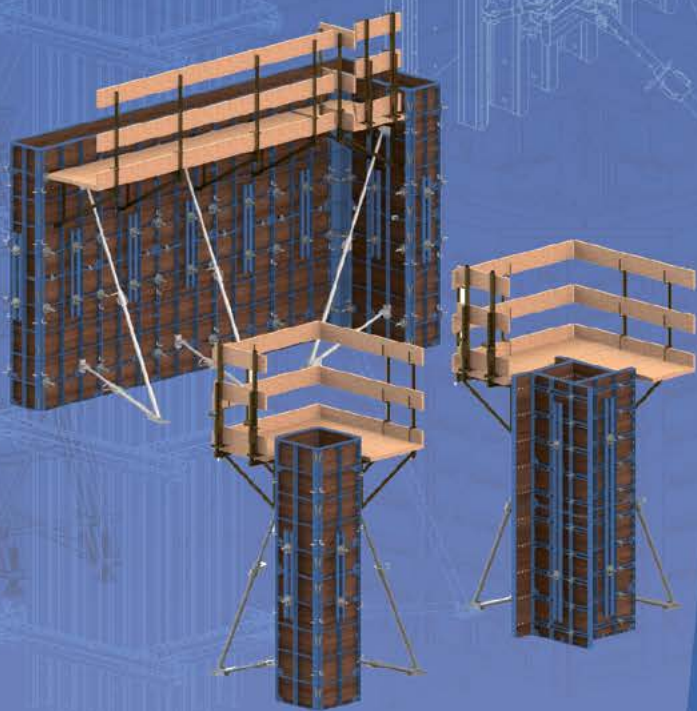
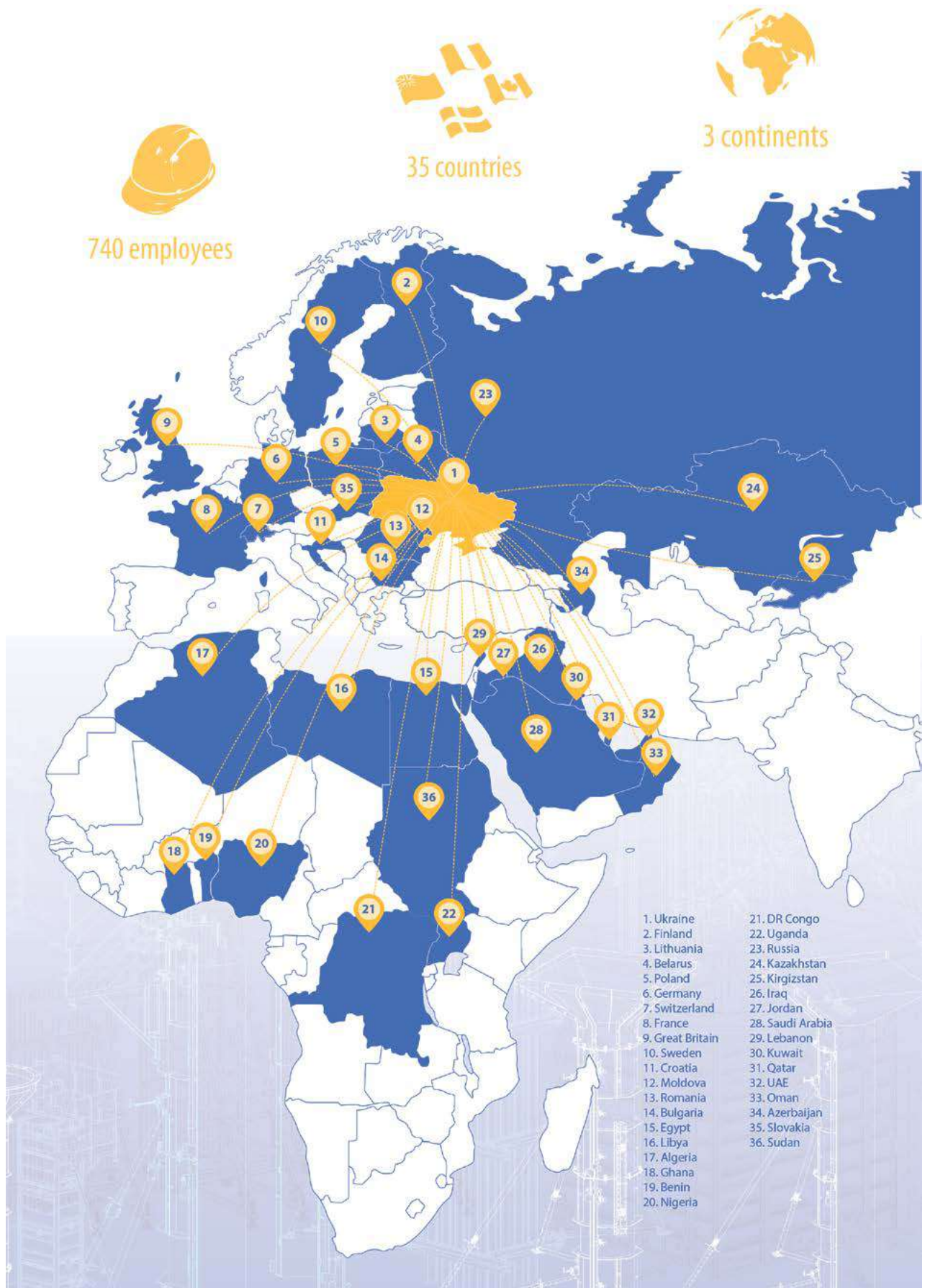


Super-lightweight framed formwork **HANDI**



USER MANUAL



Contents

GENERAL INSTRUCTIONS	4
WARNING NOTES	5
SYSTEM OVERVIEW	6
SYSTEM GRID	7
CONNECTIONS	8
The clip	8
Binding clip	8
5-pin clamp for compensation of linear extensions	8
Guide plate Handi	12
Expansion block Handi	13
Tension screw	13
Connection screw 5-10	14
Waling Handi	14
VERTICAL STACKING OF PANELS	15
TIE-ROD SYSTEM	18
INCLINED POSITIONING	21
CORNERS	22
90 degree corners	22
Acute and obtuse angles	23
STOP-END FORMWORK	24
WALL JUNCTIONS	25
Right-angled connections	25
In-line connections	26
T-junction	27
Wall + column	28
SUPPORT BRACE	29
WALL BRACKET HANDI	30
COLUMNS	31
Column with standard panels	32
Column with versatile panels	33
TRANSPORTING, STACKING AND STORING	35
Crane grip Handi	35
Stacking angle	35
COMPONENT OVERVIEW	36



GENERAL INSTRUCTIONS

This user manual (method statement) is aimed at everyone who will be working with the «VARIANT» product or system it describes. It contains information on how to set up this system, and proper use it.

All persons working with the product described herein must be familiar with the contents of this manual and with all the safety instructions it contains.

The customer is to ensure that the information materials provided by «VARIANT» are available to all users, and that they have been made aware of them and have easy access to them at the usage location.

Persons who are incapable of reading and understanding this booklet, or who can do so only with difficulty, must be instructed and trained by the customer.

Always observe all construction safety regulations and other safety rules applying to the application and using of our products in the country and/or region in which you are operating.

In the relevant technical documentation and formwork usage plans, «VARIANT» shows the workplace safety precautions that are necessary in order to use the «VARIANT» products safely in the usage situations shown. In all cases, users are obliged to ensure compliance with national laws, Standards and rules throughout the entire project and to take appropriate additional or alternative workplace safety precautions where necessary.

The customer is responsible for drawing up, documenting, implementing and continually updating a hazard assessment on every construction site. This document serves as the basis for the site-specific hazard assessment, and for the instructions given to users on how to prepare and use the system. It does not substitute for these, however.

This manual can also be used as a generic method statement or incorporated with a site-specific method statement.

The equipment/system must be inspected by the customer before use, to ensure that it is in suitable condition. Steps must be taken to rule out the use of any components that are damaged, deformed, or weakened due to wear, corrosion or rot.

The customer must ensure that this product is erected and dismantled, reset and generally used for its intended purpose under the direction and supervision of suitably skilled persons with the authority to issue instructions. These persons' mental and physical capacity must not in any way be impaired by alcohol, medicines or drugs.

The equipment/system must be assembled and erected in accordance with the applicable laws, Standards and rules by suitably skilled personnel of the customer's, having regard to any and all required safety inspections.

Many of the illustrations in this user manual show the situation during formwork assembly and are therefore not always complete from the safety point of view.

Combining our formwork systems with those of other manufacturers could be, but needs to be checked by customer compatibility «VARIANT» product/system with other independently under its responsibility.

It is not permitted to modify «VARIANT» products because of a safety risk.

Only original «VARIANT» components may be used as spare parts. Repairs may only be carried out by the manufacturer or authorized facilities.

We reserve the right to make alterations in the interests of technical progress.

WARNING NOTES

«VARIANT» products and systems must be set up in such a way that all loads acting upon them are safely transferred.

Do not exceed the permitted fresh-concrete pressures. Excessively high pouring rates lead to formwork overload, cause greater deflection and risk causing breakage.

The stability of all components and units must be ensured during all phases of the construction work.

All connections must be checked regularly to ensure that they still fit properly and are functioning correctly. It is very important to check all screw-type connections and wedge-clamped joints whenever the construction operations require (particularly after exceptional events such as storms), and to tighten them if necessary.

Remove any loose parts or fix them in place so that they cannot be dislodged or fall free.

It is strictly forbidden to weld «VARIANT» products – in particular anchoring/tying components, suspension components, connector components and castings etc. – or otherwise subject them to heating. Welding causes serious change in the microstructure of the materials from which these components are made. This leads to a dramatic drop in the failure load, representing a very great risk to safety. The only articles which are allowed to be welded are those for which the «VARIANT» literature expressly points out that welding is permitted.

If a person or object falls against, or into, the side-guard component and/or any of its accessories, the component affected may only continue in use after it has been inspected and passed by an expert.

Provide safe workplaces for those using the formwork (e.g. for when it is being erected/dismantled, modified or repositioned etc.).

It must be possible to get to and from these workplaces via safe access routes.

Fire-sources are not permitted anywhere near the formwork. Heating appliances are only allowed if properly and expertly used, and set up a safe distance away from the formwork.

The work must take account of the weather conditions (e.g. risk of slippage). In extreme weather, steps must be taken in good time to safeguard the equipment, and the immediate vicinity of the equipment, and to protect employees.

Do not strike the formwork until the concrete has reached sufficient strength and the person in charge has given the order for the formwork to be struck.

When striking the formwork, never use the crane to break concrete cohesion. Use suitable tools such as timber wedges, special pry-bars or system features such as «VARIANT» stripping corners.

When striking the formwork, do not endanger the stability of any part of the structure, or of any scaffolding, platforms or formwork that is still in place.

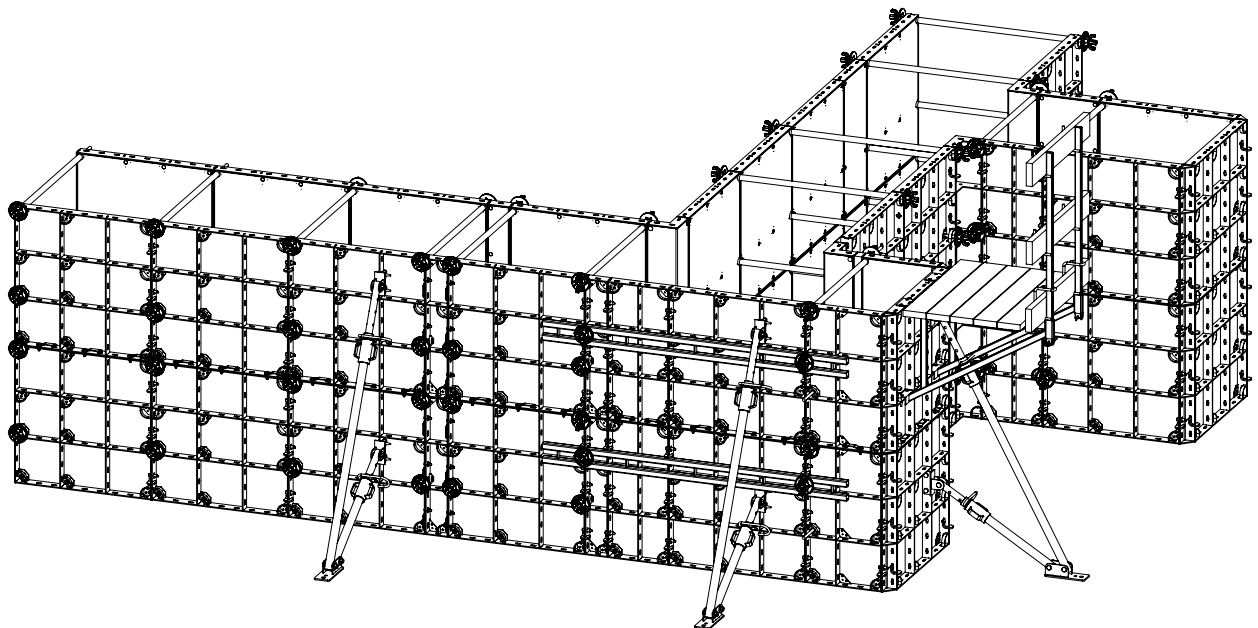
Observe all regulations applying to the handling of formwork and scaffolding.



SYSTEM OVERVIEW

The Handi is a lightweight framed formwork, which has been specially designed for quick and cost-saving construction, due to the fact that its lightweight panels can be easily handled and be erected by hand. Consequentially the Handi system suits best for foundations, small above-ground and underground concreting work in projects with limited use of crane and difficulties in usage of heavy framed formwork systems (such as Varimax system).

