



FlyForms International L.L.C.

Formwork Solutions

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H20 Wall and Column Formwork

Assembly and Application Guide

Product Information and features

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Product Features

The basis of the H20 Wall and Column Formwork system is the H20 Timber Beam. The H20 Timber Beam is made of the highest quality with competitive advantages.

The H20 Timber Beam is sturdy, easy to handle and only weighs 4.80 kg/m. It provides a high load-bearing capacity even for great distances of Walers. This advantage results to less anchor points. The project oriented design and arrangement of the H20 Timber Beam elements allow choices of various types of plywood sheet. Furthermore, the system allows an optimum and flexible arrangement of tie positions.

The H20 wall formwork elements are assembled quickly and easily by connecting the H20 Timber Beams to the Walers by means of H20 Flange Clamp. Dismantling of elements is done as easily as the erection of the system. The advantage is that the wall formwork system provides a high adaptation and easy re-assembling when ground plans of the structure change frequently.

The H20 wall and column formwork system is one of the most economical alternative to steel frame formwork panel system when it comes to complicated designs and numerous non-typical applications with the same wall heights.

The H20 wall and column formwork system is used for all types of walls and columns and has high rigidity and stability at a relatively low weight.

The H20 Wall and Column Formwork System is designed and manufactured in accordance with BS EN 12182 : 2008, code of practice for Falsework

Important Remarks

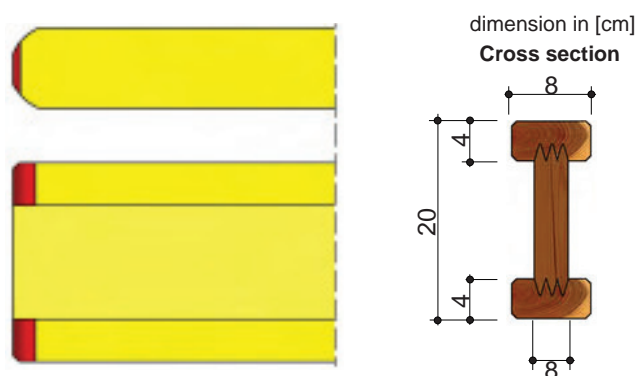
The succeeding assembly and application guide has to be carefully read as it contains detailed information on the proper application and handling of the H20 wall and column formwork system. All instructions concerning technical operation and function have to be observed carefully. Please note that exceptional use of the H20 wall and column formwork system requires a separate design calculation.

In order to ensure a technical and safe use of our product, all relevant national safety rules and regulations and safety instructions of national institutes and/or local authorities have to be observed. In general, only undamaged materials and components must be used.

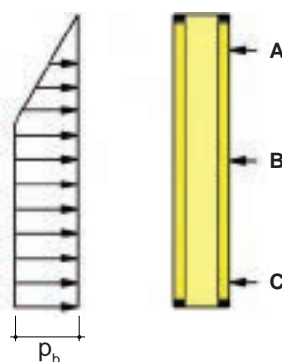
It is important that damaged components are sorted out and removed from the construction site. In case of repairs, only original spare parts of FFI must be used.

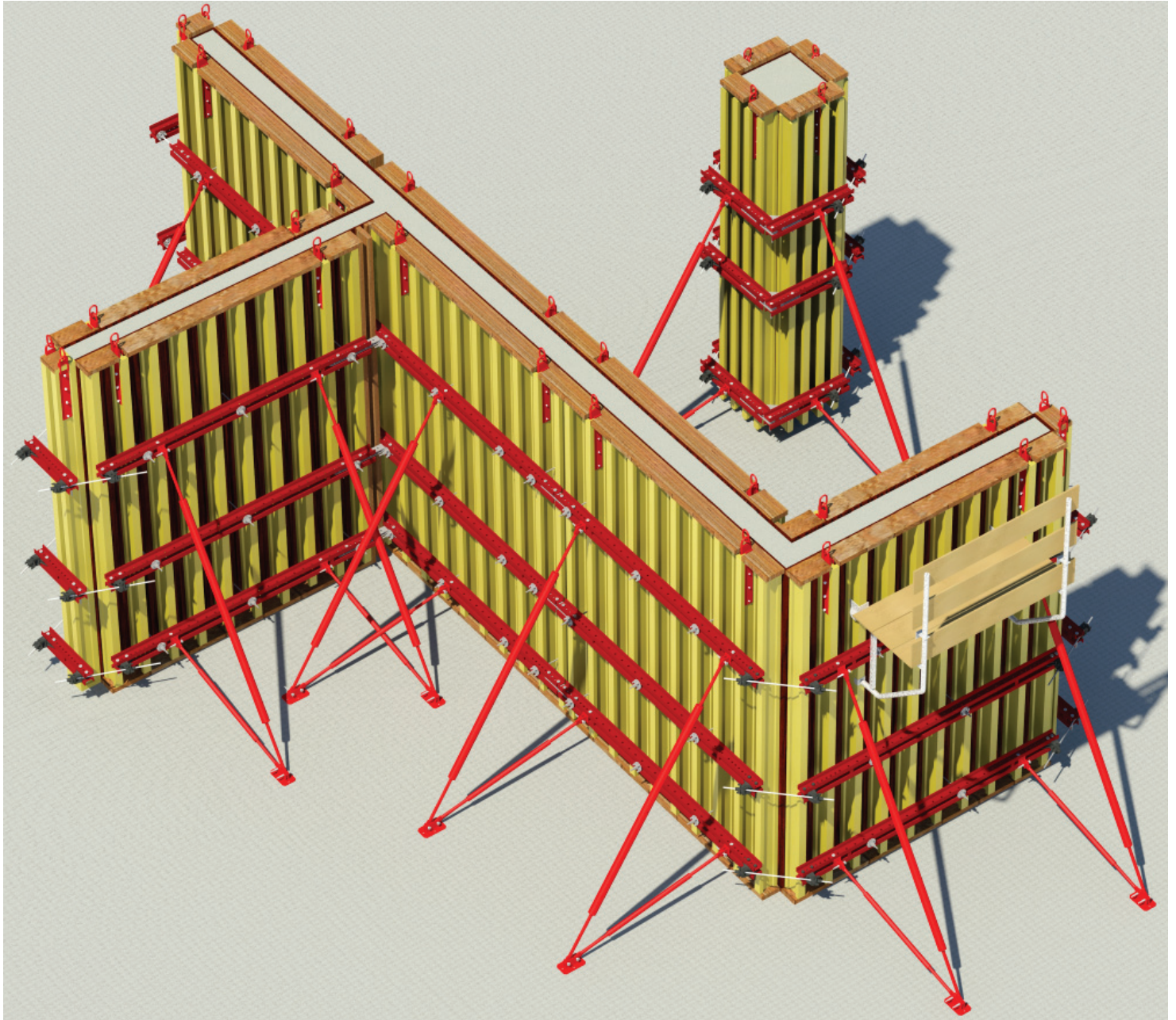
H20 Timber Beam

Beam end Protected by plastic bumper

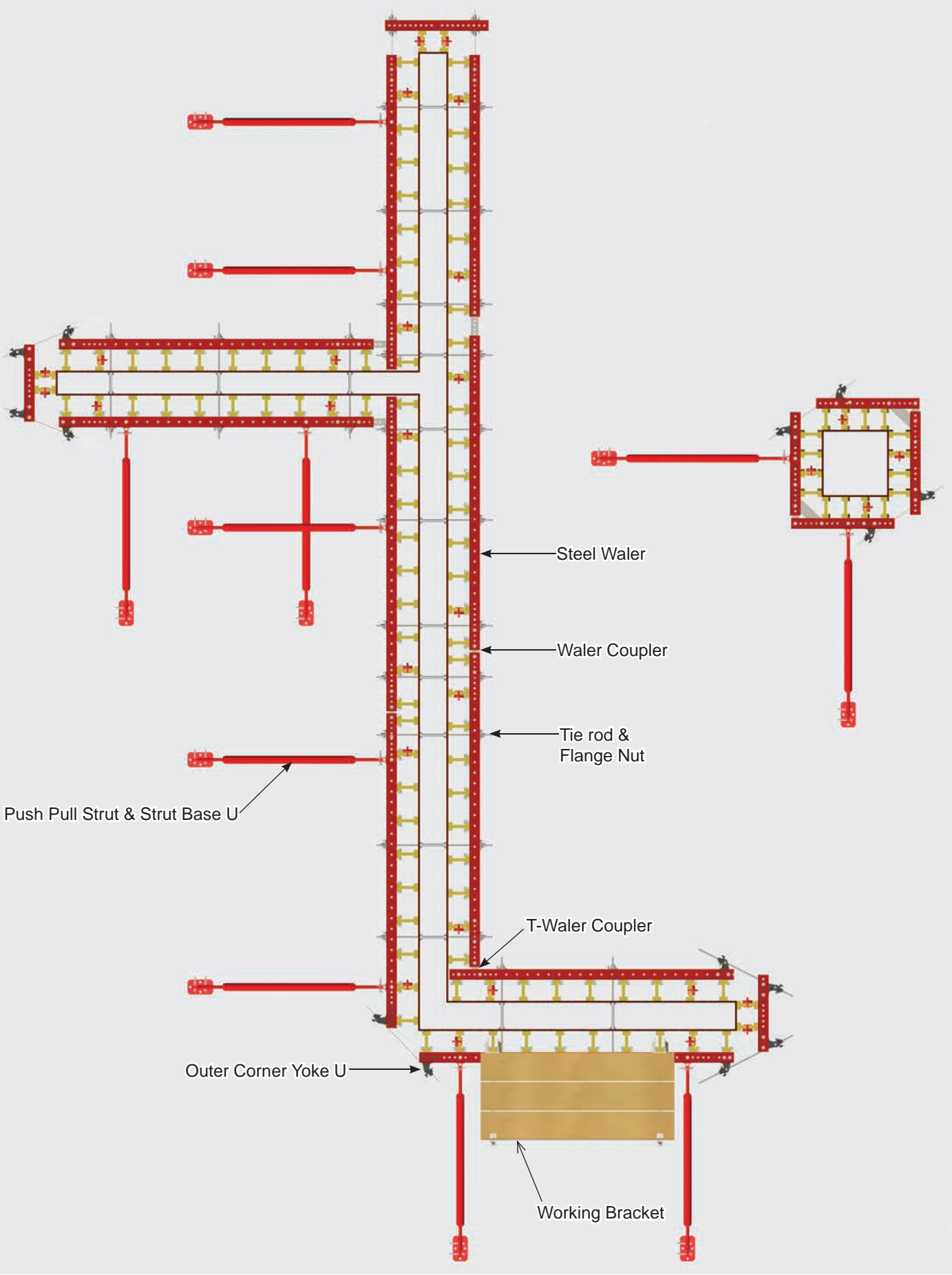


perm. M = 5 kNm (bending moment)
 perm. Q = 11 kN (shear force)
 max. B = 22 kN (support reaction)
 Flectural rigidity:
 $E \times I = 500 \text{ kNm}^2$

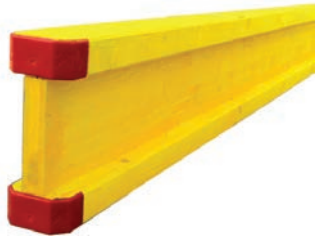
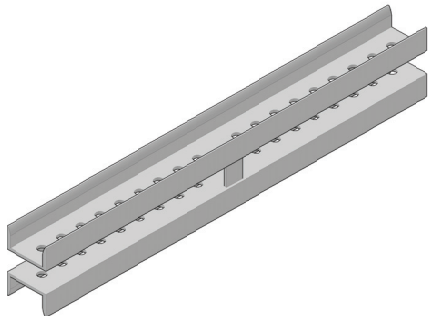

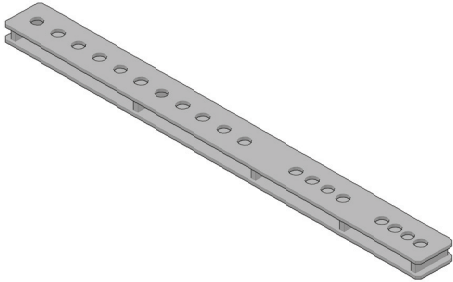
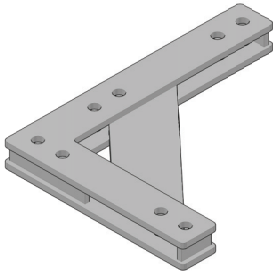




