Move up the guard rail

3 - Block the guard rail with the nut



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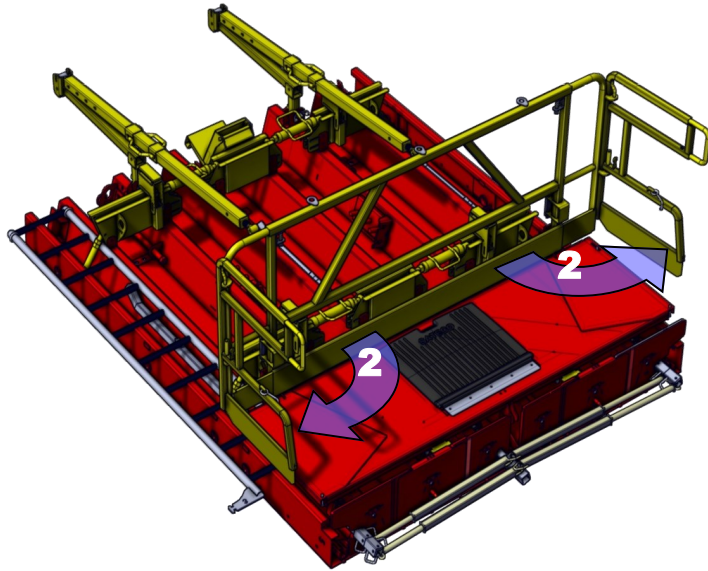
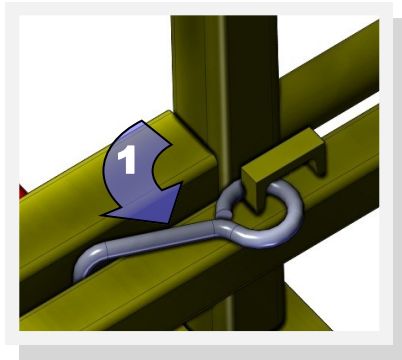
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Step 2 : Opening the gates

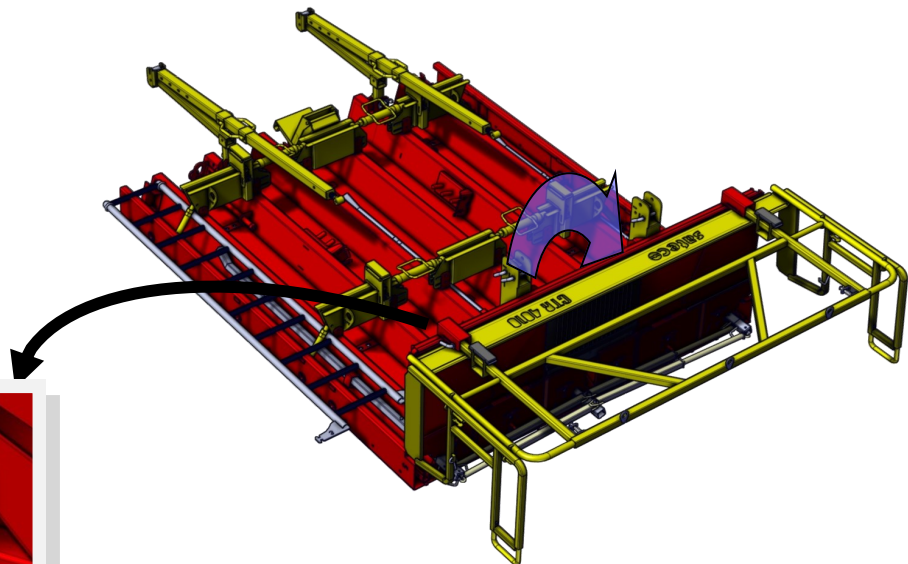
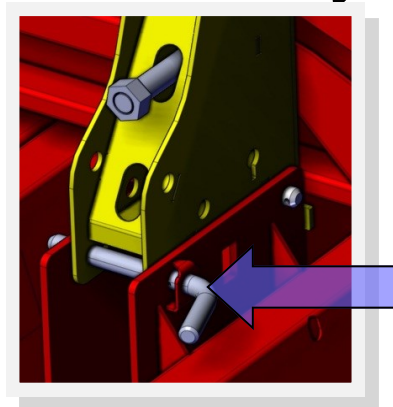
1 - Remove the hooks

2 - Open the gates



Step 3: Raising the working board

Block the working board with the nut



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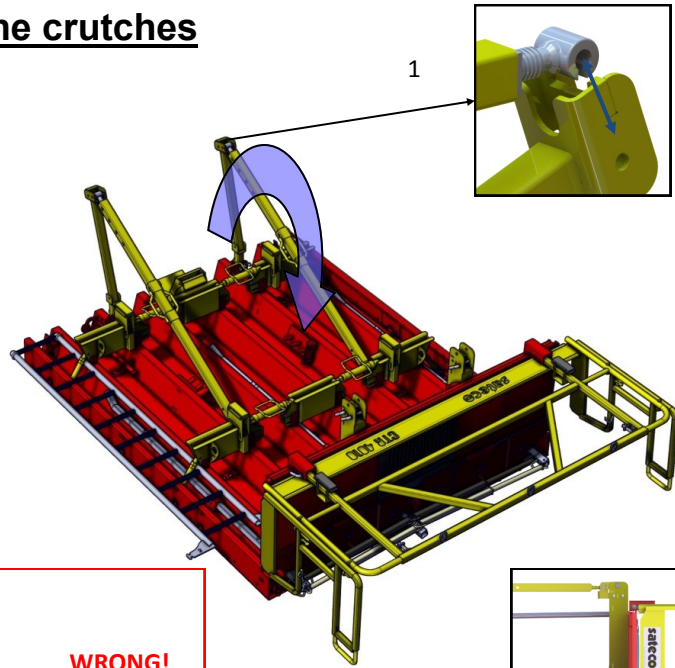
NOUS AVONS UN MONDE À BÂTIR



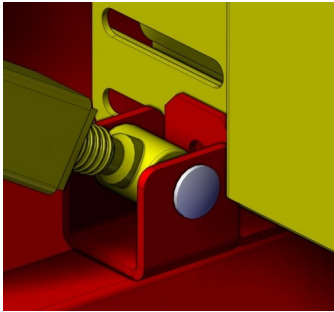
tep 4 : Assembling and adjusting the crutches

Hook the crutches

- 1- Check the right engagement of the tubes
- 2- Hook the upper part



2



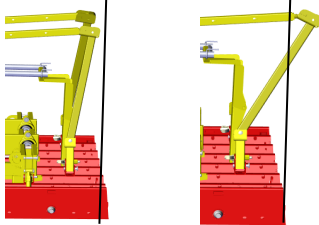
Balance the high and low threads of the crutches



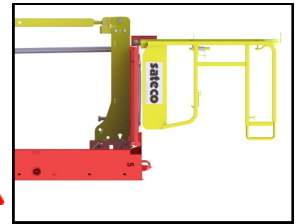
Caution:

RIGHT!

WRONG!

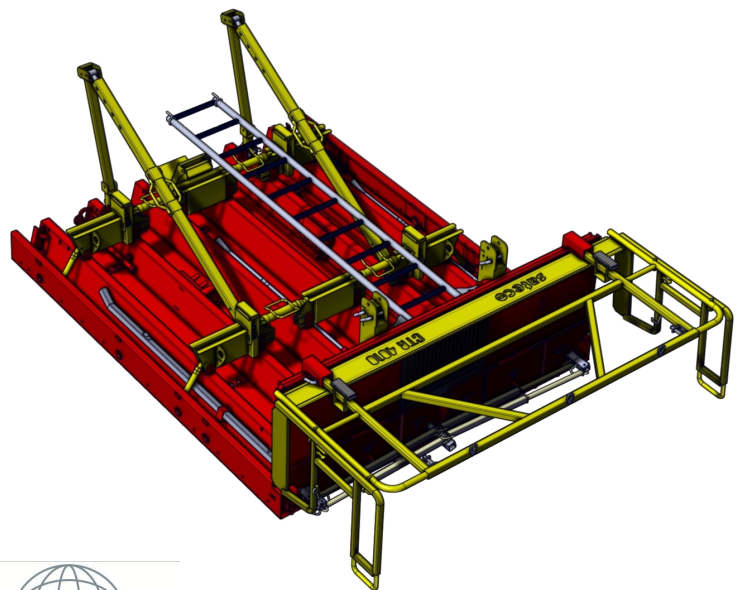
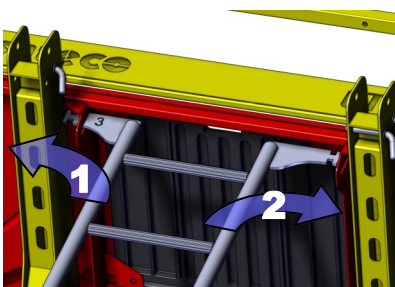


The crutches of the lower panel must be adjusted.



**SUPERPOSITION =
CRUTCH ON WORKING
BOARD**

Step 5 : Set the ladder

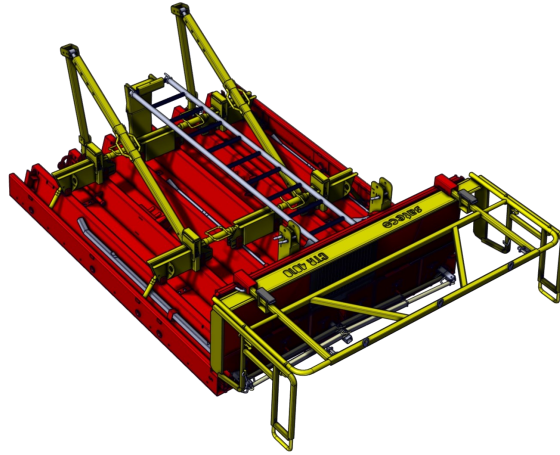
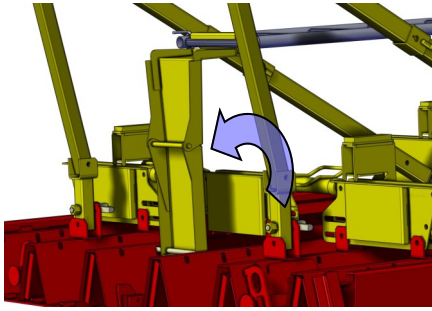


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NOUS AVONS UN MONDE À BÂTIR



Step 6 : Set the ladder step

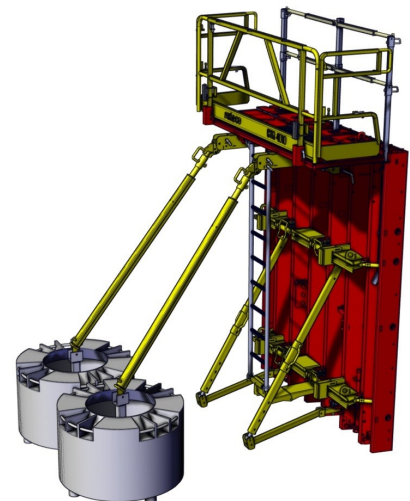
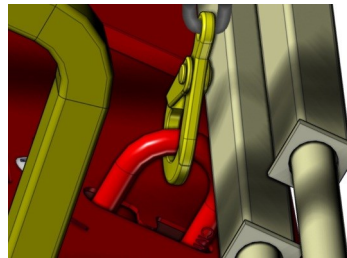
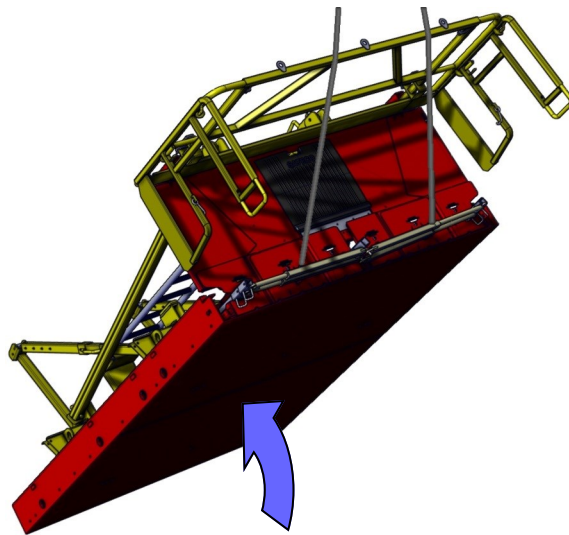


Step 7 : Set the stabilizers (see chapter on stability)



Before lifting the panel, you MUST set the wind stability

Step 8 : Slinging and lifting the panel



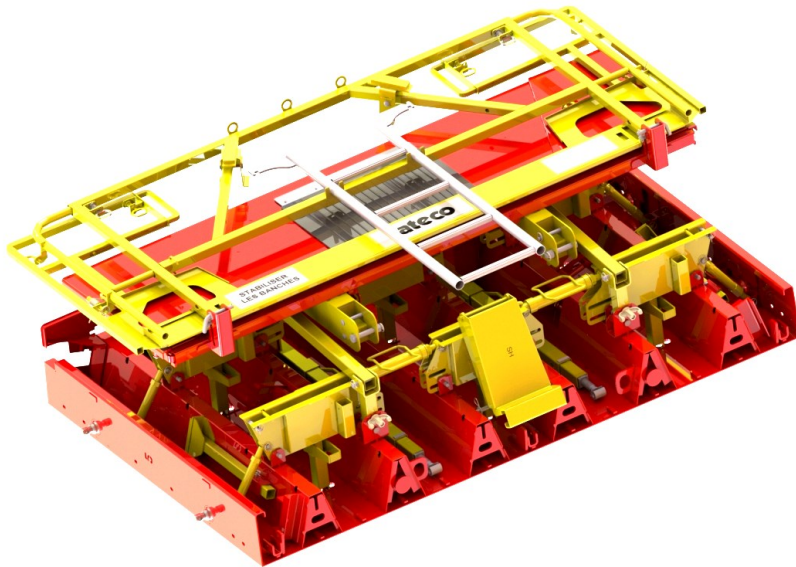
Before removing the slings,
STABILIZE THE PANEL





Step 0 : Positioning the lower extension

Lay the lower extension on the battens on the floor in order to protect the formworking surface
Make sure that the formworking surface is NOT in contact with the floor and /or vegetation.



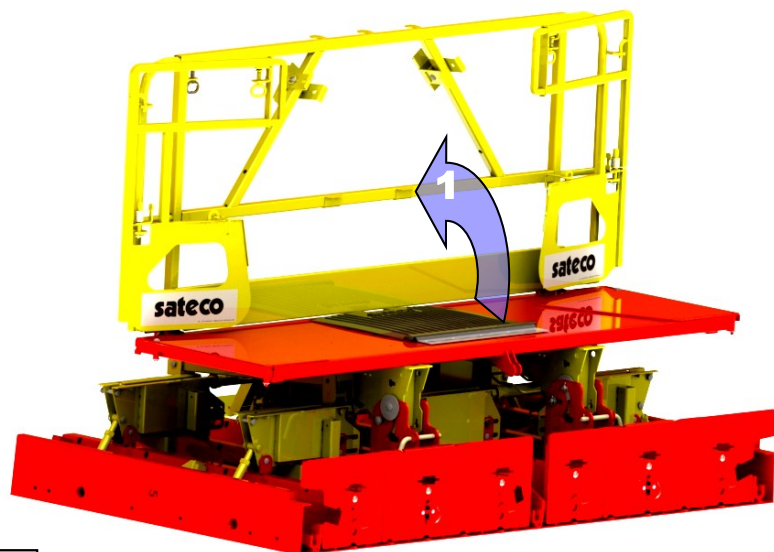
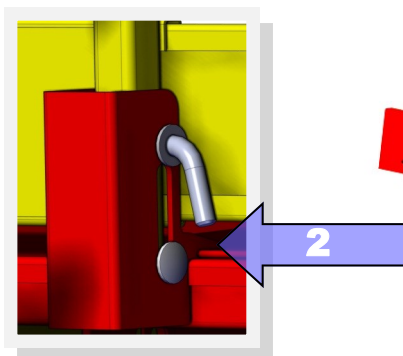
Nota: CTR panels are now presented with the ladder on the guard rail.

Dismount it during this step.

Step 1 : Raising the guard rail

1 - Move up the guard rail

2 - Block the guard rail with the nut



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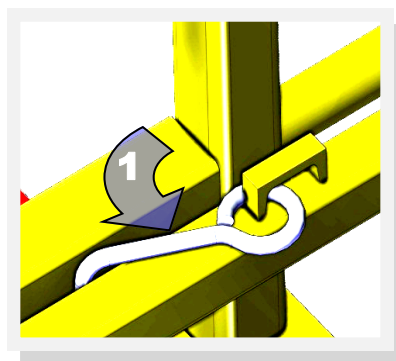
NOUS AVONS UN MONDE À BÂTIR



Step 2 : Opening the gates

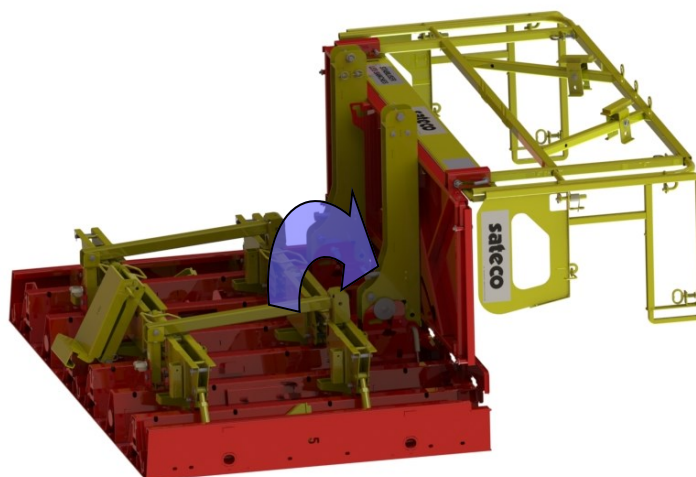
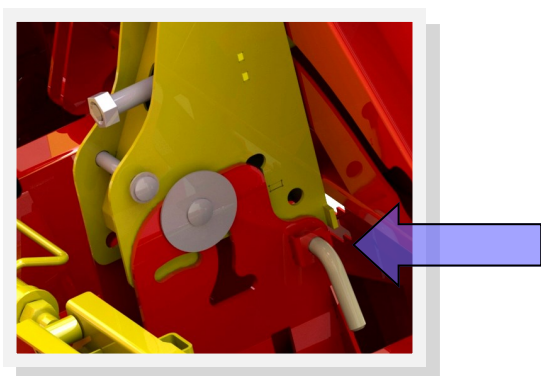
1 - Remove the hooks

2 - Open the gates



Step 3 : Raising the working board

Block the working board with the nut



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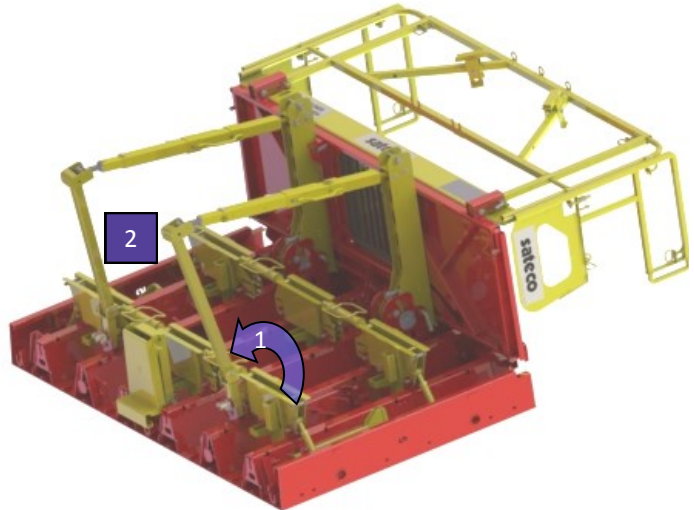
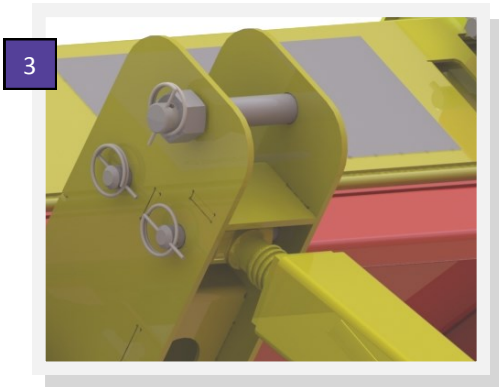
NOUS AVONS UN MONDE À BÂTIR



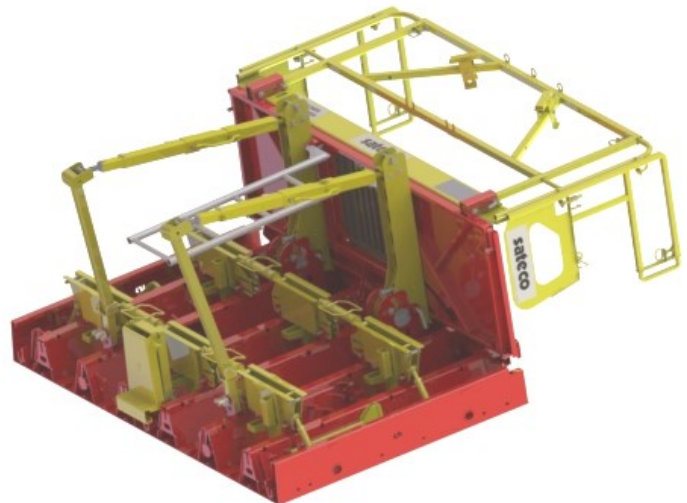
Step 4 : Assembling and adjusting the crutches

Block the crutches with the nut:

- 1- Lift the low part of the crutch
- 2- check the right engagement of that part
- 3- Block the upper part with a nut



