GFT German Formwork Technology

Formwork ▪ Support Systems ▪ Services

H20 Wall and Column Formwork

HP System

Assembly and Application Guide

Product Information and Features

Contents

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/rm. 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 cosily by connecting the H20 Timber Beams to the Walers by means of H20 Timber Beam 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 Single Sided Support Frame is designed and manufactured in accordance with BS EN 12812 : 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.

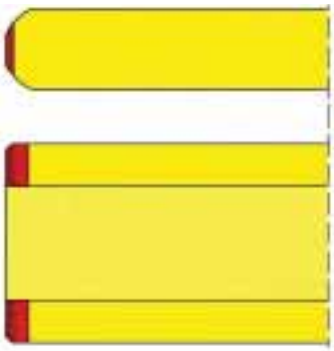
In order to ensure a technical and safe use of our product, all relevant national safety rules and regulations and safety instructions of national institutes and/or local authorities have to be observed. In general, only undamaged materials and components must be used.

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

The use of GFT formwork systems combined with other supplier's materials may involve certain dangers and, therefore require an additional inspection and quality check by our formwork specialist.

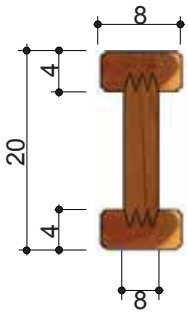
H20 Timber Beam

Beam end Protected by plastic bumber

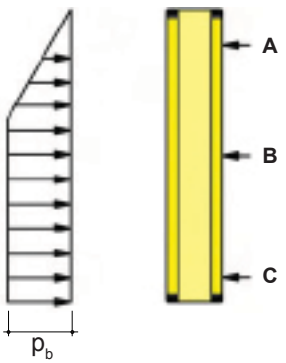


dimension in [cm]