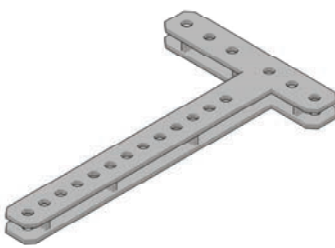
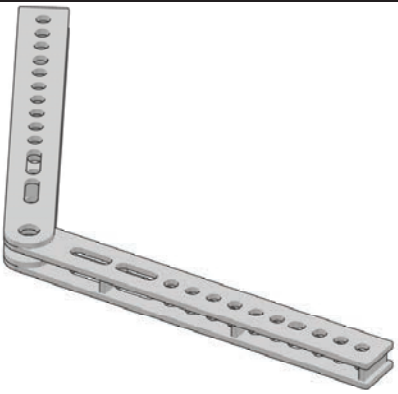
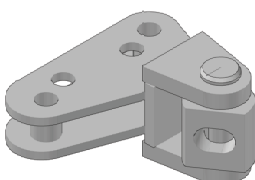
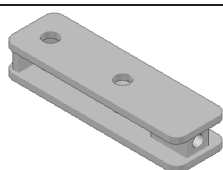
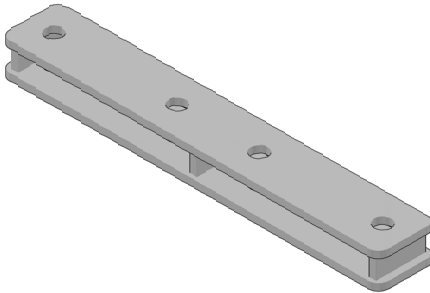


Plan View




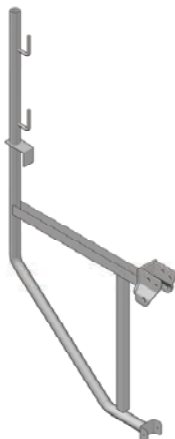

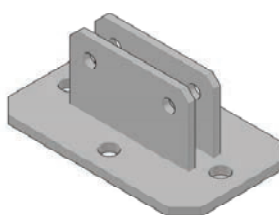
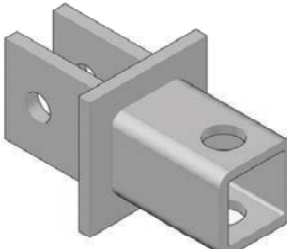
Components

	Art. No	Weight Kg/pc.	
H20 Timber Beam H20 Beam 190 H20 Beam 245 H20 Beam 265 H20 Beam 290 H20 Beam 330 H20 Beam 360 H20 Beam 390 H20 Beam 450 H20 Beam 490 H20 Beam 590	401TB190 401TB245 401TB265 401TB290 401TB330 401TB360 401TB390 401TB450 401TB490 401TB590	9.12 11.76 12.72 13.92 15.84 17.28 18.72 21.60 23.52 28.32	 The H20 Timber Beam serves as a supporting element of the plywood. The distance of the beams from axis to axis and the wall elements depends on the calculated and expected concrete pressure as well as of the chosen type of plywood. Tested and approved permissible loads: Max. perm. M = 5.00 kNm Max. perm. Q = 11.00 kNm E I = 500 kNm ² (bending moment)
Steel Walers Steel Waler-100/050 Steel Waler-100/075 Steel Waler-100/100 Steel Waler-100/125 Steel Waler-100/150 Steel Waler-100/200 Steel Waler-100/250 Steel Waler-100/300 Steel Waler-100/375 Steel Waler-100/500 Steel Waler-100/600	101SW050 101SW075 101SW100 101SW125 101SW150 101SW200 101SW250 101SW300 101SW375 101SW500 101SW600	10.26 15.39 20.55 25.77 31.09 41.63 52.04 62.58 78.31 104.34 125.42	 Walers are connected by means of Waler Connectors which provide a tension and pressure resistant element connection. The element connections are tight and precisely aligned.
Flange Clamp U This clamp connects the H20 Timber Beam to the Waler at any desired position.	101WC009	0.90	
Adjustable Waler Coupler This coupler joins two steel waler to form a long one, and to connect panels with a closures between them.	101AC080	5.14	
Corner Waler Coupler Used for forming L shape panels to form column formworks.	101CC048	11.55	






Components

	Art. No	Weight Kg/pc.	
T Waler Coupler U Used for forming an inner corner with length adjustments in combination with connecting pin to form column formworks.	101TC655	8.11	
Articulated Waler Coupler Used for the arrangement of polygonal element connections.	101AC002	7.49	
Outside Corner Yoke U To be attached to the walers by means of connecting pin at the end of the wall element for bracing and stiffening the outer corner.	101OC130	3.84	
Waler Head Anchor U Used in combination with a connecting pin for stopends. it is used together with tie rod 15mm dia. D & W and Flange nut	101BH240	1.85	
Waler Coupler U Used to connect two panels and also It joins two walers lengthwise to form longer one.	101WC046	4.21	
Connecting Pin U 20x190 Used for various types of connections.	101PE190	0.40	
Spring Cotter 5mm Used to lock Connecting Pin	101CP003	0.03	

Components

	Art. No	Weight Kg/pc.	
Beam Coupler Plate U Connects to adjustable waler coupler and is fixed to H20 beams, providing support for adjustable infill panels.	101CC135	2.14	
Working Bracket Equipped with upper U-profile where wooden beams on top can be fasten by nails. Furthermore, the bracket is built in with handrail post.	101WB011	16.50	
Push Pull Strut 1.10 - 1.70m With adjustable lengths between 1.10 - 1.7 m, used to plumb the panel and provide support against uplift and wind force.	101PP170	7.70	
Push Pull Strut 2.40 - 3.50m With adjustable lengths between 2.40 - 3.50 m, used to plumb the panel and provide support against uplift and wind force.	101PP350	24.30	
Push Pull Strut 3.60 - 4.80m With adjustable lengths between 3.60 - 4.80 m, used to plumb the panel and provide support against uplift and wind force.	101PP480	43.40	
Push Pull Strut 5.00 - 6.00m With adjustable lengths between 5.00 - 6.00 m, used to plumb the panel and provide support against uplift and wind force.	101PP600	51.30	
Push Pull Strut Base Plate for push pull strut which connects the push pull strut to the ground.	101PS007	3.60	
Push Pull Strut Head Head for Push Pull Strut which allows the joint of Push Pull Strut to waler to plumb and stabilize panels.	101NH045	2.75	

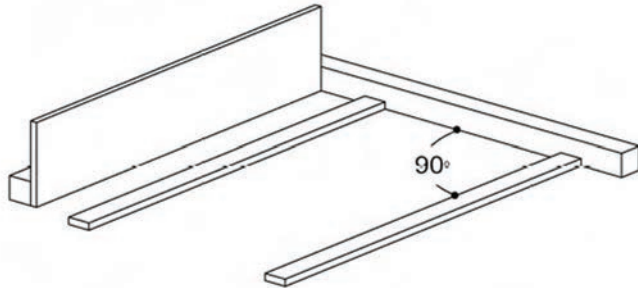
Components

	Art. No	Weight Kg/pc.	
Plate Washer Nut 15 U Equipped with base plate and nut and allows an incline of up to 10°. With max. permissible load of 90 kN.	315PW119	1.40	
Lifting Bracket U Lifting bracket is bolted to the upper part of the H20 beams providing a lifting point to which crane slings can be attached	101LB685	10.16	
Tie Rod 75 15mm dia./D&W Tie Rod 100 15mm dia./D&W Tie Rod 130 15mm dia./D&W Tie Rod 175 15mm dia./D&W Tie rod with max. permissible load of 90kN	315TR075 315TR100 315TR130 315TR175	1.05 1.40 1.82 2.45	
H20 splice plate Used for height extension of the extension of the wall formwork elements by fixing the H20 extension piece to the web of the H20 timber beams the H20 splice plate should be ordered twice the bolt M20x80 ordered 4 times	101CP080	4.50	
Flange Nut 3 Wing 100 V Used for stopends and other tying and connecting purposes. With a max. permissible load of 90 KN.	315FN120	0.59	

Pre-Assembly of Elements

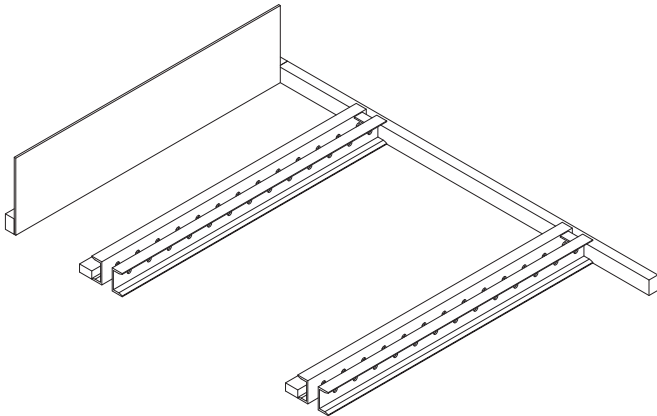
A. Basic Assembly

For basic assembly of the H20 elements, an assembly floor big enough for the largest wall formwork element has to be prepared. To ensure the exact position of the H20 Walers and Timber Beams, stop bars have to be fixed on the ground. The position of the stop bars should correspond to the spacing of the Walers



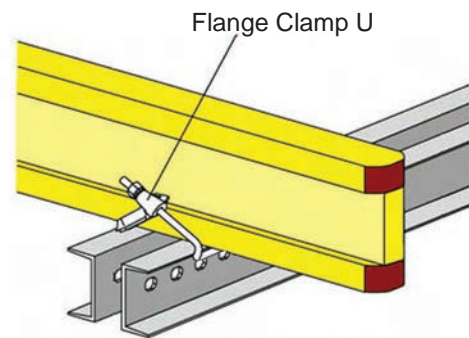
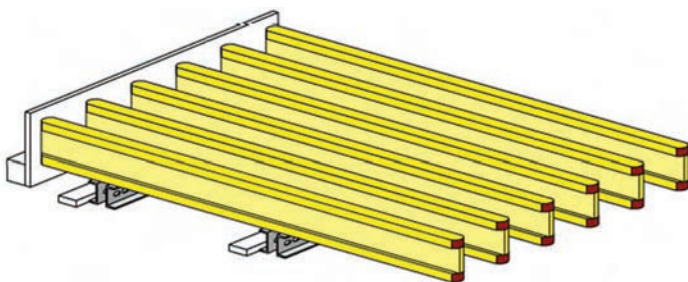
B. Waler Positioning

The Walers have to be placed on the assembly ground with the traverse on top facing upward.



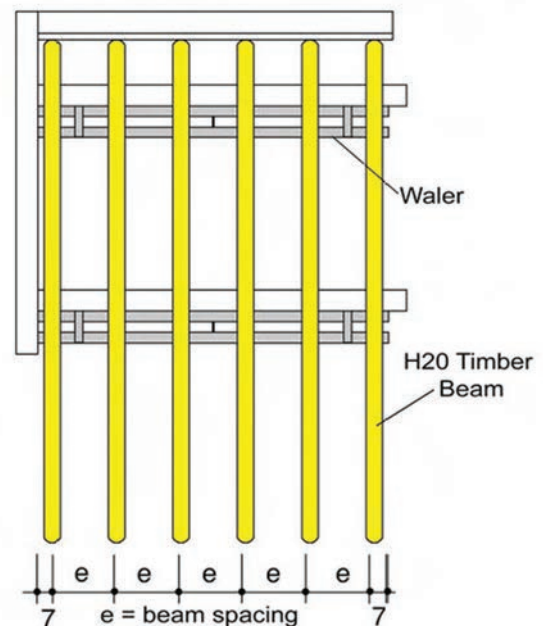
C. H20 Timber Beam Positioning

The spacing and positioning of the H20 Timber Beams are arranged based on the statical requirements. The H20 Timber Beam is fixed to the Waler using H20 Flange Clamps.



D. Fixing the Plywood Sheet

The plywood is fixed to the shuttering grid by means of nails, screw nails, or Spax screws.