Permitted fresh-concrete pressure:
35 kN/m²



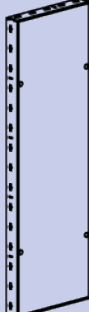
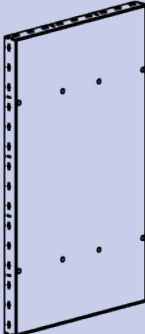
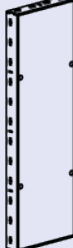
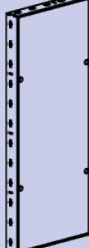
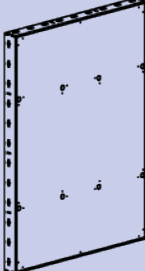
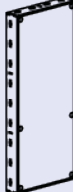
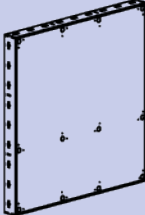
The Handi panel consist of metal frame (made of 6 mm thick steel strip) and 15 mm thick film faced plywood.

Maximum permitted fresh-concrete pressure is 35 kN/m².

SYSTEM GRID

Handi formwork is graded for all ranges in height from the foundation to the walls of any height (90 cm, 120 cm and 150 cm). Also it is possible to put the panel on side, and use it in this way to satisfy any heights needs.

With a wide range of the panels 15, 20, 30, 40, 50, 60, 90 cm in width and the presence of the expansion block Handi formwork can be adapted to any layout.

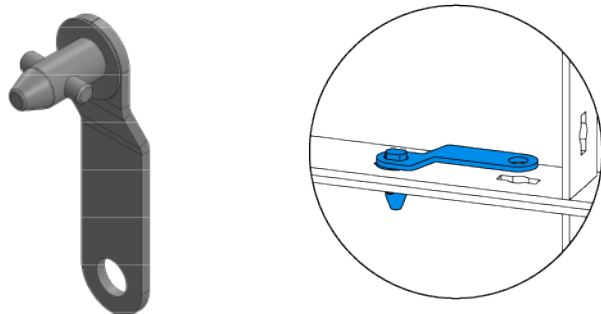
Height	Width						
	150	200	300	400	500	600	900
1500							
1200							
900							



CONNECTIONS

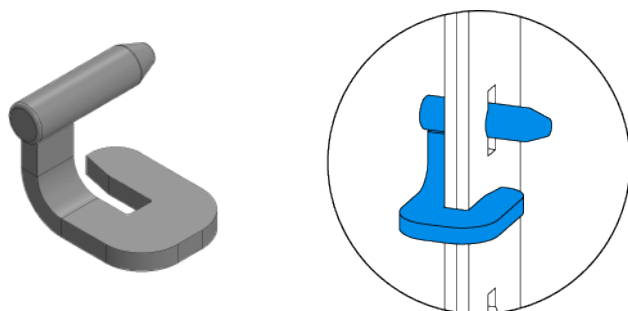
CLIP

For Handi panels connection use binding clip. Install the clip into the slot and turn it 90°- elements are firmly connected.



BINDING CLIP

For Handi panels connection use binding clip.



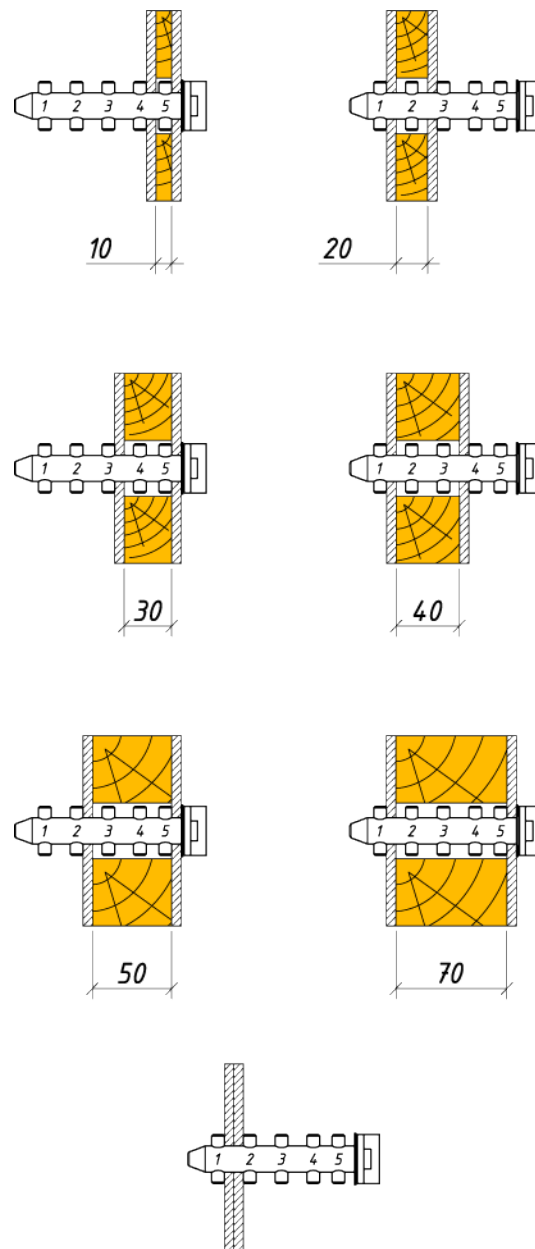
5-PIN CLAMP FOR COMPENSATION OF LINEAR EXTENSIONS

In the case of compensation of linear extensions (1-5 cm and 7 cm) between the panels (in accordance with the project) connect panels with 5-pin clamp. Installation of the 5-pin clamp is identical to the installation of the clip.



CONNECTIONS

COMPENSATION OF LINEAR EXTENSIONS USING 5-PIN CLAMP

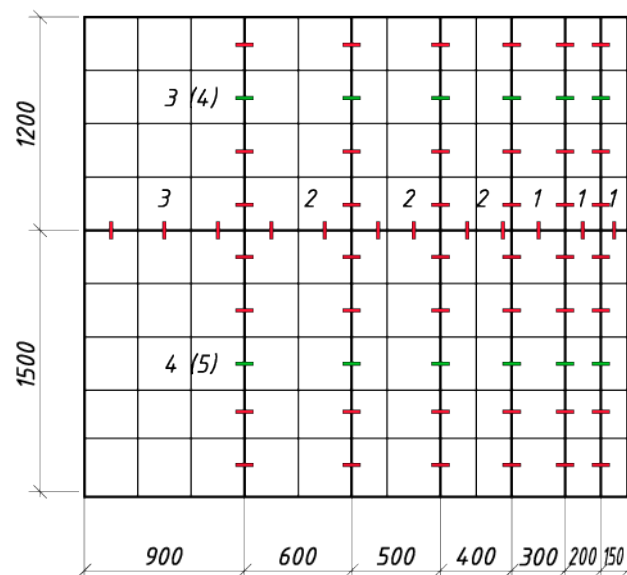
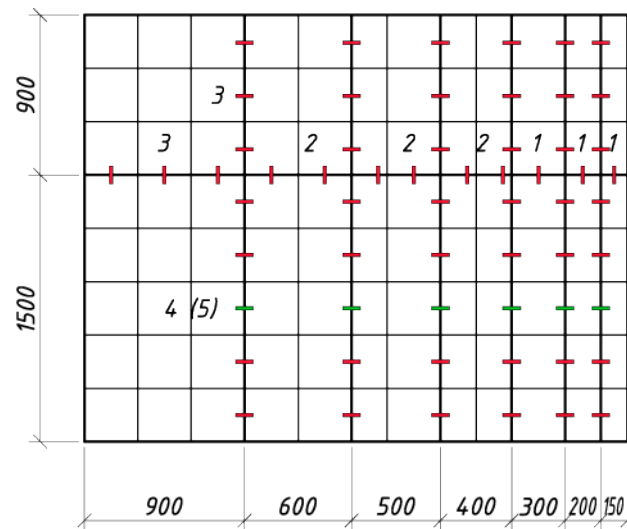




CONNECTIONS

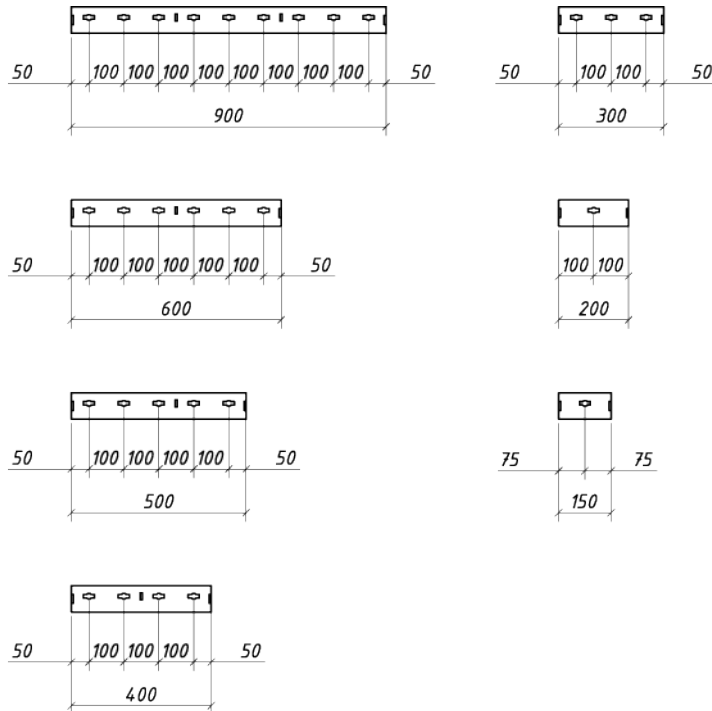
Minimum (recommended) quantity of clips/binding clips/5-pin clamps:

- height 900 mm – 3 (3) psc;
height 1200 mm – 3 (4) psc;
height 1500 mm – 4 (5) psc.
- width 900 mm – 3 psc;
width 600 mm-400 mm – 2 psc;
width 300-150 mm – 1 psc.

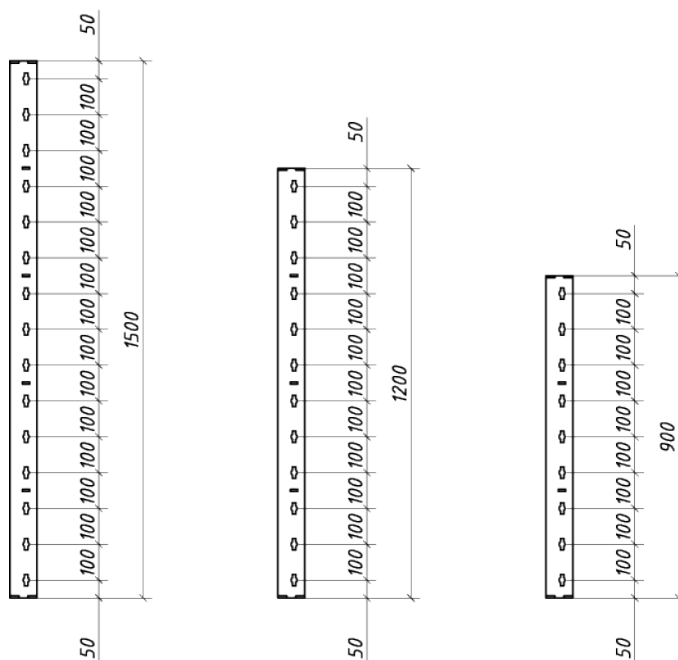


CONNECTIONS

SLOTS FOR CONNECTION OF ELEMENTS (WIDTH)



SLOTS FOR CONNECTION OF ELEMENTS (HEIGHT)



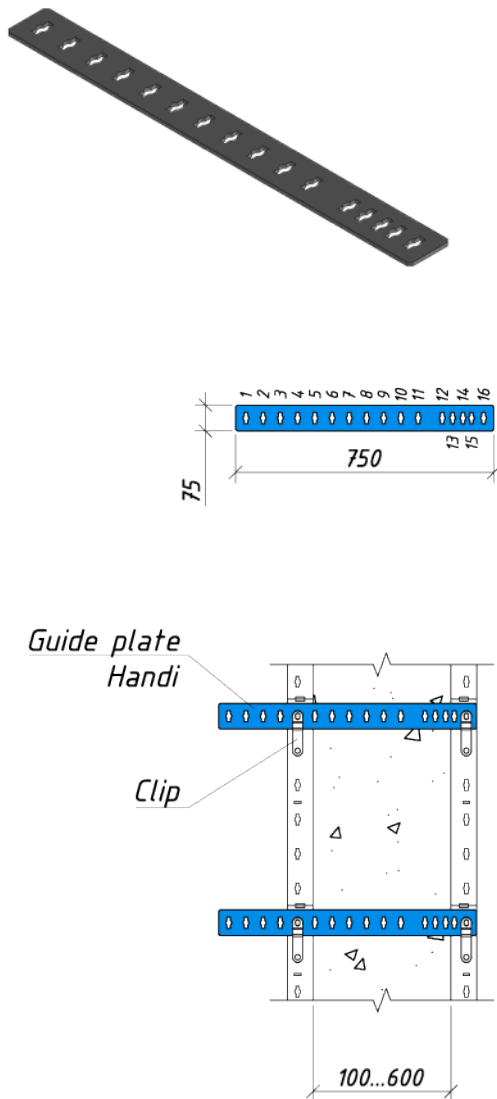
CONNECTIONS

GUIDE PLATE HANDI

The guide plate Handi can be used to form stop-ends or to substitute the tie-rod at the top of the formwork.

Fastening the guide plate Handi to the panels is provided by using clips.

Wall thickness and the corresponding numbers of slots are listed in the table below.