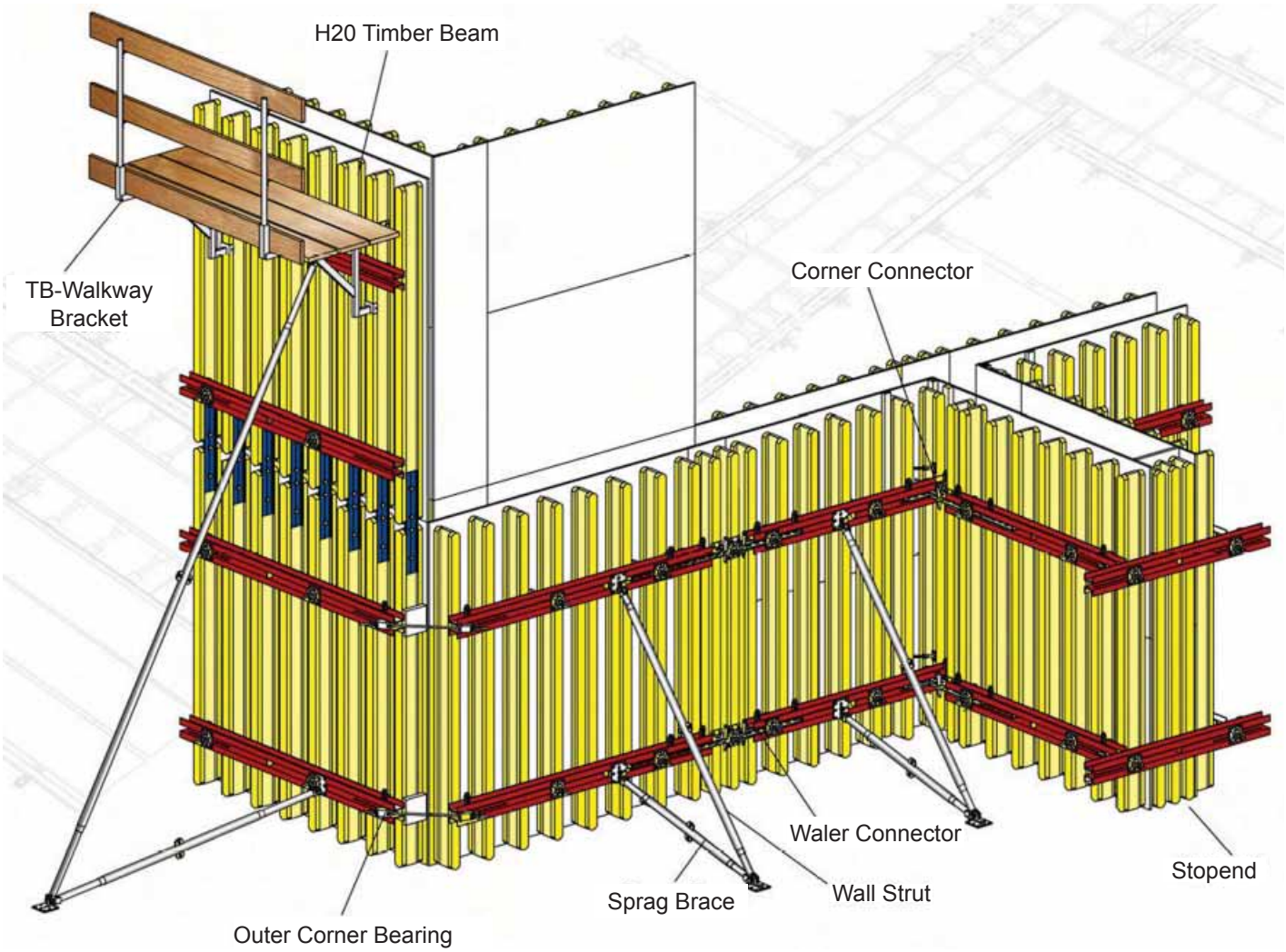
Cross section



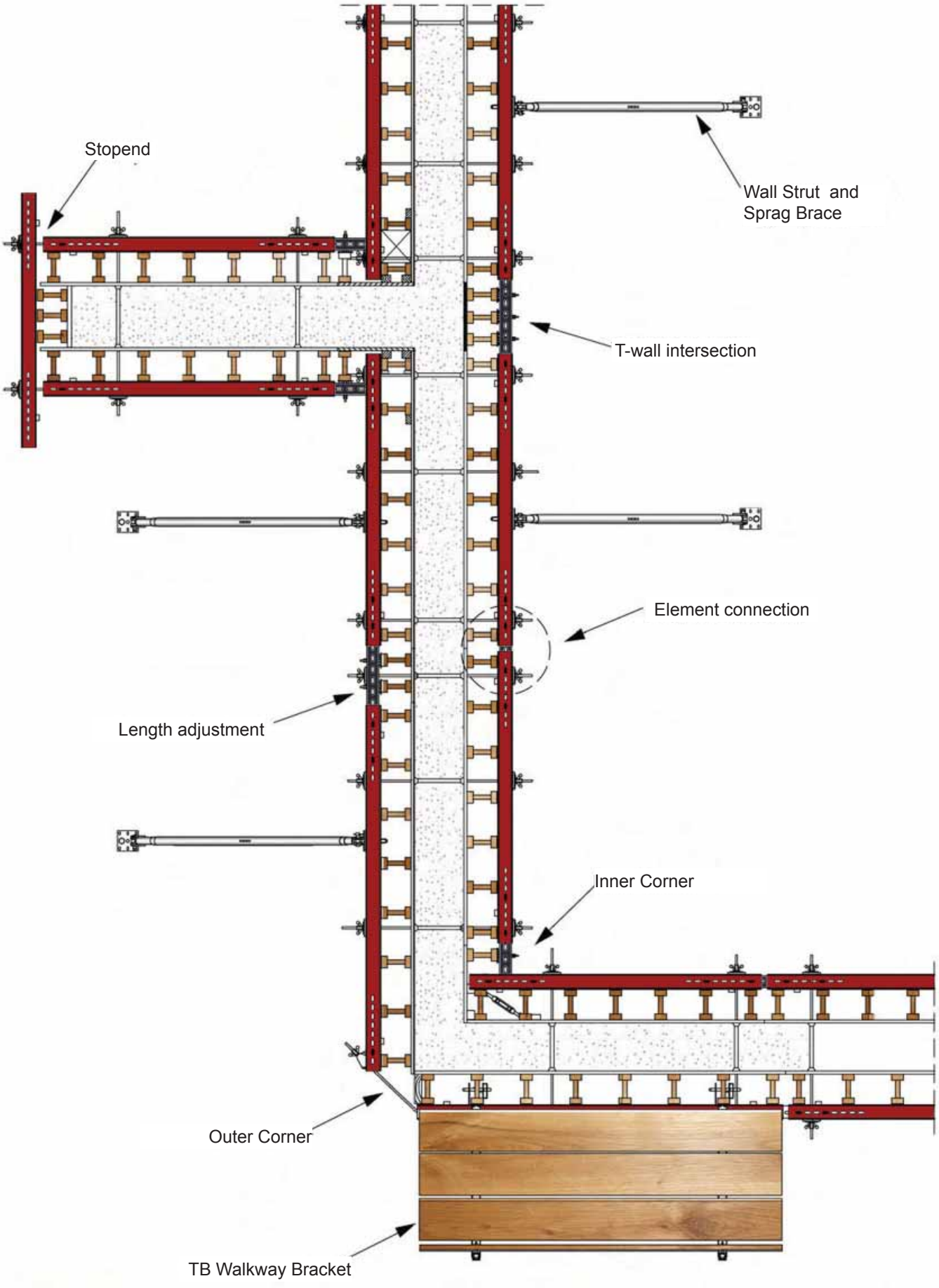
perm. M =5 kNm (bending moment)
perm. Q = 11 kN (shear force)
max. B = 22 kN (support reaction)
Flectural rigidity:
E x I = 500 kNm^2



H20 Wall and Column Formwork



Plan View


Stopend
Wall Strut and Sprag Brace
T-wall intersection
Element connection
Length adjustment
Inner Corner
Outer Corner
TB Walkway Bracket

H20 Timber Beam

	Art. No	Weight Kg/pc.
H20 Beam 190	310011	9.12
H20 Beam 245	310012	11.76
H20 Beam 265	310013	12.72
H20 Beam 290	310014	13.92
H20 Beam 330	310015	15.84
H20 Beam 360	310016	17.28
H20 Beam 390	310017	18.72
H20 Beam 450	310018	21.60
H20 Beam 490	310019	23.52
H20 Beam 590	310020	28.32

Protective Cap - Shock resistant, protection against splintering which increases durability

Web - 3-ply laminated solid wood panels, best performance, durability

Chords - Superior quality selected solid wood with friction fitted finger joints

Tested and approved permissible loads:
Max. perm. M = 5.00 kNm
Max. perm. Q = 11.00 kNm
E . I = 500 kNm2 (bending moment)

Walers

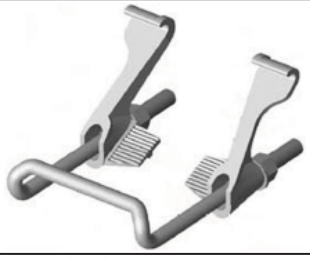
Waler 96	180011	22.5
Waler 121	180012	27.9
Waler 146	180013	33.4
Waler 171	180014	38.9
Waler 196	180015	44.3
Waler 221	180016	49.7
Waler 246	180017	55.0
Waler 271	180018	60.0
Waler 296	180019	66.2

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.

H20 Timber Beam Clamp

This clamp connects the H20 Timber Beam to the Waler at any desired position.

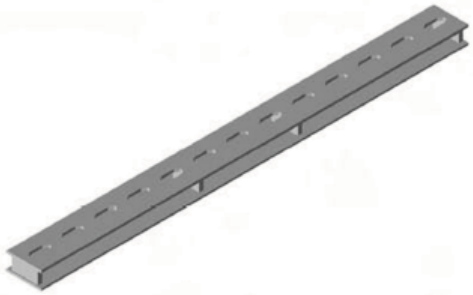
180111 — 0.80



Waler Connector 100
180115 — 7.40

Waler Connector 165
180116 — 13.00

For connecting formwork elements. To be attached to the walers with joining wedge

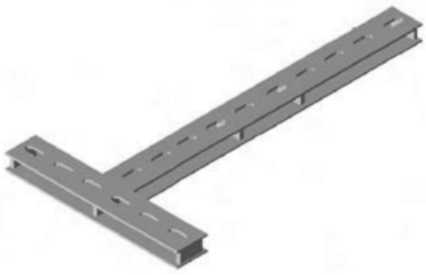
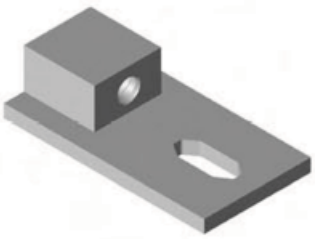
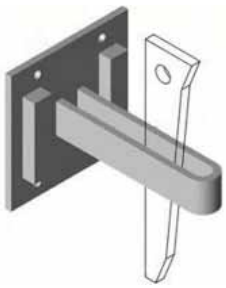


Corner Connector 60x60

180117 — 9.00

Used for forming inner corner of 90° in combination with the Joining Wedges.

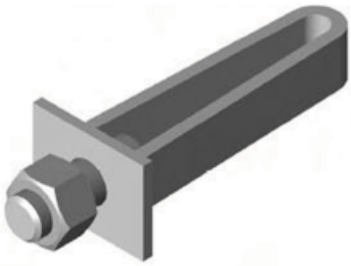
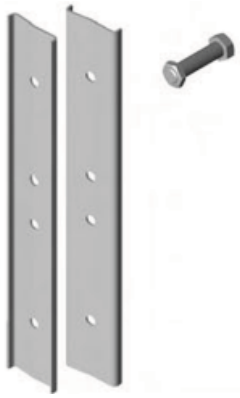
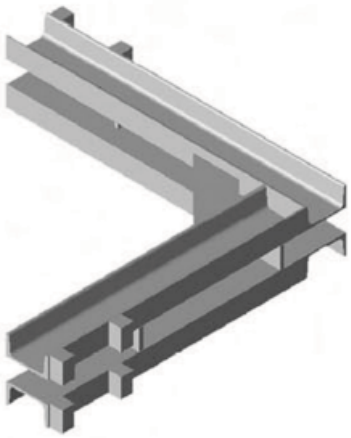
Components

	Art. No	Weight Kg/pc.	
Corner Connector L24/H20 Alternatively used for forming an inner corner with length adjustments in combination with Joining Wedges.	180118	11.00	
Hinged Connector 65 x 65 **Double Hinged Connector** Alternatively used for forming an inner corner with length adjustments in combination with Joining Wedges.	180119 180180	12.00 12.50	
Outer Corner Bearing To be attached to the Walers by means of Joining Wedge at the end of the wall element for bracing and stiffening the outer corner.	180186	1.50	
Tension Strap To be attached to the Walers by means of Joining Wedge at the end of the wall element for bracing and stiffening the outer corner.	180187	1.50	
Joining Wedge To be used with Walers, Corner and hinged connectors, as well as outer corner bearings and tension straps	180181	0.90	
Beam Fixing Device Used in combination with infill panels for element length adjustment and fixed by nails to the H20 Timber Beams. The Waler Connectors are attached to the Beam Fixing Device by a Wedge.	180182	1.00	