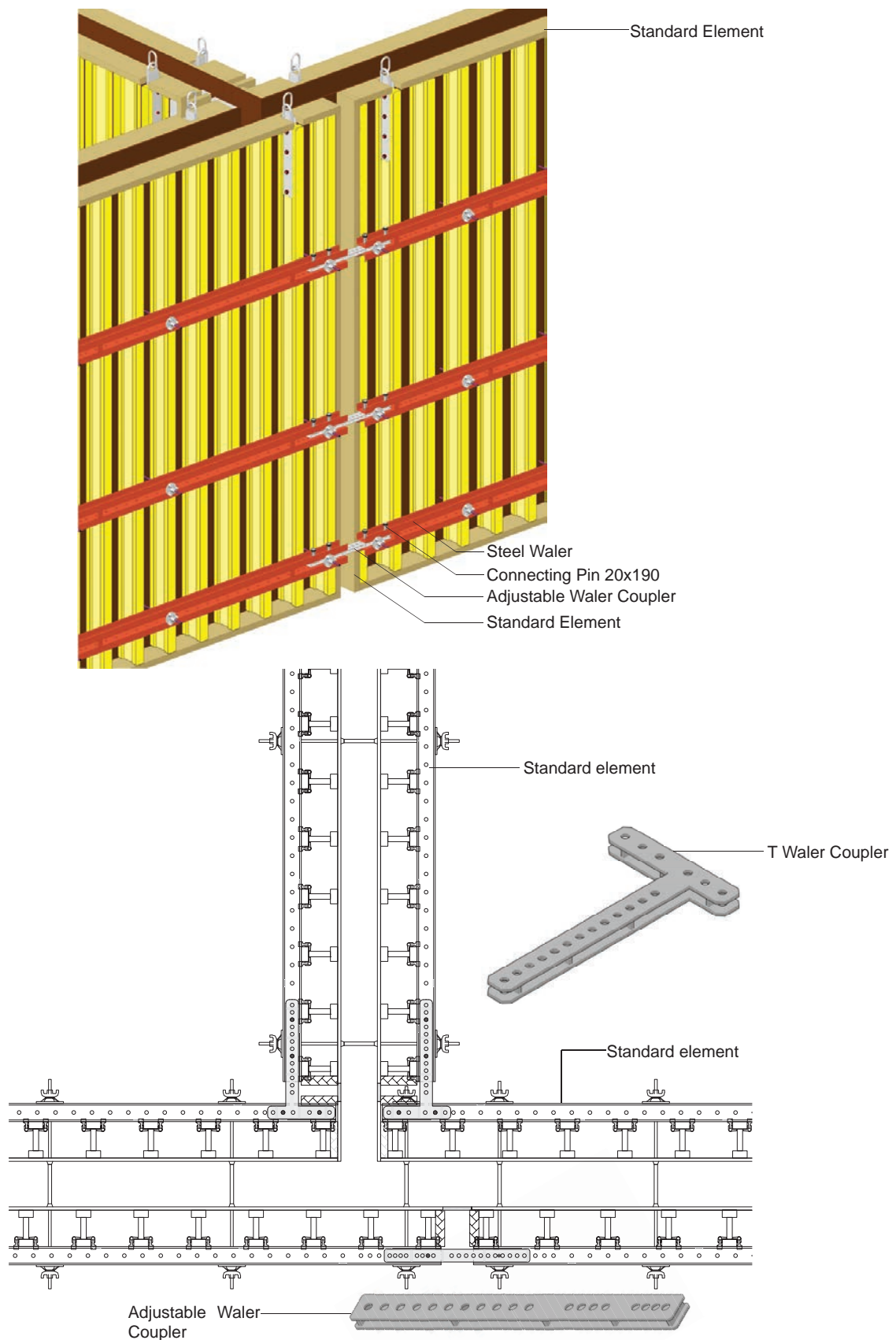
Note:-

H20 beams must be pre-drilled prior to assembly to accommodate fixing of working and lifting bracket. Check your formwork shop drawings regarding correct placement of pre-drilled beams

T-Shaped Wall Arrangement

The arrangement of a T-shape wall can be done with standard wall formwork elements and an additional infill panel which is fixed by means of Adjustable Waler Coupler.

The inner corners are arranged with standard elements.

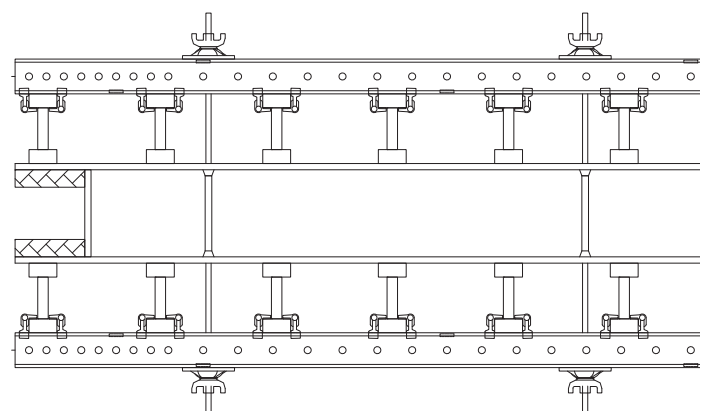
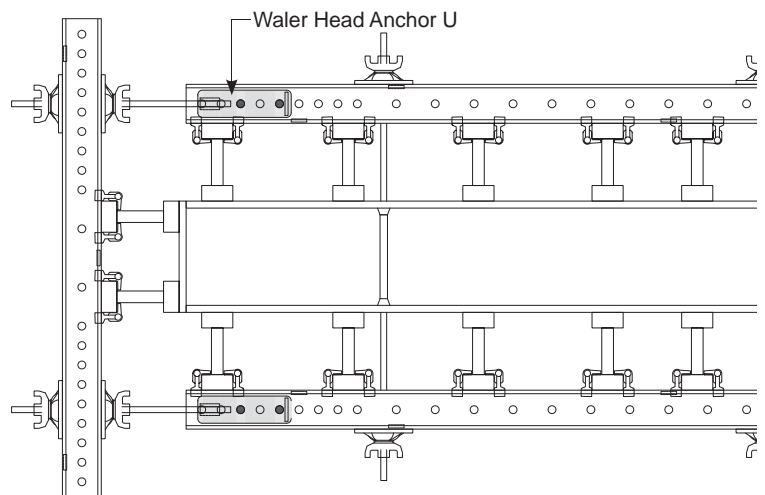
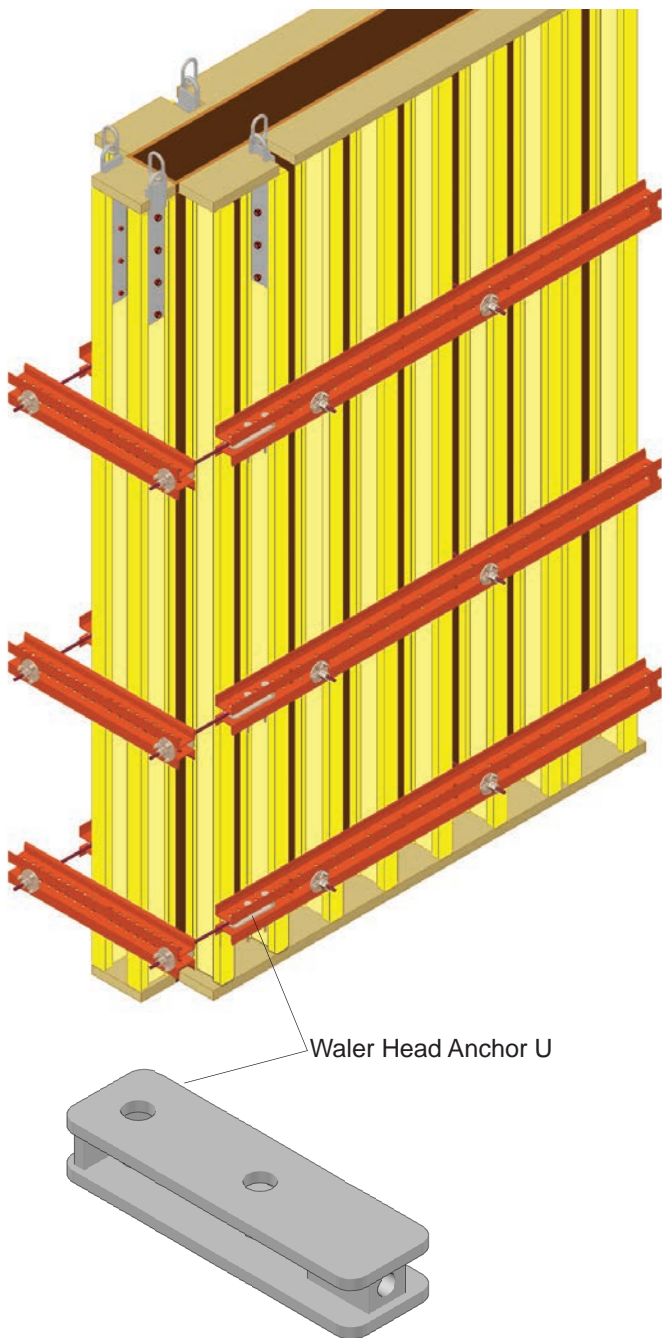
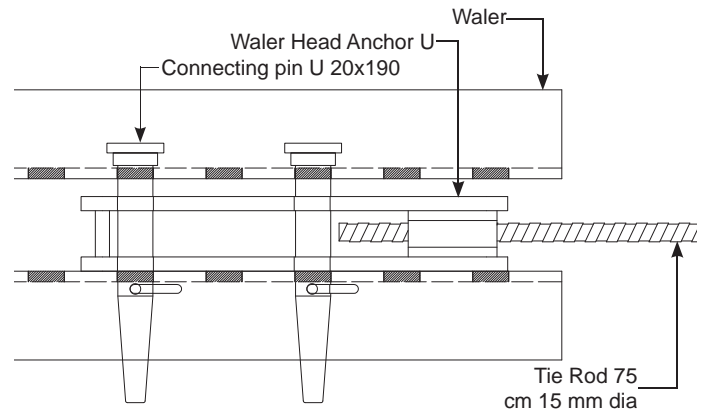


Stopend Arrangement

The stopend is arranged at the wall ending, a construction joint or an extension joint.

For arranging the stopend element, The Waler Head Anchor U is fixed between the Walers using a connecting pin U 20x190. The loads from the concrete pressure are transferred by the Tie Rods into the Walers. Flange Nut 3 Wing 100 V permits a tension resistant connection and exact adjustment.

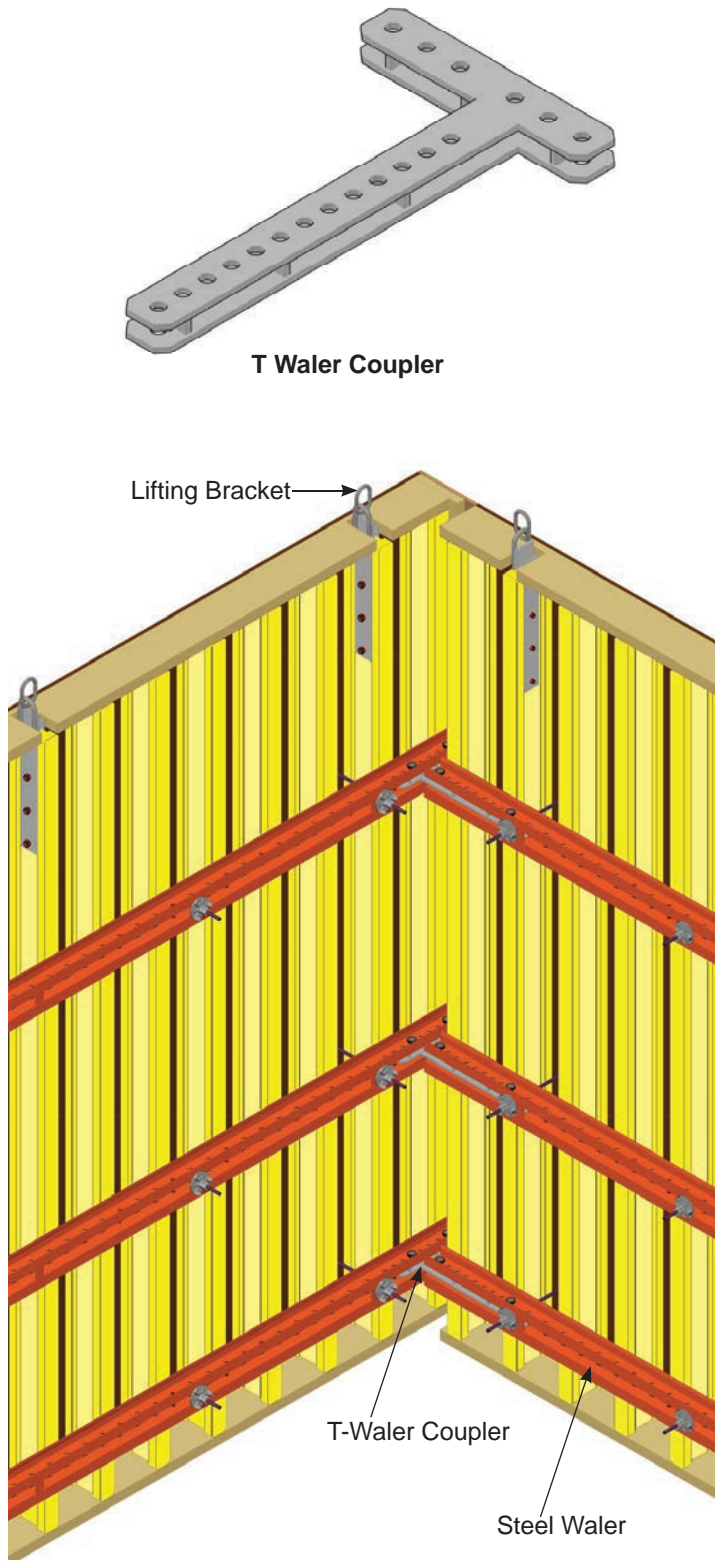
Depending on wall thickness, at least two H20 Timber Beams have to be used as stopend element.