Step 5 : Setting the ladder

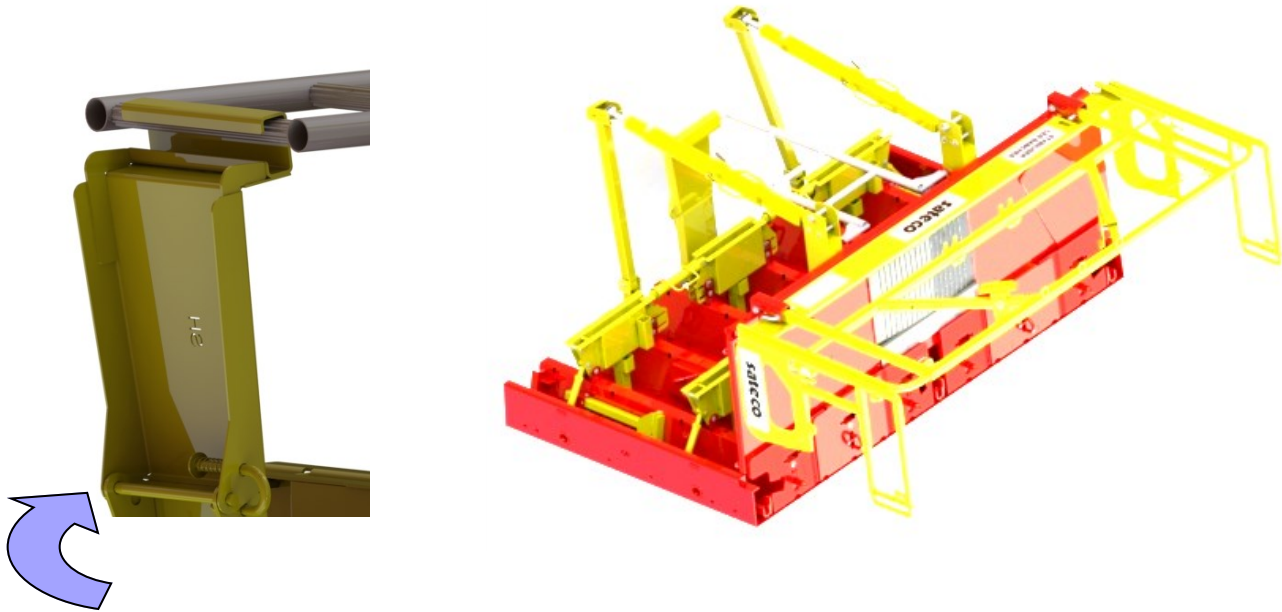


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NOUS AVONS UN MONDE À BÂTIR



Step 6 : Setting the ladder step



Step 7 : Slinging and raising the lower extension



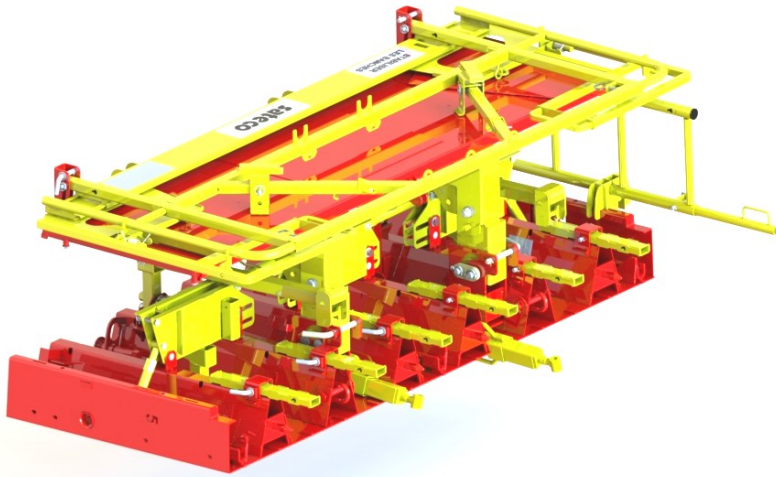
See chapter 34.40





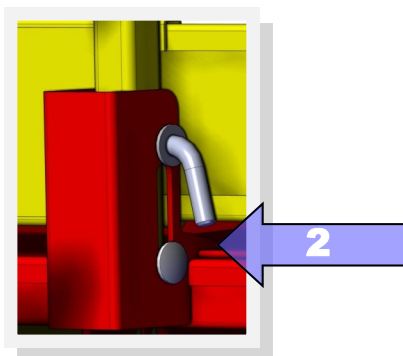
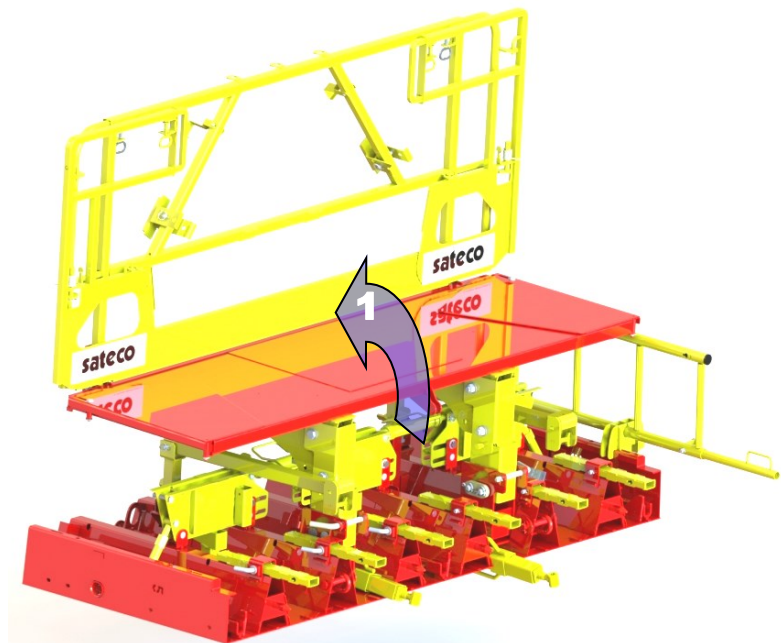
Step 0 : Positioning the lower extension

Lay the lower extension on the battens on the floor in order to protect the formworking surface
 Make sure that the formworking surface is NOT in contact with the floor and /or any vegetation.



Step 1 : Raising the guard rail

- 1 - Move up the guard rail
- 2 - Block the guard rail with the nut

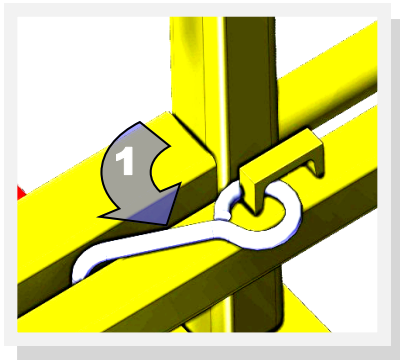




Step 2 : Opening the gates

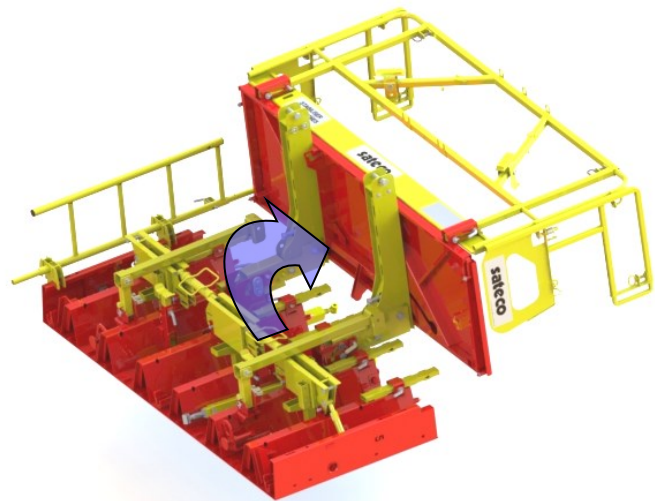
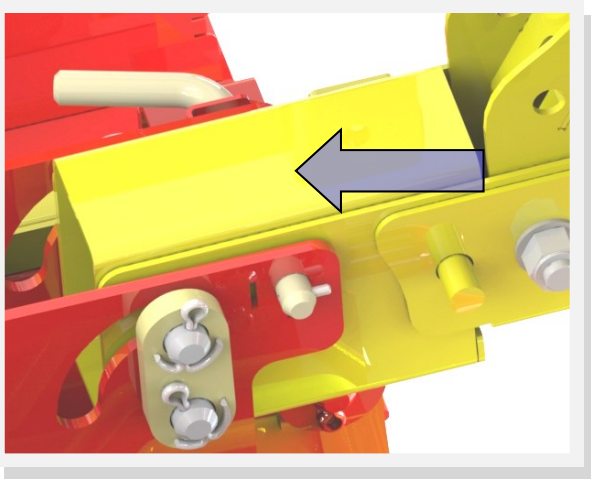
1 - Remove the hooks

2 - Open the gates



Step 3 : Raising the working board

Block the working board with



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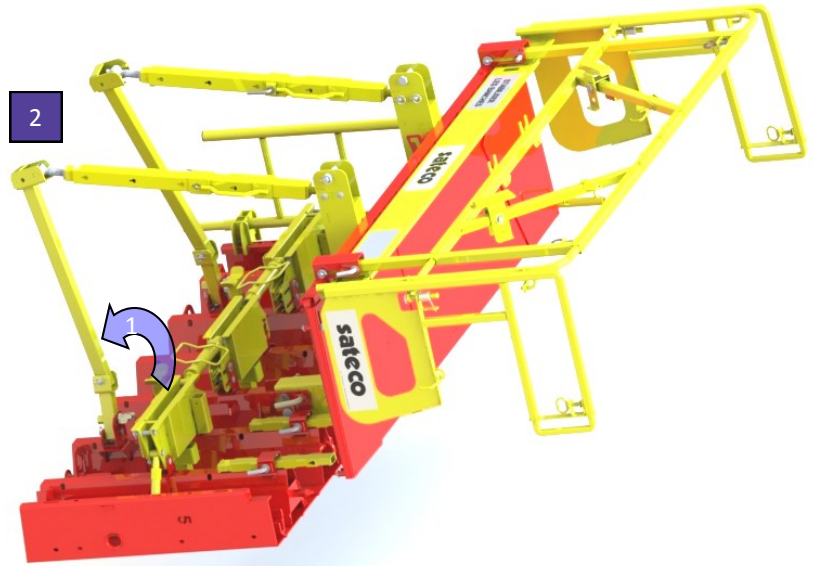
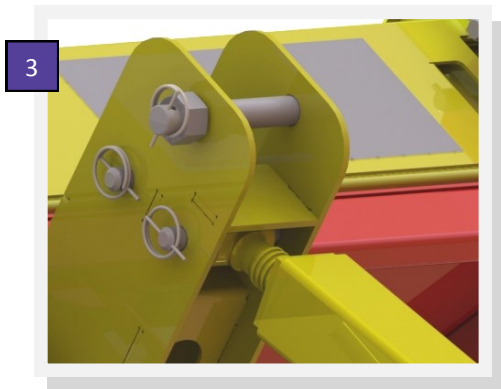
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Step 4 : Assembling and adjusting the crutches

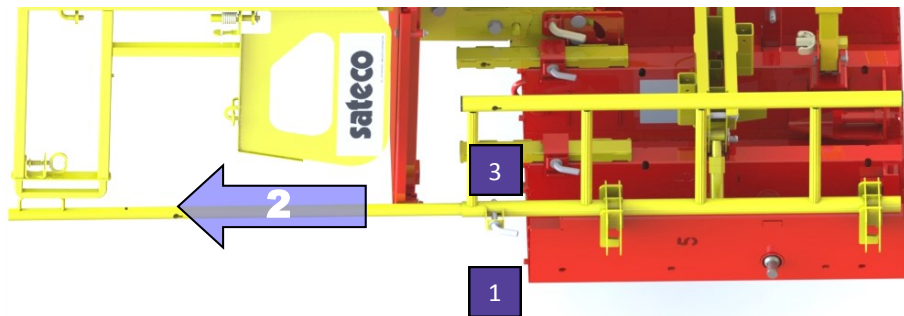
Block the crutches with the nut:

- 1- Lift the low part of the crutch
- 2- check the right engagement of that part
- 3- Block the upper part with a nut

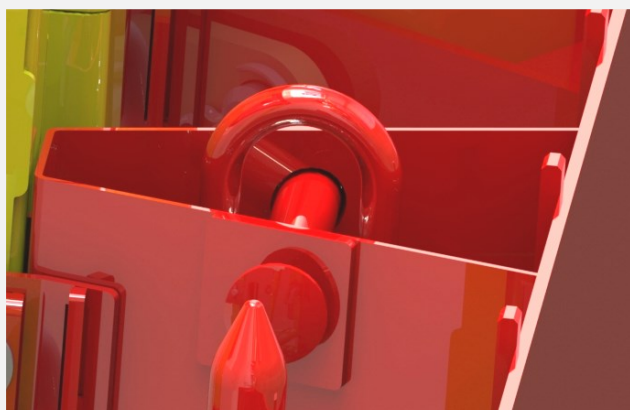


Step 5 : Setting the ladder

- 1- Unblock the nut
- 2- Pull
- 3- Block the nut



Step 6 : Slings and raising the lower extension



See chapter 34.40



Cleaning and 1st oiling



1. Cleaning

The panel are delivered with a protection oil on the steel formworking surface. This oil is not compatible with the oil used to release the concrete.

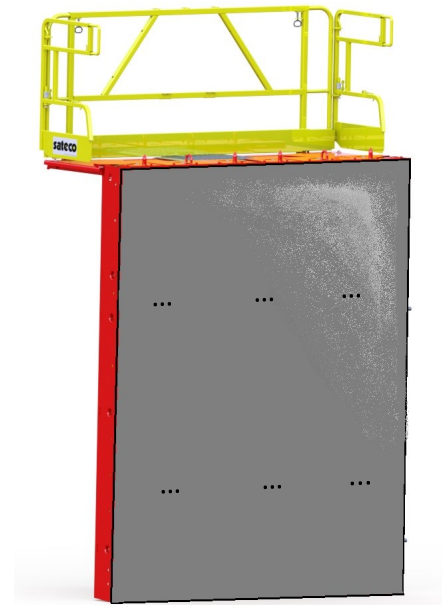


Clean the formworking surface before first use.

SATECO suggests a high pressure cleaner of warm water, on a vertical panel.

2. Oiling

When the formworking surface is dry, apply right after an oil used to release concrete, in order to avoid any risks of oxidation.



Panel delivered with protection oil



- *Contact your supplier to know which oil used for removing concrete, is adapted to your use conditions.*
- *Follow the instructions for the oil application, mainly the instructions about the interval between the application and the concrete casting.*





34.30 ASSEMBLING

-



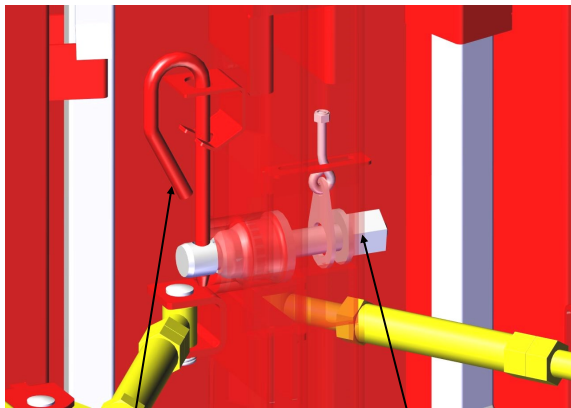
Some of the pictures are represented without stability for a better understanding.



Juxtaposition assembling

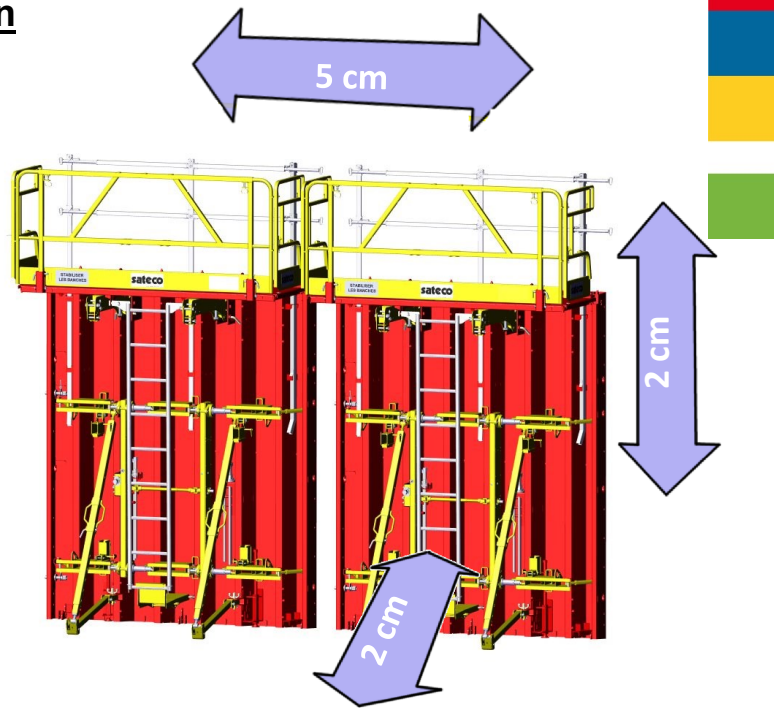
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Keys for assembling in juxtaposition



Vertical assembling piece

Pin



Admissible gaps before assembling

Etape 1 : Panels in juxtaposition

Always check that the edges are clean.

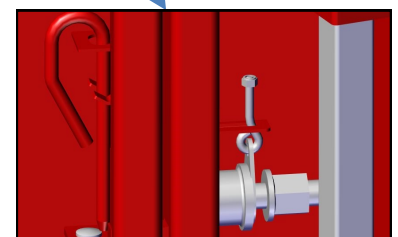
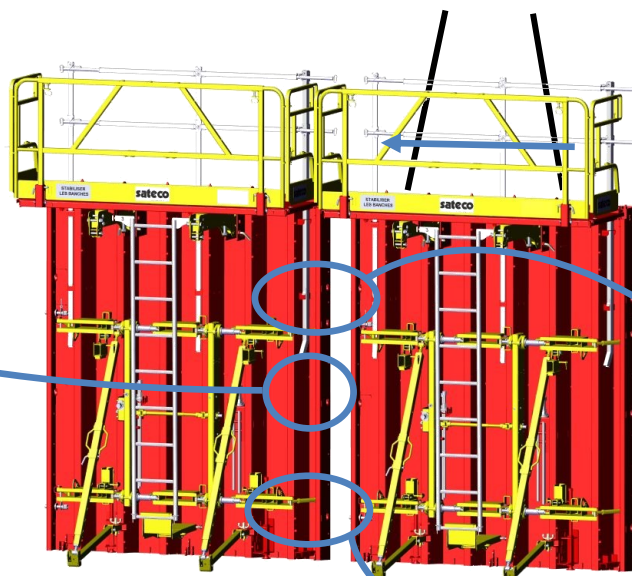
Position the panels next to each other, align the formworking steel surfaces:



The ridge of the edge makes it easier for the panels to gather, so that you avoid having your hands caught in between, during the operation.



Conception of the ridge of the edge



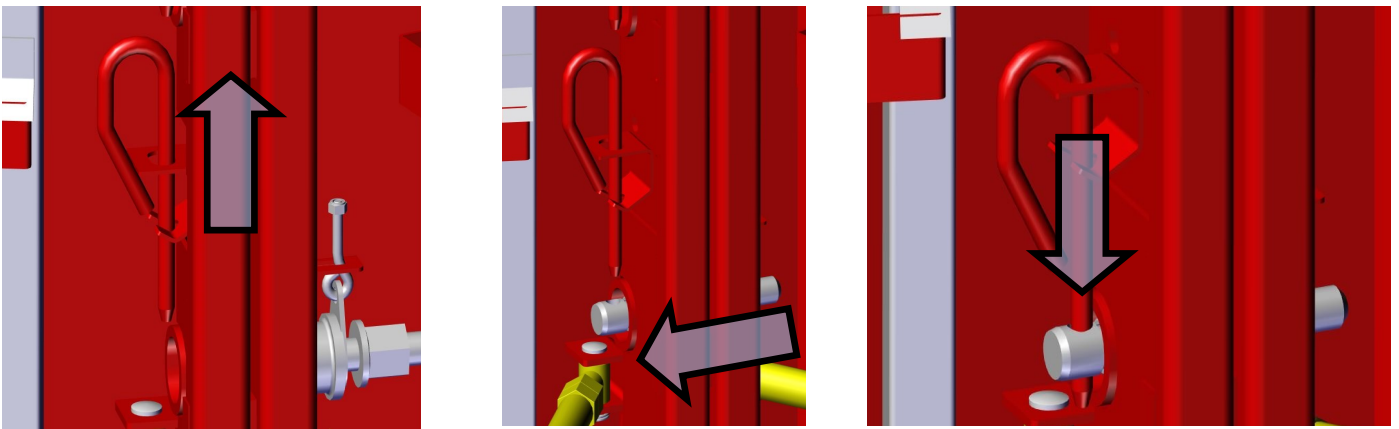
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Step 2 : The assembling screw

- Insert the edge assembling piece into the sleeve
- Position the pin
- Check the alignment in height of the panels
- Start inserting and tightening the nuts of the edge assembling piece (at the bottom, then at the top)



- Finish tightening the nuts, starting from the nut at the bottom of the panel.



To sling and do the manutention of the panels set, see chapter : Raising - manutention: sheet 34.40.00

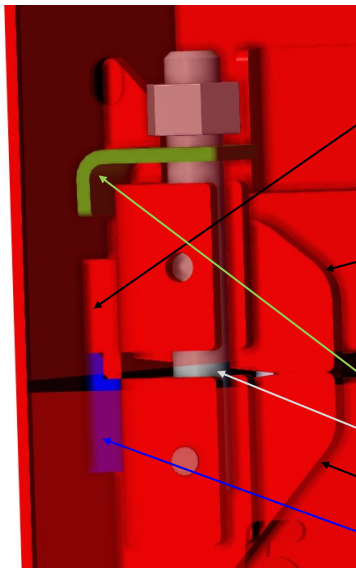
You will find the instructions to use the crutches and screw jacks to adjust the level and verticality, on sheet 34.60.04.



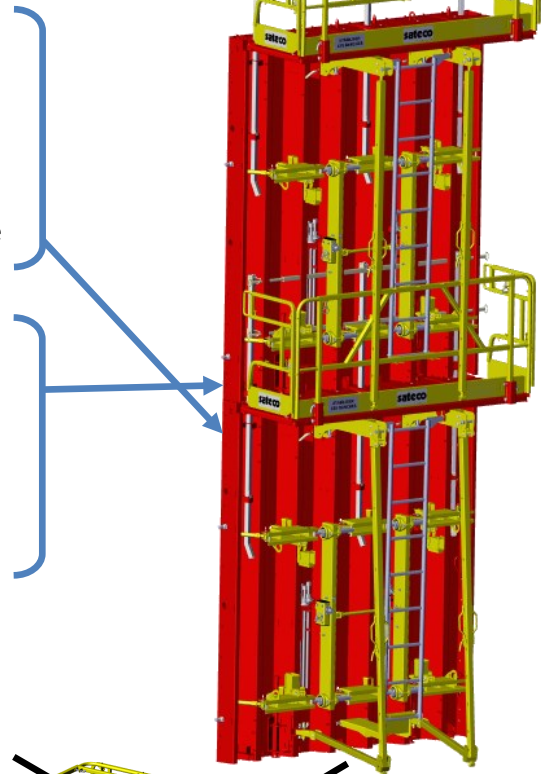


Keys for assembling in superposition

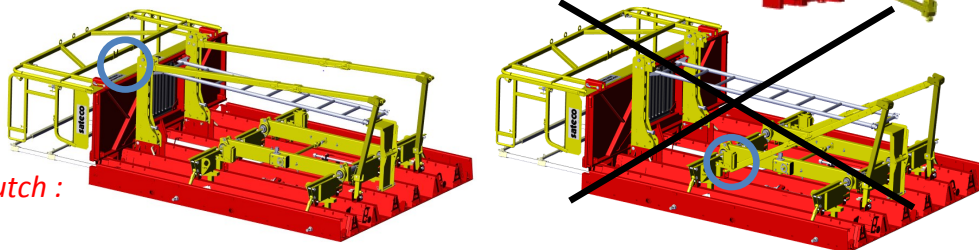
Set on the same level the formworking surfaces.



- Cleat of female centering piece
- Upper strenghtening steel plate
- Anti-tilt washer
- Removable screw with nut
- Low strenghtening steel plate
- Cleat of male centering piece



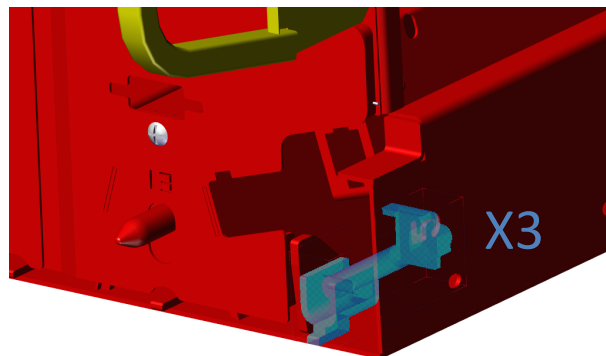
Position of the crutch :



Step 1 : Preparing the lower panels

After laying the CTR on the battens, check that the upper stiffener is clean.

Check the movement of the 3 screws and the anti-tilt washer.