Components

	Art. No	Weight Kg/pc.	
Wedge Used for securing the Beam Fixing Device to the H20 Timber Beams and attaching Aligning Struts and Wall Braces.	180151	0.30	
Brackets and Aligning Struts			
WB Railing Post Used in combination with TB Walkway Bracket	110212	4.60	
TB Walkway Bracket Equipped with upper U-profile where wooden beams on top can be fastened by nails. Furthermore, the bracket is hot-dip galvanized and consists of a squared tube for holding the WB Railing Post.	180141	14.10	
Wall Struts with 2 Hinge Plates painted For erection and aligning of formwork elements, bracing by various sizes of Wall Struts has to be arranged. The Wall Struts are attached to the Waler with the hinge plate by means of the Strut Wedge Strap and Wedge.			
Wall Strut 1 (170-240 cm)	180142	19.50	
Wall Strut 2 (220-290 cm)	180143	21.00	
Wall Strut 3 (270-340 cm)	180144	22.00	
Wall Strut 4 (320-390 cm)	180155	24.00	
Wall Strut 5 (420-490 cm)	180156	27.00	
Wall Strut 6 (530-590 cm)	180157	40.00	

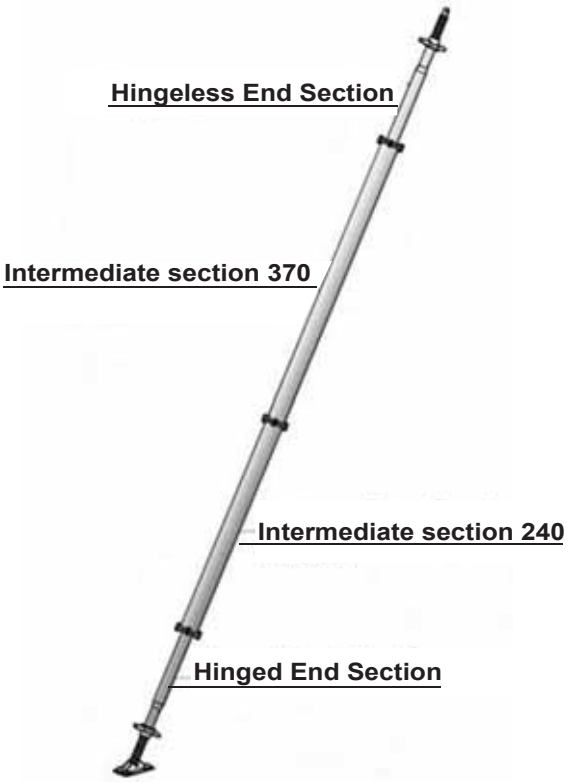
Components

	Art. No	Weight Kg/pc.	
Sprag Brace 1 With adjustable lengths between 1.20 - 1.90m, usable for Wall Strut 1 & 2. It is equipped with a hinge plate for fastening to the lower waler of the wall element and with a hinge bolt for connecting to the Wall Strut.	180148	16.00	
Sprag Brace 2 With adjustable lengths between 1.70 - 2.40m usable for Wall Strut 3 & 4. It is equipped with a hinge plate for fixing to the lower waler of the wall element and with a hinge bolt for connecting to the Wall Strut.	180149	18.00	
Strut Wedge Strap For fixing the hinge plates of the Wall Strut and Sprag Braces to the Walers by means of Wedge.	180150	0.90	
H20 Extension Piece **Bolt M20 x 80 with Nut** Used for height extension of the wall formwork elements by fixing the H20 Extension Piece to the web of the H20 Timber Beams. The H20 Extension Piece should be ordered twice while the Bolt M20 x 80 should be ordered four times.	180217 180218	4.50 0.30	
Column Formwork Walers **Column Formwork 72 x 72** **Column Formwork 89 x 89** **Column Formwork 106 x 106** **Column Formwork 123 x 123** For creating right angled formwork elements with various dimensions of columns. Anchoring and tightening of the column formwork elements are made to the welded squared bearing support.	180211 180212 180213 180214	35.5 44.3 51.7 60.7	

Components

	Art. No	Weight Kg/pc.	
Bearing Bar for Column Waler Placed In the welded squared bearing support of the column walers and held by a Tie Rod 15 mm dia./D&W.	180215	1.90	
Wing Nut 15 For tying wall elements as well as for bracing the corners of the column walers. With maximum permissible load of 90 kN.	180173	0.30	
Galvanized Plate 12/12 To be used in connection with the Wing Nut.	180174	1.00	
Tie Rod 75 15 mm dia./D&W **Tie Rod 100 15 mm dia./D&W** **Tie Rod 130 15 mm dia./D&W** **Tie Rod 175 15 mm dia./D&W** Tie rod With max. permissible load of 90 kN 1 bundle of tubular plastic sleeves, 25pcs each 2m long **Package of cones,200 pcs.** **Package of plugs or sleeve, 500 pcs.** Plastic sleeves with cones secure the distance between two opposite wall formwork elements.	110246 110247 110248 110249 490082 490083	1.10 1.40 1.90 2.50 1.50 1.60	 
Tie Nut 85 15mm dia./D&W Equipped with base plate and nut and allows an incline of up to 10°. With max. permissible load of 90 kN	110260	1.20	
Tension Nut 15 mm dia./D&W Used for stopends and other tying and connecting purposes. With a max. permissible load of 40 kN.	110154	0.70	

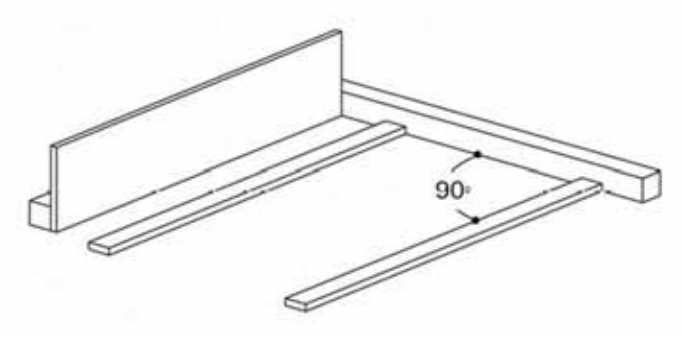
Components

	Art. No	Weight Kg/pc.	
Vito Tie Nut Equipped with a circular base plate of 130 mm diameter. With a maximum permissible load of 90 kN.	110241	1.30	
Tie Nut 230 Equipped with an extremely large base plate and nut and allows an incline of up to 10°. With a permissible load of 90 kN.	110242	2.40	
Vito Rachet Using the Vito Ratchet, tie nuts can be tightened and loosened quickly, comfortably and safely.	110315	9.50	
Aligning Struts for Extremely High Shuttering Elements Equipped with base plate and nut and allows an incline of up to 10°.			
Hinged End Section	490092	36.20	
Hinge less End Section	490093	29.00	
Intermediate Section 240 cm	490094	44.00	
Intermediate Section 370 cm	490095	63.00	
Bolt M16 x 60 with nut 4 pcs/joint	490096	0.20	
Fit Bolt M20 x 80 with nut 1pc.	180218	0.40	
Combinable inclined struts (IBK Aligning Strut). For aligning extremely high wall elements, combinable Aligning Strut sections can be arranged for a tension and compression resistant bracing. The connection of the Aligning Strut to the wall elements is done by means of the Connection Beam CFB230.			