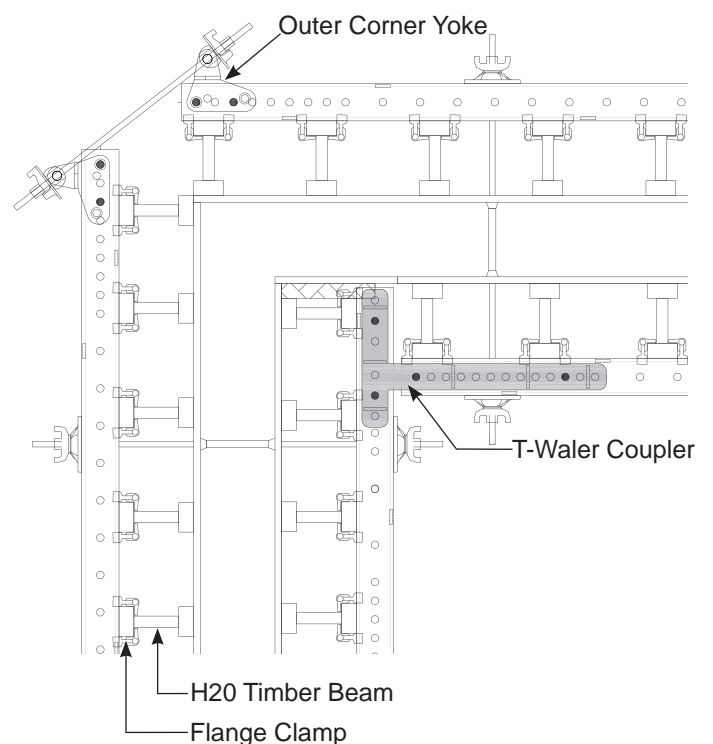
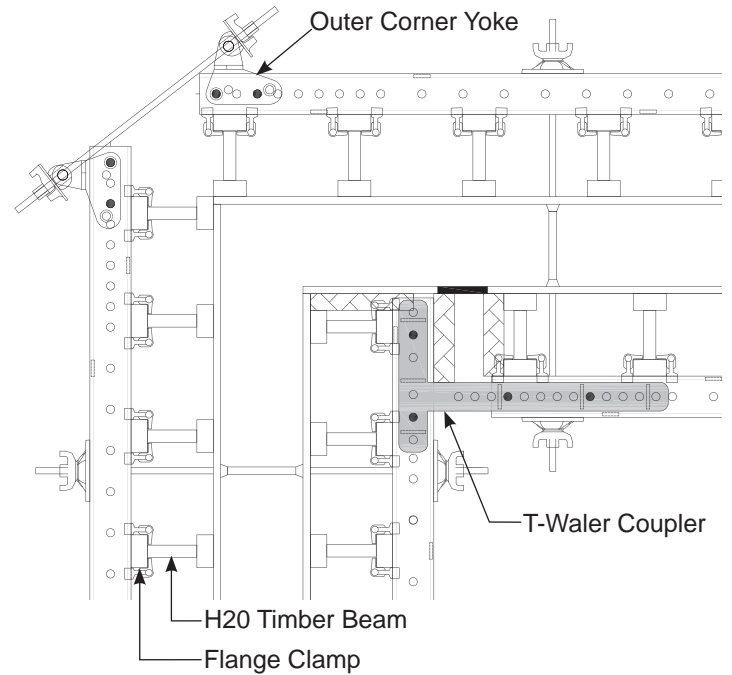
Corner Arrangement

Inner Corner

The erection of the inner corner is also possible by making use of T Waler Coupler in combination with Walers, H20 Timber Beams. The T Waler Coupler is fixed to the Waler by means of Connecting Pin.



Please take note that the T Waler Coupler shorter leg should be positioned towards the H20 formwork's inner corner.



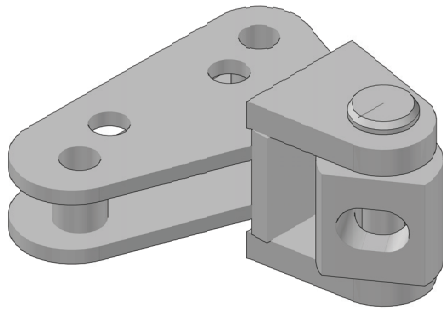
Corner Arrangement

Outer Corner

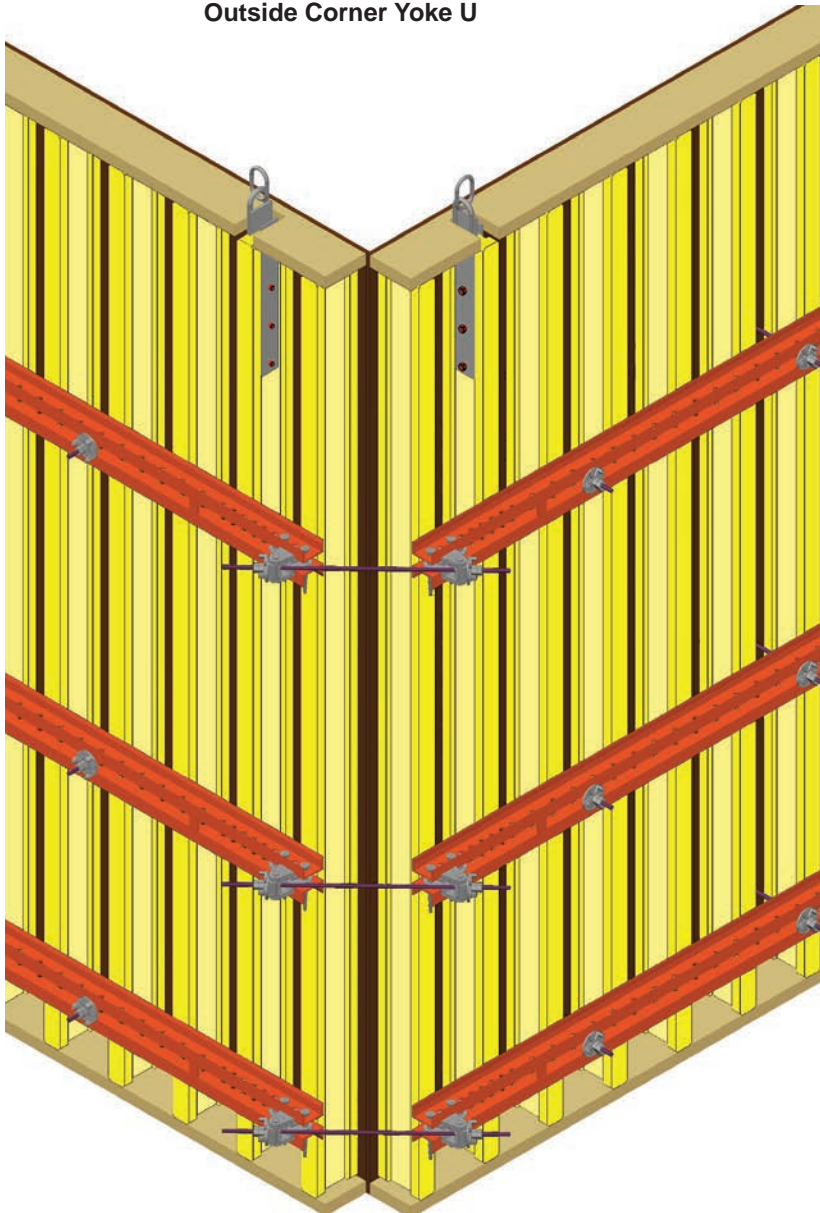
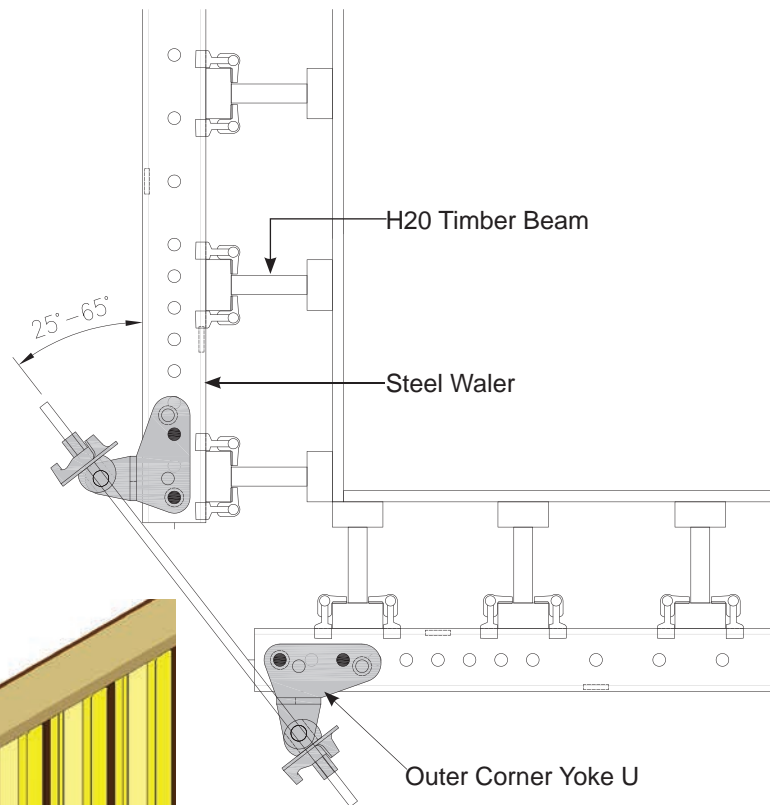
The standard outer corner is comprised with Outside Corner Yoke, Tie rod and Flange nuts. The Outside Corner Yoke U is fixed to the waler by means of Connecting Pin.

Tightening at the corner should be done at 45 degrees angle to the Waler.

Please note that the application of Outside Corner Yoke U must be at a min. 40 degrees and max. 50 degrees.



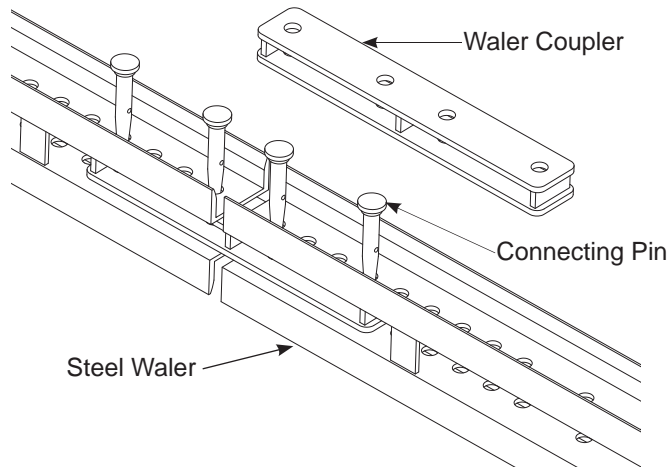
Outside Corner Yoke U



Element Connection

Connection of the Wall Elements

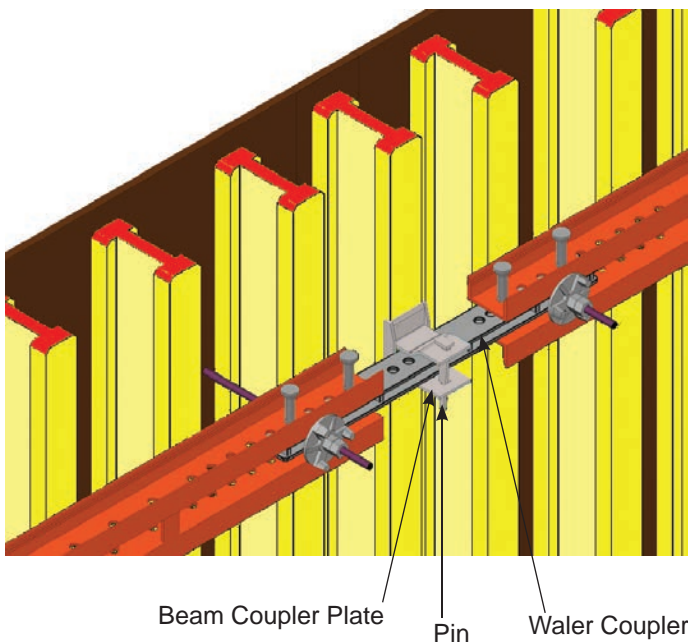
Fixing of the wall elements by means of Waler Coupler and four Connecting Pin provides an aligned, tension and compression resistant wall element connection.