Lower panel: no front guard rail



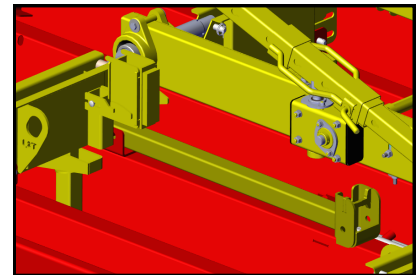
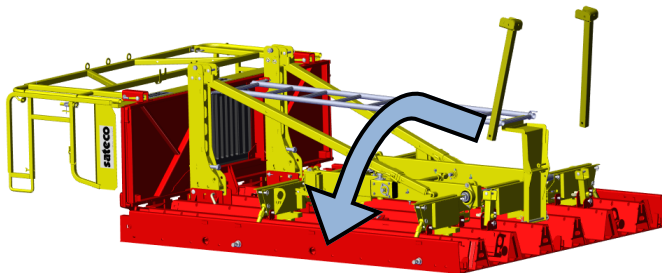
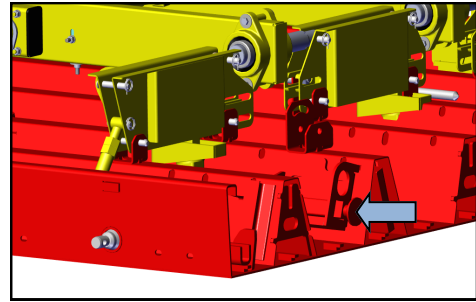


Step 2: Preparing the upper panels

Check that the bottom of the panels is clean

Move up the screw jacks

Remove the low parts of the crutches

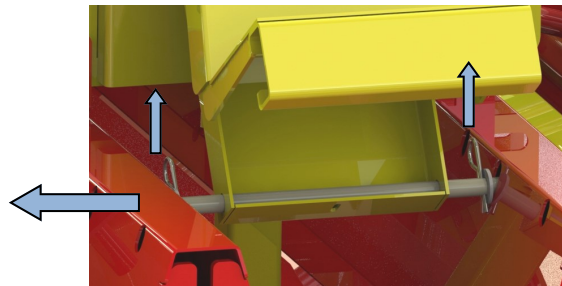


Storage position

Fold up again the ladder step

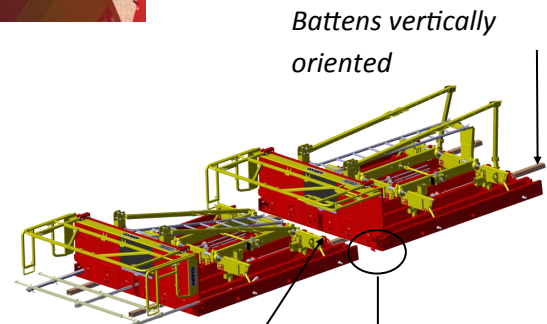
1 - Remove the pins

2- Pull the axis



Step 3 : Assembling

- Prepare the battens oriented vertically (like the panels)
- Lay the upper panel
- Lay and bring closer the lower panel

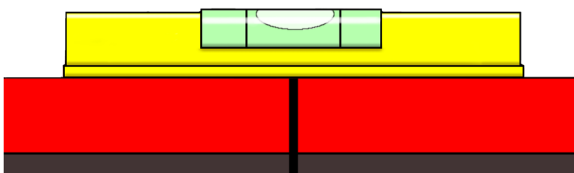
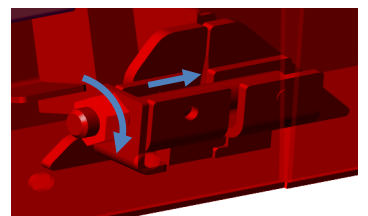


Battens vertically oriented

Screw jacks retracted

Assemble together the 2 panels following these assembling system instructions :

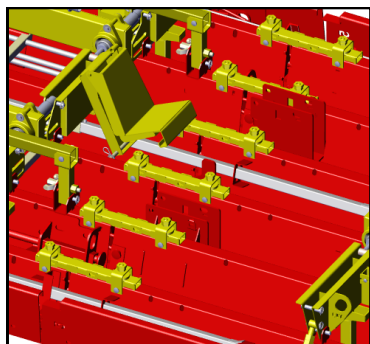
- Bring closer the screw and the anti-tilt washer, start tightening
- Align the panels on the edge
- Set them on the same level
- Tighten the panels with a wrench



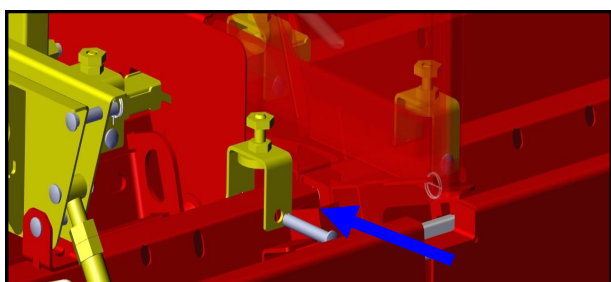
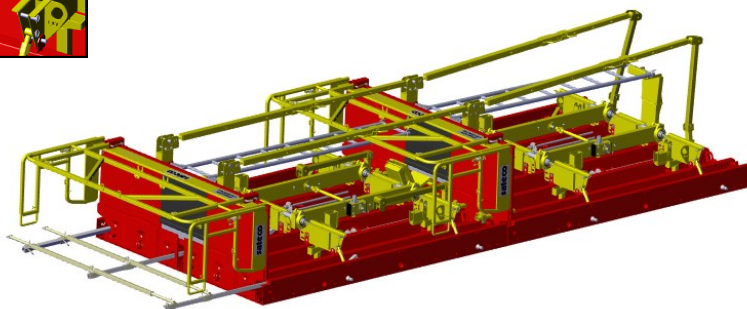


Step 4: Set the superposition fish plates

Before raising, each of the CTR stiffeners must be in support each other with the fish plates



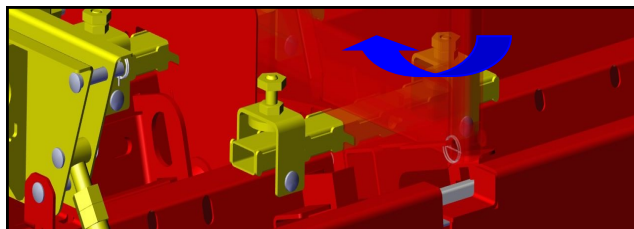
View of the fish plates without the working board and the guard rail



Set the blocking pieces on both high and low stiffener

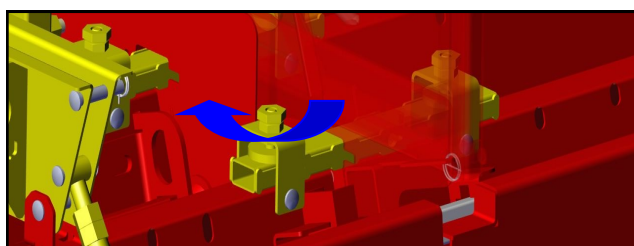


Insert the fish plate



Tighten the blocking pieces

With the 36 spanner



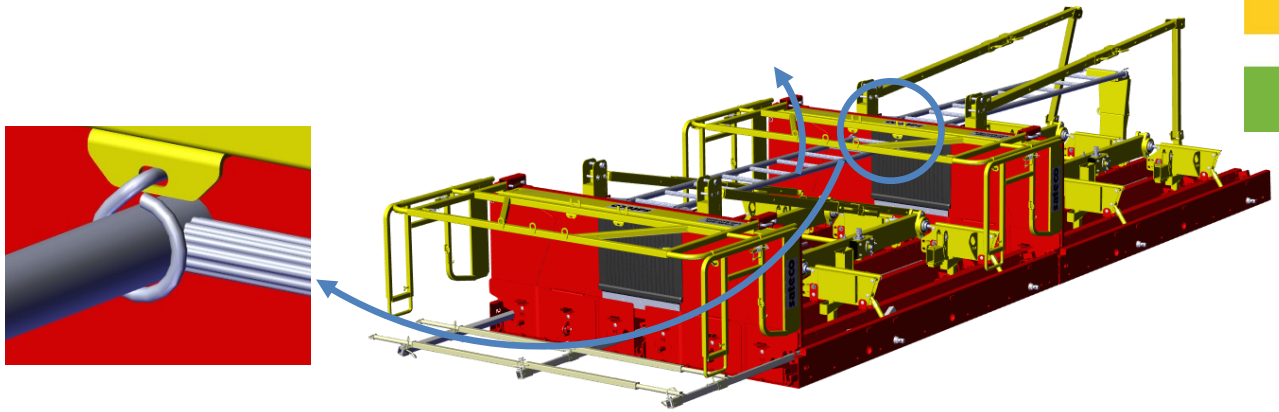
Hook on the lower extension
1000





Step 5 : Ladder

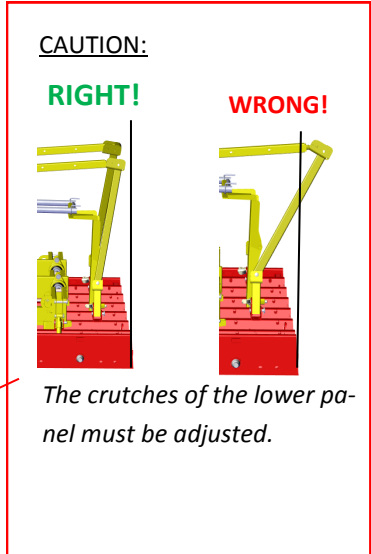
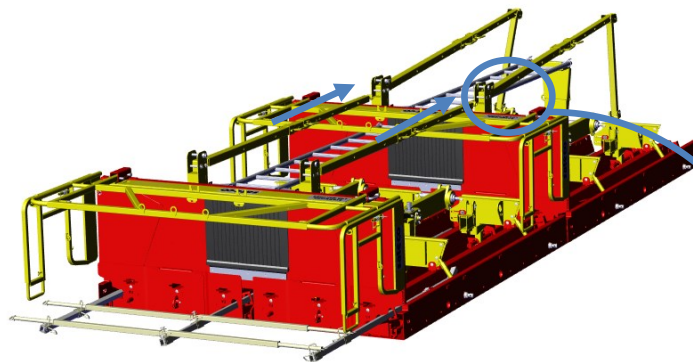
Move up the upper panel ladder



Fix the ladder on the working board of the lower panel

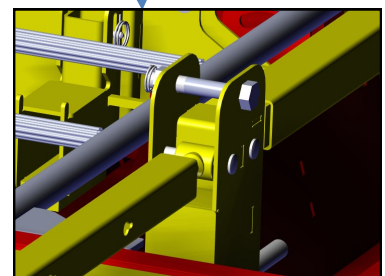
Step 6 : Crutches

Position the crutches sliding them



Broach the oblic crutch on the working board of the lower panel.

Stretch the crutches



Before lifting the panel, you MUST set the wind stability.

See chapter on stability : 34.50.



Balance the upper and low threads of the crutches

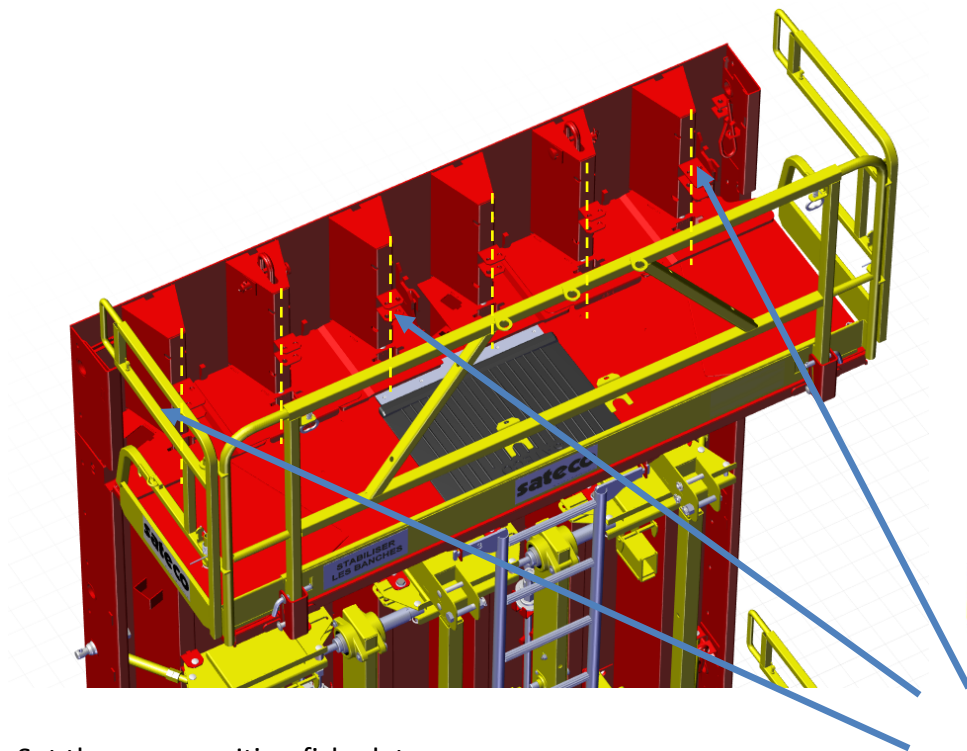
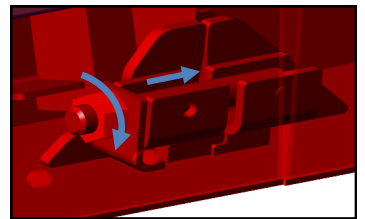
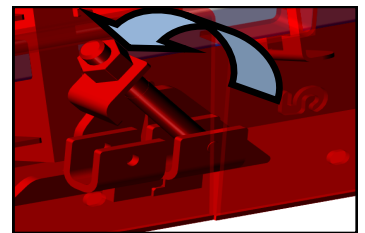
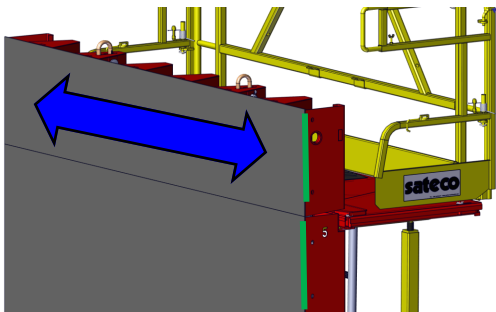


Assembling the upper extensions

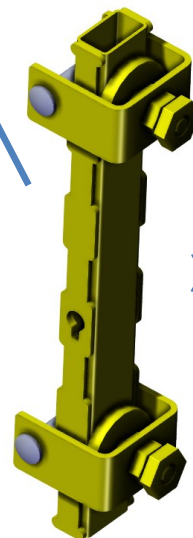
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- Check that the upper and lower stiffeners are clean
- Position the upper extension
- Assemble the upper extension to the panel with the screws and the anti-tilt plates.
- Align the formworking surfaces on the edge



Set the superposition fish plates



X6



Setting the fish plates : sheet 34.30.04



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34.40 RAISING

-

MANUTENTION



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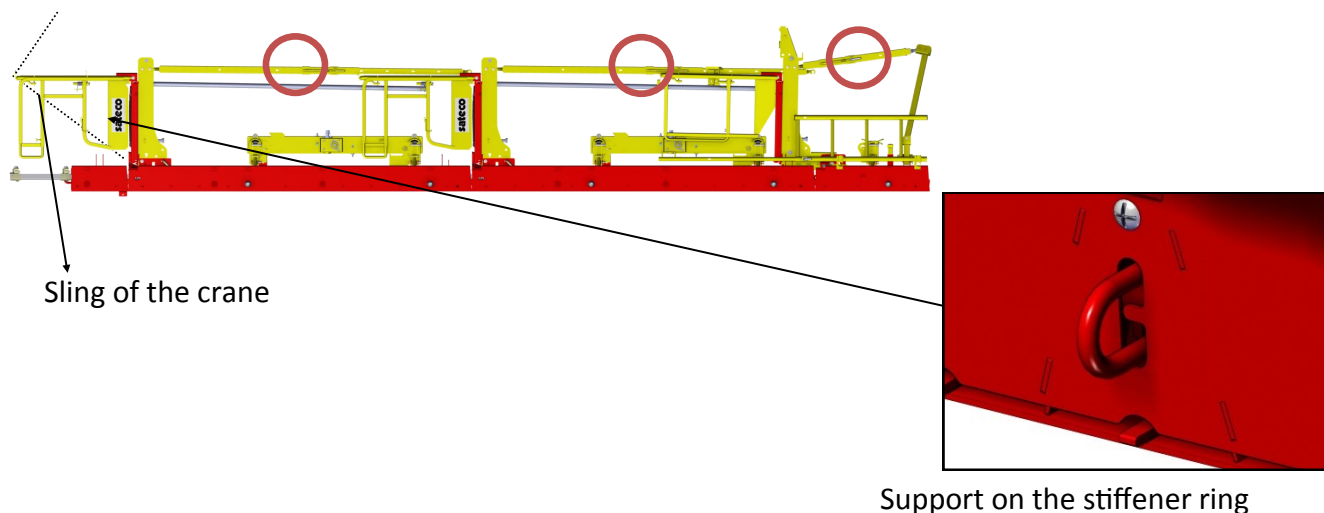
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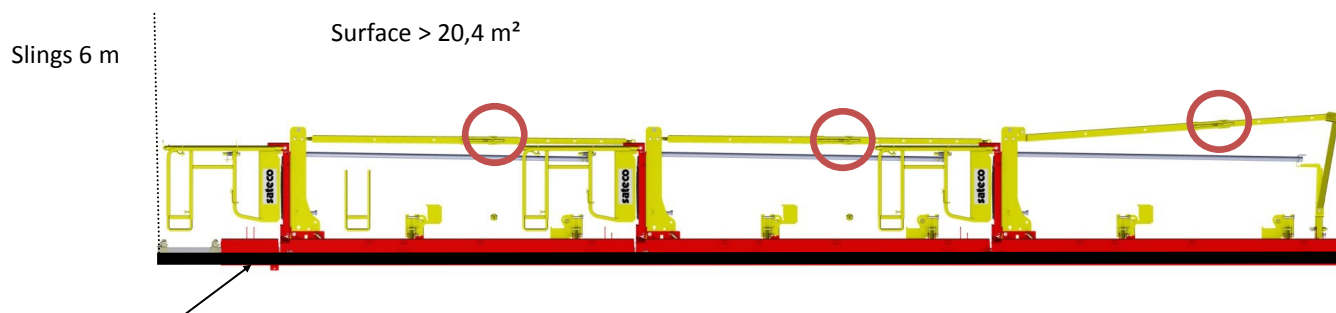
The crutches tightness and the superposed panels tightening **MUST BE CHECKED BEFORE BEING RAISED.**

See next

Raising : Height ≤ to 8.0m



Raising from the floor : Height between 8.00m and < to 15,00m



U shape steel device with lifting ring, mouting on the edge assemblings.

Length = Formwork height, contact us.

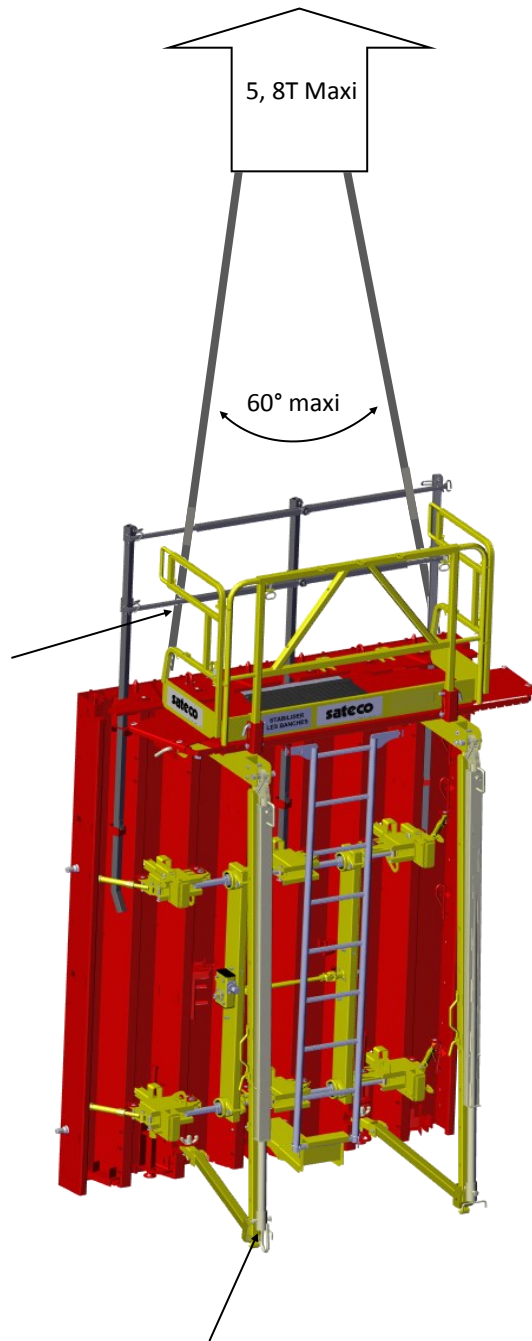
Sling spacer : provided by the customer.