Pre-Assembly of Elements

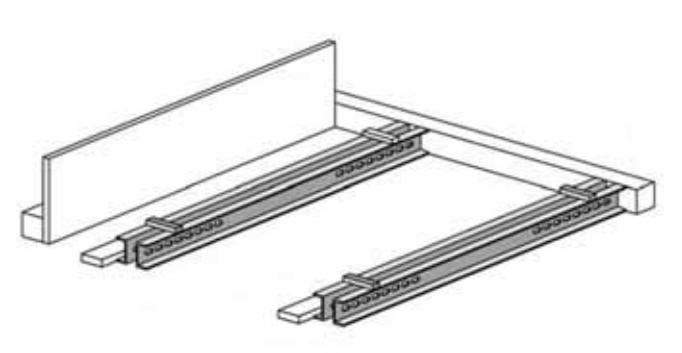
A. Basic Assembly

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



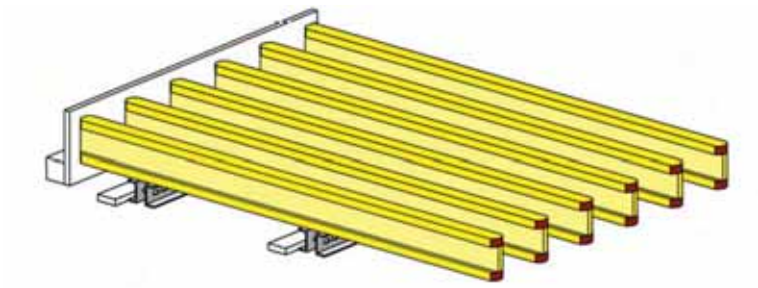
B. Waler Positioning

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

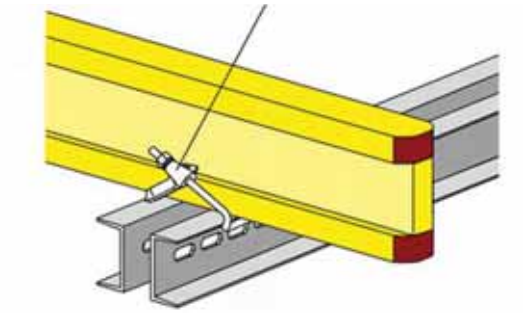


C. H20 Timber Beam Positioning

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 Timber Beam Clamps.