Waler Connector 165 is used together with length adjustment panels with a maximum width of 80 cm.

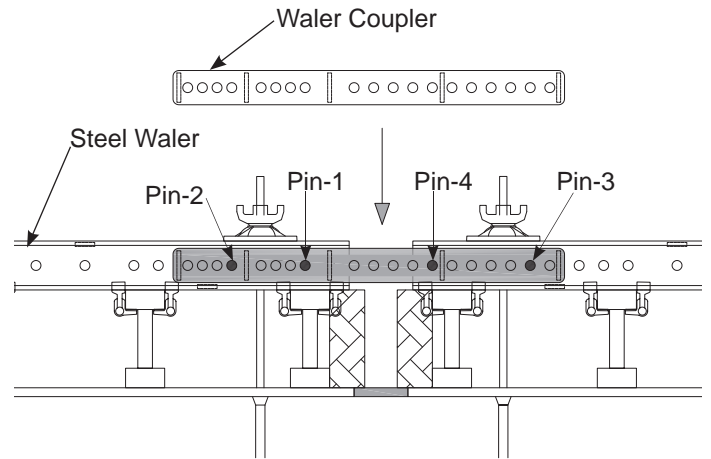
Length Adjustment

For length adjustment, Adjustable Waler Coupler, Beam Coupler Plate and connecting Pin are to be used and fixed to the H20 Timber Beam.



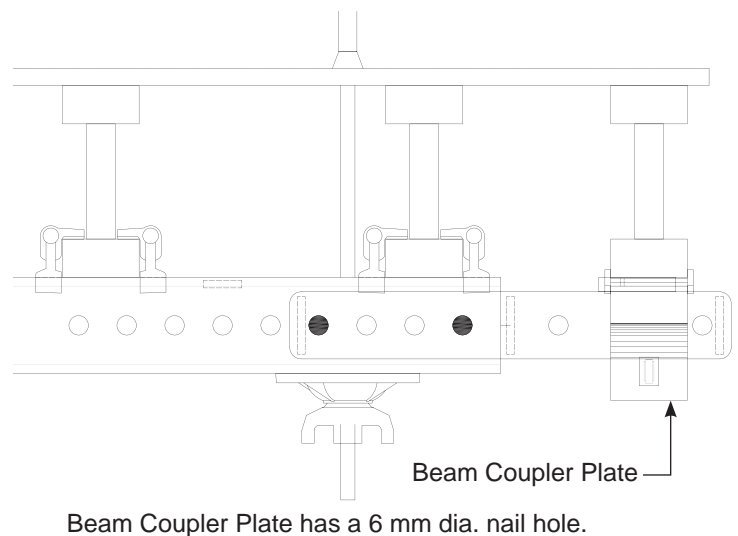
A. The center of the Waler Coupler has to be placed in between the two adjacent wall elements and secured with Pin 1.

B. Place Pin 2 at a maximum distance from Pin 1 and fasten.



C. Insert Pin 3 and tighten element joint then fasten Pin1 and Pin 3.

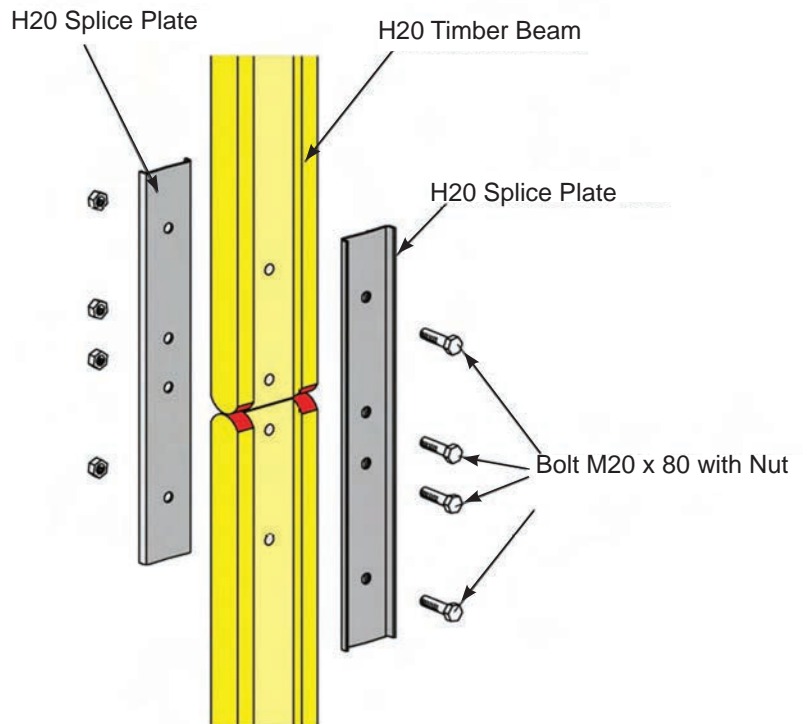
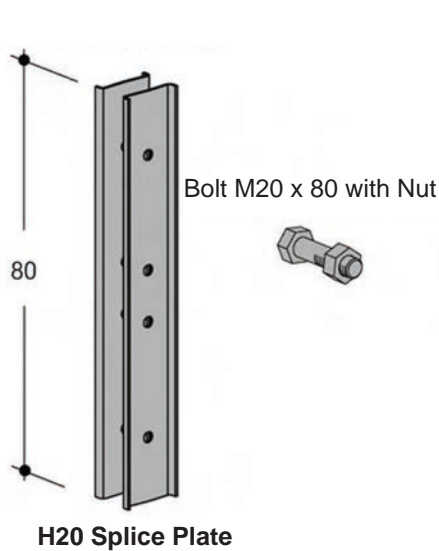
D. Pin 2 and Pin 4 have to be tightened as well.



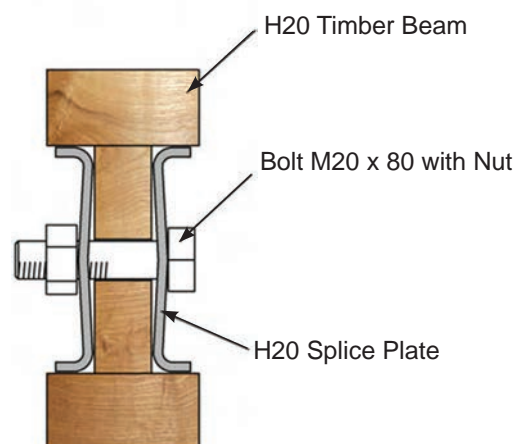
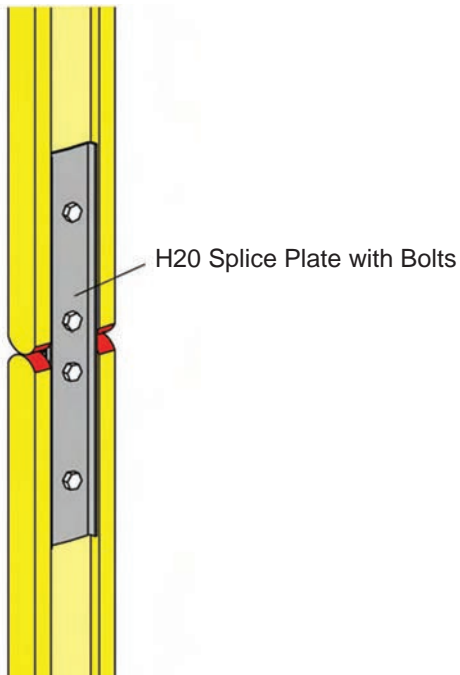
Height Extension

The H20 Splice Plate is used to extend the height of the wall formwork's standard elements. By fixing the H20 Splice Plate to the web of the individual H20 Timber Beams, an aligned and rigid connection which is compression and tension resistant is achieved.

The H20 Splice Plate is fastened to the H20 Timber Beams using two H20 Splice Plate and four Bolts M20 x 80 with Nut.