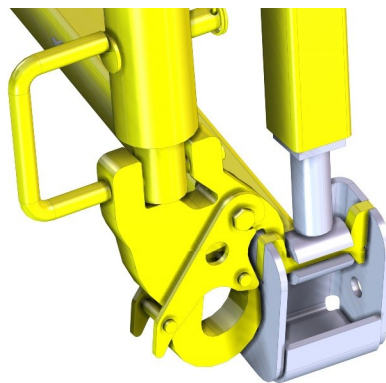


Lifting ring : Max Load 3.2T à 60°

Slings between the guard rail and the front counter railings



Position of the stabilizer during the raising operation

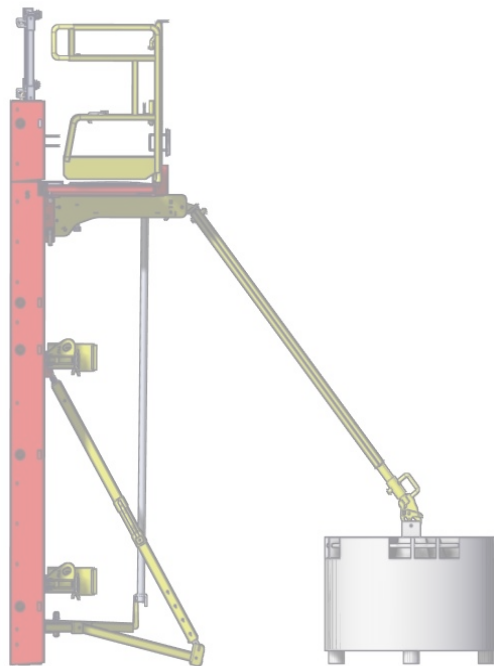


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34.50 STABILIZATION

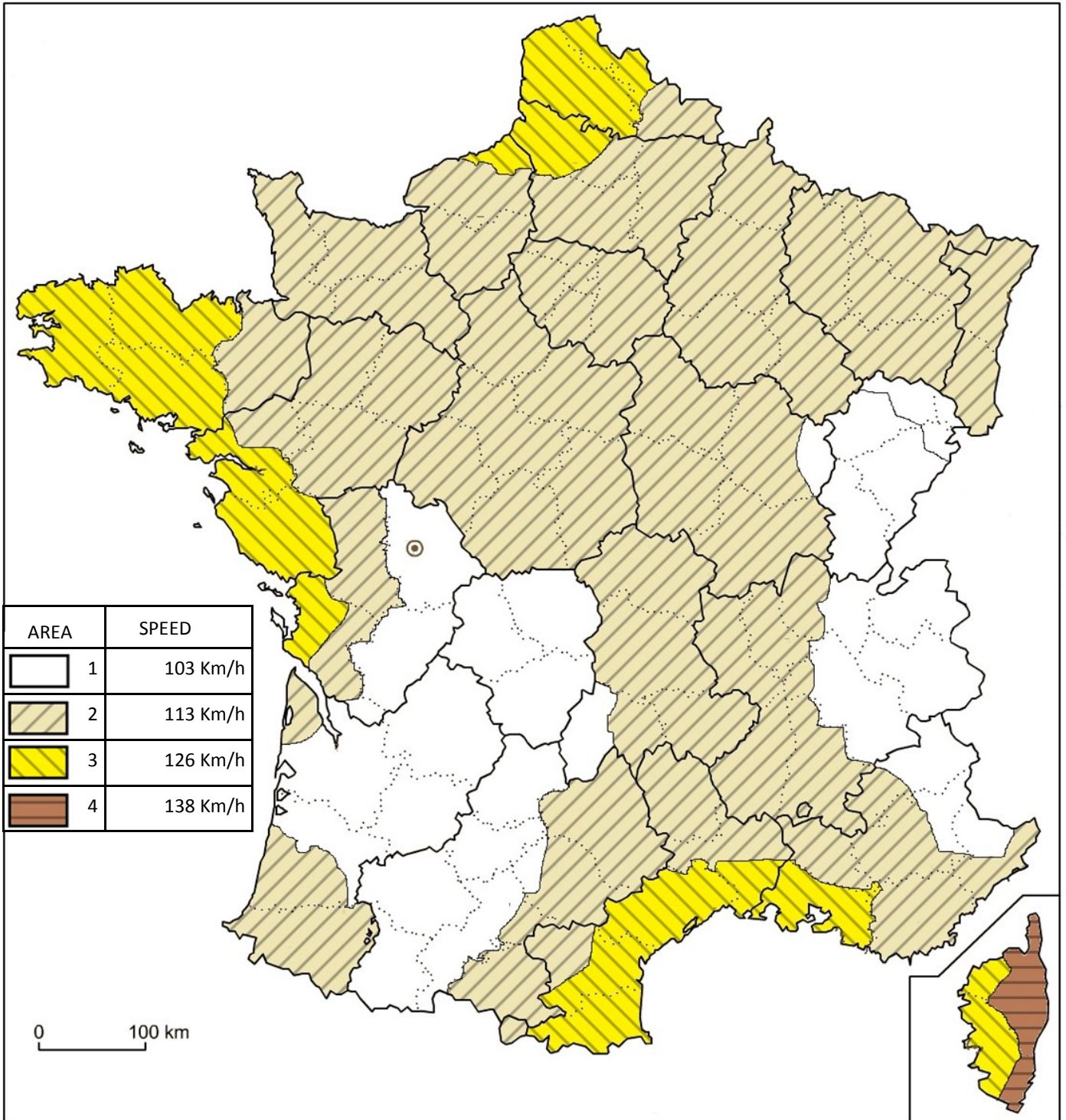


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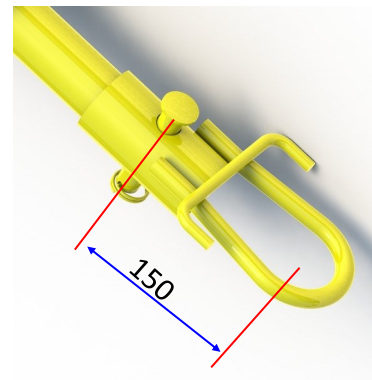
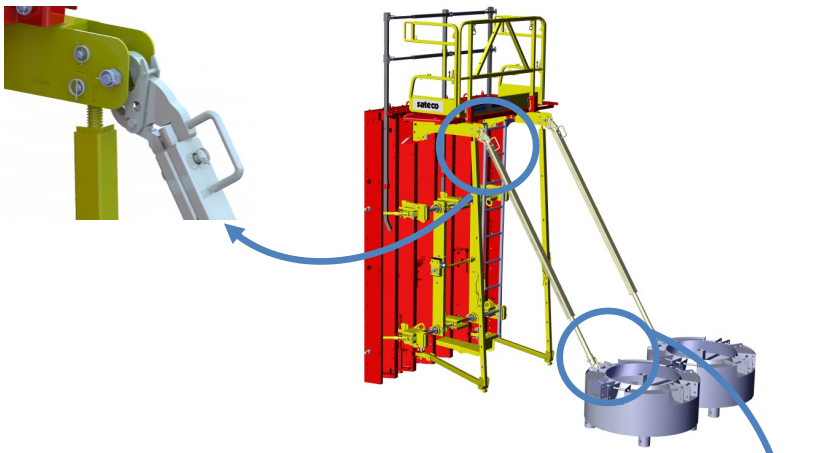


Stabilization with or without ballast, adjustable according to the winds map (hereunder) and following SATECO instructions.

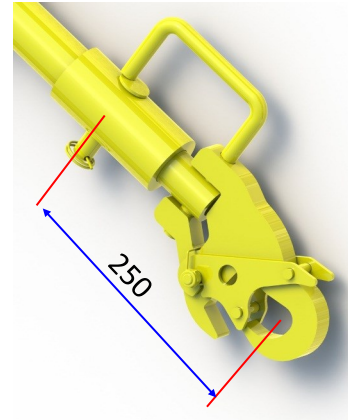


Stabilizer T1

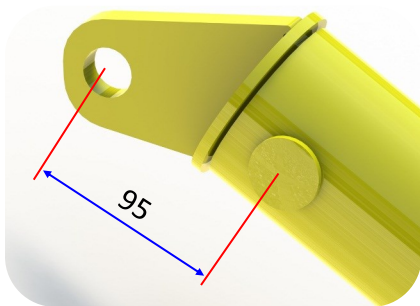
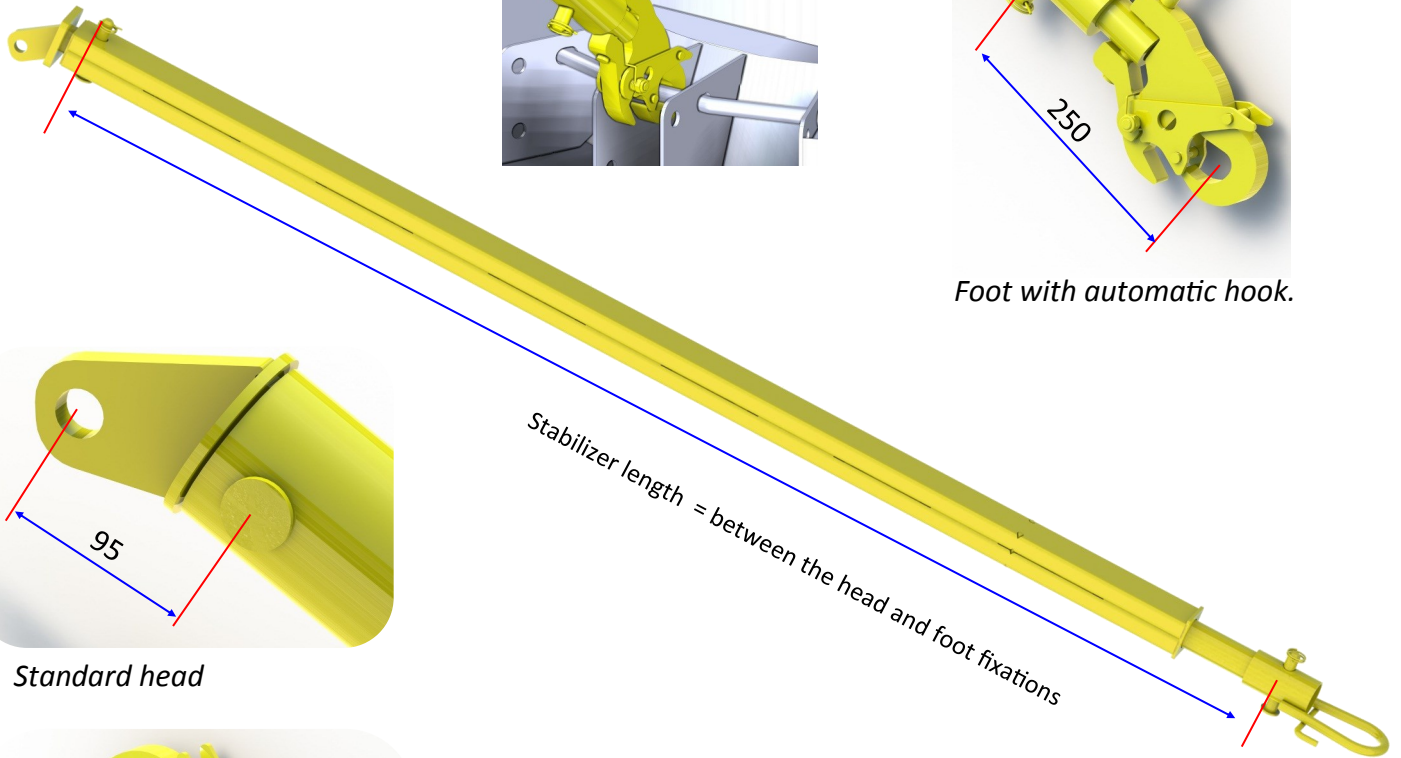
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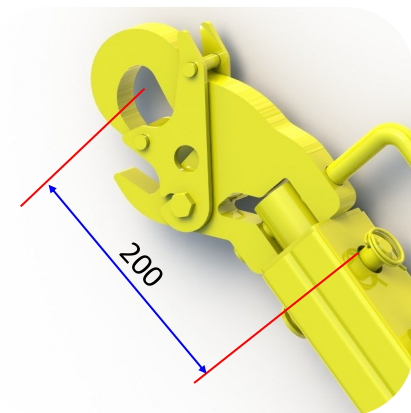
Ring on the stabilizer foot



Foot with automatic hook.



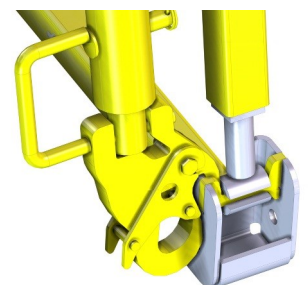
Standard head



Head with automatic hook

Notice : the rings on the stabilizer foot and the foot with automatic hook are positioned on the crutch foot during the panels manutention.

See chapter 34.40 Raising and manutention.



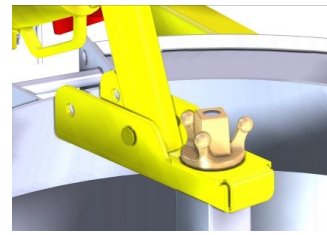
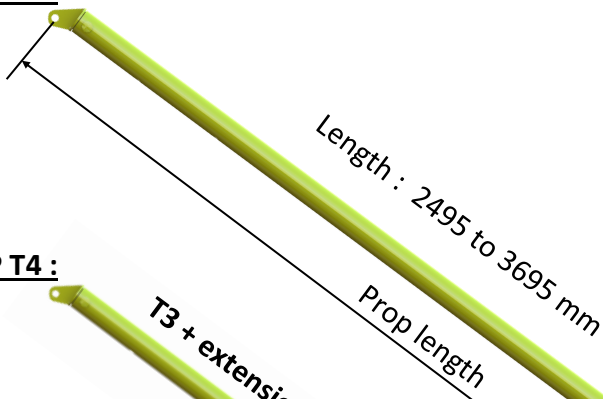
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STABILIZING PROPS

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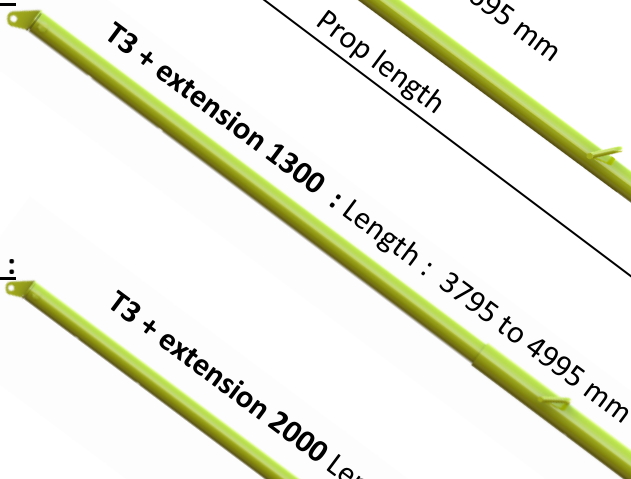


PROP T3 :



Fixing the props on the ballasts

PROP T4 :



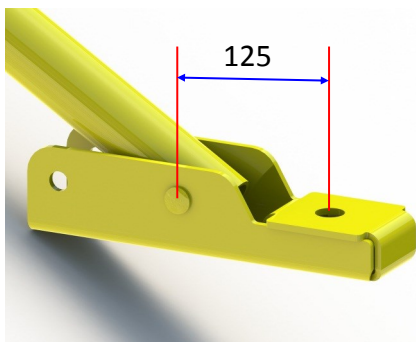
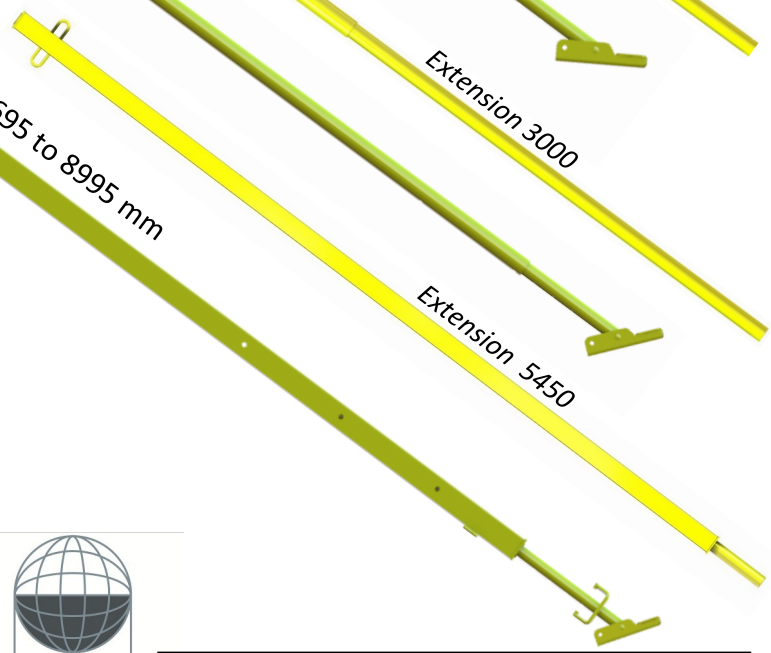
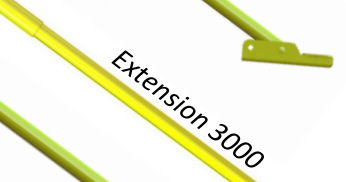
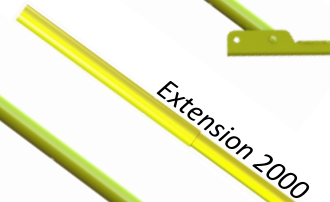
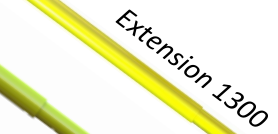
PROP T5 :



PROP T6 :



PROP T7 :



Anchoring support



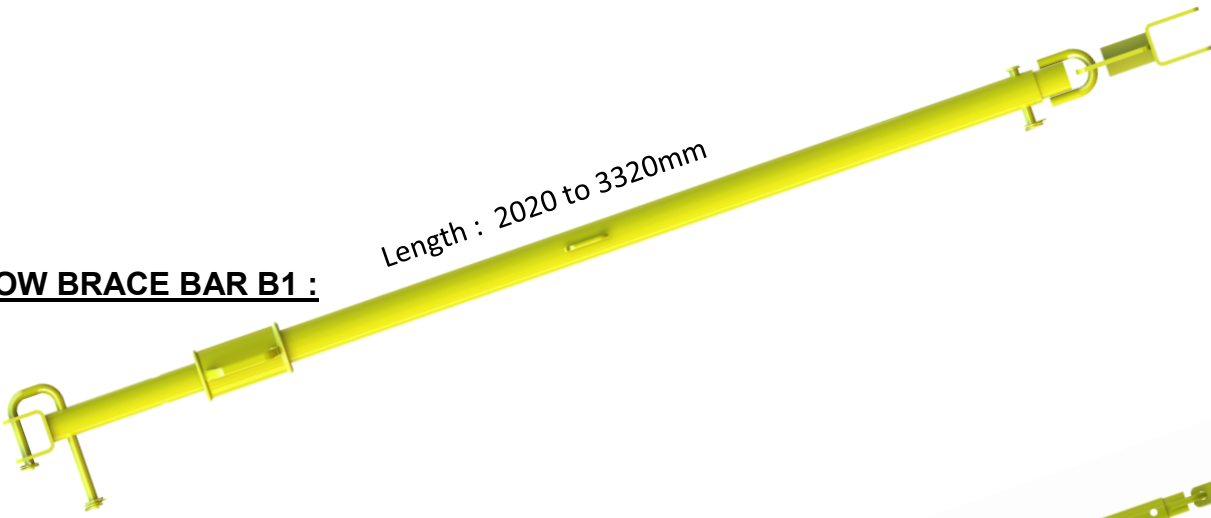
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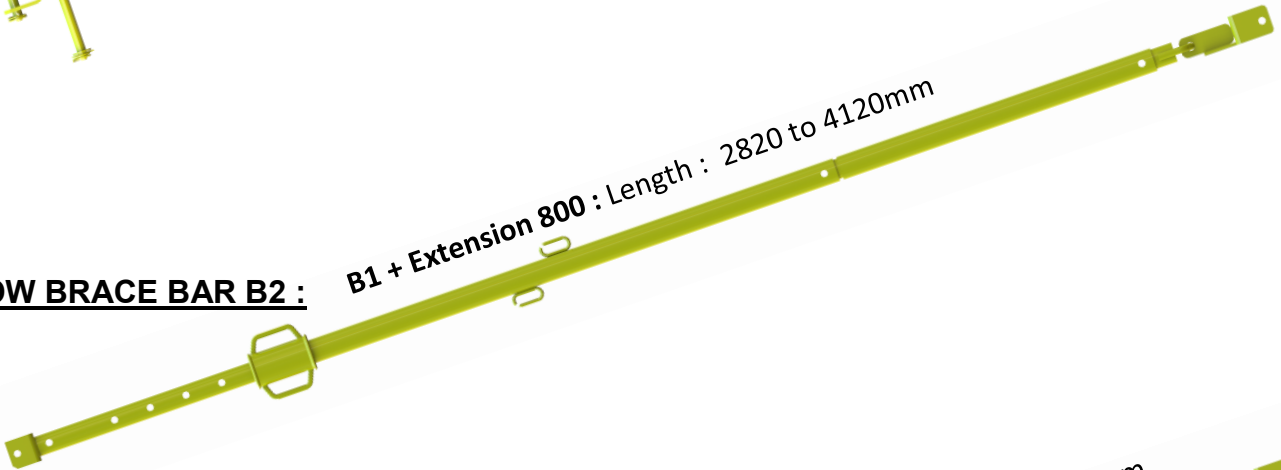
LOW BRACE BAR B1 :

Length : 2020 to 3320mm



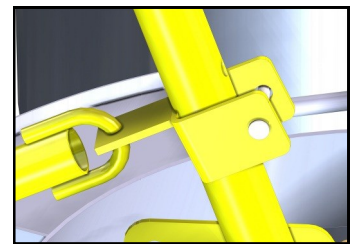
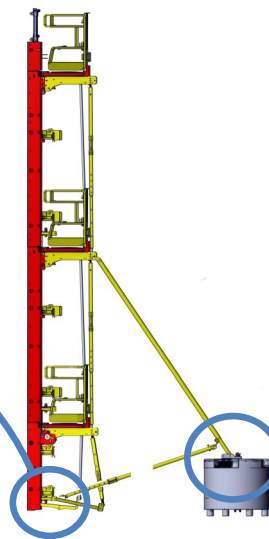
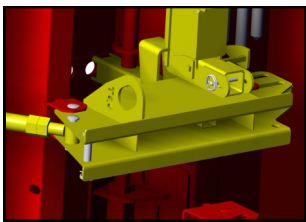
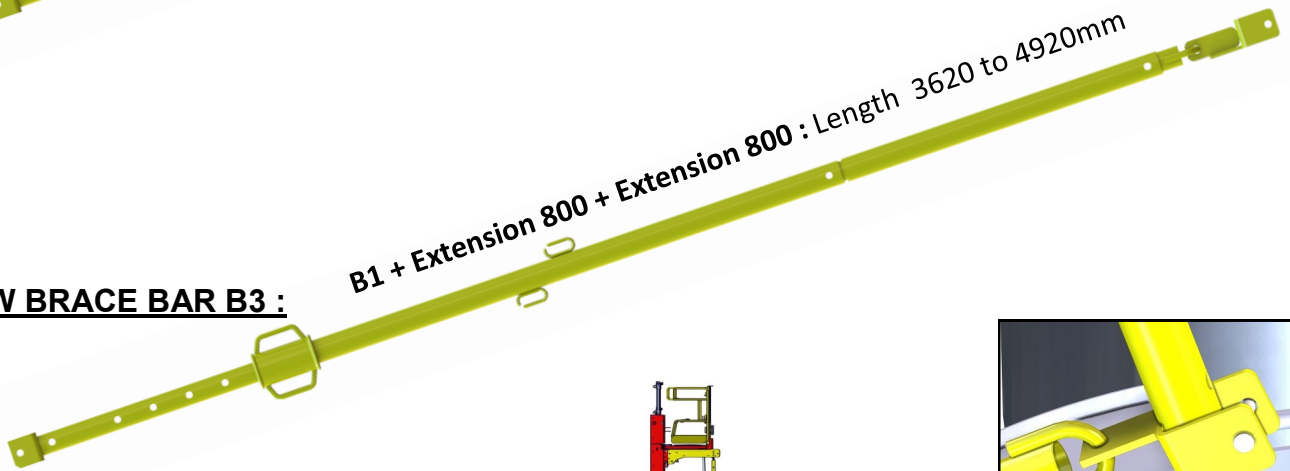
LOW BRACE BAR B2 :

B1 + Extension 800 : Length : 2820 to 4120mm



LOW BRACE BAR B3 :

B1 + Extension 800 + Extension 800 : Length 3620 to 4920mm

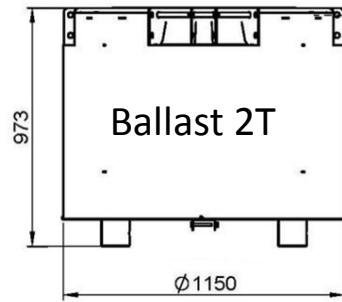
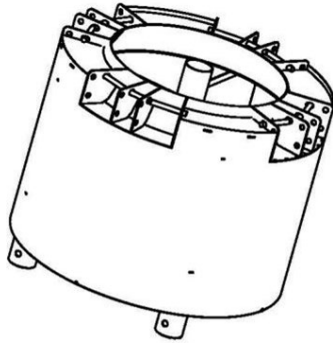
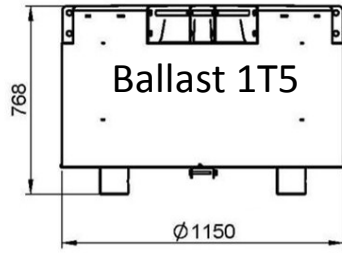
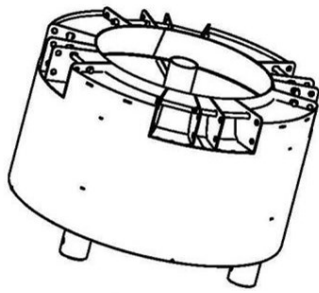


Ring to support the brace bar on the tie rods

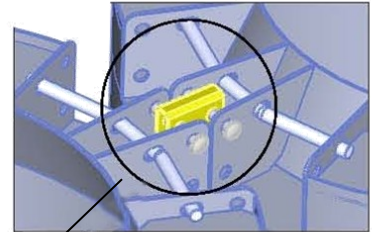


Ballasts

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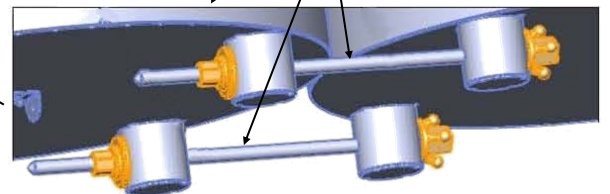