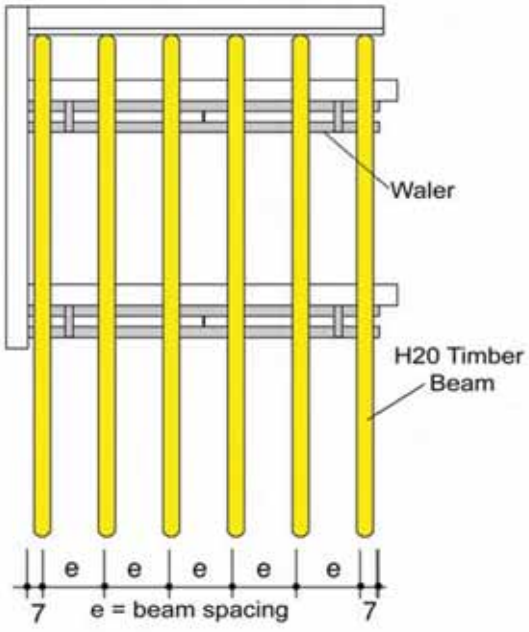


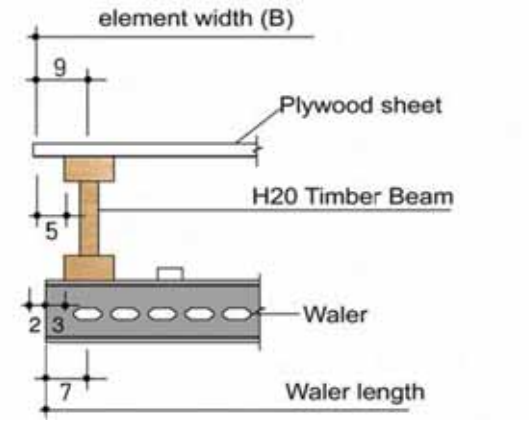
H20 Timber Beam Clamp



D. Fixing the Plywood Sheet

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

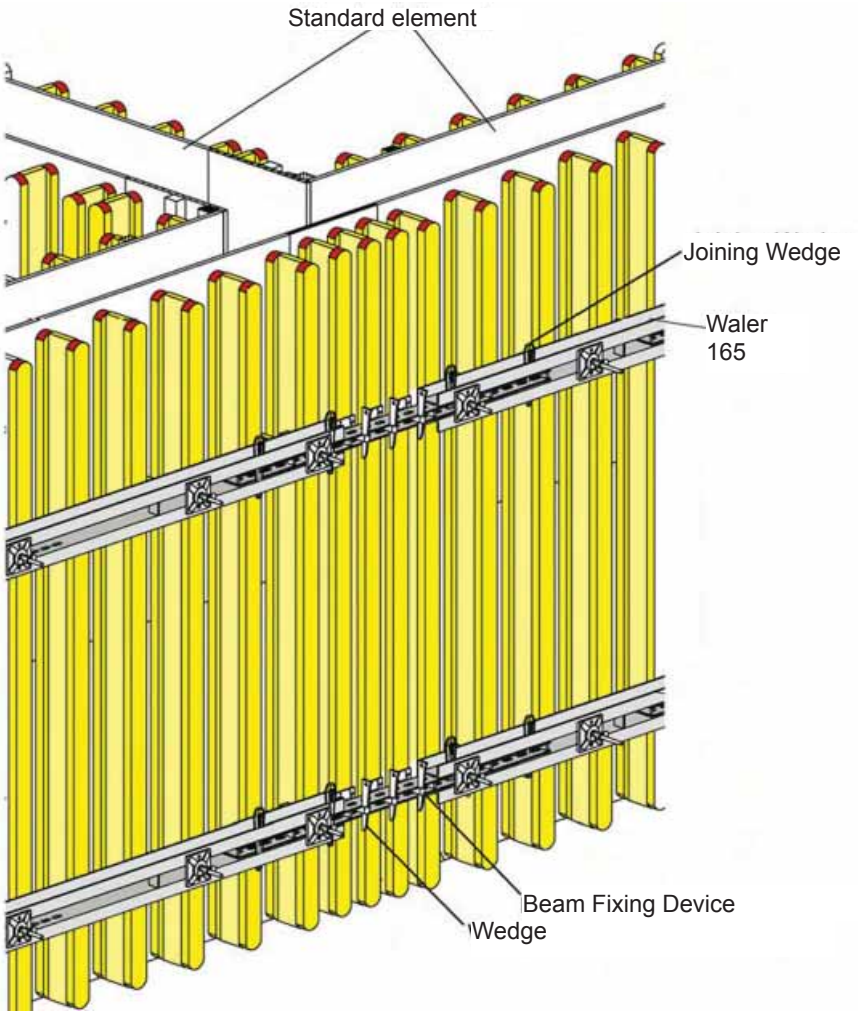


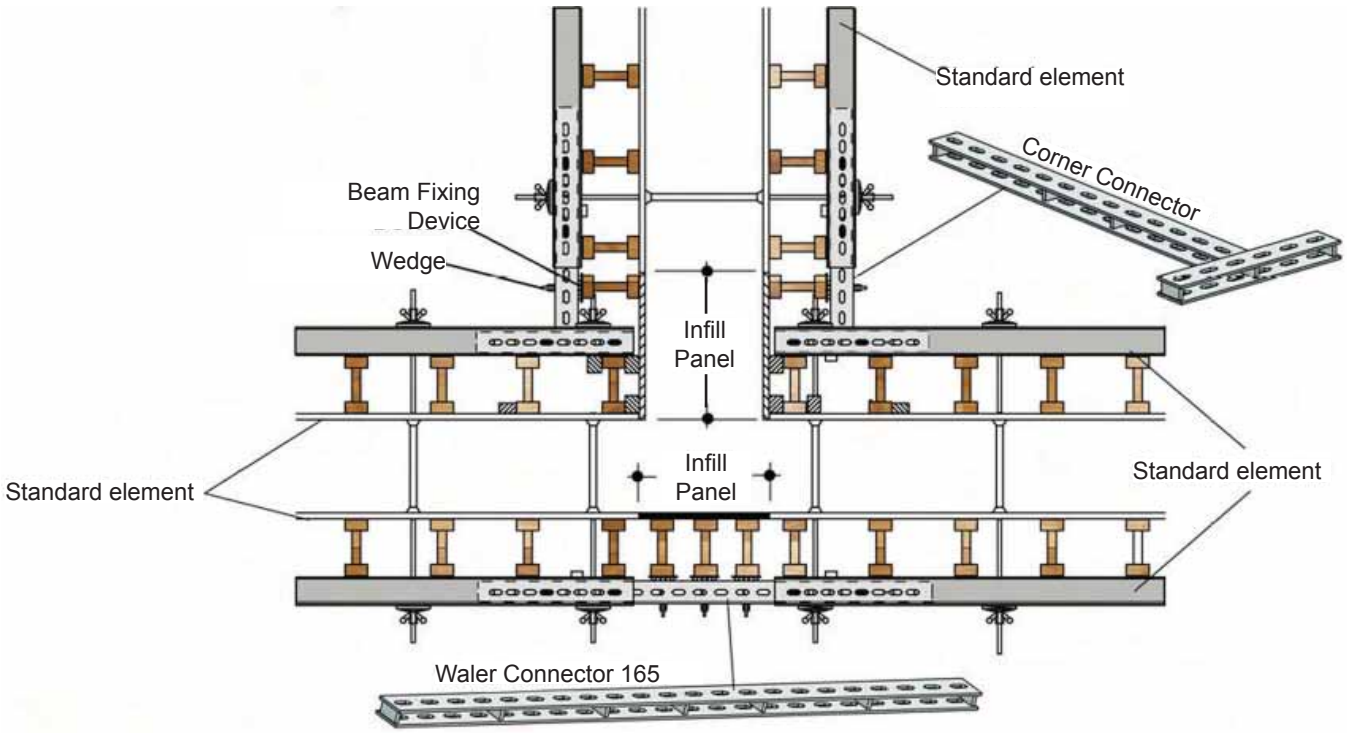


T-Shaped Wall Arrangement

The arrangement of a T-shaped wall can be done with standard wall formwork elements and an additional infill panel which is fixed by means of Waler Connector 165.

The inner corners are arranged with standard elements as shown and described on page 17.



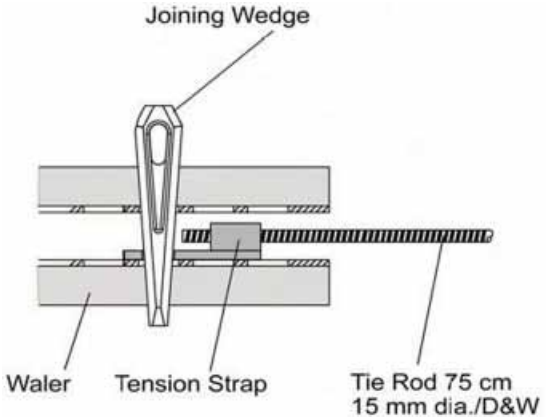


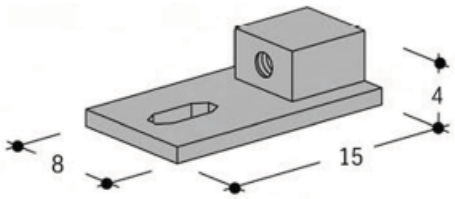
Stopend Arrangement

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

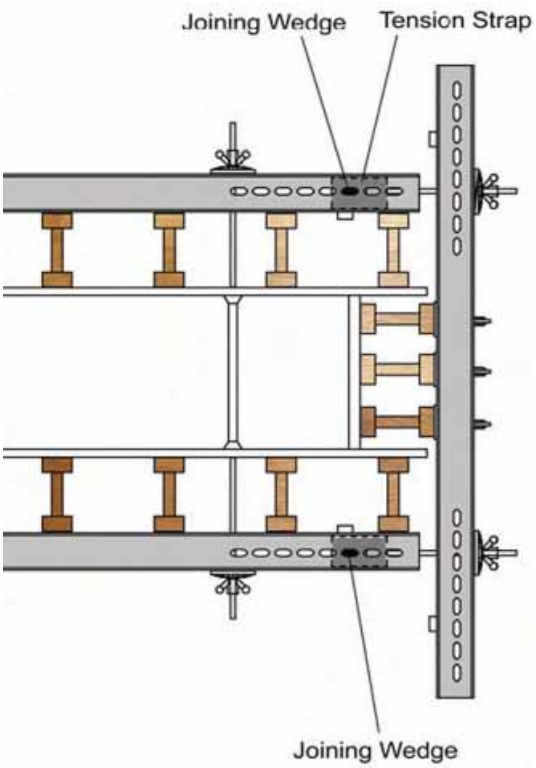
For arranging the stopend element, the Tension Strap is fixed between the Walers using a Joining Wedge. The loads from the concrete pressure are transferred by the Tie Rods into the Walers. Wing Nut with Counter Plate or Tie Nut permits a tension resistant connection and exact adjustment.

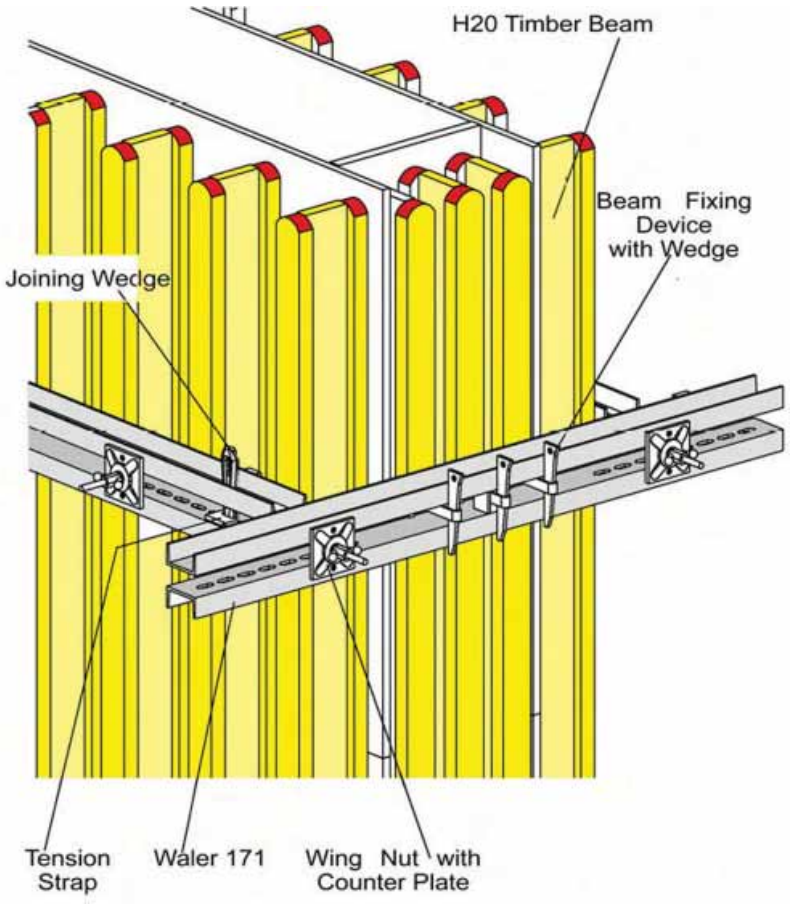
Depending on wall thickness, at least two H20 Timber Beams or Lattice Girders have to be used as stopend element.