Thickness	Numbers
100	16-11
150	16-10
200	16-9
250	16-8
300	16-7
350	16-6
450	16-4
500	16-3
550	16-2
600	16-1
110	1-5
115	15-10
130	12-8
140	14-9
160	1-6
165	15-9
180	12-7
190	14-8
210	1-7
215	15-8
230	12-6
240	14-7

Thickness	Numbers
260	1-8
265	15-7
280	12-5
290	14-6
310	1-9
315	15-6
330	12-4
340	14-5
360	1-10
365	15-5
380	12-3
390	14-4
410	1-11
415	15-4
430	12-2
440	14-3
465	15-3
480	1-12
480	12-1
490	14-2
510	1-13

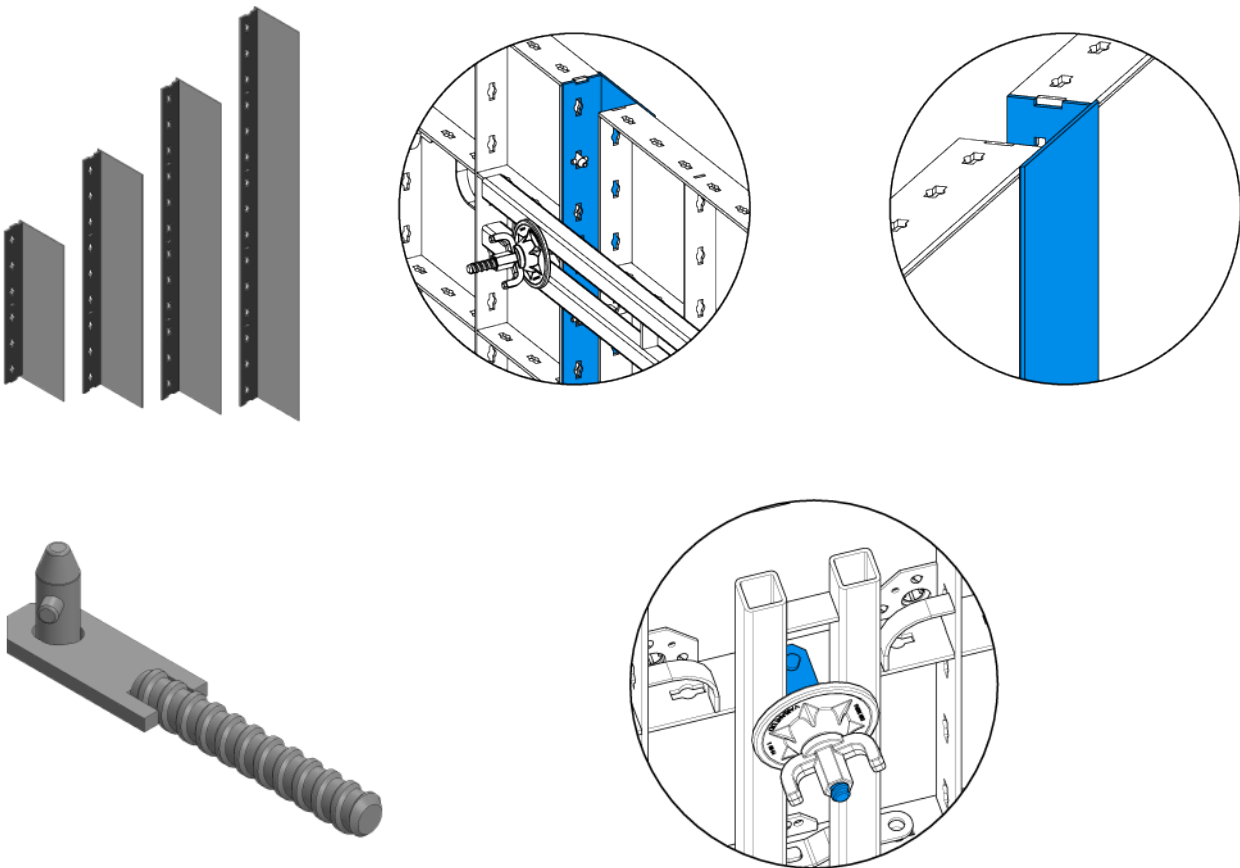
CONNECTIONS

EXPANSION BLOCK HANDI

In the case of compensation of linear extensions up to 15 cm between the panels (in accordance with the project) use expansion block Handi with waling Handi.

With a wide range of height (60, 90, 120 and 150 cm) the expansion block Handi can be adapted to walls of any height up to 3.0 m.

Fastening the expansion block Handi to the panel is provided by using clips or binding clips.



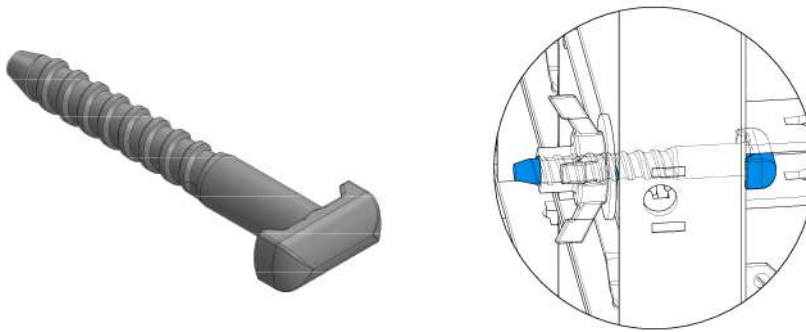
Use tension screw to fasten waling on the panels. Installation of the tension screw on the panel profile is similar to the installation of the clip: install it into the slot and turn 45°.



CONNECTIONS

CONNECTION SCREW 5-10

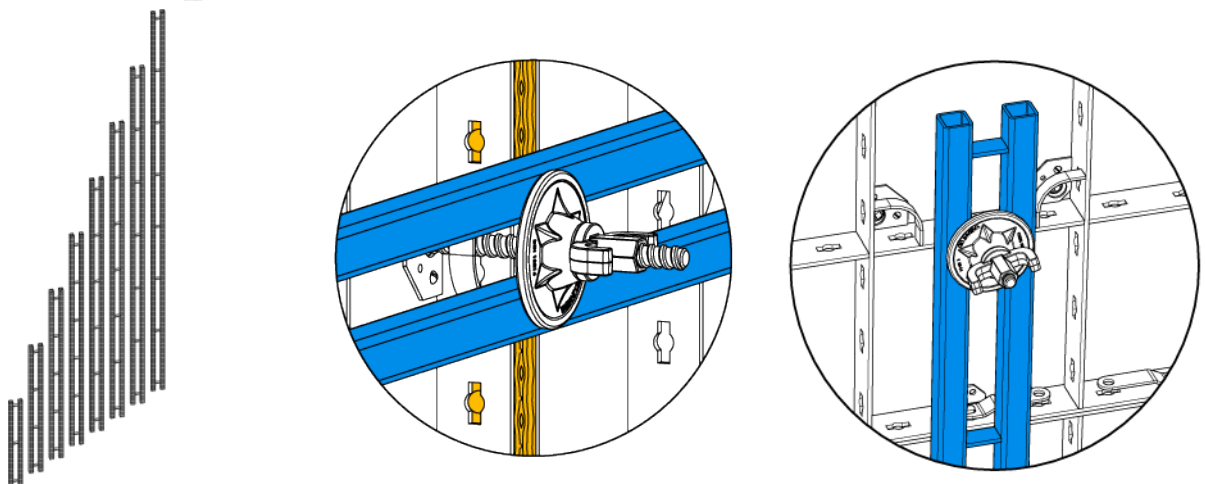
Use connection screw with washer and star-shaped nut to join versatile panels in column formwork.



WALING HANDI

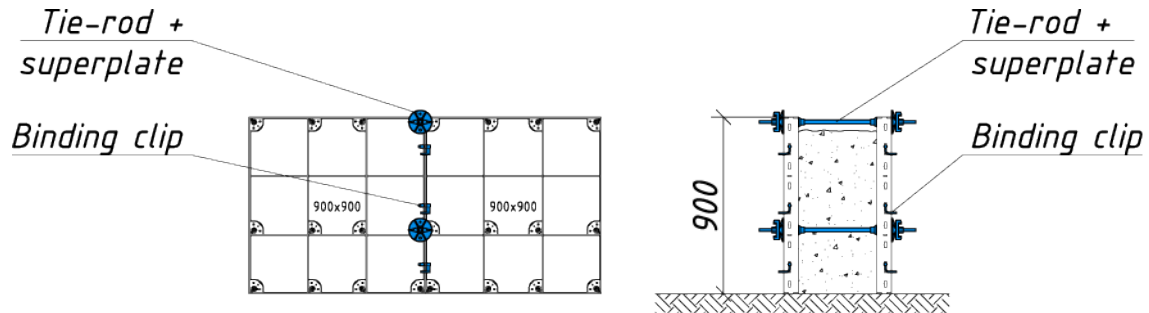
Walings Handi are used:

- when there is the expansion timber or the expansion block Handi between the panels (fix waling Handi with the tie-rod and the superplate);
- in case of using joint angles Handi (for more detailed information see "Acute and obtuse angles");
- in case of vertical stacking of the panels (fix waling Handi with the tension screw and superplate).