1 device for upper link

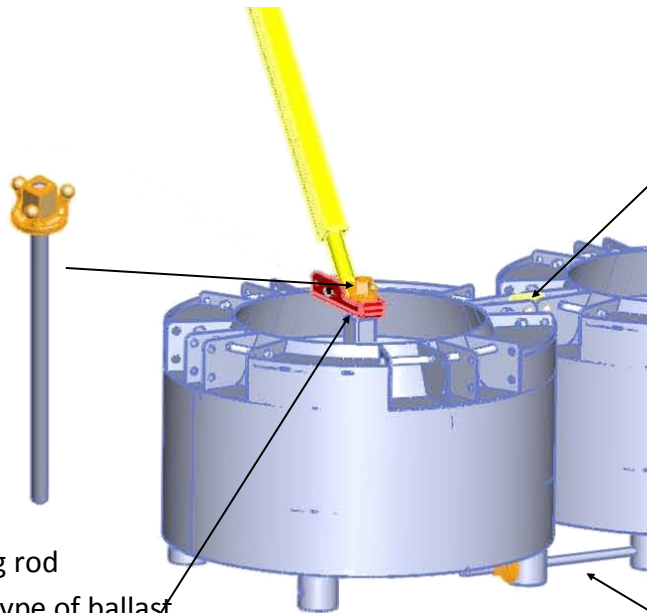


Ballasts junction kit

2 rods for low links

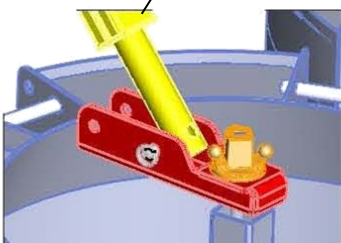


Fixing rod
Any type of ballast

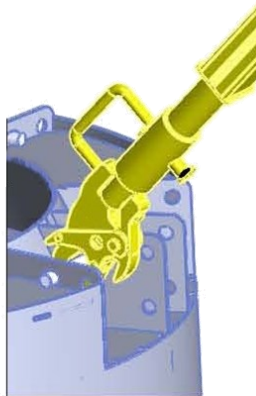


To store ballasts :
Ballast 1.5T : 4 maxi
Ballast 2T : 3 maxi

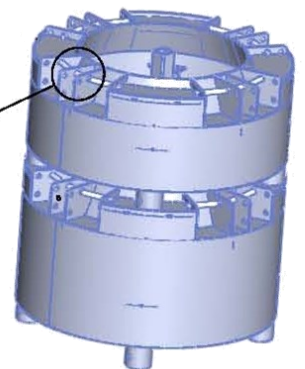
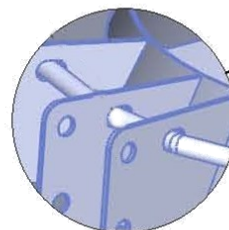
Manutention
on 4 points
Max. load 3T

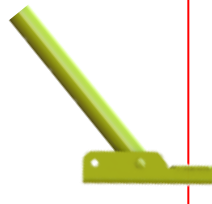
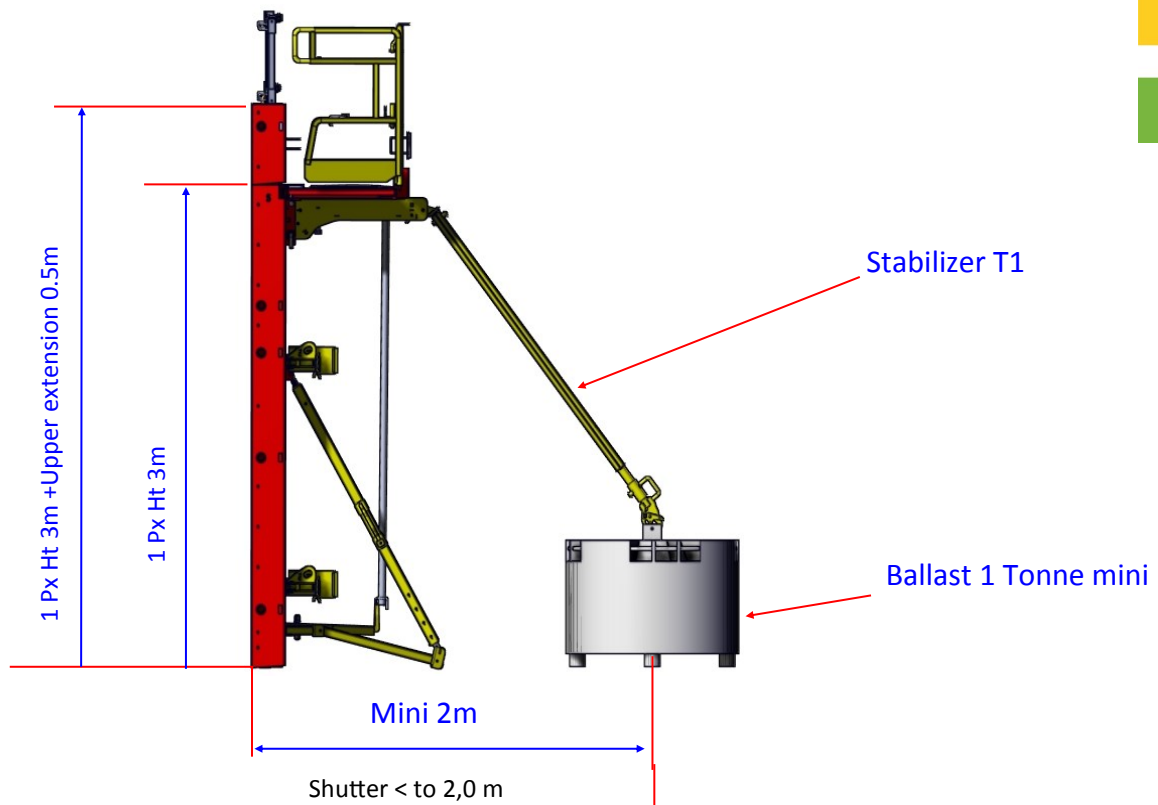


Anchoring support

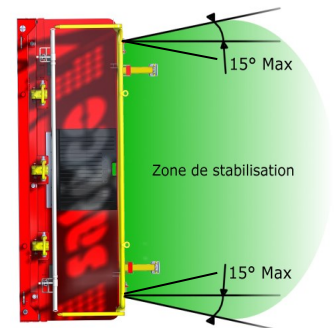


Stabilizer T1





Stabilization with anchoring system: T3



Equipments number	
Length of the panels set	Equipment number
1,2 to < 3,9 m	2
>3,9 to <5,7 m	3
>5,7 to 7,5 m	4

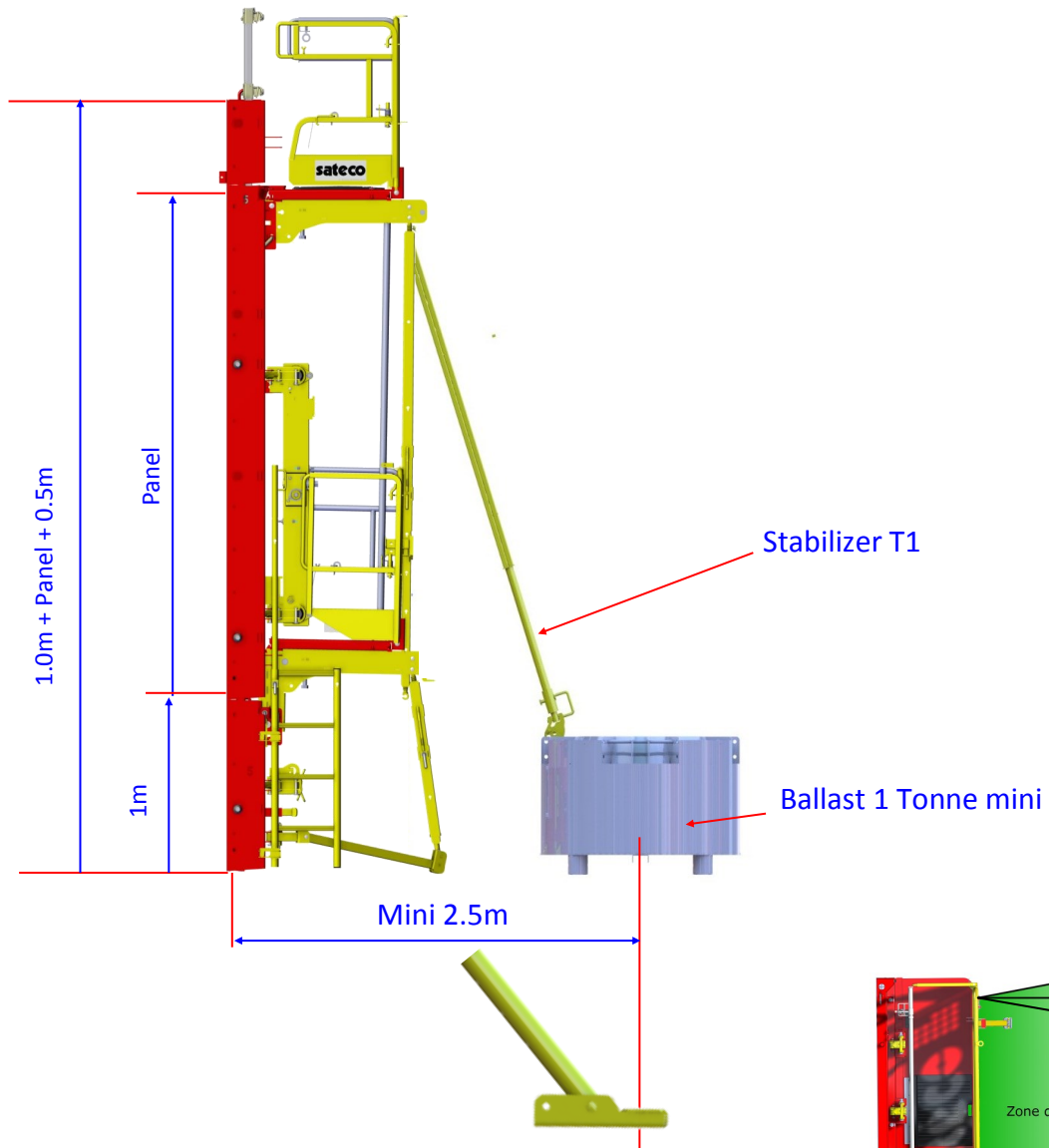


Applicable for wind conditions = 85Km/h



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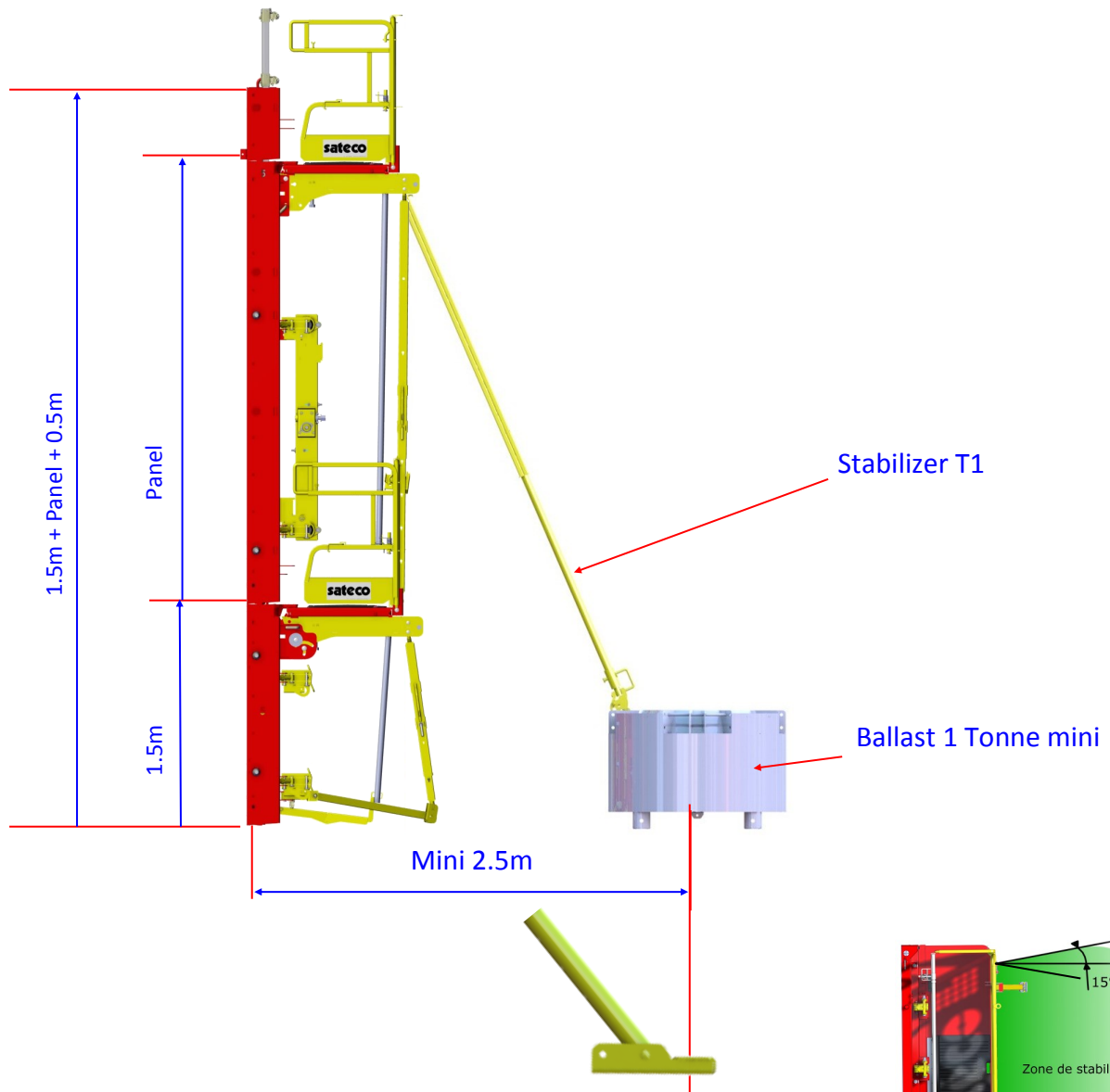
Stabilization with anchoring system: stabilizer T4

<u>Equipments number</u>	
Length of the panels set	Equipments number
1,2 to < 3,9 m	2
>3,9 to <5,7 m	3
>5,7 to 7,5 m	4



Applicable for wind conditions = 85Km/h





Stabilisation with anchoring system: stabilizer T4

<u>Equipments number</u>	
Length of the panels set	Equipments number
1,2 to < 3,9 m	2
>3,9 to <5,7 m	3
>5,7 to 7,5 m	4

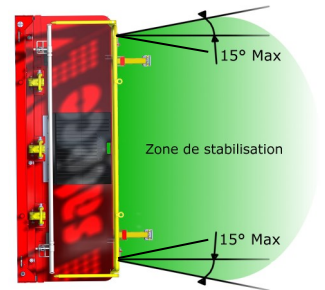
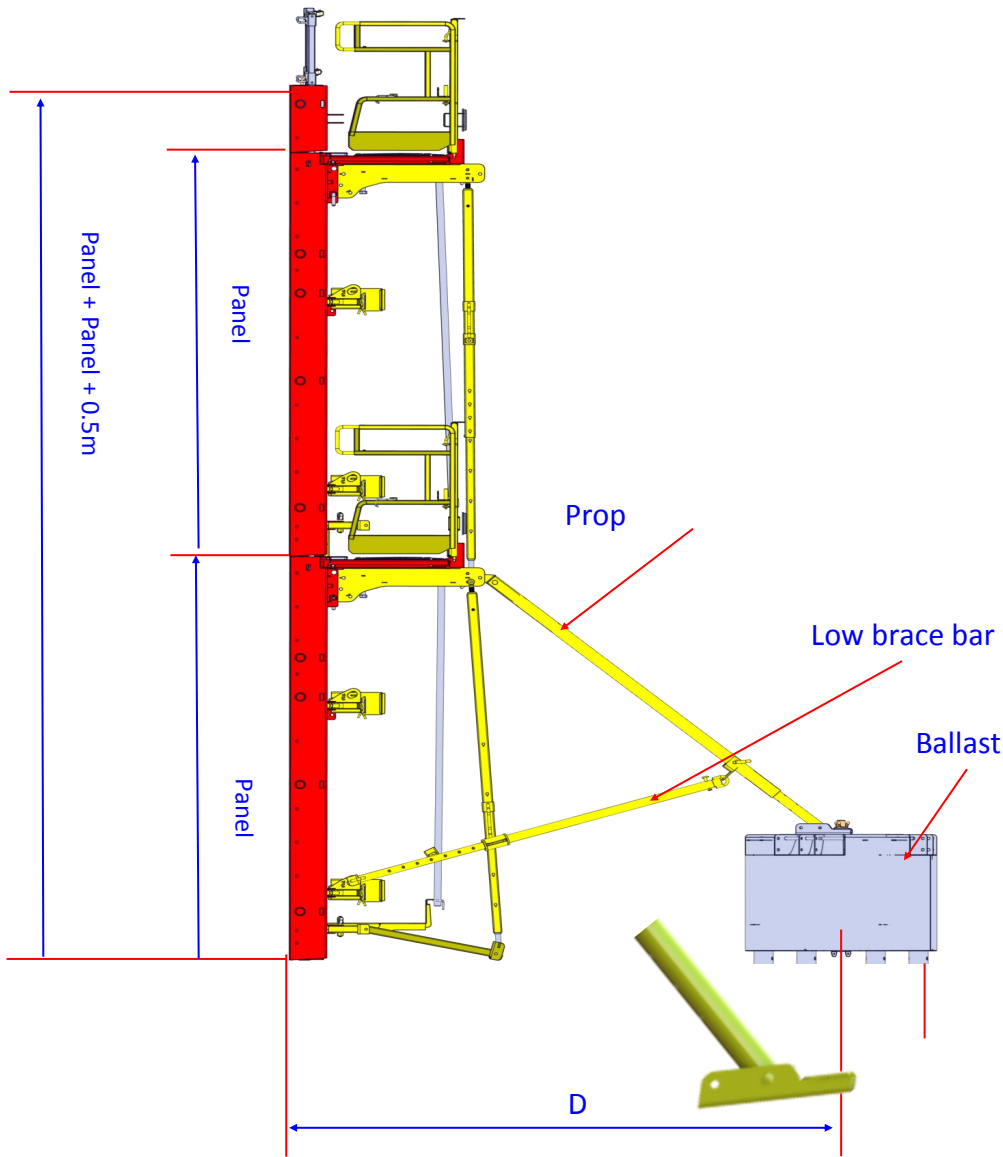


Applicable for wind conditions = 85Km/h



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Stabilization with anchoring system: stabilizer T3

Equipments layout

	1-2	3	4
Wind area	1-2	3	4
Wind speed	113km/h	126km/h	138km/h
Stabilizer	T3	T3	T3
Low brace bar	B1	B1	B1
Ballast weight	2 Tonnes	2 Tonnes	2 Tonnes
3000	2900	3000	3100

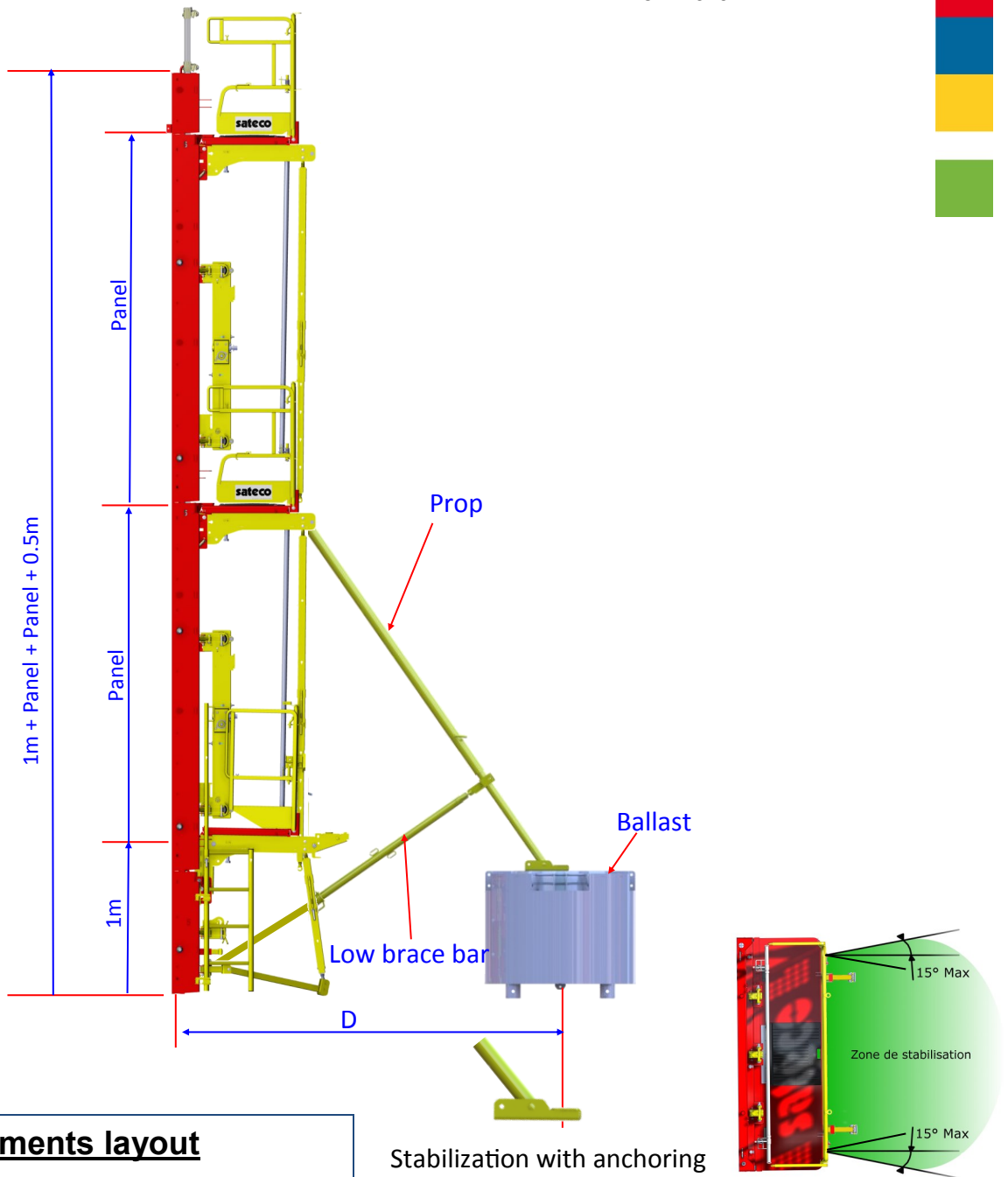
Equipments number

Length of the panels set	Equipments number
1,2 to < 3,9 m	2
>3,9 to <5,7 m	3
>5,7 to 7,5 m	4



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Equipments layout

Wind area	1-2	3		4
Wind speed	113km/h	126 km/h		138km/h
Stabilizer	T3	T3	T3	T3
Low brace bar	B1	B1	B1	B1
Ballast weight	2 Tonnes	2 Tonnes	3 Tonnes	3 Tonnes
D mini en mm	2700	3200	24	200