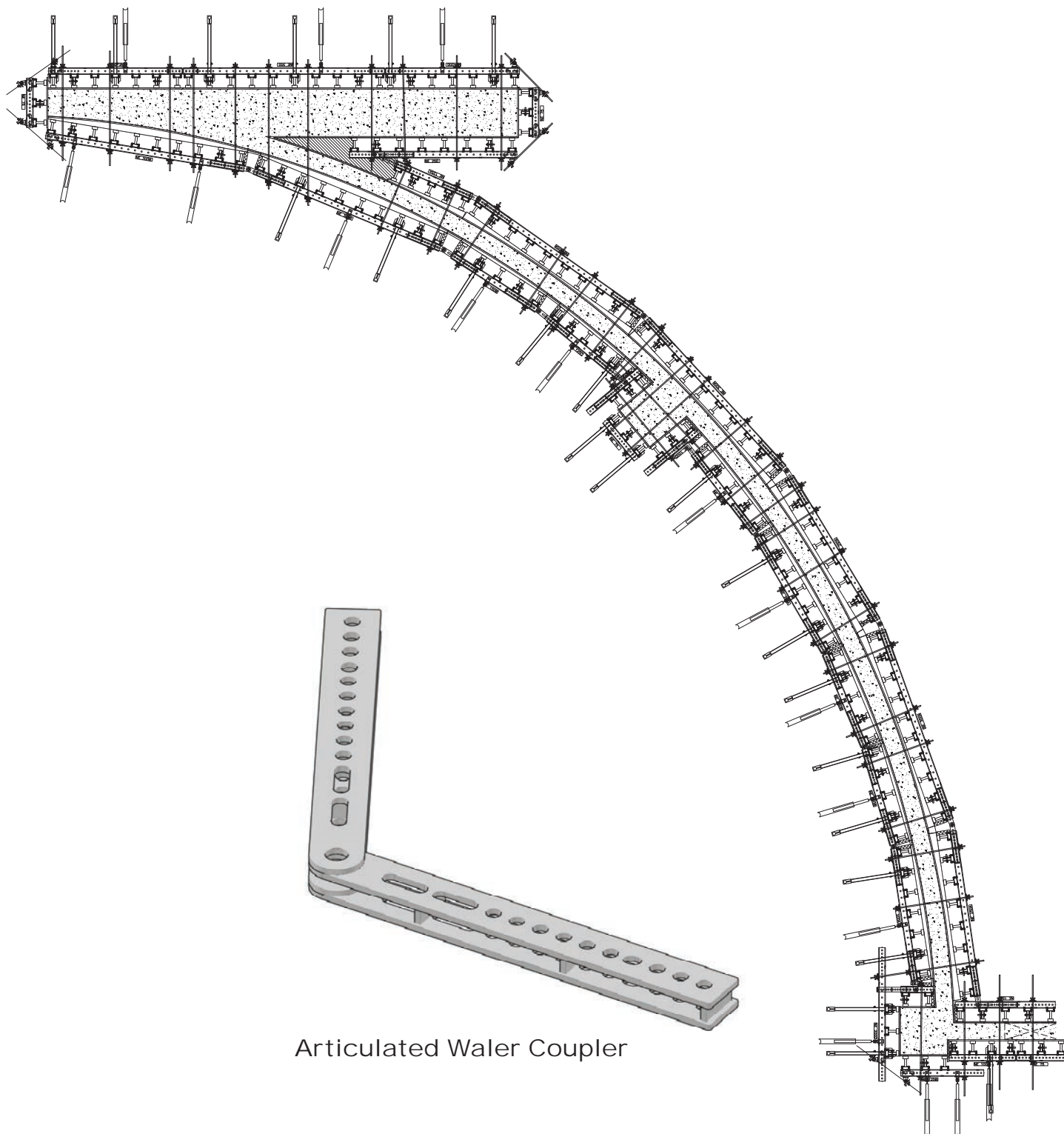


Joined beam ends

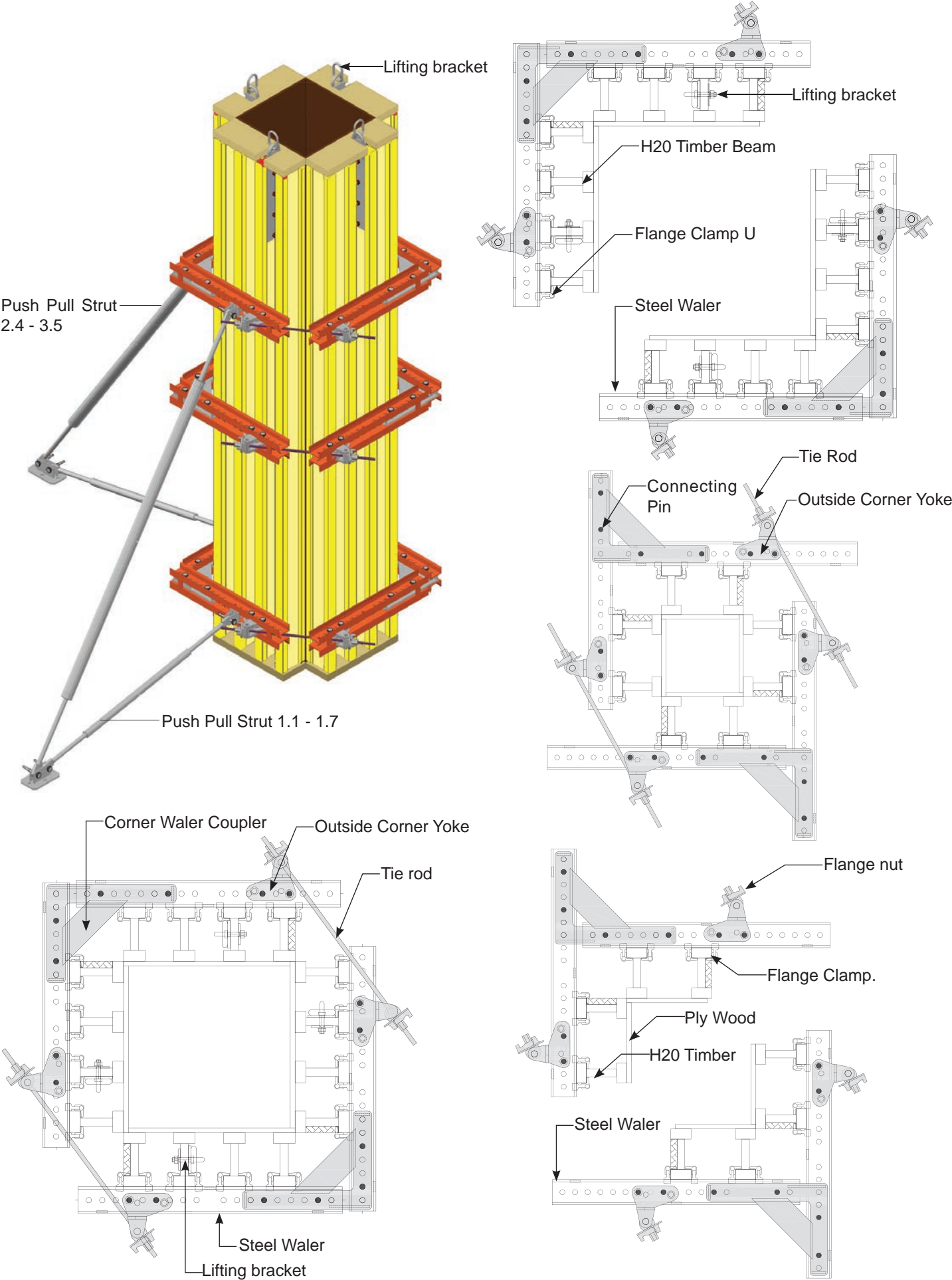


Circular Formwork Arrangement

H20 Timber Beam elements arranged as circular wall shuttering can be connected by means of the Articulated Waler Coupler secured by inserting Connecting Pin 20X190 in the Waler.



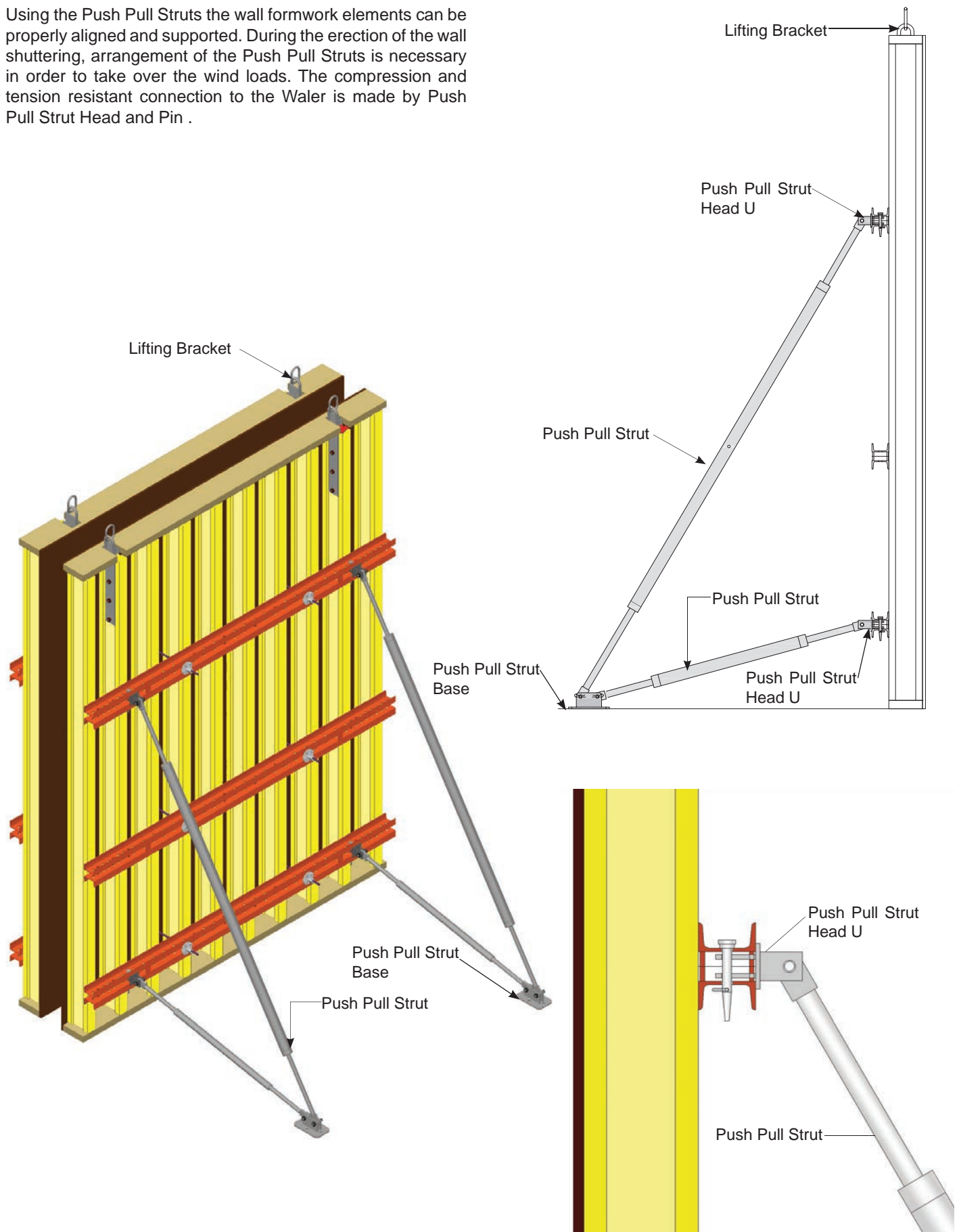
Column Formwork Arrangement



Aligning the Wall Formwork Elements

Arrangement of Push Pull Strut 1.1 - 1.7 & 2.4 - 3.5

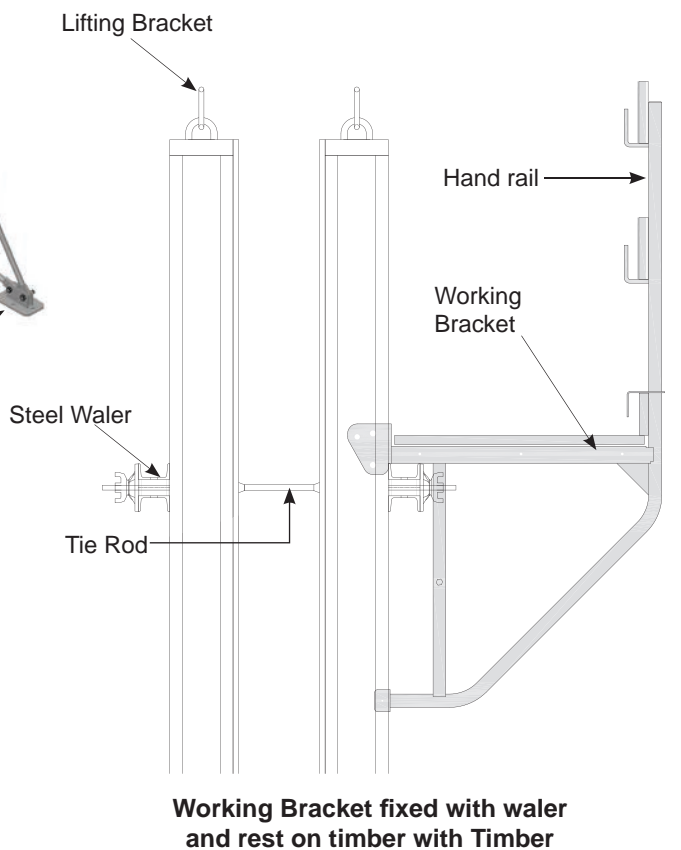
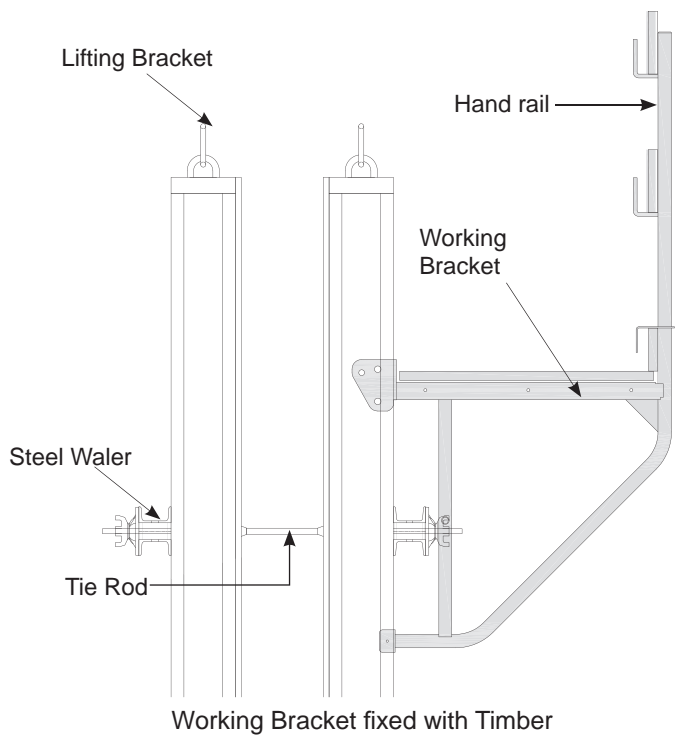
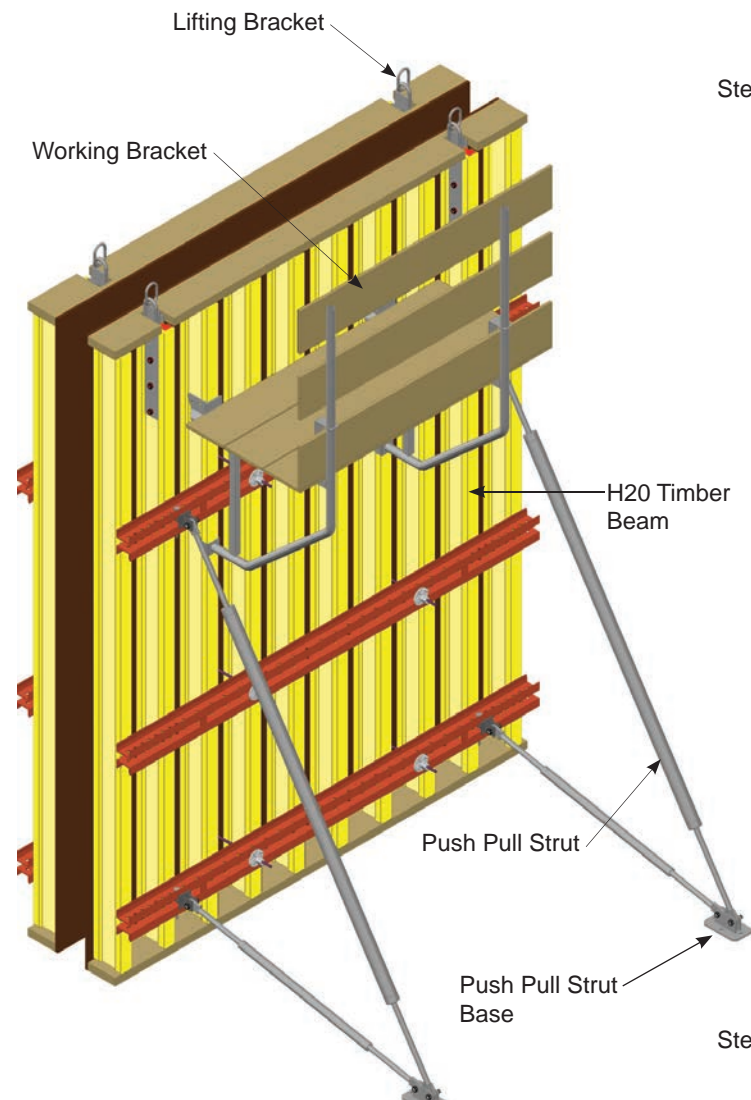
Using the Push Pull Struts the wall formwork elements can be properly aligned and supported. During the erection of the wall shuttering, arrangement of the Push Pull Struts is necessary in order to take over the wind loads. The compression and tension resistant connection to the Waler is made by Push Pull Strut Head U and Pin.