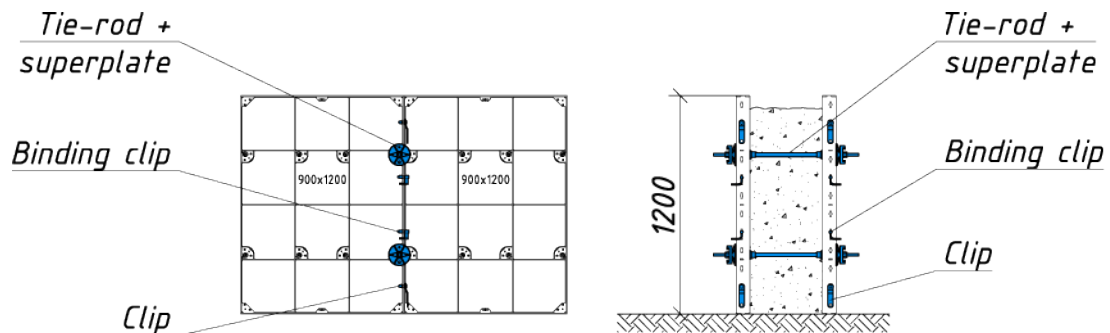


VERTICAL STACKING OF PANELS

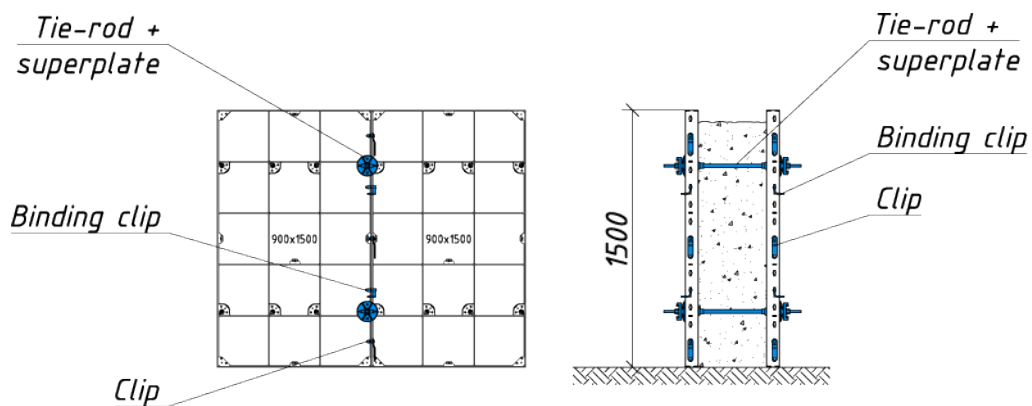
WALL HEIGHT 900 mm



WALL HEIGHT 1200 mm

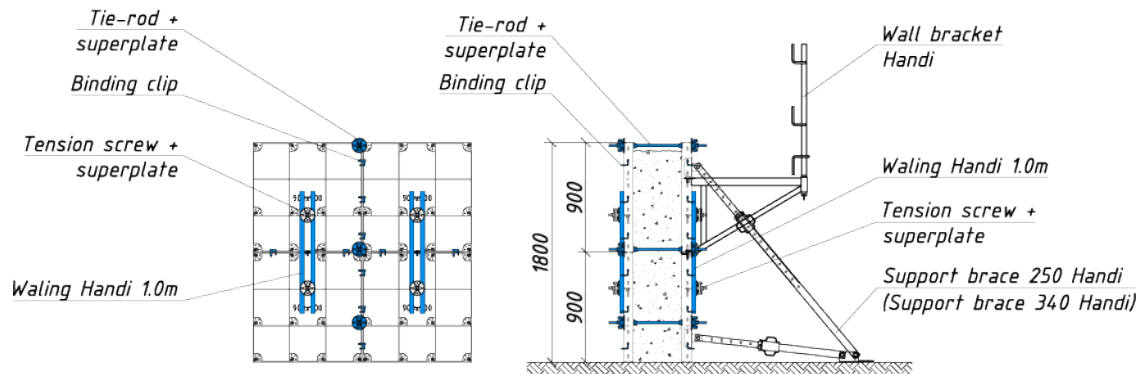


WALL HEIGHT 1500 mm

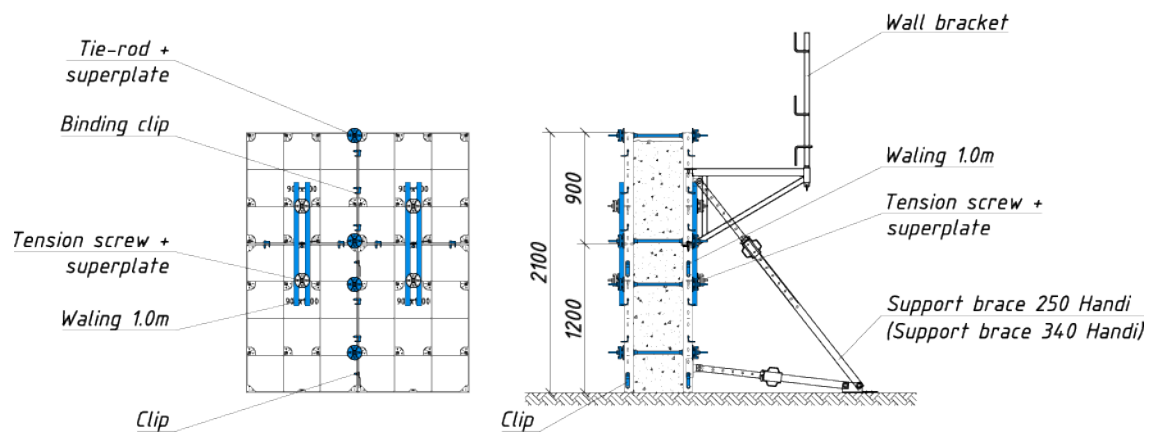




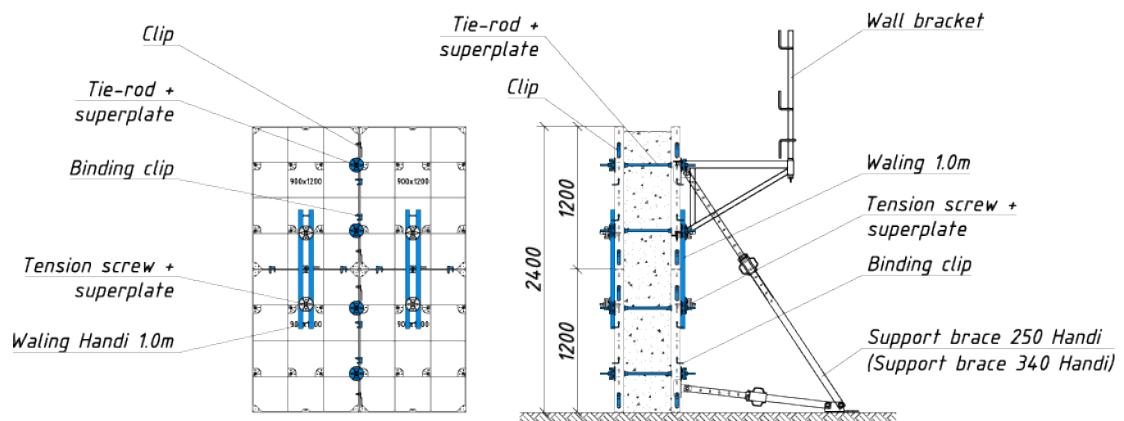
WALL HEIGHT 1800 mm



WALL HEIGHT 2100 mm

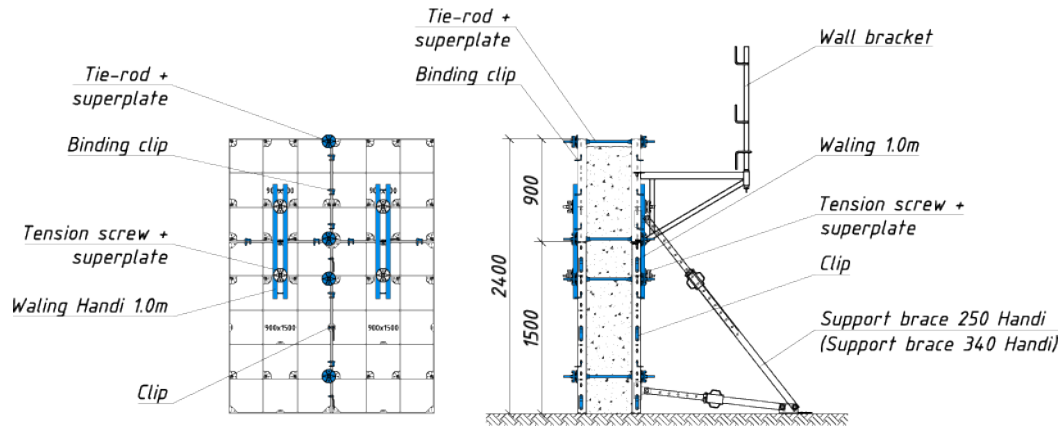


WALL HEIGHT 2400 mm (1200+1200)

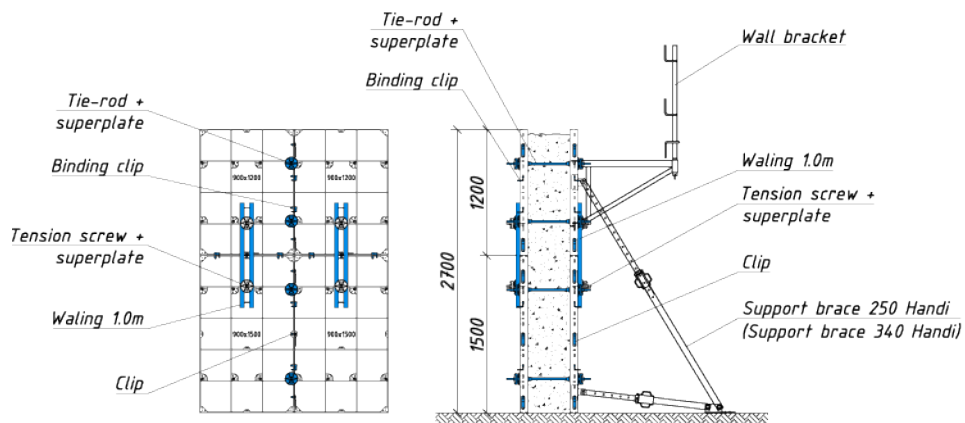


HANDI LIGHTWEIGHT FRAMED FROMWORK SYSTEM

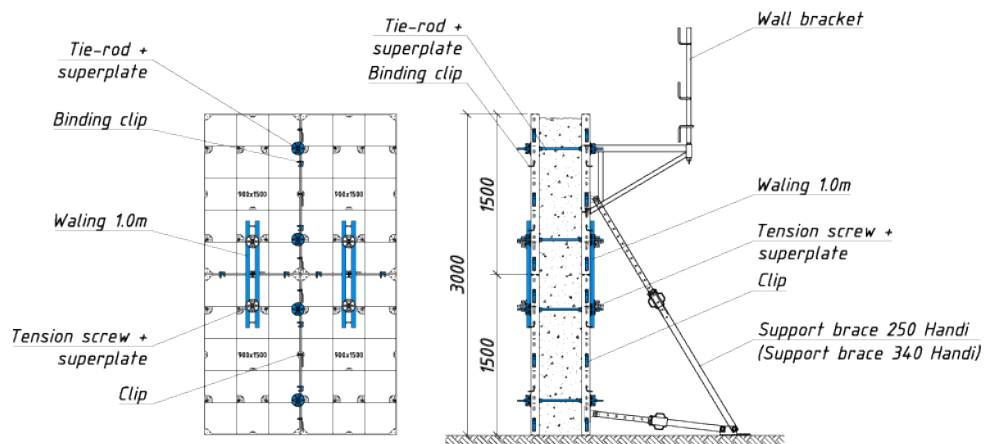
WALL HEIGHT 2400 mm (1500+900)



WALL HEIGHT 2700 mm

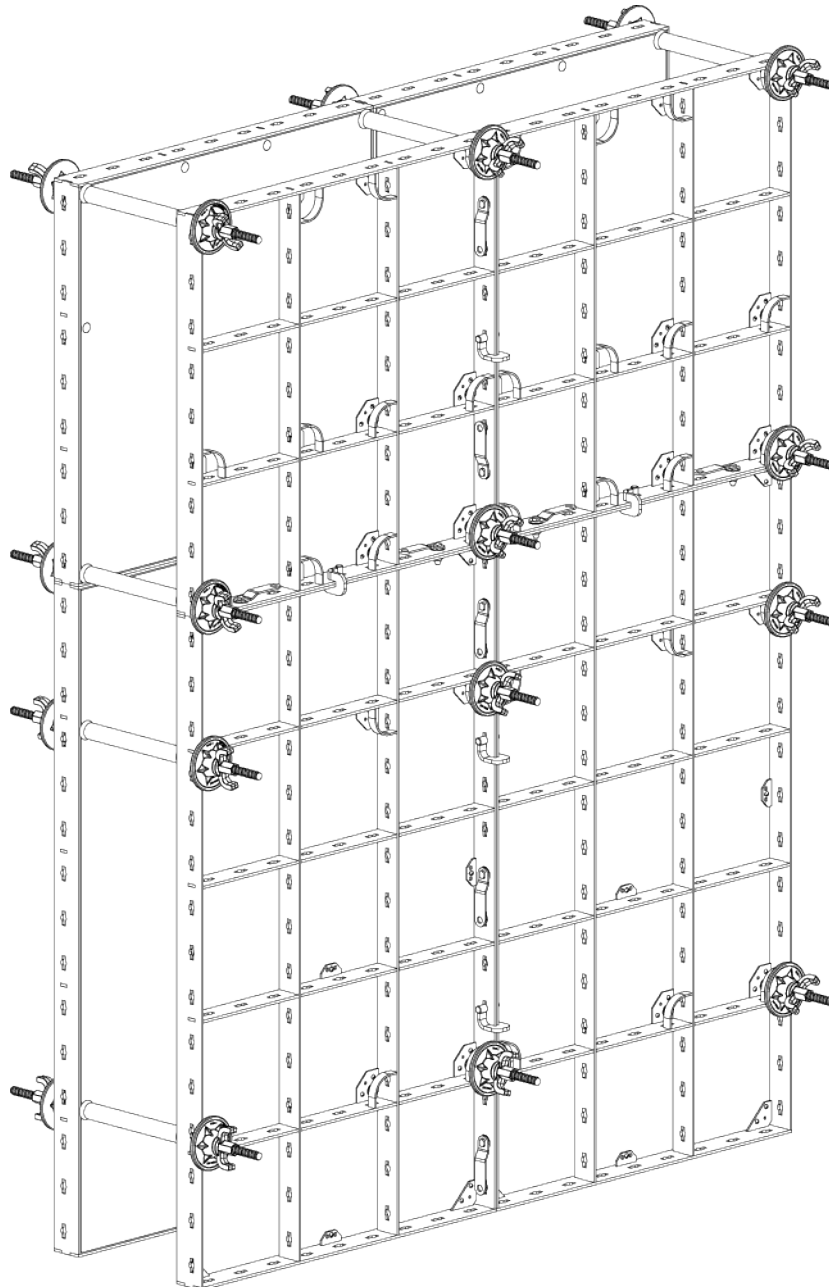


WALL HEIGHT 3000



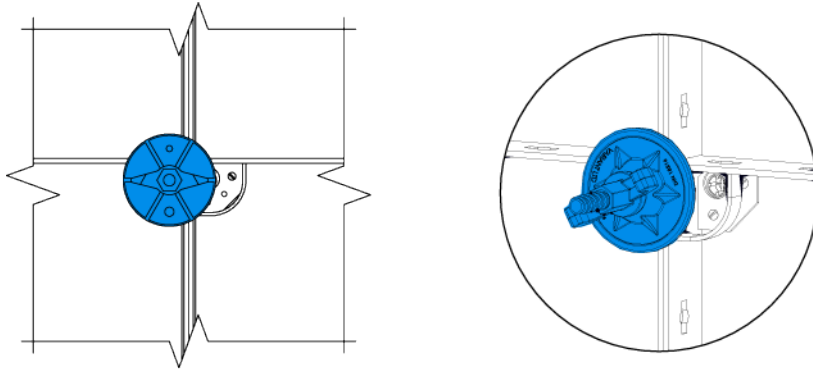


TIE-ROD SYSTEM



PLACING FORM-TIES IN GENERAL

1. Fix a tie-rod in every tie-rod hole that is not covered over by a superplate.



2. Always install a tie-rod in a tie-rod hole of wider (bigger) panel.

3. For exceptions, see the sections headed «Connections» and «Vertical stacking of panels».

IMPORTANT NOTE:

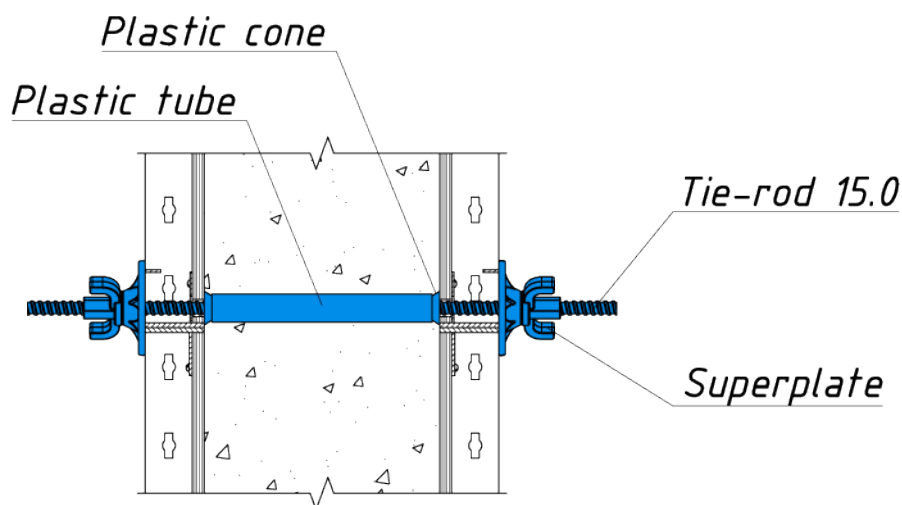
Only use approved tie-rods.

Never weld or heat tie-rods up.

Seal up not needed tie-rod holes.

THE TIE-ROD SYSTEM 15.0

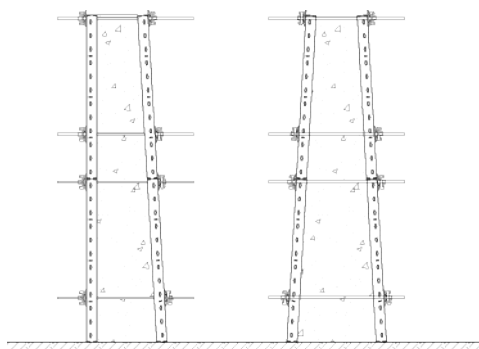
Plastic cones and tubes are expendable components.





INCLINED POSITIONING

Thanks to the special shape of the superplate, the panels can be inclined on one or both sides.