Stabilization with anchoring system: T4

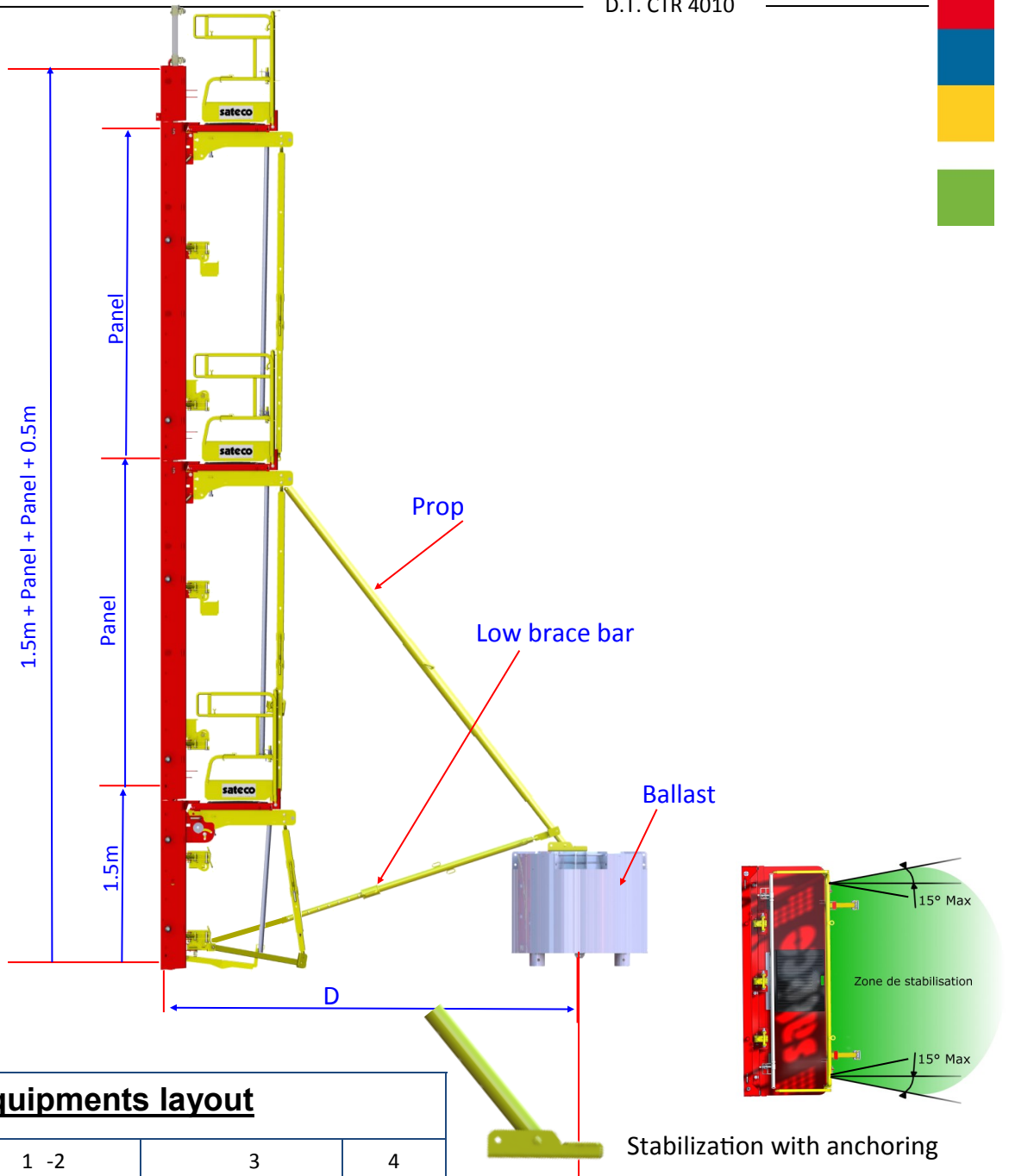
Equipments number

Length of the panels set	Equipments number
1,2 to < 3,9 m	2
>3,9 to <5,7 m	3
>5,7 to 7,5 m	4



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NOUS AVONS UN MONDE À BÂTIR



Equipments layout

Wind area	1 -2		3		4
Wind speed	113 Km/h		126 Km/h		138Km/h
Stabilizer	T4	T4	T4	T4	T4
Low brace bar	B1	B1	B2	B1	B1
Ballast weight	2 Tonnes	3 Tonnes	2 Tonnes	3 Tonnes	3 Tonnes
D mini en mm	3100	2400	3700	2400	3100

Stabilization with anchoring system: T4

Equipments number

Length of the panels set	Equipments number
1,2 to < 3,9 m	2
>3,9 to <5,7 m	3
>5,7 to 7,5 m	4



From height 08.00m, reinforcing the raising with U shape steel devices (height of the formwork) IS NECESSARY : Contact SATECO.



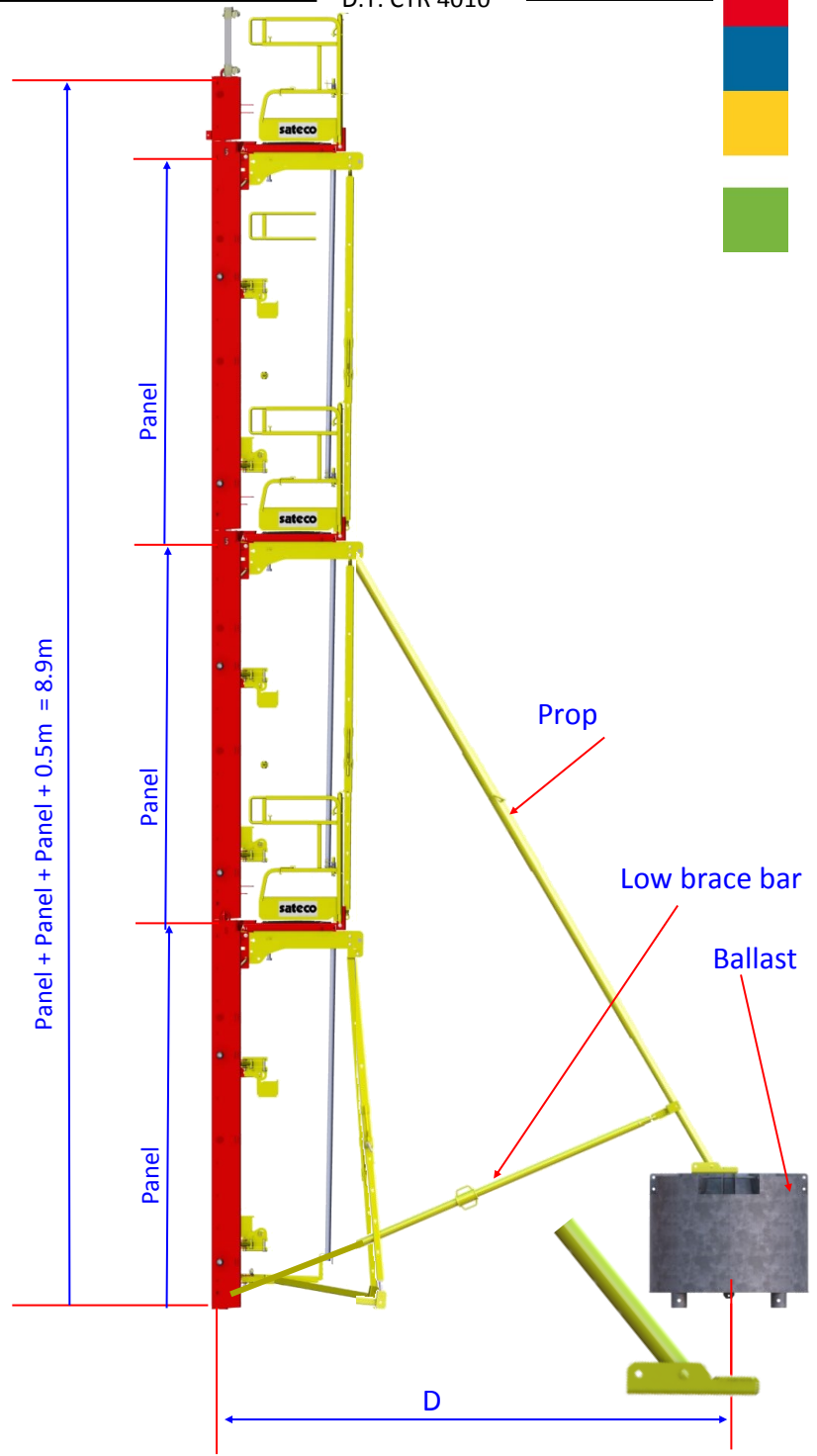
sateco

NOUS AVONS UN MONDE À BÂTIR



Equipments layout			
Wind area	1-2	3	4
Wind speed	113km/h	126Km/h	138Km/h
Stabilizer	T5	T5	T5
Low brace bar	B1	B2	B1
Ballast weight	2 Tonnes	2 Tonnes	3 Tonnes
D mini en mm	3000	3500	3000

Equipments number	
Length of the panels set	Equipments number
1,2 to < 3 m	2
>3 to <4,2 m	3
>4,2 to 5,4 m	4
>5,4 to <6,6 m	5
>6,6 to < 7,8 m	6



Stabilization with anchoring system: T6

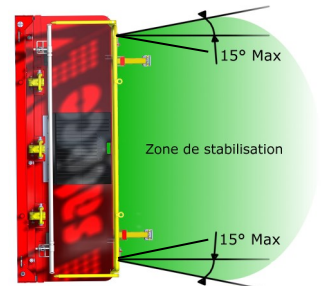


Formula to calculate the equipments number :

Number of equipments = (length of the panels set - 600) / 1200 rounded up to the nearest whole number



From height 08.00m, reinforcing the raising with U shape steel devices (height of the formwork) IS NECESSARY : Contact SATECO.





34.60 PROCEEDINGS





EQUIPMENTS

Following the Prevention Organisation, each of our shutters is equipped with working board with a hatch and access ladder, as well as full guard rails. A front counter railing must be installed to allow the access to the working board.

Ensure the operator safety : make sure there are guard rails and working board mainly at the junction and extremities (working board gates) of EACH panels.

The working board and the accesses must be clear of obstacles

Moreover, in order to ensure the safety of the operators, the user shall make sure that :

- The access to the working board is possible from inside the shutter, using the ladder and the hatch provided to this end,
- The hatch is kept closed and the working board cleared of obstacles,
- The end gates are shut and the front guard rails are set to prevent any risk of falling
- Bypass devices are proposed :
 - with corbelling working platforms

SATECO cannot be held responsible in case one of the safety equipment belonging to the shutter is being dismantled or not installed at all.





STABILITY

All and any shutter must be equipped with its wind stability system.

2 shutters facing each other and jointed with tightened tie rods may be stabilized on one face in condition that the stabilization instructions are fully respected.

Stabilization instructions must be strictly followed step by step by the worksite operators in order to avoid any stabilization problems.

It is reminded that, according to the recommendations R399 of the operators insurance organization (dated 2003, June 19th, it is the worksite team responsibility, in line with this present documentation :

- To predefine the stabilization used as well as the manner to use the formwork material in safety conditions (rotation, walking areas et position of the ballasts, quality and dimensions of the ground supports, storage areas...)
- Ensure that the rules determined during the work are respected, mainly regarding the stabilization of the shutters when being used and when being stored

SATECO cannot be held responsible in case the work operators use the material in different ways than the ones explained in this present document, and without prior validation.

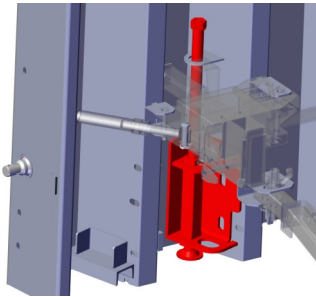
Once the shutters are stabilized, all the various operations on the shutter can be achieved in total safety.





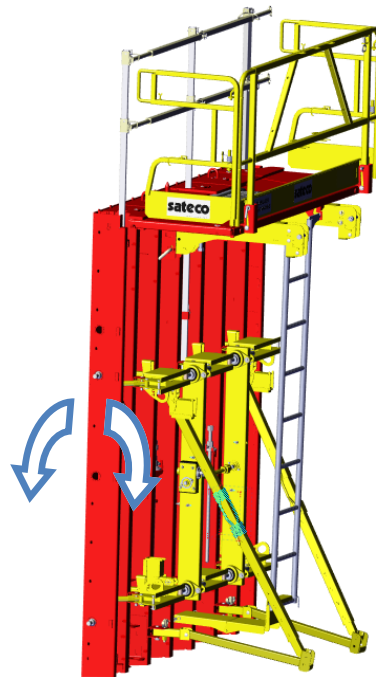
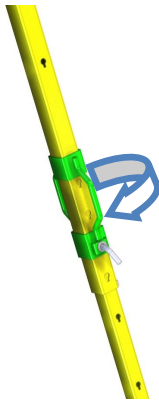
Adjustment of the verticality and the level

Screw jacks adjust the level.



7cm stroke

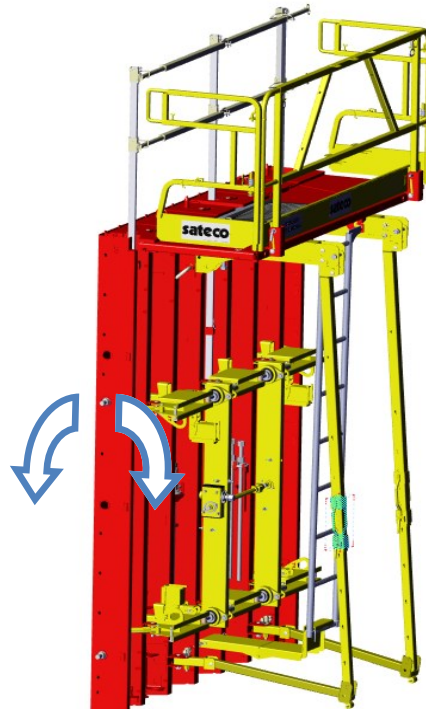
To adjust the verticality, turn the handle of the oblic crutch.



MIND THE POSITION OF THE CRUTCHES !!!



For simple height



For superposition



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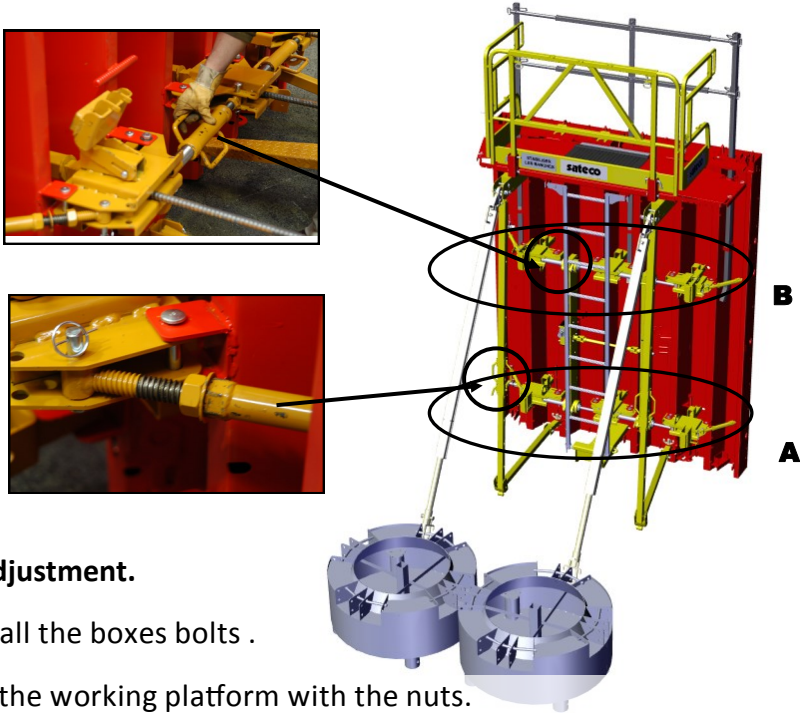
Before :

Check the bending template, the working board, check that the anti-tilt wedge is raised up and that the crutches are free.

A- Adjust with the low and upper central tighteners , do the same number of rotation alternately

B- Refine the radius with the 2 lateral tighteners at the same time.

Adjusting the lateral tighteners is done with a 36 flat spanner. They make it possible the perfect sticking of the formworking surface to the bending template.



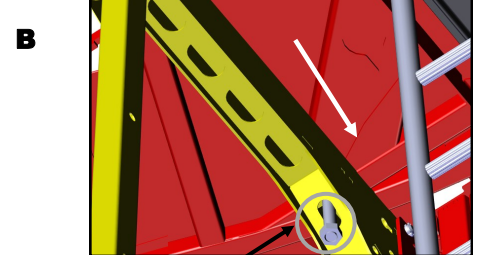
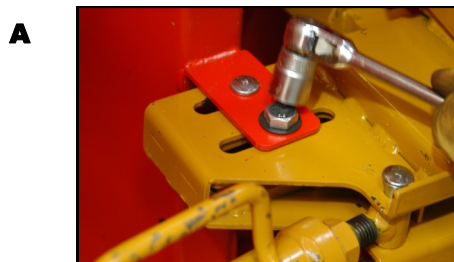
Lock the adjustment.

A- Tighten all the boxes bolts .

B- Tighten the working platform with the nuts.

C- Block the crutches nuts.

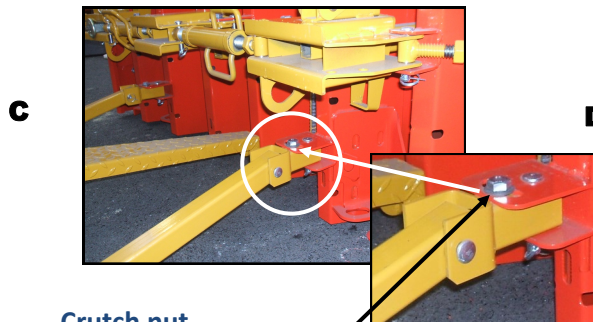
D- Block the anti-tilt formworking wedges after you made them do half a spin



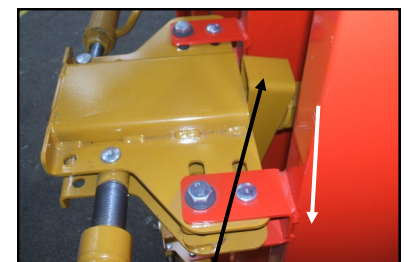
Blocking nut

Reminder:

Before any operation, clean the formworking surface with hot water, then apply right after a concrete release oil.



Crutch nut



Wedge

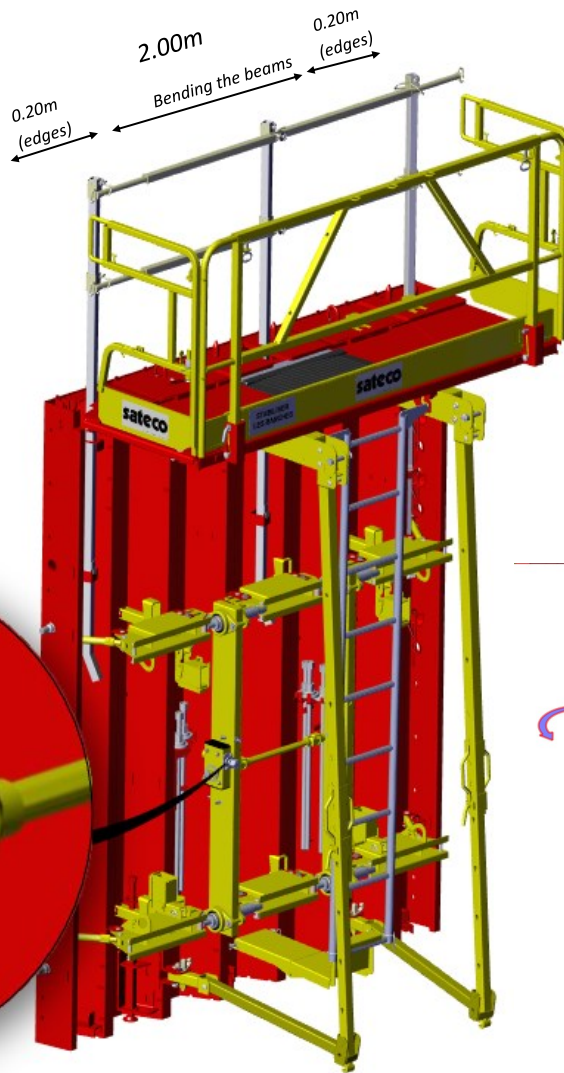
Central Bending kit

A– Before bending

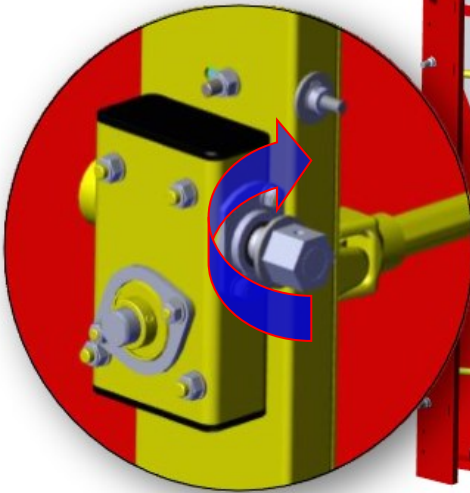
-> Check the bending template, the working board, check that the anti-tilt wedge is raised up and that the crutches are free.

B– Bending

Done with a standard 36 key or another adapted tool



1– Panels bending



2– Bending the edges



Reminder:

Before any operation, clean the formworking surface with hot water, then apply right after a concrete release oil.

- A) Min. radius = 2,0m
- B) Radius < 3,0m . Inner working board dismounted





GENERAL REMARKS:

- The additional panels catch up with the spaces between the tie rods way throught
- They are either inside or outside (depending on the radius or the wall thickness).