Tension Strap

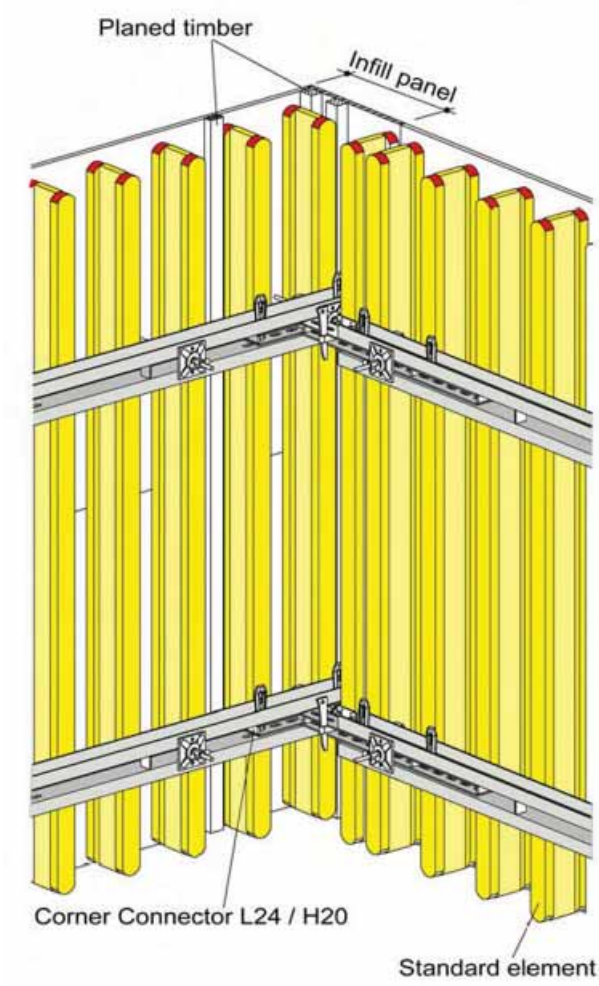




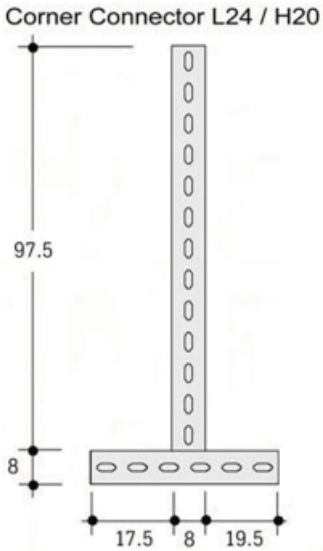
Corner Arrangement

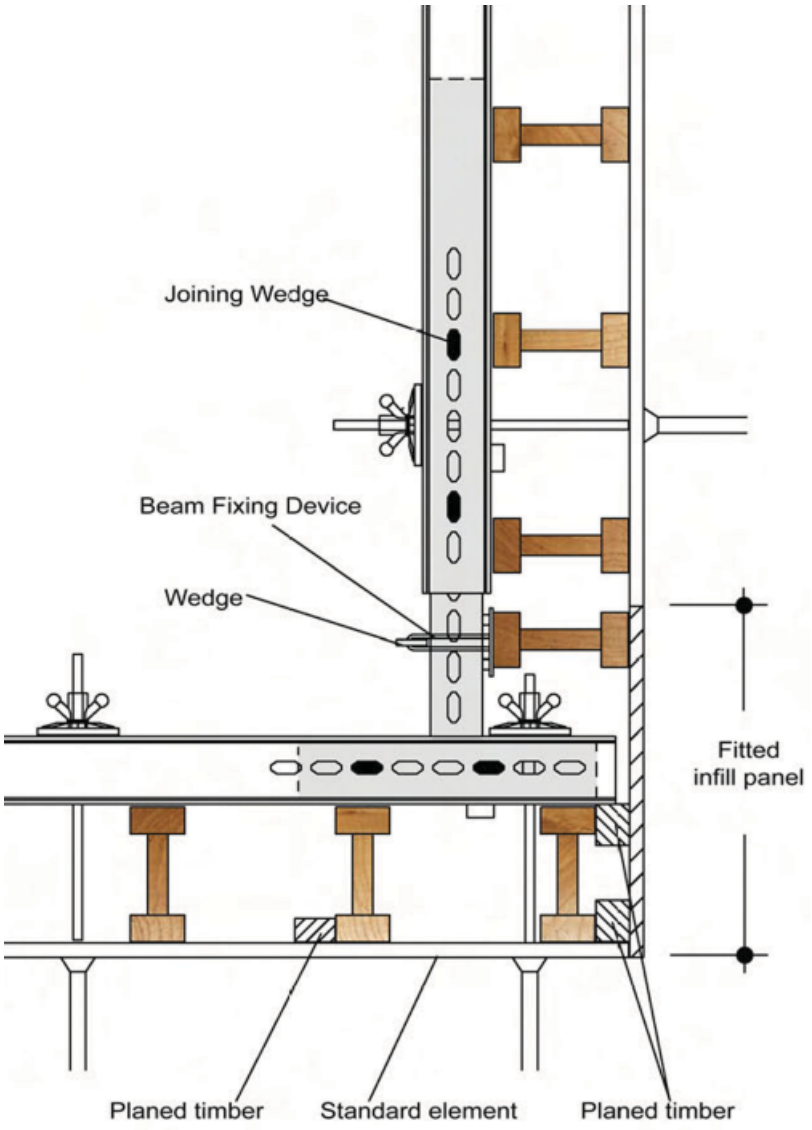
Inner Corner

The erection of an inner corner is also possible by making use of Corner Connector L24 / H20 in combination with Walers, H20 Timber Beams or Lattice Griders. The Corner Connector L24 / H20 is fixed to the Waler by means of Joining Wedges.



Please take note that the corner connector's shorter leg should be positioned towards the H20 formwork's inner corner.