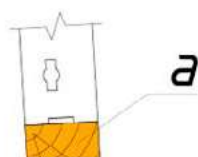


Tt – top thickness

Tb – bottom thickness

ΔT – inequality between top and bottom thickness

Height	Scheme / ΔT		
	Tt < 250 mm	Tt $\geq$ 250 mm, a=2.5cm	
	ΔT		
1.8 m	11.5 cm	14.6 cm	9.4 cm
2.4 m	13.9 cm	20.6 cm	12.5 cm
2.7 m	15.1 cm	23.6 cm	14.0 cm
3.0 m	16.3 cm	26.6 cm	15.6 cm



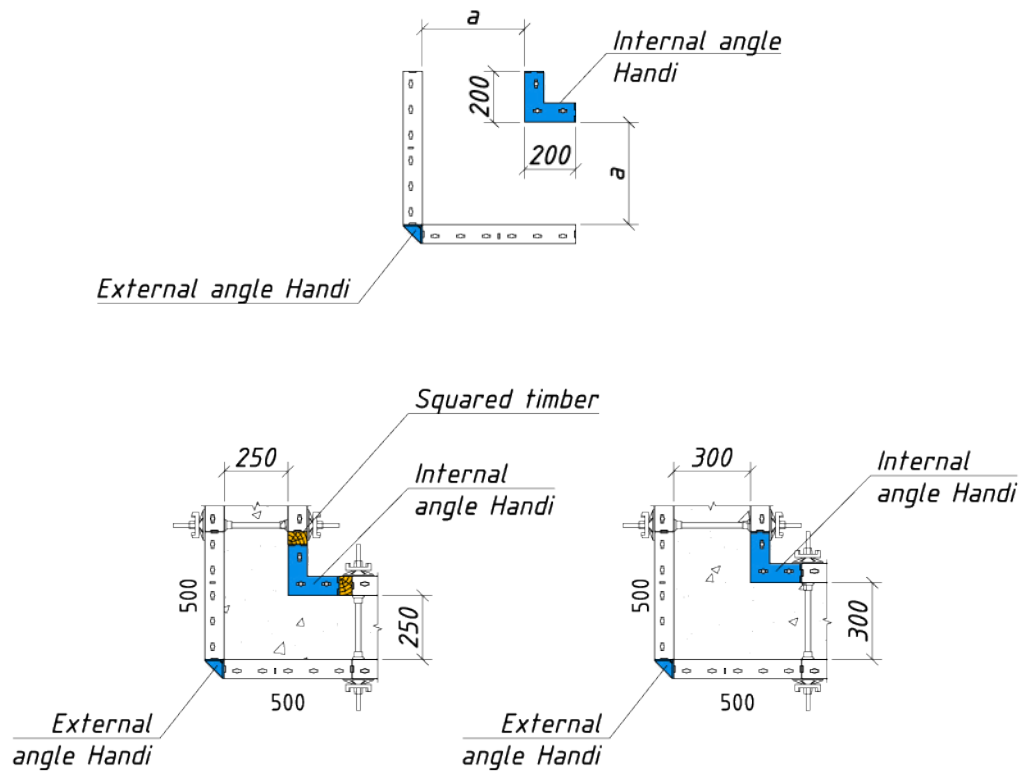
$T_t \geq 250 \text{ mm}$

Secure inclined panels against uplift.

CORNERS

90 DEGREE CORNERS

The corner solutions are based upon the strong, torsion-proof internal angle Handi.

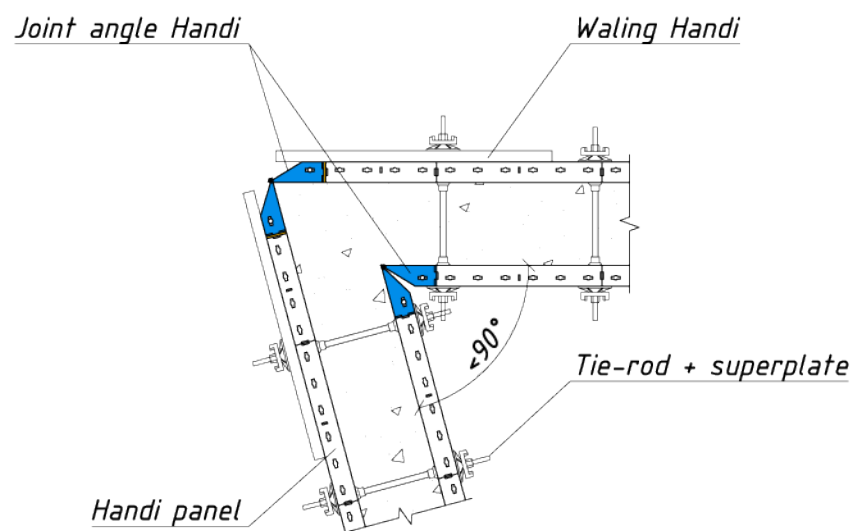
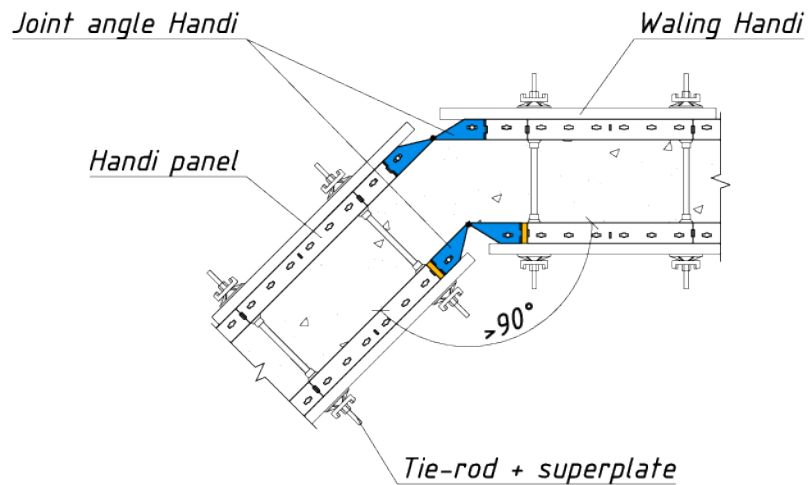


Wall thickness, a	Positioning element
100 mm	30 cm
150 mm	40 cm+ 5cm (squared timber)
200 mm	40 cm
250 mm	50 cm+ 5cm (squared timber)
300 mm	50 cm
350 mm	60 cm+5cm (squared timber)
400 mm	60 cm



ACUTE AND OBTUSE ANGLES

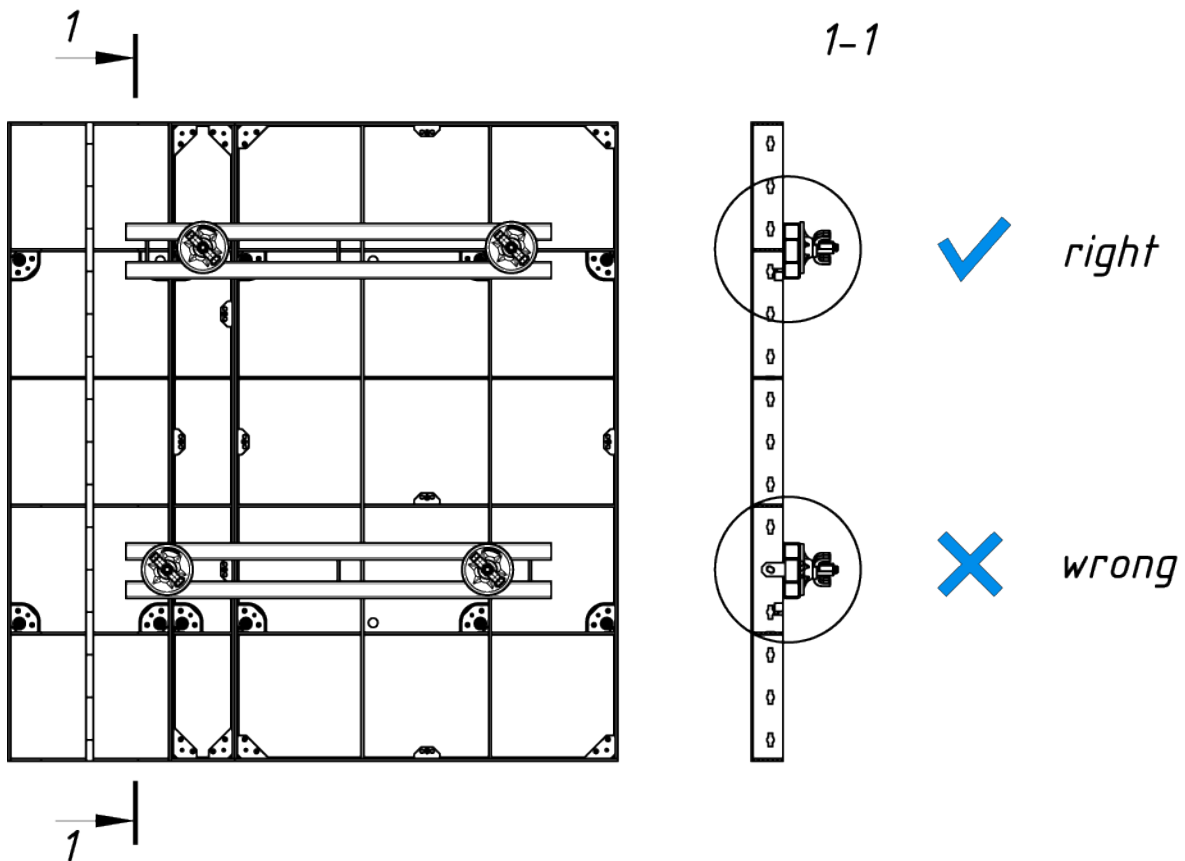
On acute and obtuse angles formwork compiled with the use of joint angle Handi.



Guaranteed operating range of the joint angle Handi - from 75° to 270° .

HANDI LIGHTWEIGHT FRAMED FORMWORK SYSTEM

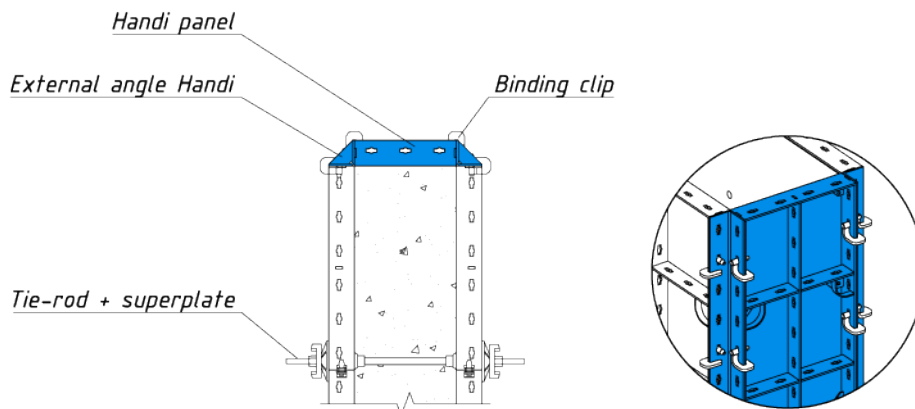
Provide walings on internal and external angles as shown in the picture below.
Fasten waling with tension screw and superplate on the horizontal ribs of the panels.



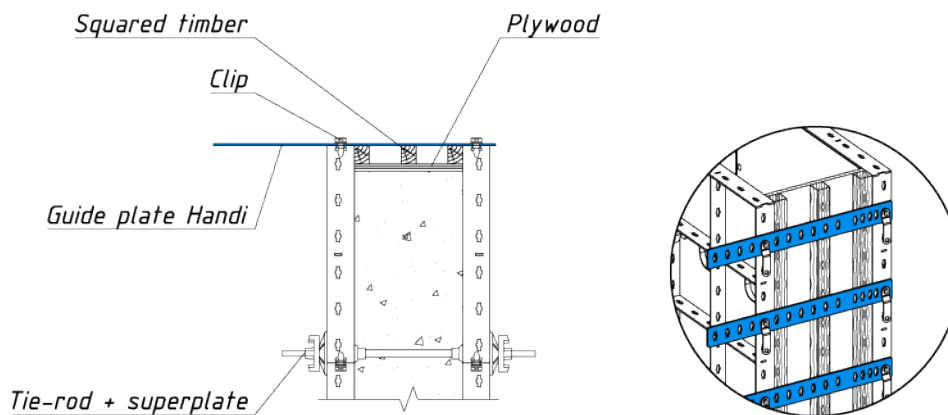
STOP-END FORMWORK

There are 2 possible ways of forming stop-ends:

1) with Handi panels and external angles Handi



2) with guide plates Handi

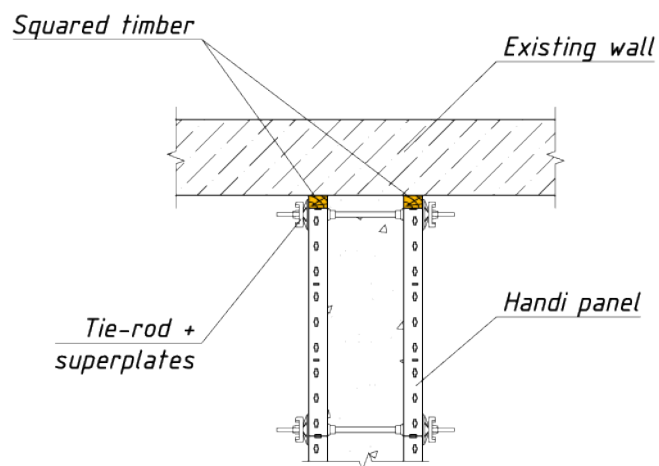


Number of guide plates Handi needed to create a proper stop-end joint: 2.5 – 3 psc per each meter (for max. wall thickness 600 mm)