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<p>2</p>	<p>-ASSEMBLE WITH THE OTHER PANEL</p>	<p>-ASSEMBLE WITH THE OTHER PANEL</p>	<p>-ASSEMBLE WITH THE OTHER PANEL</p>	<p>-ASSEMBLE WITH THE OTHER PANEL</p>
<p>1</p>	<p>-ASSEMBLE WITH THE SCREWS FS 12x40</p>	<p>-ASSEMBLE WITH THE SCREWS H 12x50</p>	<p>-ASSEMBLE WITH THE SCREWS H 12x50</p>	<p>-ASSEMBLE THE ADDITIONAL PANEL ON THE RIGHT SIDE OF THE PANEL</p>
	<p>BLOCKING THICKNESS.10</p>	<p>BLOCKING THICKNESS.30</p>	<p>BLOCKING THICK..50</p>	<p>BLOCKING THICK.70-90 110-130</p>



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DIMENSION ADDITIONAL PANEL

2400 ==> OUTER PANEL
2300 ==> INNER PANEL

Page1

Value of additional panel (1)

D.T. CTR 4010

RADIUS	WALL THICKNESS															
	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300
1250	176	194	213	231	250	268	286	305	323	342	360	378	397	415	434	452
1300	165	183	201	218	236	254	272	289	307	325	342	360	378	395	413	431
1350	156	173	190	207	224	241	258	275	292	309	326	343	360	377	394	411
1400	146	163	179	196	212	229	245	261	278	294	311	327	344	360	376	393
1400	146	163	179	196	212	229	245	261	278	294	311	327	344	360	376	393
1500	130	145	161	176	191	207	222	237	253	268	283	299	314	329	345	360
1600	116	130	144	159	173	188	202	216	231	245	259	274	288	303	317	331
1700	103	116	130	144	157	171	184	198	211	225	238	252	265	279	292	306
1800	92	104	117	130	143	156	168	181	194	207	219	232	245	258	271	283
1900	82	94	106	118	130	142	154	166	178	191	203	215	227	239	251	263
2000	72	84	95	107	119	130	142	153	165	176	188	199	211	222	234	245
2100	64	75	86	97	108	119	130	141	152	163	174	185	196	207	218	229
2200	57	67	78	88	99	109	120	130	140	151	161	172	182	193	203	214
2300	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
2400	44	53	63	73	82	92	101	111	120	130	140	149	159	168	178	188
2500	38	47	56	66	75	84	93	102	112	121	130	139	148	158	167	176
2600	33	42	50	59	68	77	86	95	103	112	121	130	139	148	157	165
2700	28	36	45	53	62	70	79	87	96	104	113	121	130	139	147	156
2800	23	31	40	48	56	64	72	81	89	97	105	114	122	130	138	146
2900	19	27	35	43	51	59	67	74	82	90	98	106	114	122	130	138
3000	15	23	30	38	46	53	61	69	76	84	92	99	107	115	122	130
3100	11	19	26	34	41	48	56	63	71	78	85	93	100	108	115	123
3200	8	15	22	29	37	44	51	58	65	72	80	87	94	101	108	116
3300	5	12	18	25	32	39	46	53	60	67	74	81	88	95	102	109
3400	1	8	15	22	29	35	42	49	56	62	69	76	83	89	96	103
3500	1	5	12	18	25	31	38	45	51	58	64	71	77	84	91	97
3600	4	2	9	15	21	28	34	41	47	53	60	66	72	79	85	92
3700	7	1	6	12	18	24	31	37	43	49	55	62	68	74	80	86
3800	9	3	3	9	15	21	27	33	39	45	51	57	63	69	76	82



Blocking on the inner panels

Blocking on the outer panels

Blocking on the outer panels for special layout



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Value of additional panel (2)

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3900	12	6	0	6	12	18	24	30	36	42	47	53	59	65	71	77
4000	14	8	2	3	9	15	21	26	32	38	44	49	55	61	67	72
4100	16	10	5	1	7	12	18	23	29	35	40	46	51	57	63	68
4200	18	12	7	1	4	10	15	20	26	31	37	42	48	53	59	64
4300	20	14	9	4	2	7	12	18	23	28	34	39	44	50	55	60
4400	22	16	11	6	1	5	10	15	20	25	31	36	41	46	52	57
4500	23	18	13	8	3	2	7	12	18	23	28	33	38	43	48	53
4600	25	20	15	10	5	0	5	10	15	20	25	30	35	40	45	50
4700	27	22	17	12	7	2	3	8	13	17	22	27	32	37	42	47
4800	28	23	19	14	9	4	1	5	10	15	20	25	29	34	39	44
4900	30	25	20	16	11	6	1	3	8	13	17	22	27	31	36	41
5000	31	26	22	17	13	8	3	1	6	10	15	20	24	29	33	38
5200	34	29	25	20	16	12	7	3	2	6	11	15	19	24	28	33
5400	36	32	28	23	19	15	11	6	2	2	6	11	15	19	24	28
5600	38	34	30	26	22	18	14	10	6	1	3	7	11	15	19	23
5800	41	37	33	29	25	21	17	13	9	5	1	3	7	11	15	19
6000	42	39	35	31	27	23	19	16	12	8	4	0	4	7	11	15
6200	44	41	37	33	30	26	22	18	15	11	7	4	0	4	8	11
6400	46	42	39	35	32	28	25	21	17	14	10	7	3	1	4	8
6600	48	44	41	37	34	30	27	23	20	16	13	9	6	2	1	5
6800	49	46	43	39	36	32	29	26	22	19	15	12	9	5	2	1
7000	51	47	44	41	38	34	31	28	24	21	18	15	11	8	5	1
7200	52	49	46	43	39	36	33	30	27	23	20	17	14	11	7	4
7400	53	50	47	44	41	38	35	32	29	25	22	19	16	13	10	7
7600	55	52	49	46	43	39	36	33	30	27	24	21	18	15	12	9
7800	56	53	50	47	44	41	38	35	32	29	26	23	20	17	14	12
8000	57	54	51	48	45	43	40	37	34	31	28	25	22	20	17	14
8500	59	57	54	51	49	46	43	40	38	35	32	30	27	24	22	19
9000	62	59	57	54	51	49	46	44	41	39	36	34	31	28	26	23
9500	64	61	59	56	54	52	49	47	44	42	39	37	35	32	30	27
10000	65	63	61	59	56	54	52	49	47	45	43	40	38	36	33	31
10500	67	65	63	61	58	56	54	52	50	47	45	43	41	39	36	34
11000	69	67	64	62	60	58	56	54	52	50	48	46	44	41	39	37
12000	71	69	67	66	64	62	60	58	56	54	52	50	48	46	44	42
13000	73	72	70	68	66	65	63	61	59	58	56	54	52	50	49	47
14000	75	74	72	70	69	67	66	64	62	61	59	57	56	54	52	51

Blocking on the inner panels

Blocking on the outer panels

Blocking on the outer panels for special layout



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Value of additional panel (3)

D.T. CTR 4010


15000	77	75	74	72	71	69	68	66	65	63	62	60	59	57	56	54
16000	78	77	76	74	73	71	70	68	67	66	64	63	61	60	58	57
17000	80	78	77	76	74	73	72	70	69	68	66	65	63	62	61	59
18000	81	80	78	77	76	74	73	72	71	69	68	67	66	64	63	62
19000	82	81	79	78	77	76	75	73	72	71	70	69	67	66	65	64
20000	83	82	80	79	78	77	76	75	74	72	71	70	69	68	67	65
21000	84	82	81	80	79	78	77	76	75	74	73	72	70	69	68	67
22000	84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69
24000	86	85	84	83	82	81	80	79	78	77	76	75	74	73	72	71
26000	87	86	85	84	83	82	81	81	80	79	78	77	76	75	74	73
28000	88	87	86	85	84	84	83	82	81	80	79	79	78	77	76	75
30000	89	88	87	86	85	85	84	83	82	82	81	80	79	79	78	77
35000	90	89	89	88	88	87	86	86	85	84	84	83	82	82	81	80
40000	91	91	90	90	89	88	88	87	87	86	86	85	84	84	83	83
45000	92	92	91	91	90	90	89	89	88	88	87	87	86	86	85	85
50000	93	93	92	92	91	91	90	90	89	89	89	88	88	87	87	86
60000	94	94	93	93	93	92	92	92	91	91	90	90	90	89	89	89
70000	95	95	94	94	94	93	93	93	92	92	92	91	91	91	90	90
80000	96	95	95	95	95	94	94	94	93	93	93	93	92	92	92	91
100000	97	96	96	96	96	95	95	95	95	94	94	94	94	94	93	93
200000	98	98	98	98	98	98	98	97	97	97	97	97	97	97	97	97
300000	99	99	99	99	99	98	98	98	98	98	98	98	98	98	98	98



NOUS AVONS UN MONDE À BÂTIR



 Blocking on the inner panels

 Blocking on the outer panels

 Blocking on the outer panels for special layout



34.70 INSTRUCTIONS TO CAST CONCRETE



A - THE USER AND THE FORMWORK**Get to know the construction to be achieved, in accordance with the chosen formwork.**

You will find in the table hereunder the features of the facings flatness mentioned above :

Facings	General flatness reported with a 2 meters ruler	Precise flatness – not including joints – reported with a 0.20m ruler
Basic	No special specification	No special specification
Ordinary	15 mm	6 mm
Modern	7 mm	2 mm
Neat	5 mm	2 mm





Général precautions for any type of formwork

Storage :

- Never store the formworking surface directly on the floor
- Choose a protection agent adapted to the storage period

When using any type of formwork :

- Rods tightening (30dNm maxi);
- Sealing between the formworking elements;
- Adjustment and vertical alignment ;
- Choice of spacers and positioners.

Type of formworking surface

Steel :

Cleaning brand new surfaces :

Degrease the steel surface, operation carried out by the manufacturer or the customer equipment-department, dry if necessary, then lay a mould-release agent to avoid the oxydation whaever the-type of steel.

Cleaning surfaces rodées :

If you notice, at the arrival on the worksite, rust stains and following the oxydation degree, treat as following :

- If the stains are light, rub them with a cloth soaked with a mould-release agent ;
- With rust transformer (phosphating treatment) ;
- Rinse ;
- Lay a corrosion inhibitor;
- Dry ;
- Lay a mould release agent ;

Sanding ;

- Clean ;
- Lay a mould release agent ;

Cleaning during the formworking phases :

- Right after formwork removal, remove all concrete marks with a neat squeegee adapted to the shutter height.
- If necessary use an individual wheelplatform or a scaffolding.
- Lay a mould release agent as described in the following chapter.



B - THE USER AND THE MOULD REMOVAL AGENTS



Before any operation, make sure that the formworking surface is clean and dry.

If it rained, remove the water excess.

General remarks :

The mould removal agent is layed between the concrete and the formworking surface.

It aims at :

- Making easier the formwork removal;
- Protecting formworking surfaces (mainly those in steel) from corrosion and acid oils ;
- Stopping the adhesion on the formworking surface during the concrete casting and the vibration.

Choosing the mould removal agent is important to obtain a high quality concrete wall and to avoid concrete residues on the formworking surface.

Laying the moul removal agent is like « painting » : uniform layer, without drops. Operation done with a sprayer or an adapted nozzle.

Remove the excess product if necessary.

According the product viscosity, the covering power is from 20 to 40 m² per litre. See the manufacturer instructions.



- *Mould removal agents have an efficiency specific time depending on the manufacturer and the product nature.*
- *Casting the concrete too early after the layer can prevent the remover evaporation.*
- *Mould removal agents may be inefficient if the operators wait many days before concrete casting, the formworking surface is not protected anymore. The protection against corrosion is not ensured anylonger.*
- *Do not mix different types of mould removal agents.*

Operators must wear adapted gloves, masks, glasses, clothes to protect themselves from any possible removal products agressions.



C - THE OPERATOR AND THE CONCRETE



Get to know about the concrete used on the worksite :

Concretes are defined by the DTU 21 (NF P18-201 de Mars 2004) and the French standards EN 206-1.

Mixing the concrete:

An excess of water may affect the concrete resistance, it leads to aggregates separation with fragments appearance and washes the gravels that are no more coated.

Respect mixing time.

Limit the waiting time of concrete mixer.

Proceeding with the concrete :

Check the concrete texture : do the spreading measure with the Abraham cone, on the worksite or anytime you think there is a doubt.

Adding water is forbidden.



Gravity casting :

- The casting speed must be as constant as possible, in accordance with the formworks resistance pressure and the concrete hardening step ;
- Limit the drop height to 80 cm ;
- Include horizontal layers ≤ 30 cm height ;
- Check the reinforcements structures are being properly coated ;
- Do not operate when its rains heavily (water excess, aggregates being washed, fragments appearing) ;
- To cast the self-compacting concrete, always let the hose submerged ;
- Spread evenly in the formwork (do not spread with the vibrator) ;
- Spread evenly the concrete everywhere it has to be.

For the SCC, use flat and very flexible hoses. The concrete pressure increases in the hose and the concrete comes out loose from the hose.

Pumping casting :

Pumping casting is a continuous and homogeneous way to cast concret.

Always use a rigid hose in order to limit the height of the concrete fall on the frames.

The end of the rigid hose must always be dived to ensure a constant casting. It will be pulled up at the time as the concrete raises in the formworks.

Caution : pressure on the formworks may rise since the climbing speed of the concrete is higher by pumping casting than casting with a bucket.

Effects of outdoor temperature:

The weather conditions change the formworks removal requirements. There must be a partnership between the operator, the concrete manufacturer, the formwork manufacturer and the mould release agents provider.



D - THE OPERATOR AND THE VIBRATION

Inner vibration :

Choosing the vibrator :

It depends on the nature and the mass of the concrete, the reinforcement density.

Protect the vibrator head in order to avoid damage on the formwork surface.

Operating instructions :

A vibration excess may cause different problems such as :

- Separation of the aggregates ;
- Higher pressure on the formworks ;
- Poor quality wall.

Vibrate by moving the vibrator head, by horizontal layers of 50cm.

The vibrator must be dived quickly and pulled out slowly.

Stop the vibration as soon as :

- The concrete has stopped settling ;
- The emission of air bubbles stops (too much vibration may lead to air renewal that will provoke the aggregates separation) ;
- Laitance starts appearing on the surface (shiny aspect of the surface) ;
- The vibrator noise stabilizes.

Outer vibration :

For the vertical formworks, it is studied deeply in accordance with the nature of the formwork (wood or steel surface).

This study will determine the place of the vibrators, the frequency and the vibration duration.

The formworks frame are specially equipped accordingly (reinforcements added)

Nota : self-compacting concrete shall never be vibrated.





E - FORMWORKING OPERATION

Cleaning, oiling, proceeding, adjusting, locking and blocking.

Before proceeding, check the shutter and its accessories are in good conditions, mainly the adjustment and stabilization pieces.

Clear the working area of any obstacles.

Clean the formworking surface of the shutter.

Removing the shutter will be done easily if this one was properly cleaned and coated with mould removal oil.

You can start operating on a vertical shutter **ONLY WHEN** you are sure it is stabilized.

Use the concrete buckets that fit in the space left available by the working boards guard rails.

Using a chute will help avoiding concrete loss, stains on the shutters and shutters being overburdened.

F - REMOVING THE FORMWORK

Tightening the tie rods must be done evenly with the formworking spanner without extension.

The maximum tightening effort accepted is 2T5, thus to avoid irreversible distortion of the formworking surface and the spacing cones.

Do not remove the formwork hastily.

Remove the shutter from the wall using the adjustment jacks. You can also use hand levers.

Never use the crane for the removal .

Before moving the shutters, make sure that the working boards are cleared with objects likely to fall.

The rods must be stored in their respective places. All the concrete wastes must be removed.

Check that there is no link whatsoever between the shutter and the floor or the walls.





Maximum concrete casting speed (M/H)

		Concrete temperature (°C)			
		5	10	15	20
Slump (mm)	50	2.7	3.4	4.5	6.8
	75	2.4	2.9	3.6	4.9
	100	2.1	2.5	3	3.9
	125	1.9	2.2	2.6	3.2
	150	1.7	1.9	2.3	2.7
	200	1.4	1.6	1.8	2.1

Casting speed for a concrete pressure of 10T/sqm

Maximum concrete pressure : 10T/sqm

Maximum height of fresh concrete : 5.5m

If the concrete height is < 5.5m: unlimited casting speed

Important Instructions :

- 1/ Caution: casting speed must not be exceeded
- 2/ Tighten the tie rods with the spanner without using the hand lever (30dNm maxi)
- 3/ The concrete is cast by 60cm high layer
- 4/ The vibration must be even.

$$\text{Casting time (h)} = \frac{\text{shutter height (m)}}{\text{speed (m/h)}}$$



A	t°		Vt								
			1	1.5	2	2.5	3	4	5	6	7
50	5	Pr	4	6	8	9.5	11	13.5	15.5	17.5	19.5
		H	2	3	4	5	6	8	10	12	14
	10	Pr	3.5	5	6.5	8	9	11.5	13.5	15	17
		H	1.5	2.5	3	4	5	6.5	8	9.5	11
	15	Pr	2.5	4	5	6	7	9	11	12.5	14
		H	1	2	2.5	3	3.5	5	6	7	8.5
	20	Pr	2	2.5	3.5	4	5	6.5	8	9	10
		H	1	1	1.5	2	2.5	3	4	5	5.5
75	5	Pr	5	7	8.5	10.5	12	15	17	19	21
		H	2.5	3.5	4.5	5.5	7	9	11.5	14	16
	10	Pr	4	6	7.5	9	10.5	13	15	17	18.5
		H	2	3	4	4.5	5.5	7.5	9.5	11.5	13.5
	15	Pr	3	4.5	6	7.5	8.5	11	13	14.5	16
		H	1.5	2.5	3	3.5	4.5	6	7.5	9	10.5
	20	Pr	2.5	3.5	4.5	5.5	6.5	8.5	10	11.5	13
		H	1	1.5	2	2.5	3.5	4.5	5.5	6.5	7.5
100	5	Pr	5.5	7.5	9.5	11.5	13	16	18.5	20.5	22
		H	2.5	4	5	6.5	8	10.5	13	15.5	18
	10	Pr	4.5	6.5	8.5	10	11.5	14.5	16.5	18.5	20.5
		H	2	3.5	4.5	5.5	6.5	9	11	13	15.5
	15	Pr	4	5.5	7	8.5	10	12.5	14.5	16.5	18
		H	2	2.5	3.5	4.5	5.5	7	9	11	12.5
	20	Pr	3	4.5	5.5	7	8	10	12	14	15.5
		H	1.5	2	3	3.5	4	5.5	7	8.5	10

Casting speed for a concrete pressure of 10T/sqm

Maximum concrete pressure : 10T/sqm

Maximum height of fresh concrete : 5.5m

If the concrete height is < 5.5m: unlimited casting speed

Important Instructions :

- 1/ Caution: casting speed must not be exceeded
- 2/ Tighten the tie rods with the spanner without using the hand lever (30dNm maxi)
- 3/ The concrete is cast by 60cm high layer
- 4/ The vibration must be even.

$$\text{Casting time (h)} = \frac{\text{shutter height (m)}}{\text{speed (m/h)}}$$



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A	t°		Vt								
			1	1.5	2	2.5	3	4	5	6	7
125	5	Pr	6	8.5	10.5	12.5	14	17	19.5	21.5	23.5
		H	3	4.5	6	7	9	11.5	14.5	17.5	20.5
	10	Pr	5	7.5	9.5	11	13	15.5	18	20	21.5
		H	2.5	3.5	5	6	7.5	10	12.5	15	17.5
	15	Pr	4.5	6.5	8	9.5	11	14	16	18	20
		H	2	3	4	5	6.5	8.5	10.5	12.5	14.5
20	Pr	3.5	5	7	8	9.5	12	14	16	17.5	
	H	1.5	2.5	3.5	4	5	7	8.5	10	12	
150	5	Pr	6.5	9	11.5	13.5	15	18.5	20.5	22.5	24.5
		H	3	5	6.5	8	9.5	13	16	19	22.5
	10	Pr	5.5	8	10	12	14	17	19.5	21.5	23
		H	3	4	5.5	7	8.5	11	14	17	19.5
	15	Pr	5	7	9	11	12.5	15	17.5	19.5	21.5
		H	2.5	3.5	5	6	7	9.5	12	14.5	17
20	Pr	4	6	8	9.5	11	13.5	15.5	17.5	19.5	
	H	2	3	4	5	6	8	10	12	14	
200 à 300	5	Pr	7.5	10.5	13	15	17	20	22.5	24.5	26
		H	4	6	7.5	9.5	11.5	15	19	23	26.5
	10	Pr	7	9.5	12	14	16	19	21.5	23.5	25
		H	3.5	5	7	8.5	10	13.5	17	20.5	24
	15	Pr	6	8.5	11	13	14.5	17.5	20	22	23.5
		H	3	4.5	6	7.5	9	12	15	18	21
20	Pr	5.5	7.5	9.5	11.5	13	16	18.5	20.5	22	
	H	2.5	4	5	6.5	8	10.5	13	15.5	18	

Casting speed for a concrete pressure of 10T/sqm

Maximum concrete pressure : 10T/sqm

Maximum height of fresh concrete : 5.5m

If the concrete height is < 5.5m: unlimited casting speed

Important Instructions :

- 1/ Caution: casting speed must not be exceeded
- 2/ Tighten the tie rods with the spanner without using the hand lever (30dNm maxi)
- 3/ The concrete is cast by 60cm high layer
- 4/ The vibration must be even.

$$\text{Casting time (h)} = \frac{\text{shutter height (m)}}{\text{speed (m/h)}}$$



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FORMWORK WITH SELF COMPACTING CONCRETE



Use of brand new tie rods and nuts :

Write casting instructions for the heights $\geq 6.0\text{m}$ (contact SATECO).

These instructions should indicate the maximum efforts and the casting speed authorized.

To check the efforts on the tie rods, a load cell is necessary.

The load cell must not be installed in an area without concrete.

If the effort is exceeded : the casting must be stopped because the height of fresh concrete exceeds the maximum authorized.



SCC FEATURES

The self-compacting concrete (SCC) are fluid concrete, that settle without vibrations.

Precautions to use the SCC

The SCC features and its fluidity require special precautions to be respected during the proceedings.

- Special preparation and organization of the worksite (change of habits—evolution of the traditional methods of construction): material—staff—use of a crane - timing— appropriate settlement of the frames and compartments.
- Use of clean, waterproof and stronger formworks to compensate with the hydrostatic efforts of the latter.
- Use of high quality mould removal agents to avoid micro-oxygenation issues

As for any kind of concrete, different formwork removal times may cause different wall shades.





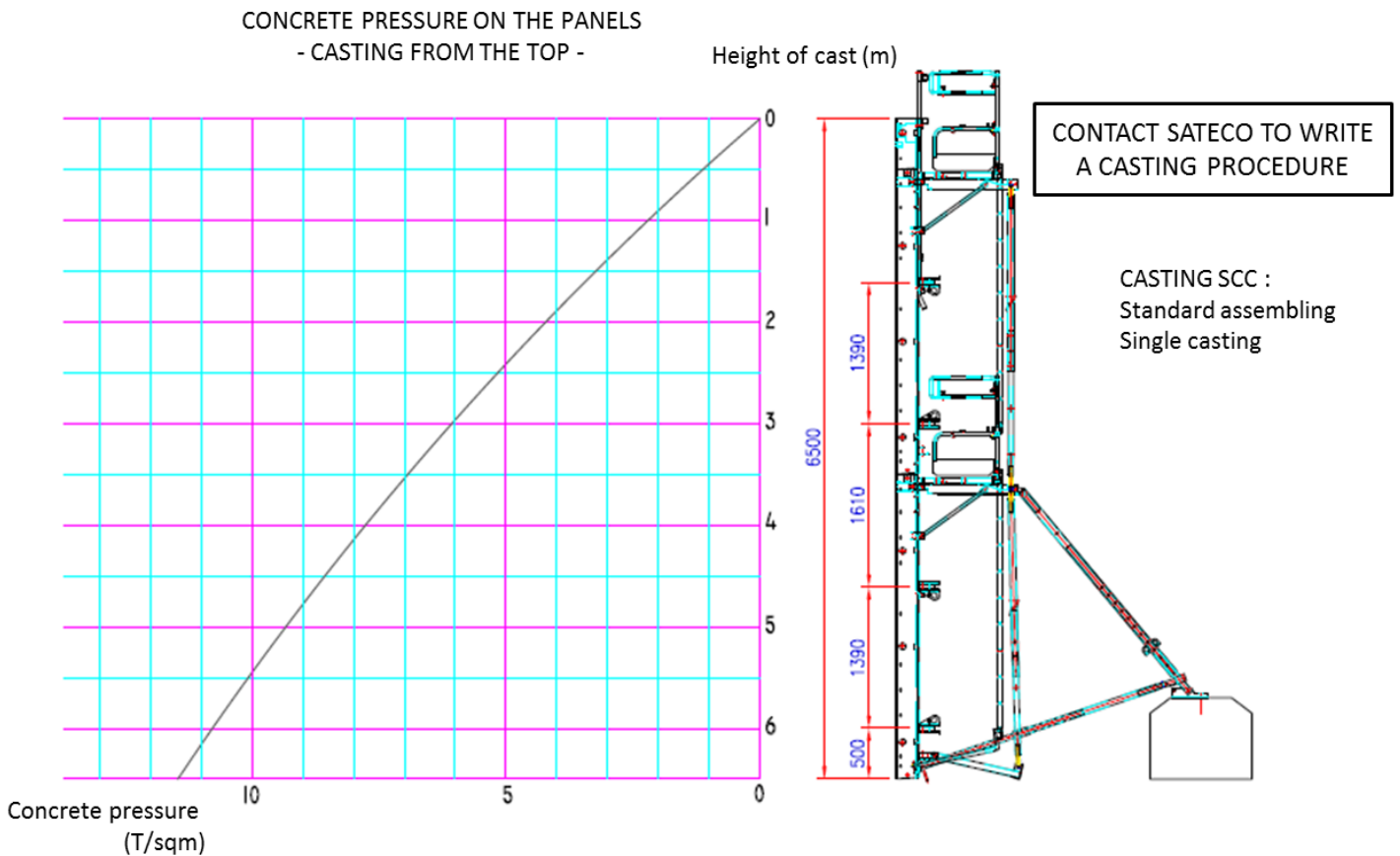
Checking the SCC

The fluidity of the SCC can be determined by the spreading measure with Abraham cone (spreading trial or sum flow).

The aim searched is from de 600 to 750 mm, this is the average spreading recommended for a SCC.