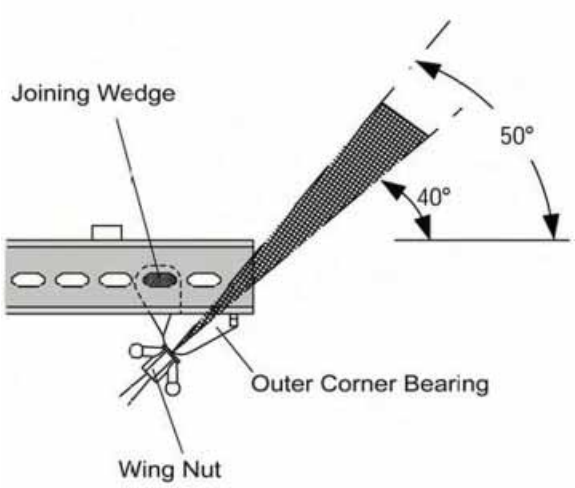


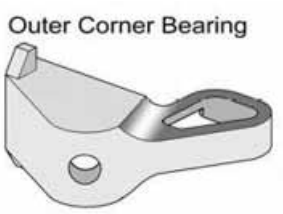
Corner Arrangement

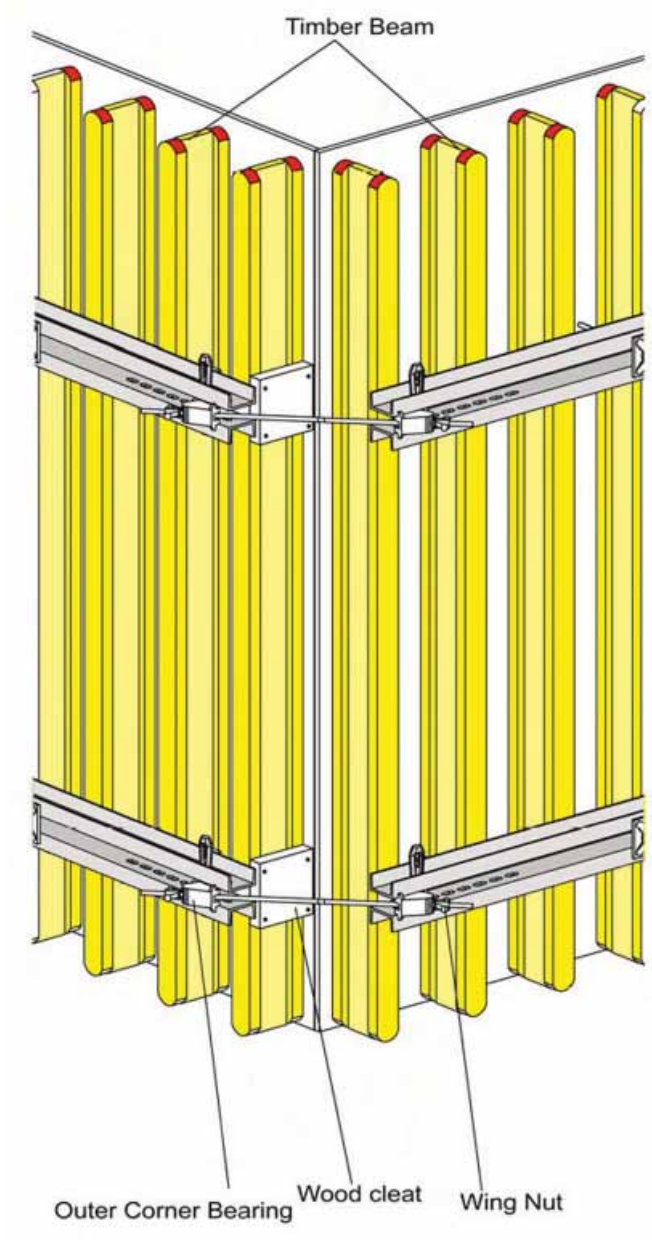
Outer Corner

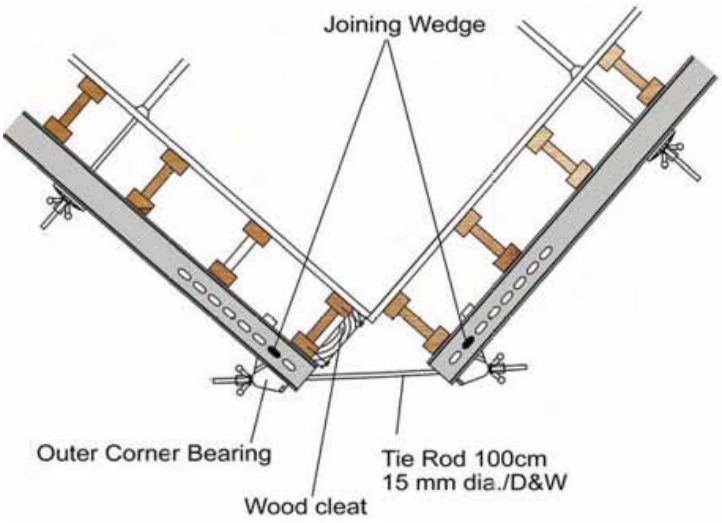
The standard outer corner is comprised of H20 Timber Beams or Lattice Girders. The Outer Corner Bearing is fixed to the Waler by means of a Joining Wedge while the wood cleat is used to prevent the H20 Timber Beams from being misaligned during tightening. Tightening the corner should be done at a 45° angle to the Waler.

Please note that the application of Outer Corner Bearing must be at a min. of 40° and max. of 50°.





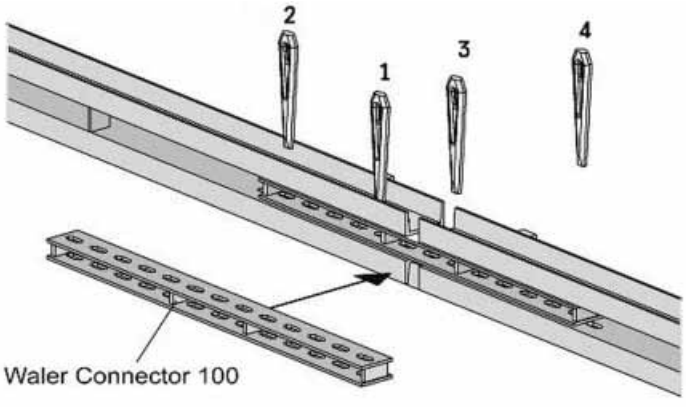




Element Connection

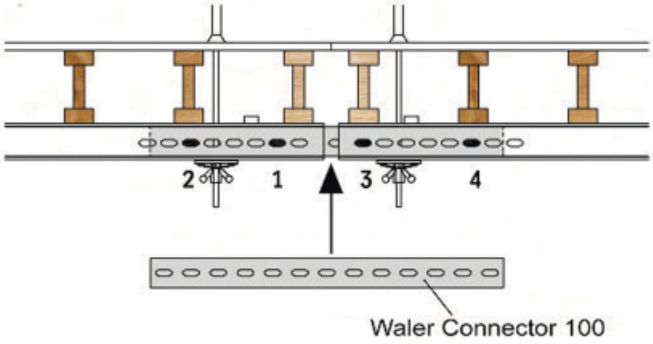
Connection of the Wall Elements

Fixing of the wall elements by means of Waler Connector 100/165 and four Joining Wedges provides an aligned, tension and compression resistant wall element connection.



A. The center of the Waler Connector 100 has to be placed in between the two adjacent wall elements and secured with Wedge 1.

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



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

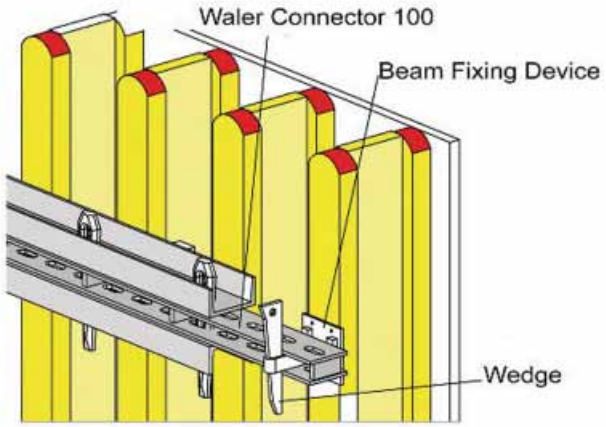
C. Insert Wedge 3 and tighten element joint then fasten Wedge 1 and Wedge 3.