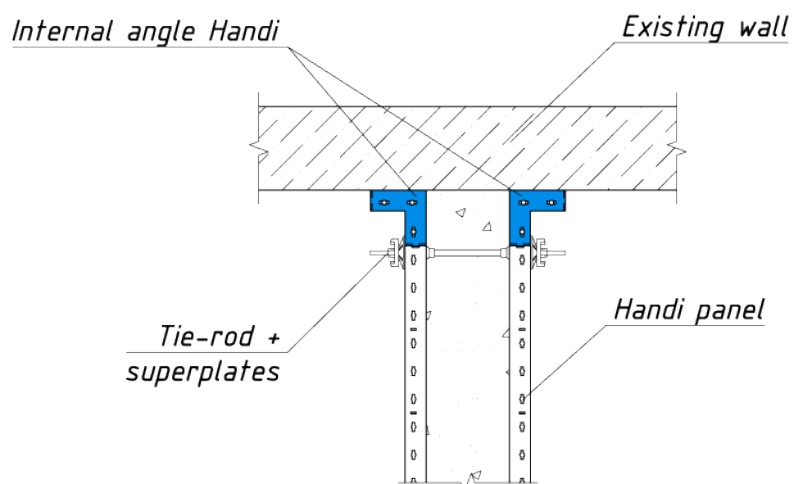
WALL JUNCTIONS

RIGHT-ANGLED CONNECTIONS

a) with Handi panel and adjustable timber 5 cm

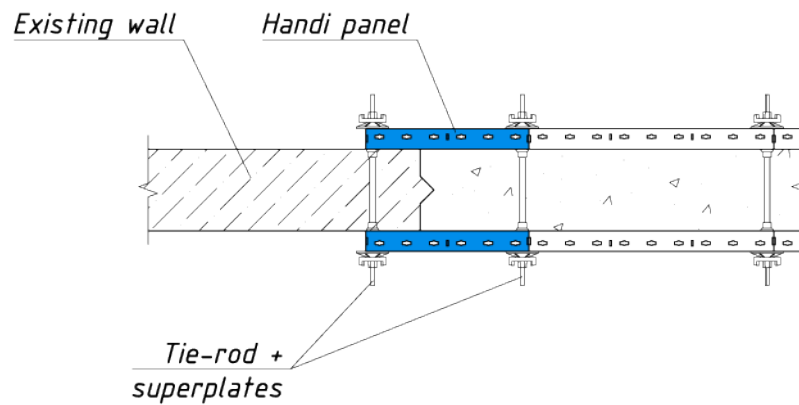


b) with Handi internal angle

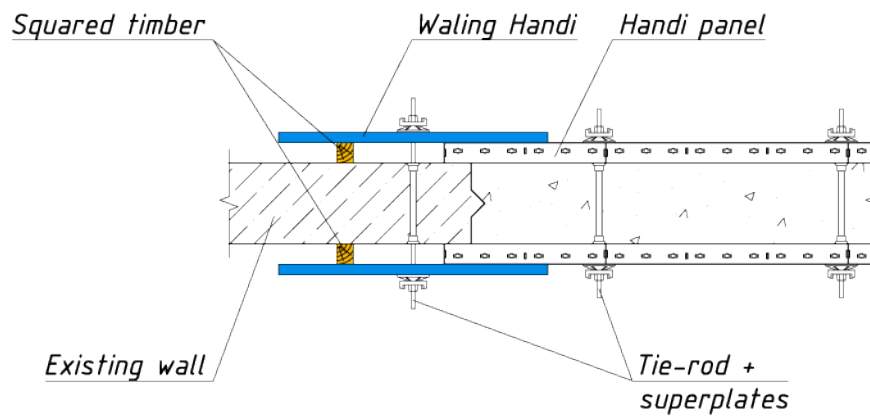


IN-LINE CONNECTIONS

a) Installation of tie-rod through existing wall and last tie-rod hole of Handi panel.
Using Handi panels and tie-rods;

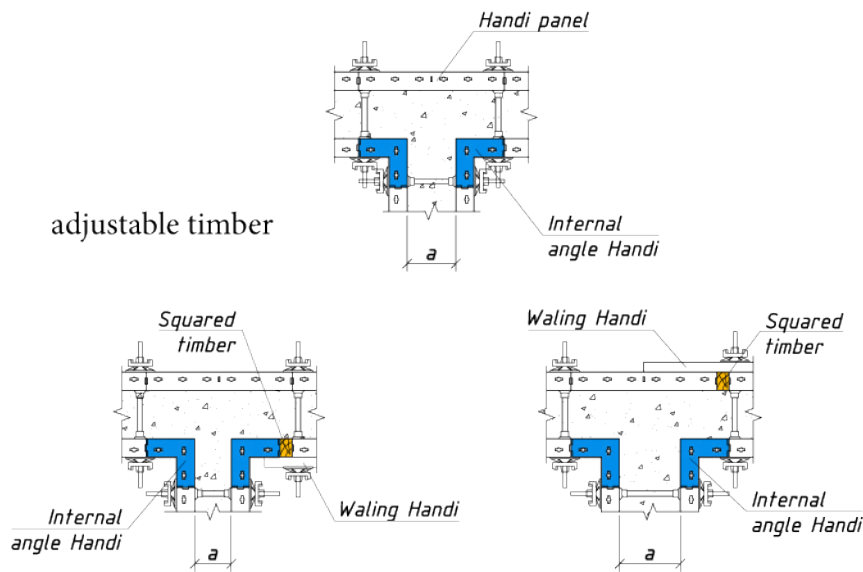


b) Installation of tie-rod through existing wall, using waling Handi and timber.



T-JUNCTION

Wall formwork connecting at 90° performed in conjunction with internal angle. The width of the opposite mounting element is calculated from the sum of the thickness of the wall formed by the lengths of the sides and 2 internal angles (2x200 mm = 400 mm).



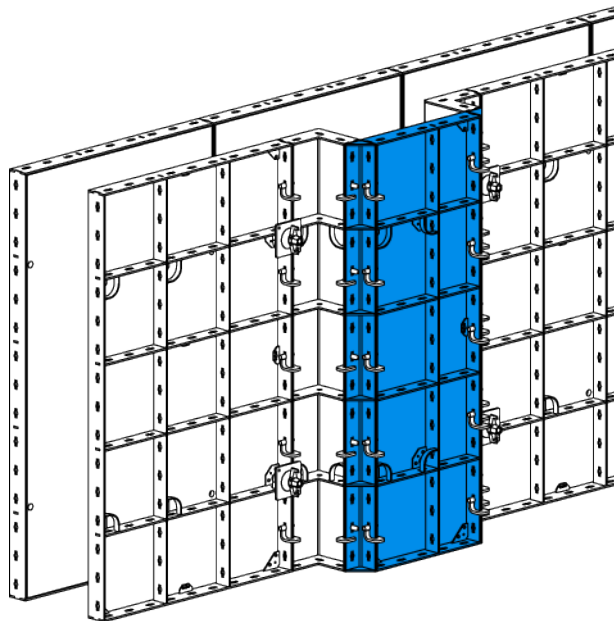
Wall thickness, a	Mounting element
100 mm	50 cm
150 mm	50 cm+ 5cm (external adjustable timber)
200 mm	60 cm
250 mm	60 cm+ 5 cm (external adjustable timber)
300 mm	60 cm+ 2x5 cm (external and internal adjustable timber)
350 mm	40 cm+30 cm+5 cm (external squared timber)
400 mm	90 cm+ 2x5 cm (external and internal adjustable timber)
450 mm	90 cm+ 5 cm (internal adjustable timber)
500 mm	

Where the adjustable timber is needed use walings (place the tie-rod through the waling and fix it with the superplate).

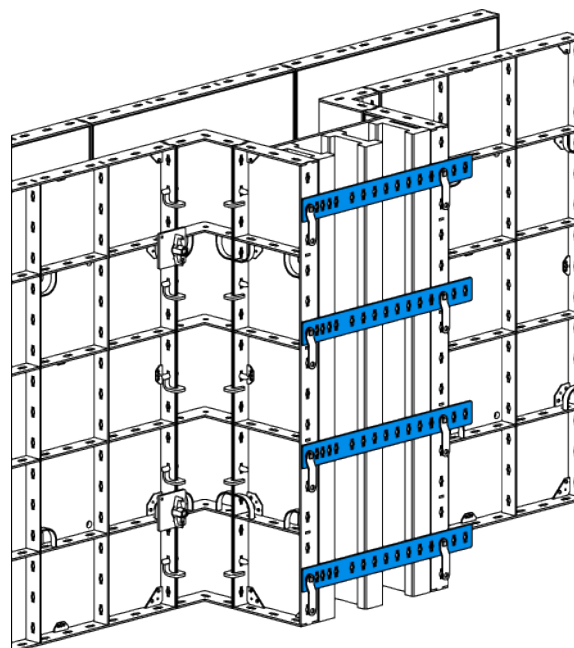


WALL + COLUMN

1) with Handi panels and external angles Handi

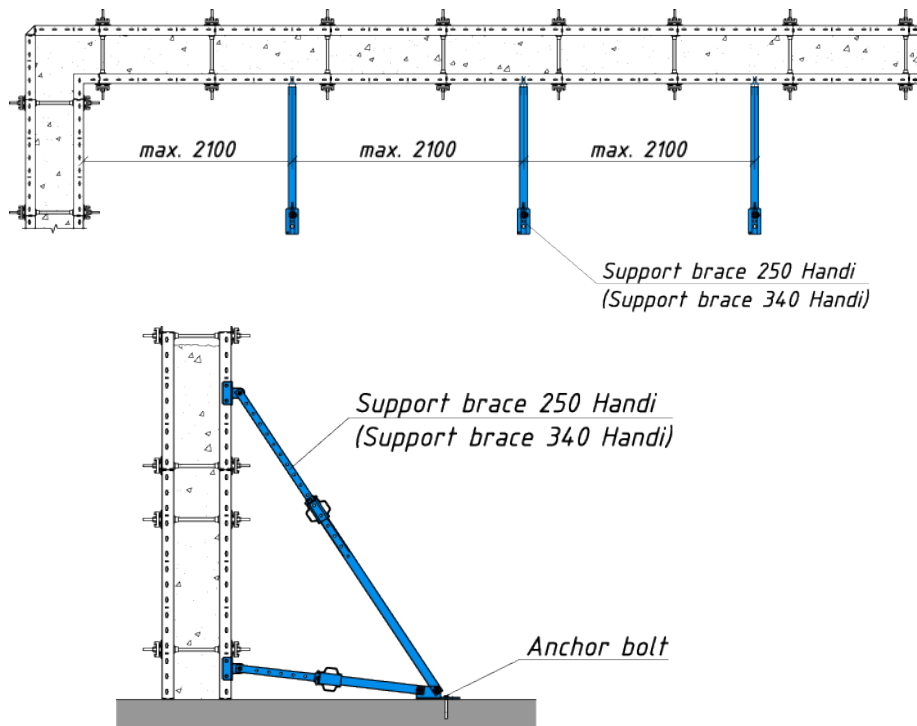


2) with guide plates Handi

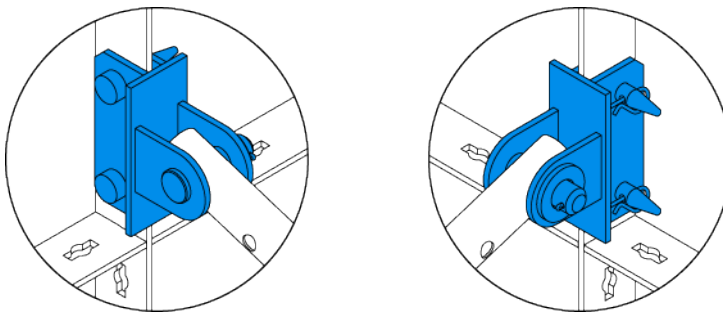


SUPPORT BRACE

Support brace creates an opportunity to align the formwork, makes it easier to plumb and braces the formwork against wind loads. Support brace is quickly and securely fixed to the ground with use of dowels or anchor bolts.



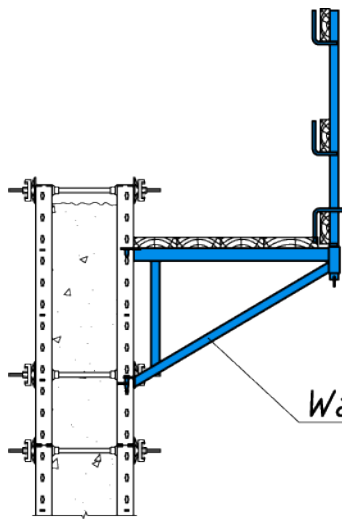
Use Support brace 250 Handi and Support brace 340 Handi with Handi formwork. Support braces are fixed to the panels using the Support braces head.



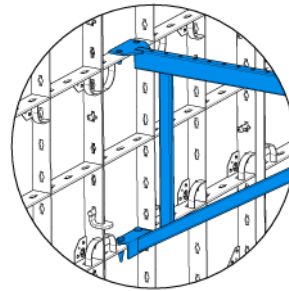


WALL BRACKET HANDI

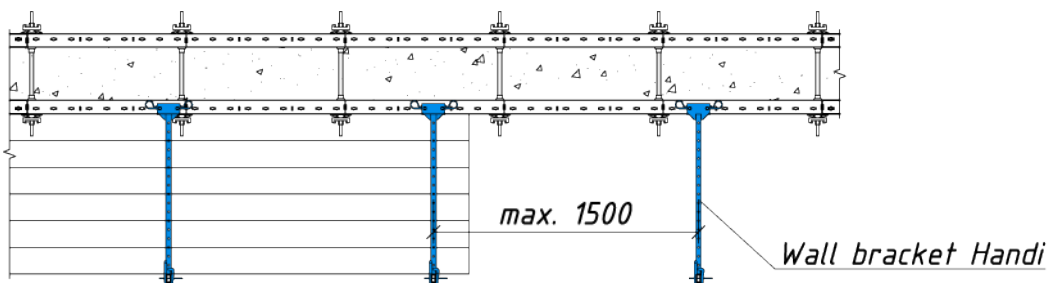
Wall brackets Handi is set into the bolt slots of formwork panels and firmly connected using two bolts. The brackets must be protected against accidental lift-out.



Wall bracket Handi



Permitted service load: 1.0 kN/m^2 (100 kg/m^2)
Maximum space between brackets: 1.5 m.