Working Bracket Arrangement

The Working Bracket, which can be attached to the formwork in varied ways as described below, is a ready to use bracket which provides a working platform with a width of approximately 90cm. It is equipped with an additional Railing Post.

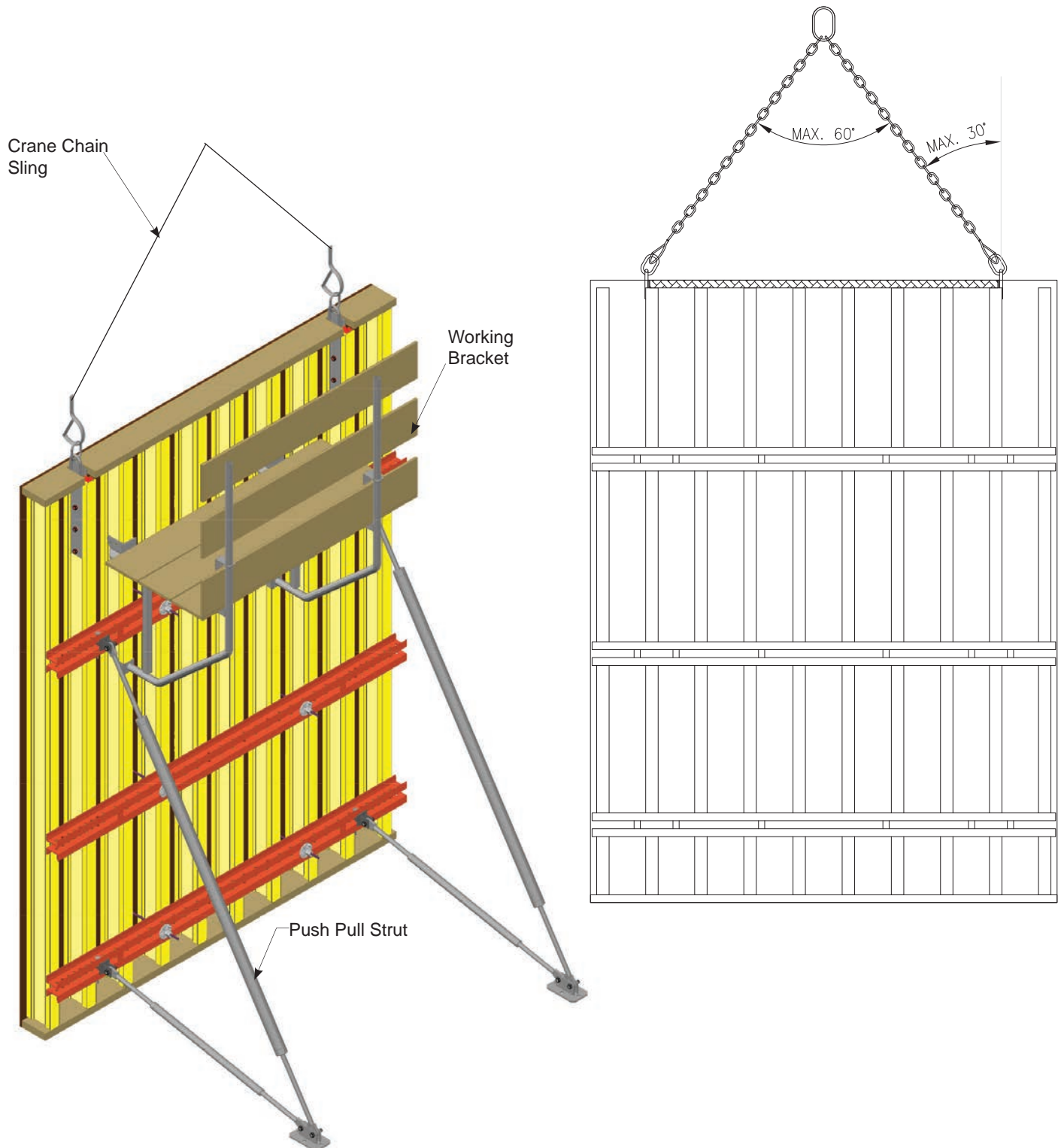
Prior to pre-assembly of the standard elements, holes with 20 mm diameter have to be drilled in the middle axis of the H20 Timber Beam web. These holes allows fastening of the Working Bracket using the Safety Pin.



Please note that the board thickness as well as dimension of the planks for the platform and railing should be in line with the specific construction and safety regulations on the site. The maximum distance of two Working Brackets should not exceed 1.50 m.

Shifting of Panel

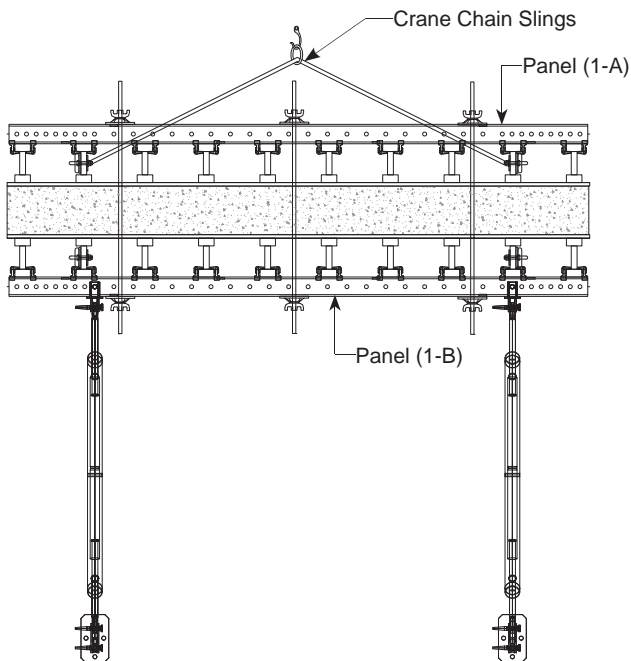
- A. Each Panel will have two Lifting Brackets
- B. The Lifting Bracket is fixed to the H20 Beam with 4 M 16 screws.
- C. The maximum working load for each Lifting Bracket is 1300 Kg (13 kN).
- D. This limit could be lower depending on the configuration of the panel.
- E. The maximum angle between the two chains of the Lifting Bracket is 60 degree.



De-shuttering Wall Formwork

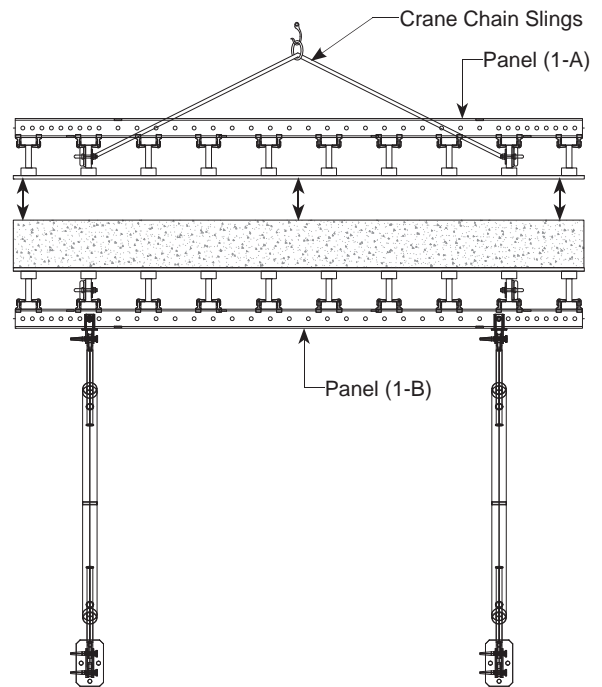
Step-1

Fix the crane chain slings to H20 Panel (1-A) not attached to the Push Pull Struts Side. Ensure slings angle does not exceed 60°. Take up the slack in the chain without taking the weight of the panel



Step-3

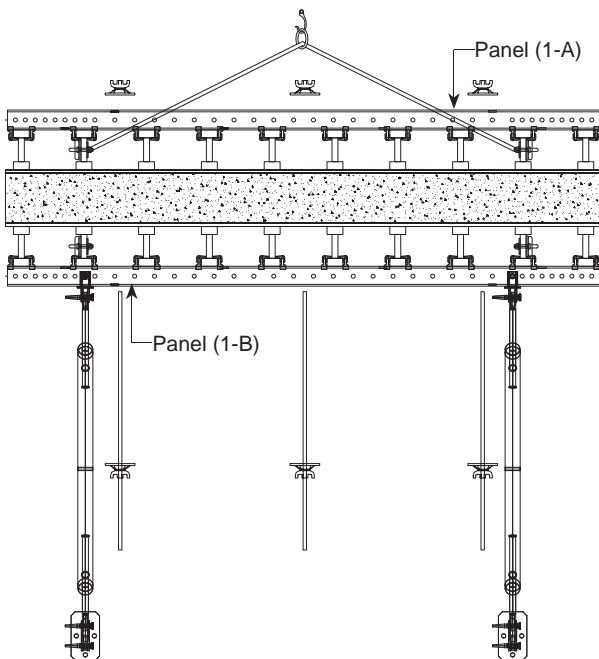
Retract H20 panel (1-A) from the wall. Carefully retract the shutter from the concrete surface using pinch bar



Step-2

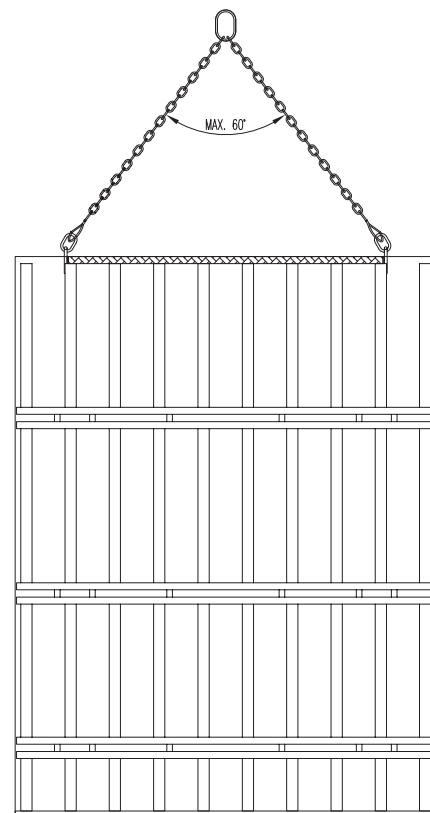
Remove and set aside all flange nut and tie rods from the panels

Ensure that all the accessories connected to the adjacent H20 Panels are removed and separated from H20 Panel (1-A).