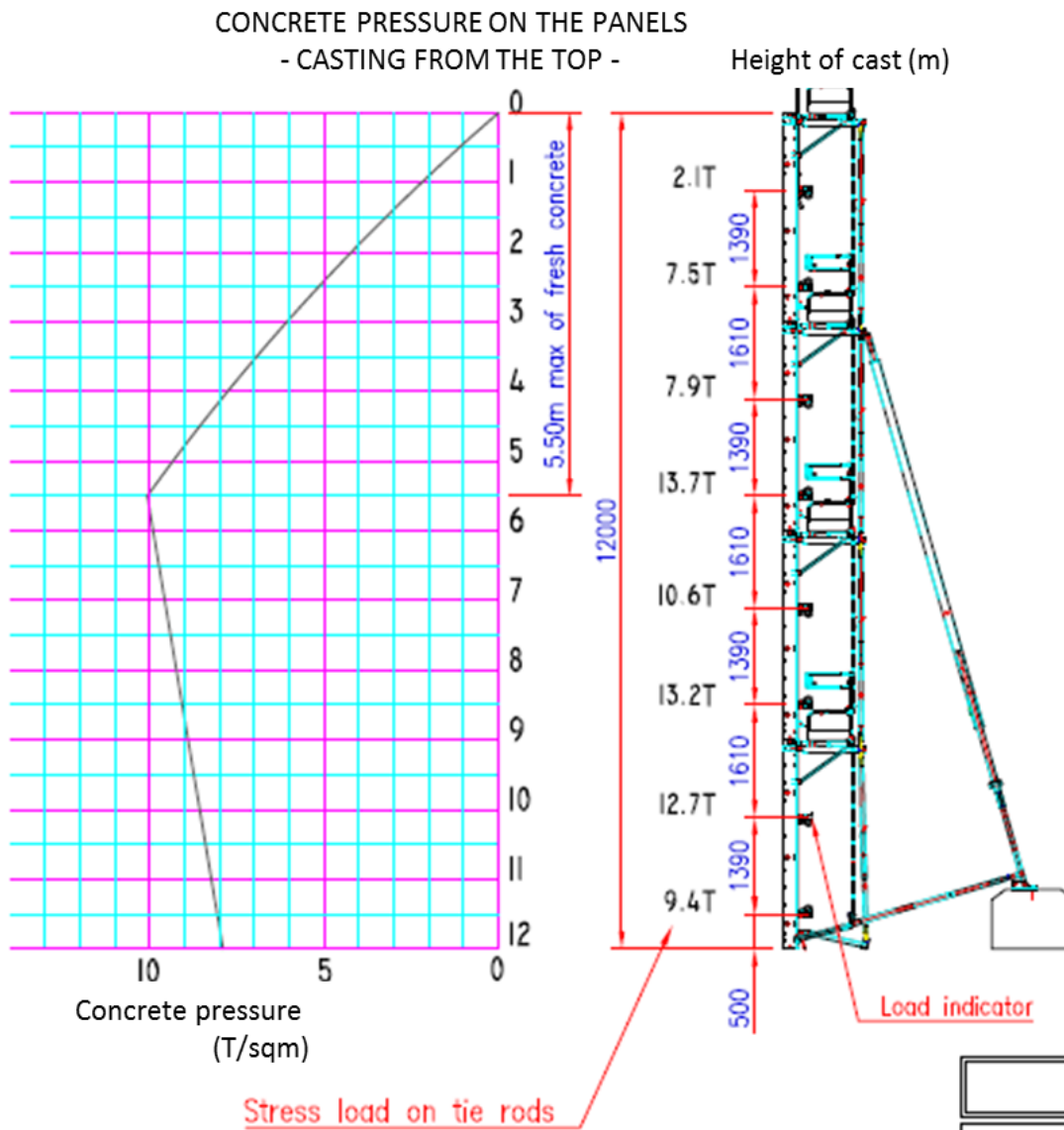
With this trial, it is possible to check the concrete fluidity when delivered on a worksite.

Curve of the SCC pressure



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Maximum concrete pressure : 10T/sqm
Maximum height of the fresh concrete : 5.5m
Setting time to be determined with the concrete provider

We recommend to set on the most requested tie rod on the first panel (intermediary tie rod), a universal load cell. The cell load shall not exceed 12.7 tonnes on this tie rod.

If the effort exceeds 12.7 tonnes, the casting must be slowed down or stopped because the concrete setting time has been underestimated.

The load cell must not be installed in an area without concrete: the efforts above correspond to a continuous pressure on the whole surface supported by the given tie rod.



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CONCRETE SETTING TIME

Concrete setting time is the time required from the casting start in order not to exceed a fresh concrete height of 5.5m in the formwork

This setting time must be confirmed by the the supplier in accordance with different parameters:

- nature of the concrete
- fluidity
- temperature.

The site manager must be informed about this time.

CALCULATIONS :

Hb : max height of fresh concrete
 Hc : total casting height
 TPb : concrete setting time
 Vc : casting speed

$$Vc = \frac{Hb}{Tp}$$

$$Tc = \frac{Hc}{Vc}$$

Tt : transport time

Ta : waiting time before casting

TPc : casting setting time

CASTING EXAMPLES
 IF SETTING TIME IS 3h40' FOR A CONCRETE TEMPERATURE OF 20°C

CAS 1 : NON STOP CASTING

Casting setting time TPc = TPb - (Tt + Ta) = 2h25min

$$\text{Casting speed } Vc = \frac{5.5m}{2h25min} = 2.28m/h$$

$$\text{Casting time } Tc = \frac{10.0m}{2.28m/h} = 4h23min$$

CAS 2 : CASTING WITH PAUSE (ALLOWS A HIGHER CASTING SPEED)

$$Vc = \frac{10.0m}{Tc - 1h} = 2.95m/h$$

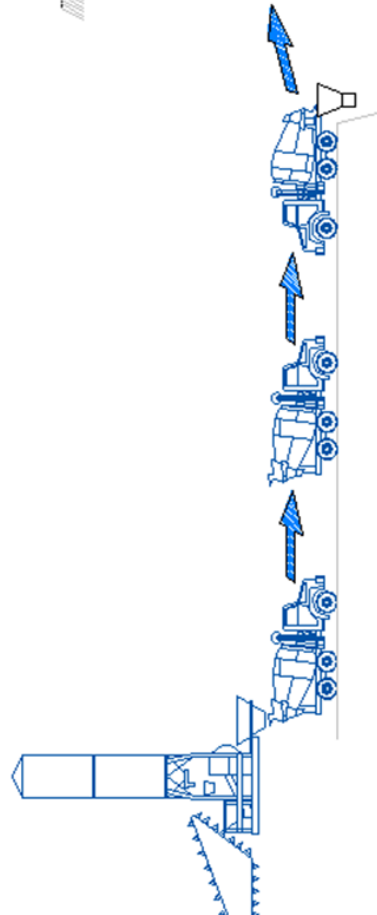
$$\text{1st casting HT } 5.5m : T1 = \frac{5.5m}{2.95m/h} = 1h51min$$

Pause* : T2 = 1h

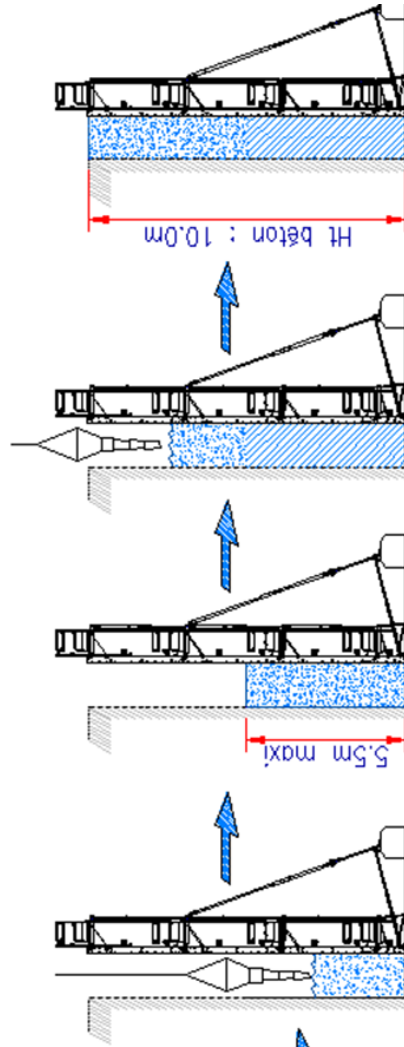
$$\text{2nd casting HT } 4.5m : T3 = \frac{4.5m}{2.95m/h} = 1h32min$$

$$\text{Total casting time } Tc = T1 + T2 + T3 = 4h23min$$

* This time shall not exceed 1hr to avoid marks on the concrete



12h → TT = 45MIN → 12h45MIN → TA = 30MIN → 13h15MIN
 - ARRIVAL ON SITE - - START CASTING -
 TIME TPB = 5h40MIN



15h40MIN - CONCRETE SETTING TIME - FRESH CONCRETE HEIGHT : 5.5M MAXI
 - CASTING -
 - CASTING -
 17h38MIN - END OF CASTING - HT BÉTON : 10 M

HYDRAULIC LOAD CELL

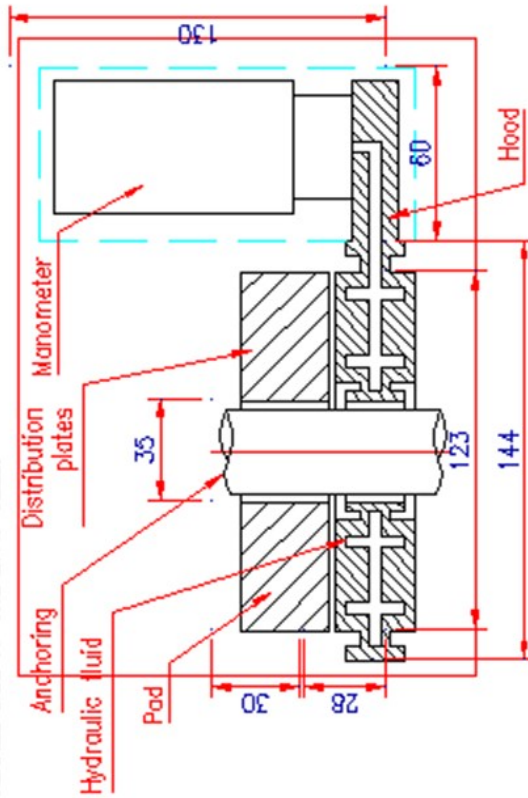
TYPE "GLÖTZL" - RÉF. KN 250 A 35

MODEL M - MANOMETRE GRADING IN KN PROTECTED BY A METAL HOOD AND FIXED TO THE CELL

APPLICATION AND DESCRIPTION :

- Measurement of the concrete load on the tie rod.
- The cell is made of a pressure pad which is formed by 2 stiff steel discs welded together at their periphery. The space inside the cell is filled with a fluid set in pressure under the load effect.
- The pressure is measured with a manometer.

OVERALL SIZE OF THE LOAD CELL:



TECHNICAL FEATURES :

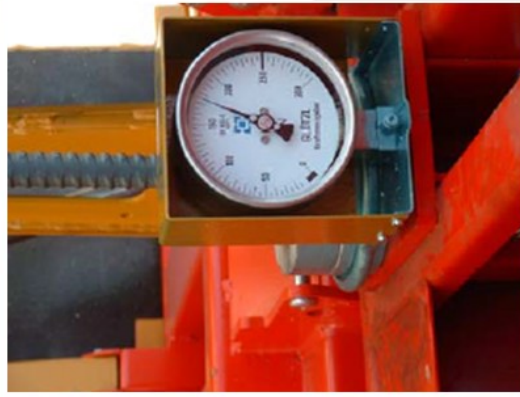
- Nominal tension : 250 KN
- Maximum tension : 300 KN
- Sensitivity : 1 % of EM
- Authorized overload : 20 % of EM
- Temperature influence: 1.2 % of EM per 20°C
- Using temperature : -30°C to 80°C

WEIGHT : 7 Kg

IMPLEMENTATION :



1 - set the load cell on the most required tie rod - outside compartments areas.



2 - Tighten the tie rod nut to reach a 2 Tonnes (20 KN) effort.

! During the concrete casting, the manometer will indicate the exact value of the effort as soon as the effort exceeds 2 tonnes of pressure. Be careful not to exceed the maximum recommended load.



CASTING REPORT

Ind 1 (30.10.12)

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RT-B07

EEN-Z6.01

Object : report of the achievement of a concrete wall with SATECO shutter

E) Concrete casting Reference of SATECO casting instructions :

Concrete casting date : Shutter removal date :
Concrete casting starting time : Shutter removal time :

Traditional concrete SCC Casting speed : m/h

G) Measures

Casting traditional concrete

Bucket or pump nbr	Concrete volume (m³)	Effort in tonnes on the cells							
		1	2	3	4	5	6	7	8
1		Start	Start	Start	Start	Start	Start	Start	Start
		End	End	End	End	End	End	End	End
2		Start	Start	Start	Start	Start	Start	Start	Start
		End	End	End	End	End	End	End	End
3		Start	Start	Start	Start	Start	Start	Start	Start
		End	End	End	End	End	End	End	End
4		Start	Start	Start	Start	Start	Start	Start	Start
		End	End	End	End	End	End	End	End
5		Start	Start	Start	Start	Start	Start	Start	Start
		End	End	End	End	End	End	End	End
6		Start	Start	Start	Start	Start	Start	Start	Start
		End	End	End	End	End	End	End	End
7		Start	Start	Start	Start	Start	Start	Start	Start
		End	End	End	End	End	End	End	End
8		Start	Start	Start	Start	Start	Start	Start	Start
		End	End	End	End	End	End	End	End

H) Conclusions



Casting report

Ind 1 (30.10.12)

Sateco

RT-B07

EEN-Z6.01

Object : report of the achievement of a concrete wall with SATECO shutter

A) Address

Company : DSB :
 Worksite : N° of wall :
 Sateco ref. : Address :



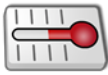
B) Environment conditions

Temperature during casting : °C

Temperature at removal time : °C

Weather : (put a cross in the relevant box)

Sunny Rain Snow
 Cloudy Cold



C) Wall features

Concrete height : m
 Wall width : m
 Wall length : m
 Concrete volume : m³

Type of concrete :
 Ref composition sheet :
 Concrete concentration : kg/m³
 Slump : cm



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D) Wall set features

Type of shutter used : (put a cross in the relevant box)

SC 9015 : SC 9015 "BOX" :
 TP CP18 : TP CP21 :
 CTR :



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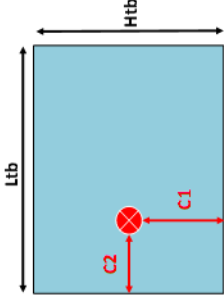
Composition of the shutter set:

Width : m + m + m + m = m
 Height : m + m + m + m = m

E) Load cells

Type of load cell :

Layout of the cells: position on the shutter set (from the left to the right and from the bottom to the top)



Sensor nbr	Cote C1 (m)	Cote C2 (m)
1		
2		
3		
4		
5		
6		
7		
8		

TYPE "G072L" - REF. KN 250 A 35



The cell shall not be set in a compartment area

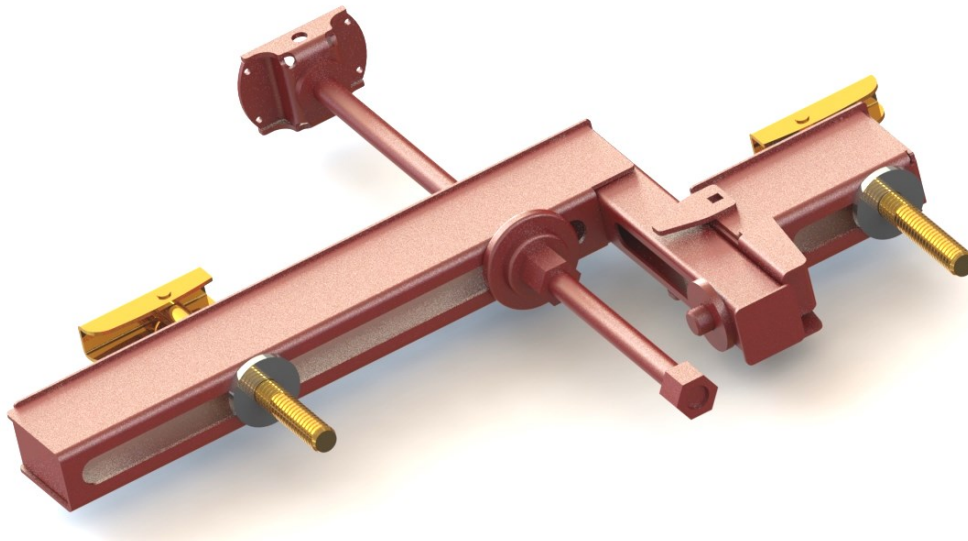


34.80 - ADDITIONAL ACCESSORIES



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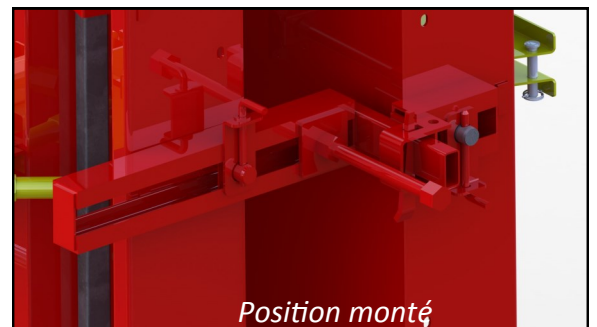
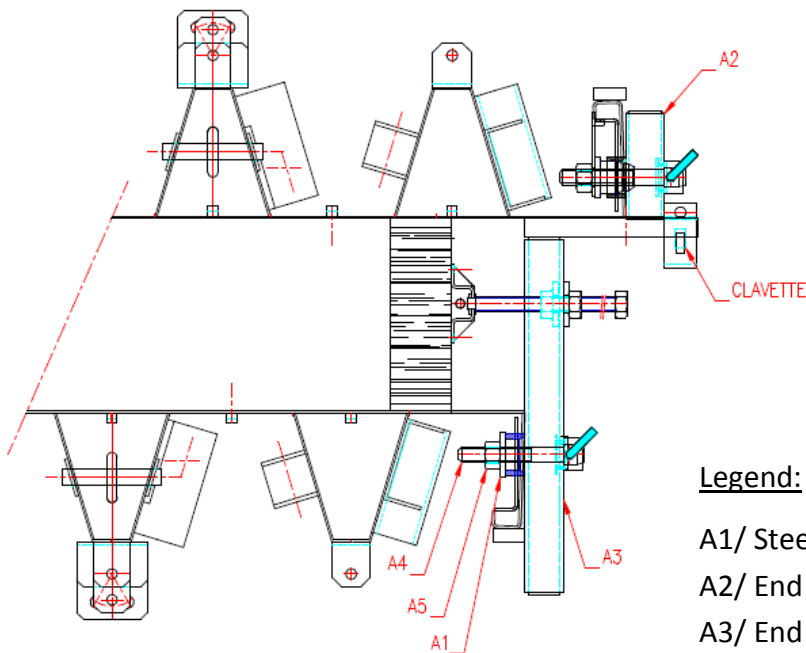
NOUS AVONS UN MONDE À BÂTIR



Function:

The adjustable end slide bar aims at making up for the gap of the bow between the outer and the inner panel following the radius.

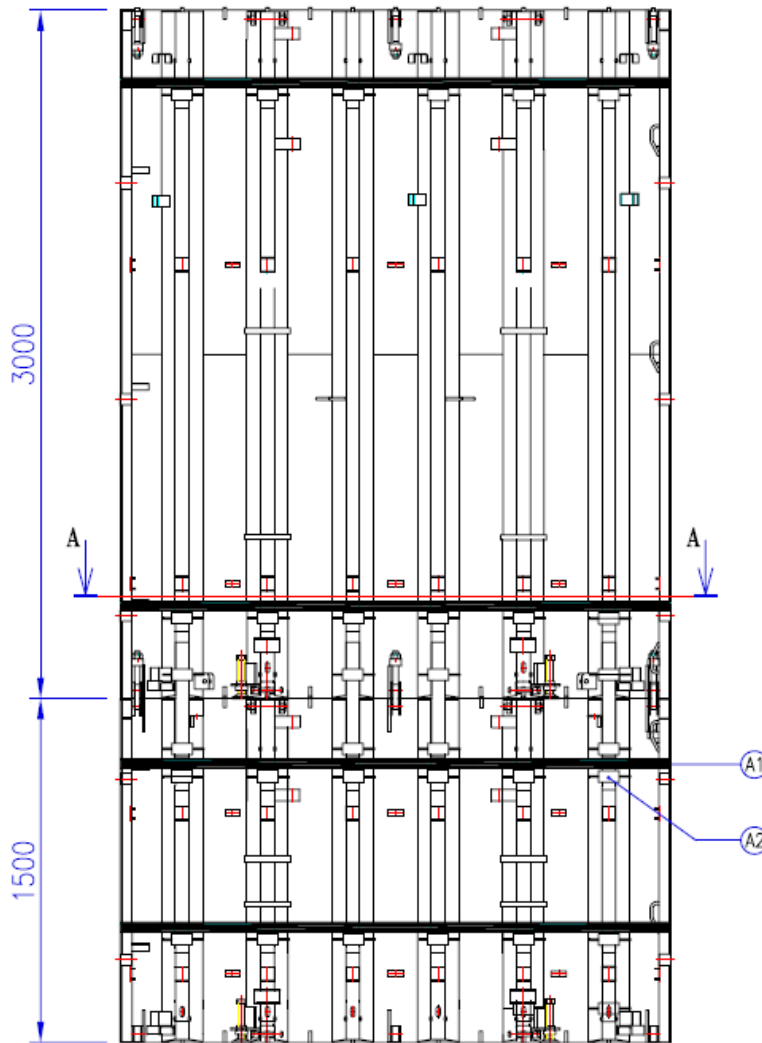
Thus it is easier to fix the timber batten for the wall sealing at the end of the panels.



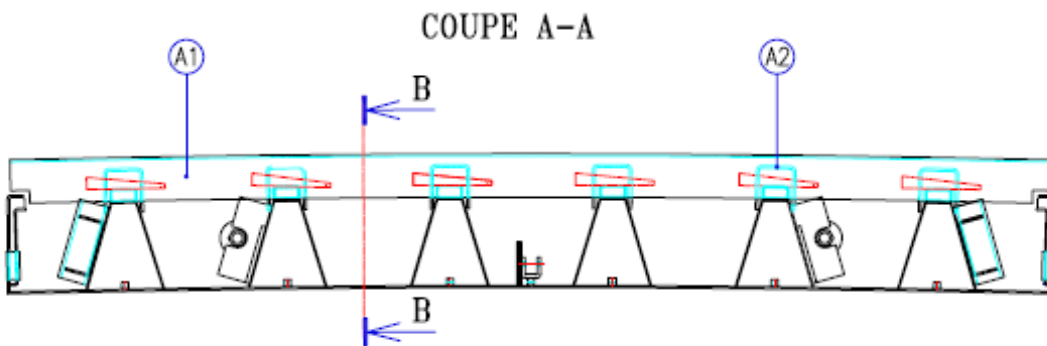
Legend:

- A1/ Steel plate
- A2/ End slide bar with fixed sleeve (wedge)
- A3/ End slide bar with mobile sleeve
- A4/ Screw for assembling piece
- A5/ Round thread nut $\varnothing 24$

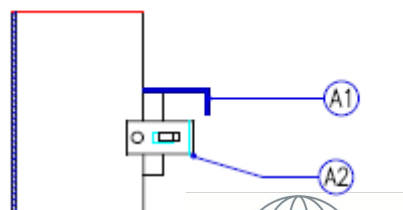




Example of panel height 3,0m and lower extension 1,5m



COUPE B-B



Legend:

A1/ beams pour radius > 50M

A2/ Wedge connecting plate support



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