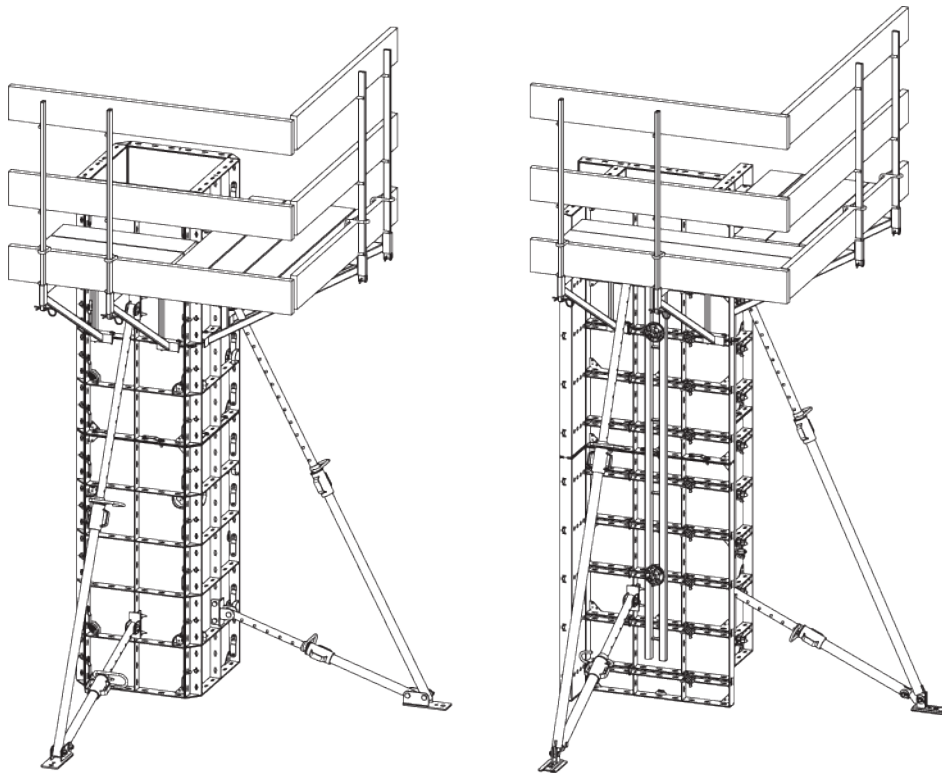
COLUMNS

There are two possible types of columns:

- 1) with standard Handi panels and external angles;
- 2) with versatile Handi panels.

PERMITTED FRESH-CONCRETE PRESSURE:

35kN/m²



Formwork for columns made of standard panels: Handi panels + external angles + clips (binding clips/ bolts) + support braces.

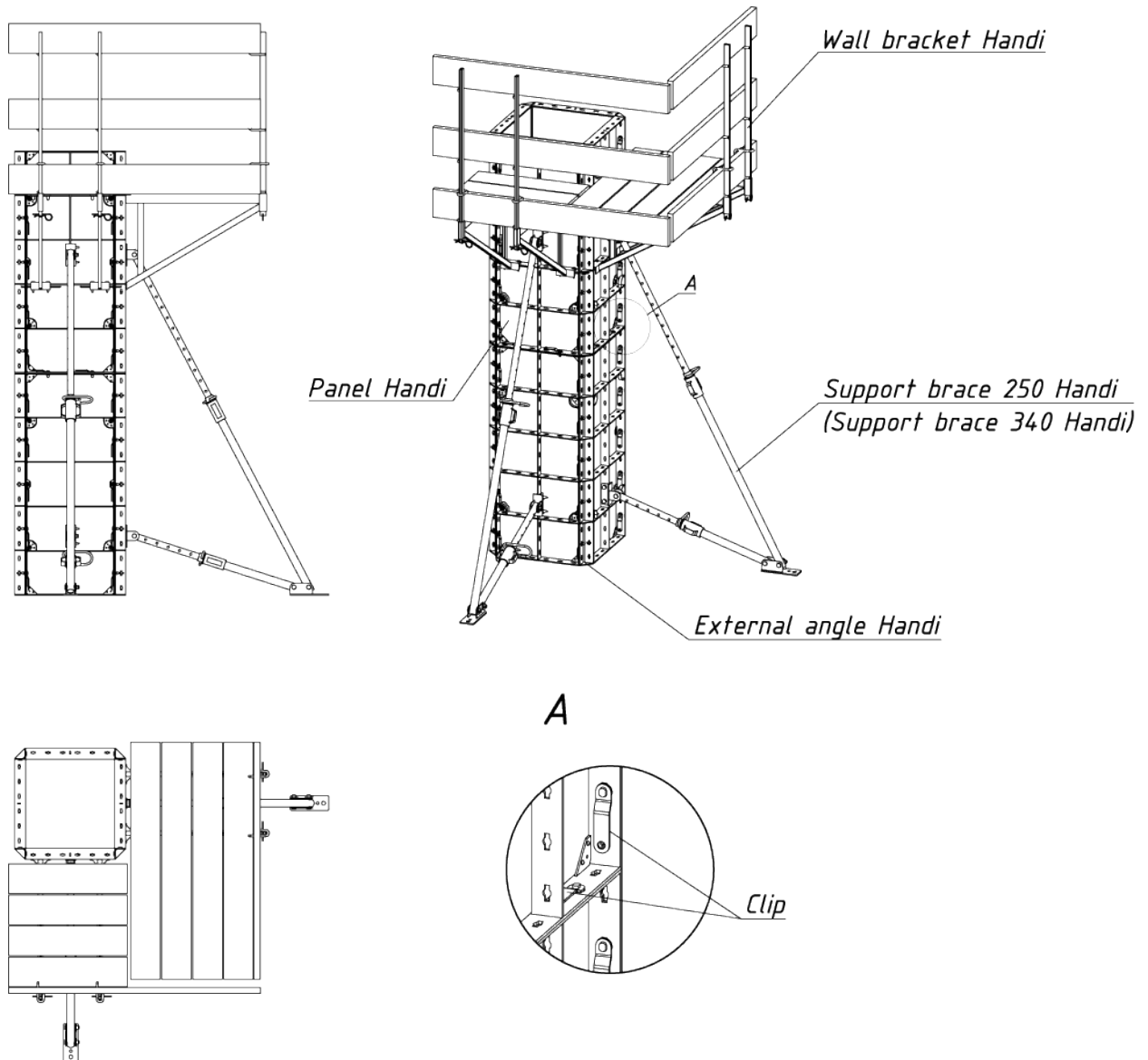
Formwork for columns made of versatile panels: Handi versatile panels + clips (binding clips/ bolts) + connection screws + star-shaped nuts + washers + support braces.

During concreting columns of Handi formwork elements must be strictly performed the following conditions:

1. 100% of connection elements must be installed in all the vertical and horizontal joints.
2. The concrete pressure must not be more than 35 kN/m² (due to deflection of plywood).
3. The support braces and wall brackets for concreting must be mounted.
4. Columns must be fitted to the crane grips (2 pcs for one set of columns).
5. Maximum recommended section of columns is 600x600 mm.



COLUMN WITH STANDARD PANELS



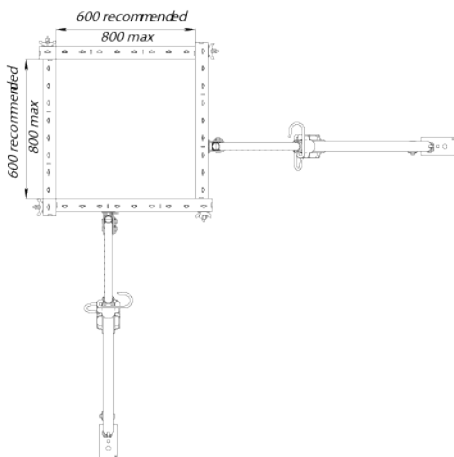
COLUMN WITH VERSATILE PANELS

Dimensions of versatile panels

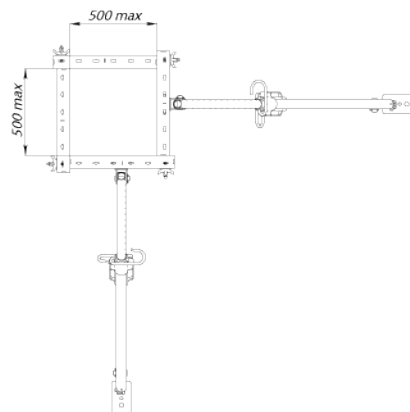
Width	Height		
	900	1200	1500
600			
900			

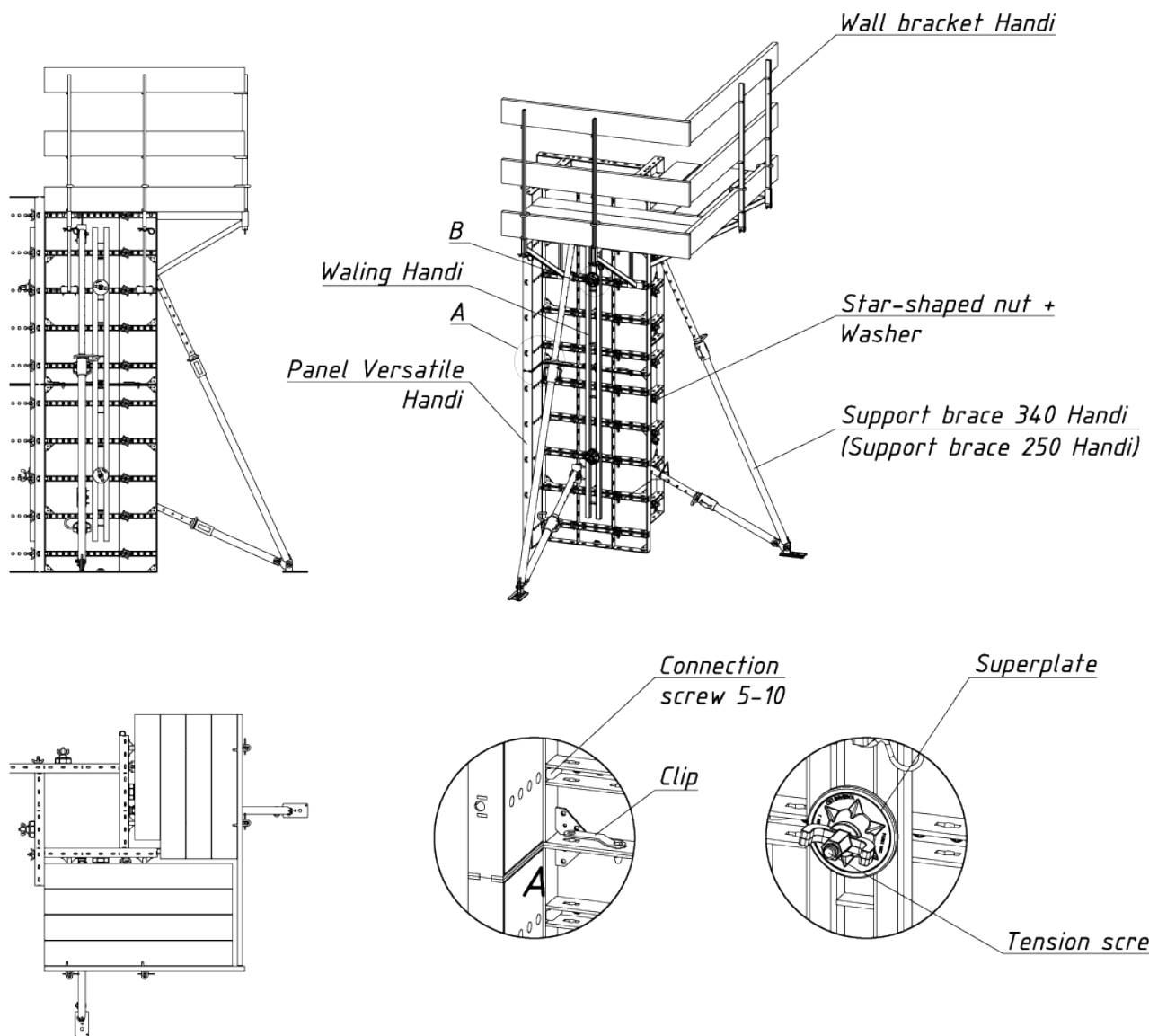
POSSIBLE DIMENSIONS OF COLUMNS

-versatile panels Handi 900



- versatile panels Handi 600



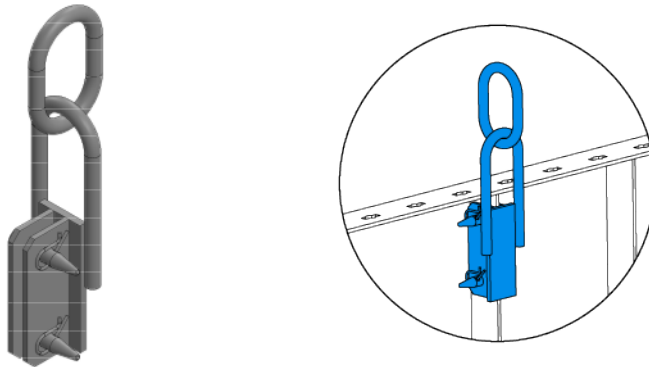


TRANSPORTING, STACKING AND STORING

CRANE GRIP HANDI

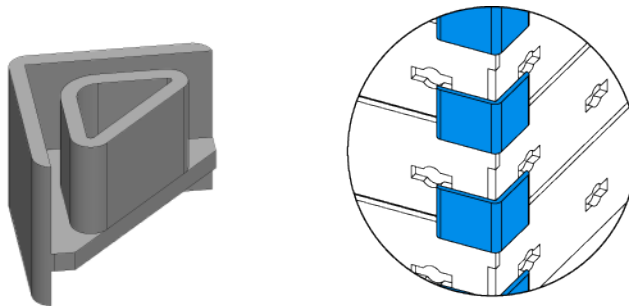
Safe crane-handling of Handi panels is possible using the crane grip handy for Handi formwork.

Maximum load: 400 kg per crane grip.



STACKING ANGLE

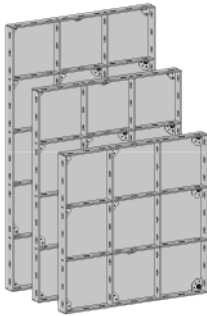
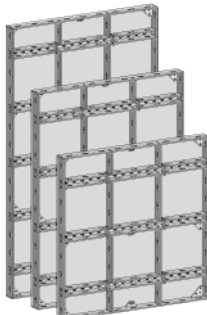
Place plastic stacking angles between each panel (max. 10 panels in one stack).



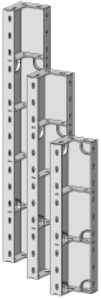
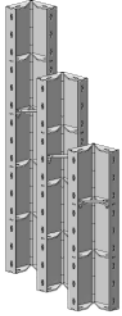
When placed on the ground put squared timbers 100x100 mm with length equal to width of panels+50 mm.