Step-4

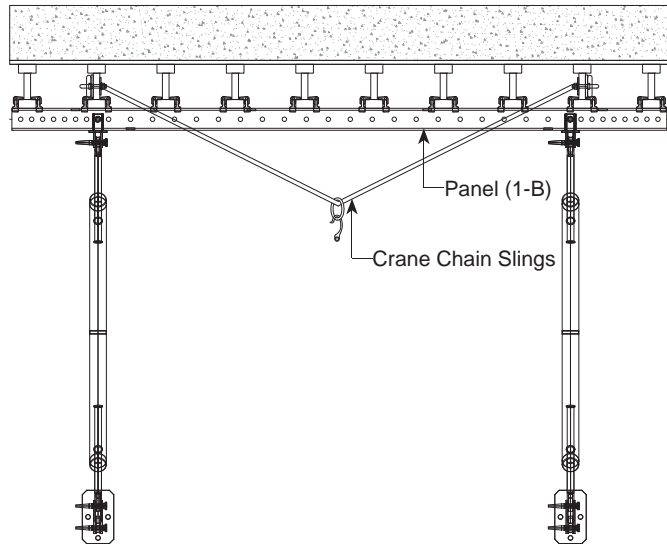
Lift and remove the retracted panel



De-shuttering Wall Formwork

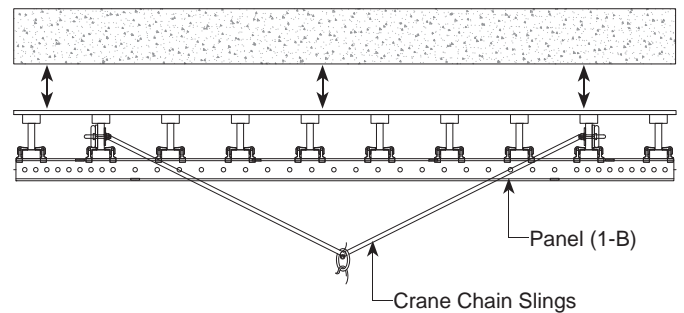
Step-5

Fix the crane chain sling to H20 Panel (1-B) attached to the Push Pull Prop. Ensure sling angle does not exceed 60°. Ensure that all the accessories that connected to the adjacent H20 Panel are removed and separated from H20 Panel (1-B)



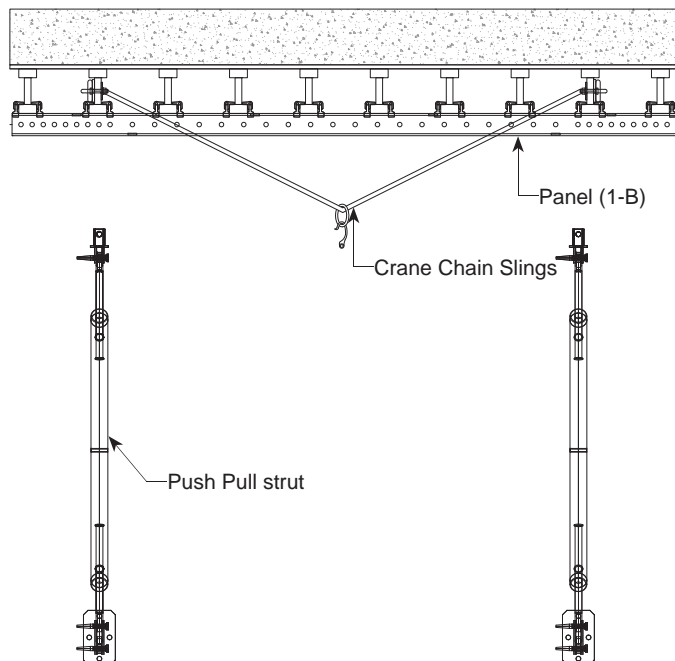
Step-7

Retract H20 panel (1-B) from wall.



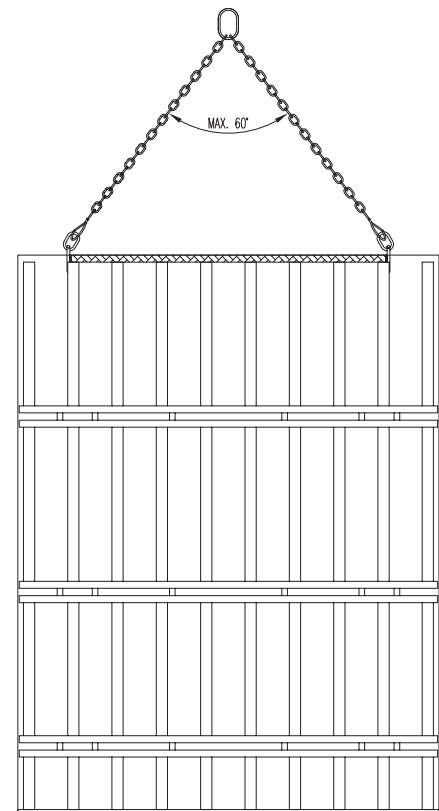
Step-6

Remove Push Pull Strut.



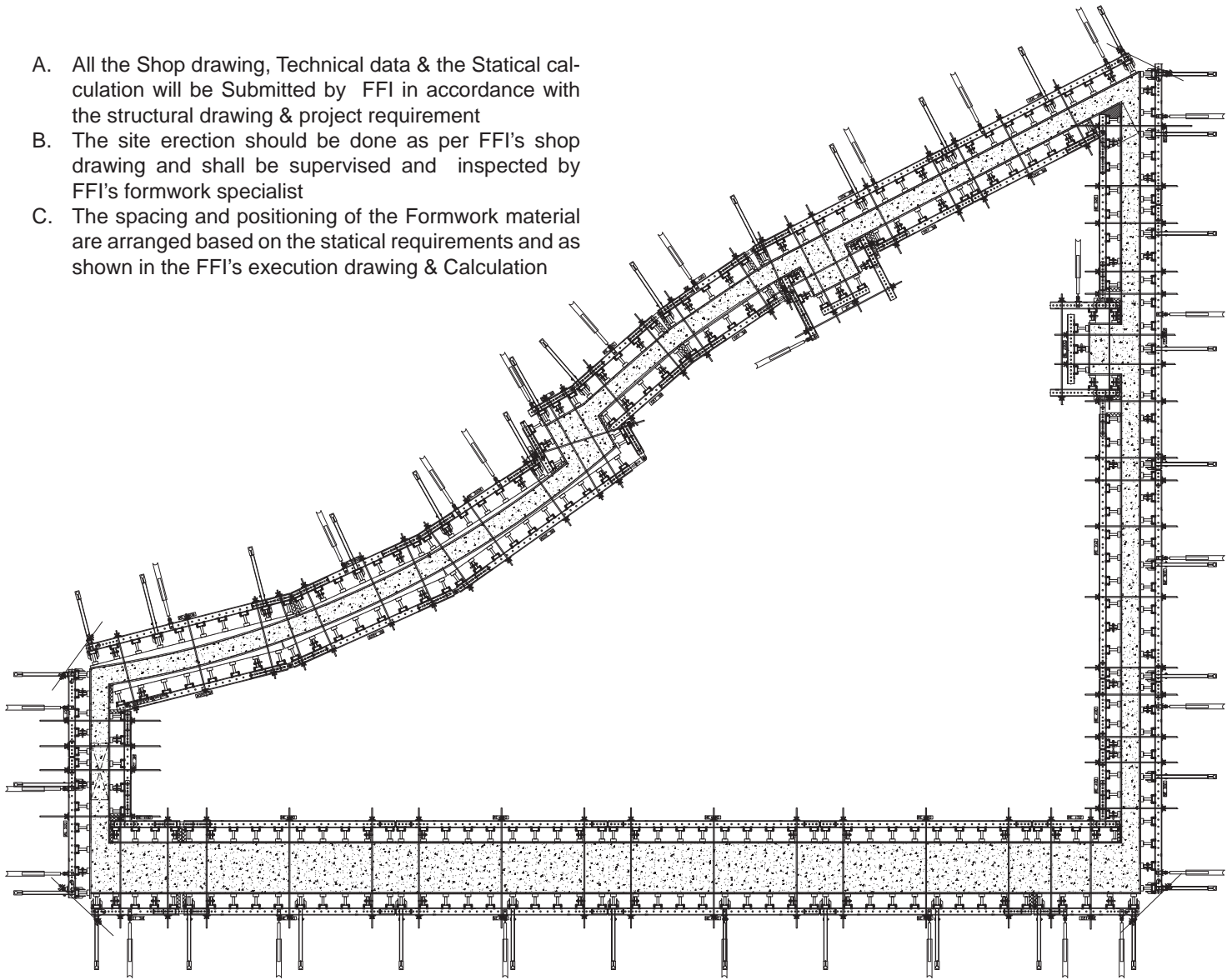
Step-8

Lift and remove the retracted panel

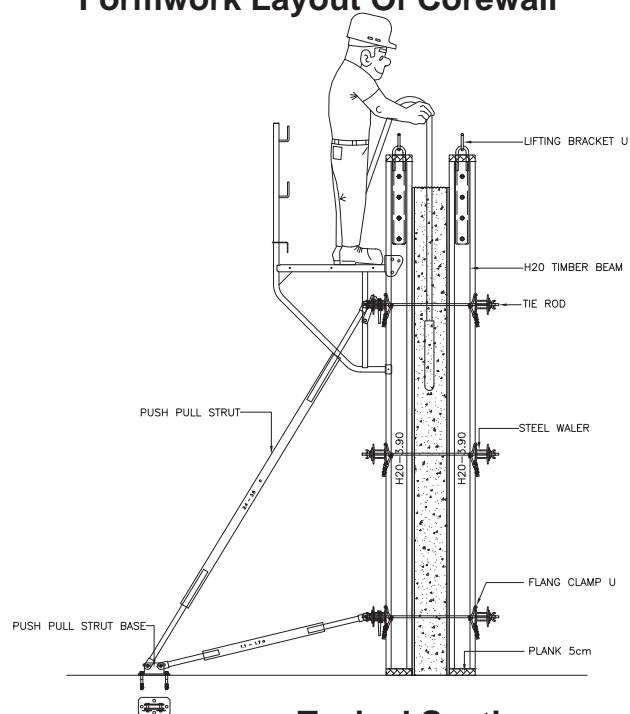


Repeat the following steps for the Adjacent H20 Panels

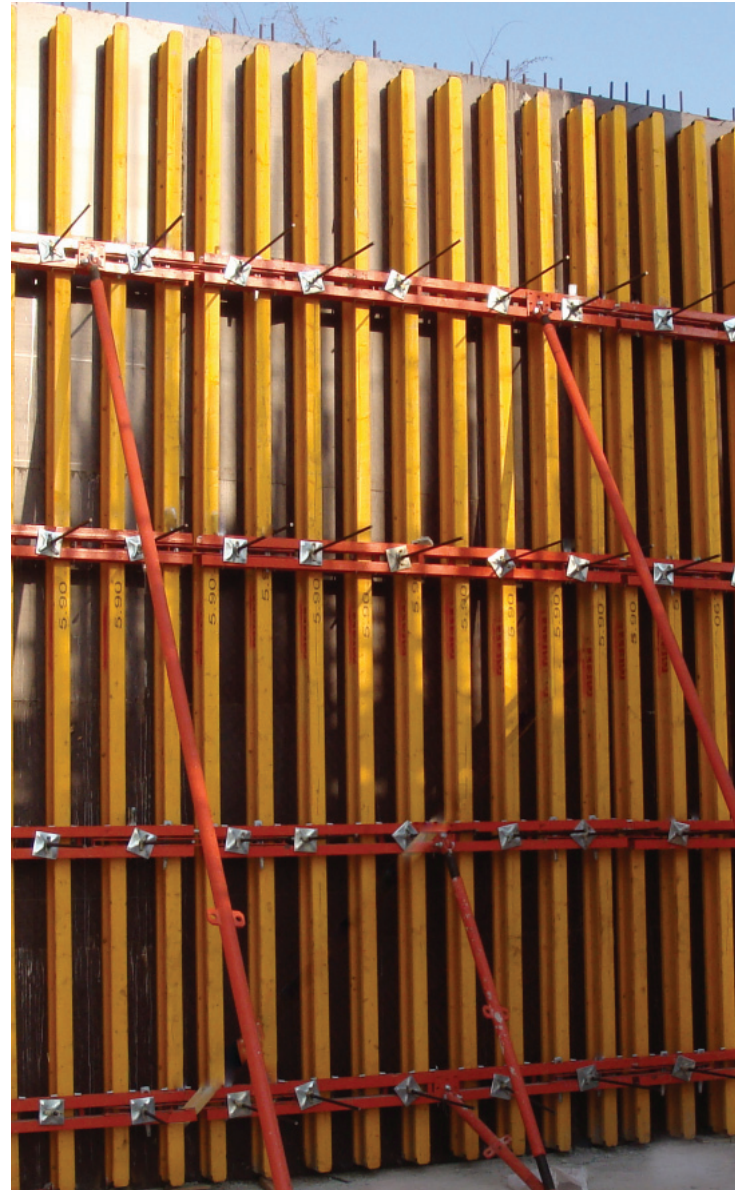
- A. All the Shop drawing, Technical data & the Statical calculation will be Submitted by FFI in accordance with the structural drawing & project requirement
- B. The site erection should be done as per FFI's shop drawing and shall be supervised and inspected by FFI's formwork specialist
- C. The spacing and positioning of the Formwork material are arranged based on the statical requirements and as shown in the FFI's execution drawing & Calculation



Formwork Layout Of Corewall



Typical Section



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