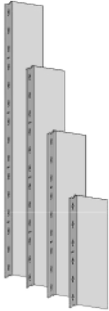
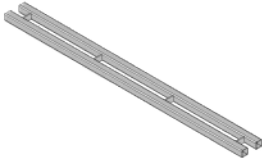
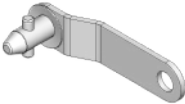
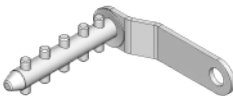
COMPONENT OVERVIEW

Item		[kg]	Article n°
Standard panel Handi  Options available: xx xxx 000 - Powder coated; xx xxx 100 - Galvanized; xx xxx 200 - Hot dip galvanized; Custom size on inquiry	0.90x1.50 m	54,10	13 112 000
	0.60x1.50 m	37,95	13 116 000
	0.50x1.50 m	34,15	13 118 000
	0.40x1.50 m	30,35	13 120 000
	0.30x1.50 m	22,48	13 122 000
	0.25x1.50 m	20,32	13 124 000
	0.20x1.50 m	18,51	13 126 000
	0.15x1.50 m	16,57	13 128 000
	0.90x1.20 m	44,17	13 212 000
	0.60x1.20 m	30,96	13 216 000
	0.50x1.20 m	27,72	13 218 000
	0.40x1.20 m	24,60	13 220 000
	0.30x1.20 m	18,24	13 222 000
	0.25x1.20 m	16,52	13 224 000
	0.20x1.20 m	15,00	13 226 000
	0.15x1.20 m	13,44	13 228 000
	0.90x0.90 m	34,59	13 312 000
	0.60x0.90 m	23,98	13 316 000
	0.50x0.90 m	21,79	13 318 000
	0.40x0.90 m	19,02	13 320 000
	0.30x0.90 m	14,23	13 322 000
	0.25x0.90 m	12,78	13 324 000
	0.20x0.90 m	11,62	13 326 000
	0.15x0.90 m	10,37	13 328 000
Versatile panel Handi  Options available: xx xxx 000 - Powder coated; xx xxx 100 - Galvanized; xx xxx 200 - Hot dip galvanized; Custom size on inquiry	0.90x1.50 m-V	64,65	13 110 000
	0.60x1.50 m-V	45,59	13 114 000
	0.90x1.20 m-V	52,51	13 210 000
	0.60x1.20 m-V	36,93	13 214 000
	0.90x0.90 m-V	41,04	13 310 000
	0.60x0.90 m-V	28,77	13 314 000

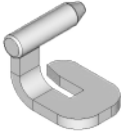
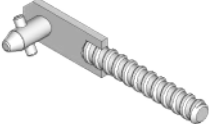
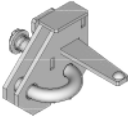
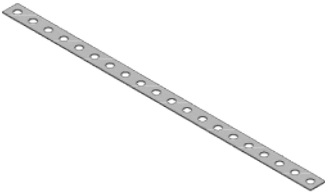
HANDI LIGHTWEIGHT FRAMED FROMWORK SYSTEM

Item		[kg]	Article n°
Internal angle Handi  Options available: xx xxx 000 - Powder coated; xx xxx 200 - Hot dip galvanized; Custom size on inquiry	0.20x1.50 m	35,64	13 410 000
	0.20x1.50 m	28,71	13 420 000
	0.20x0.90 m	21,07	13 430 000
Joint angle Handi  Options available: xx xxx 000 - Powder coated; xx xxx 200 - Hot dip galvanized; Custom size on inquiry	0.20x1.50 m	38,06	13 412 000
	0.20x1.20 m	29,19	13 422 000
	0.20x0.90 m	22,17	13 432 000
External angle Handi  Options available: xx xxx 000 - Powder coated; xx xxx 200 - Hot dip galvanized; Custom size on inquiry	1.50 m	10,50	13 414 000
	1.20 m	8,42	13 424 000
	0.90 m	6,34	13 434 000
	0.60 m	4,27	13 444 000

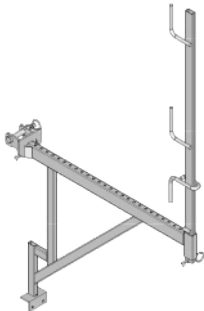


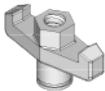
Item		[kg]	Article n°
Expansion block Handi 	1.50 m	14,93	13 610 000
	1.20 m	11,95	13 620 000
	0.90 m	9,07	13 630 000
	0.60 m	5,96	13 640 000
Waling Handi 	0.50 m	4,67	13 505 000
	1.00 m	9,37	13 510 000
	1.50 m	13,86	13 515 000
	2.00 m	18,46	13 520 000
	2.50 m	23,05	13 525 000
	3.00 m	27,57	13 530 000
Lifting hook Handi 		2,89	13 706 100
Clip Handi 		0,18	13 710 100
5-pin clamp Handi 		0,27	13 712 100

HANDI LIGHTWEIGHT FRAMED FROMWORK SYSTEM

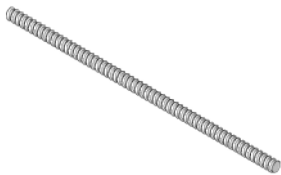
Item	[kg]	Article n°
Binding clip Handi 	0,27	13 714 100
Tension screw Handi 	0,36	13 708 100
Connection screw 	5-10	0,42 13 718 100
Stop-end plate Handi 	6x75x750 mm	2,48 13 716 000
Foundation clamp Handi 	1,64	13 722 100
Perforated tape 50x2 mm 	1.00 m 1.50 m 2.00 m 2.50 m 3.00 m	0,68 1,02 1,36 1,70 2,04 96 110 300 96 115 300 96 120 300 96 125 300 96 130 300

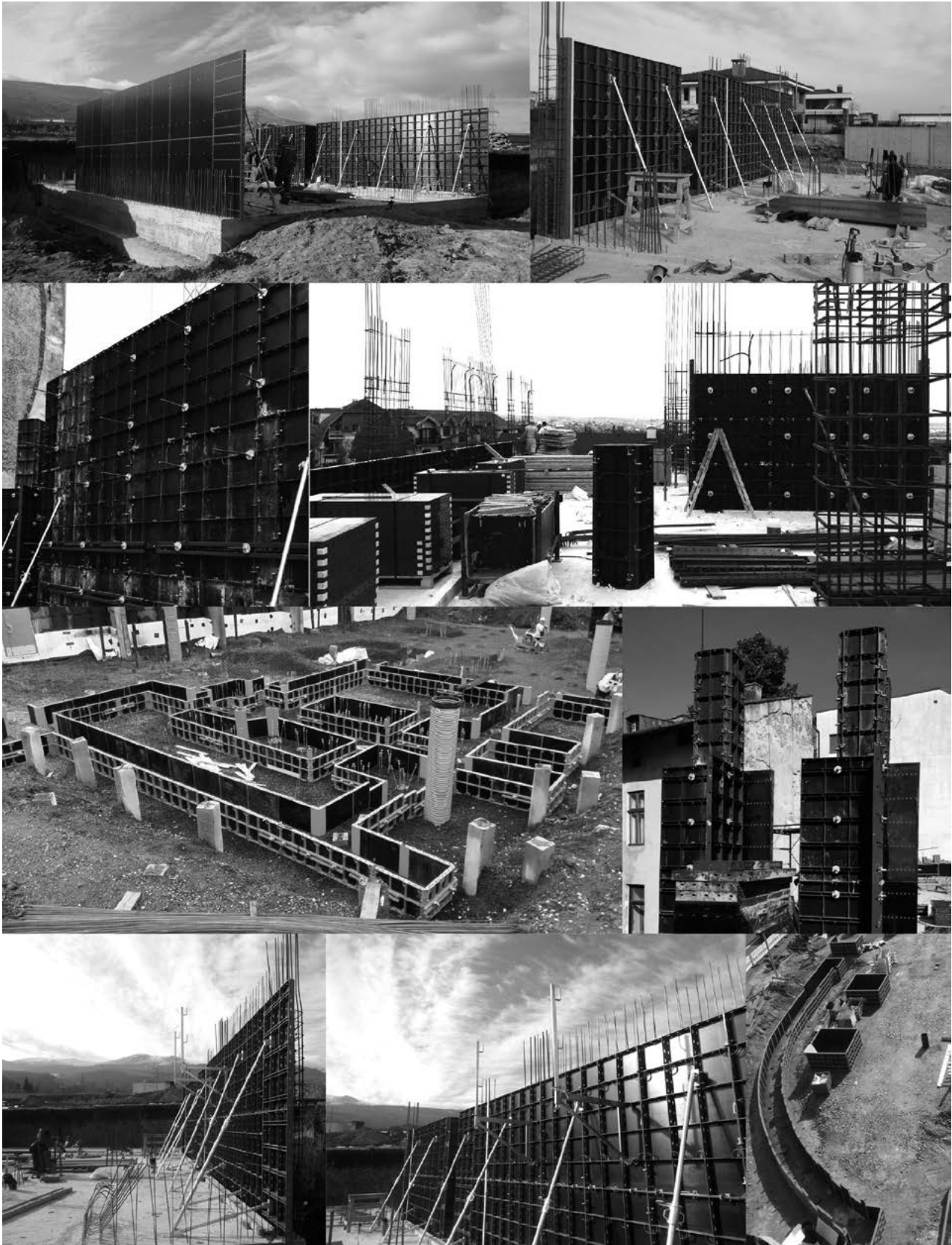


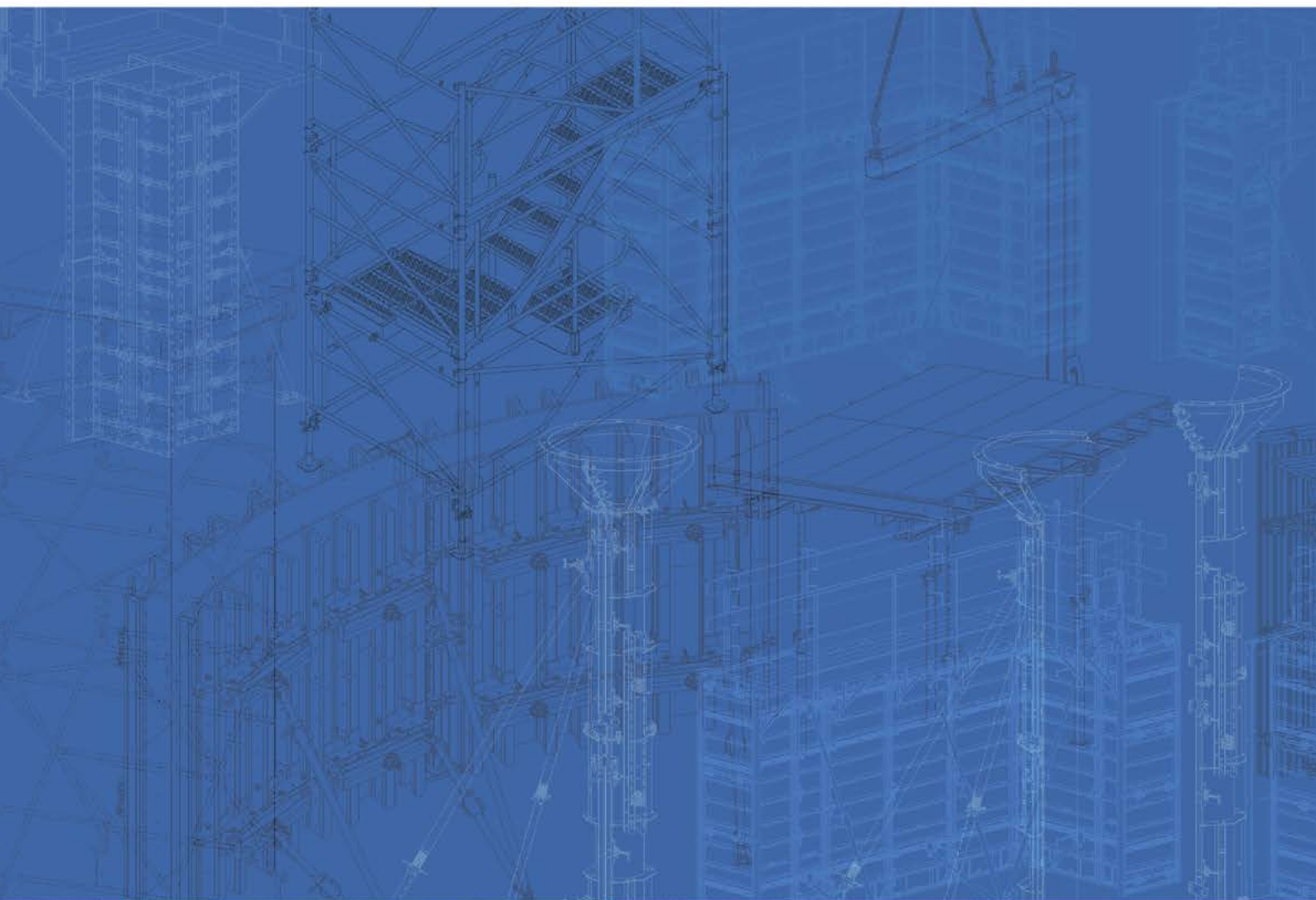
Item	[kg]	Article n°
Wall bracket Handi 	11,98	13 700 100
Guide rail clamp 	12,40	52 400 100
Supporting strut 250 Handi 	22,94	13 702 100

Item		[kg]	Article n°
Supporting strut 340 Handi 		33,29	13 704 100
Superplate 	15	1,22	95 200 100
Wing nut 	15	0,38	95 204 100
Washer 		0,10	13 720 100



Item		[kg]	Article nº
Plastic tube 22 mm 	2.00 m	0,45	99 100 400
Plastic cone 22 mm 		0,005	99 102 400
Tie rod 15.0 mm 	0.50 m	0,80	92 050 300
	0.75 m	1,20	92 075 300
	1.00 m	1,60	92 100 300
	1.25 m	2,00	92 125 300
	1.50 m	2,40	92 150 300
	1.75 m	2,80	92 175 300
	2.00 m	3,20	92 200 300
	2.25 m	3,60	92 225 300
	2.50 m	4,00	92 250 300
	2.75 m	4,40	92 275 300
	3.00 m	4,80	92 300 300
Handle Handi 			13 724 100
Stacking angle Handi 			13 990 400
Plug for holes 			12 990 400





VARIANT

Ukraine, 61070, Kharkiv,
st. Shevchenko, 325

Tel. +38 (057) 756-37-77
E-mail: international@variant-factory.eu