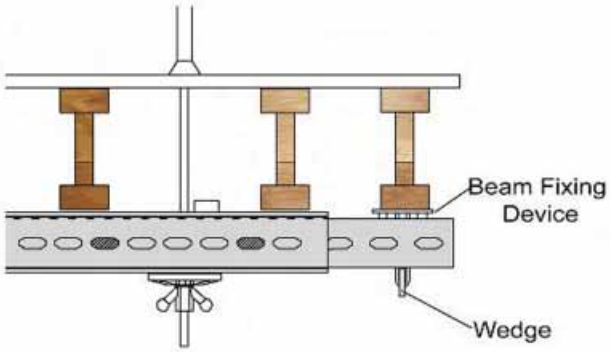
D. Wedge 2 and Wedge 4 have to be tightened as well.

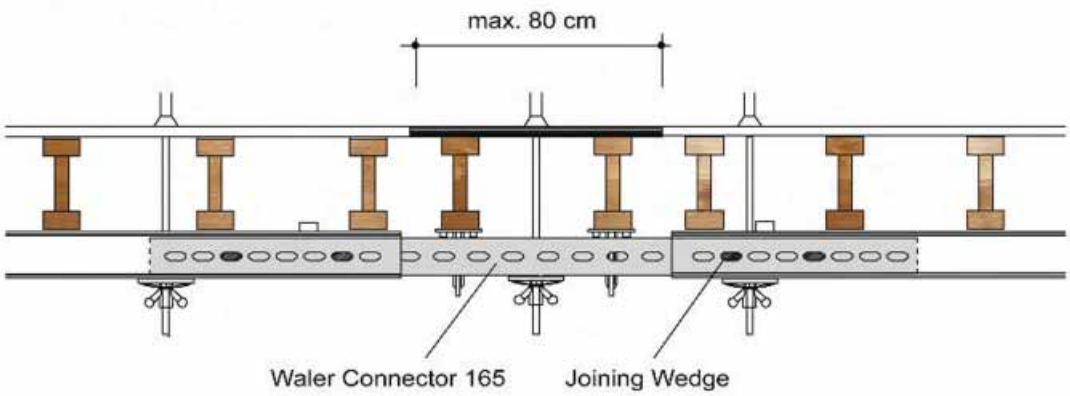
Length Adjustment

For length adjustment, the Waler Connector 100, Beam Fixing Device and corresponding Wedge are to be used and fixed to the H20 Timber Beam

The Beam Fixing Device has a 6mm dia. Nail hole.



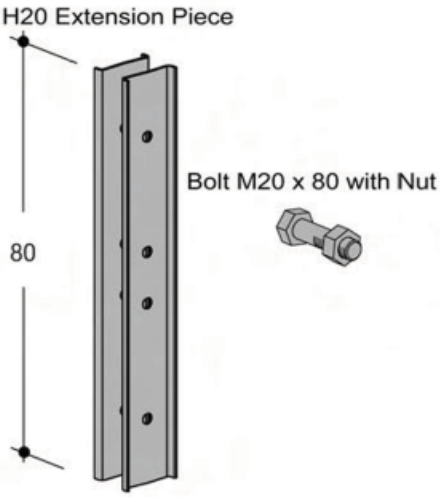


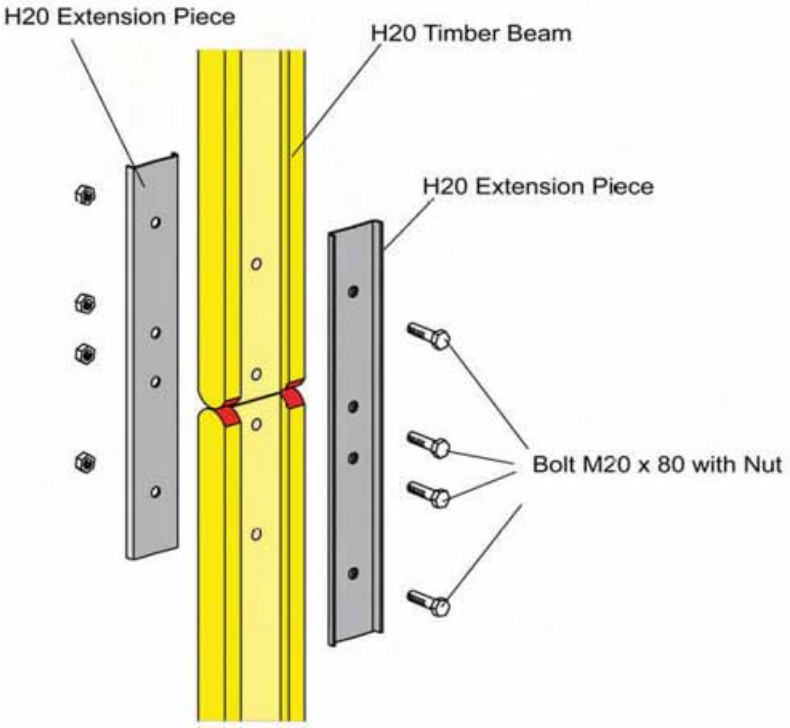


Height Extension

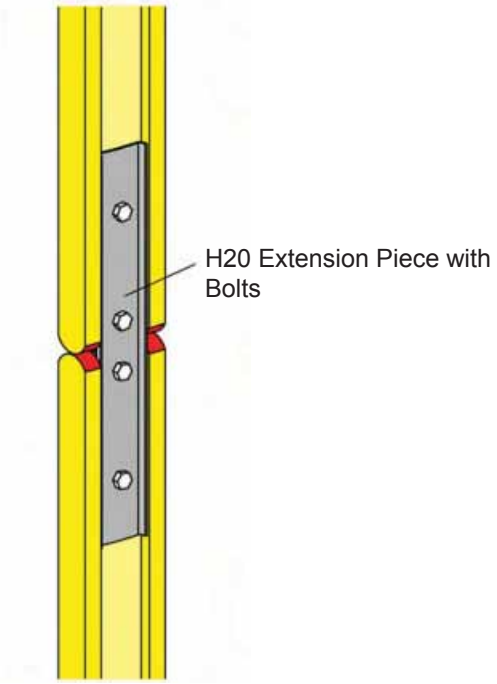
The H20 Extension Piece is used to extend the height of of the wall formwork's standard elements. By fixing the H20 Extension Piece to the web of the individual H20 Timber Beams, an aligned and rigid connection which is compression and tension resistant is achieved.

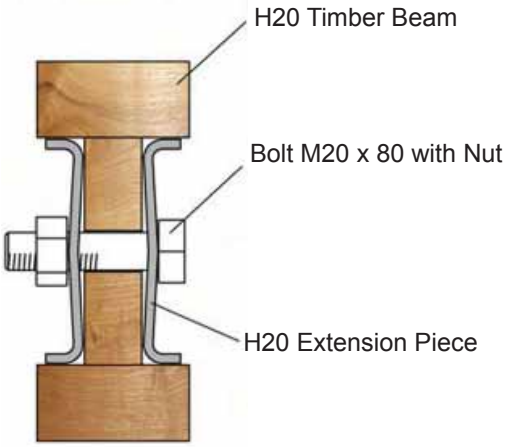
The H20 Extension Piece is fastened to the H20 Timber Beams using two H20 Extension Pieces and four Bolts M20 x 80 with Nut.





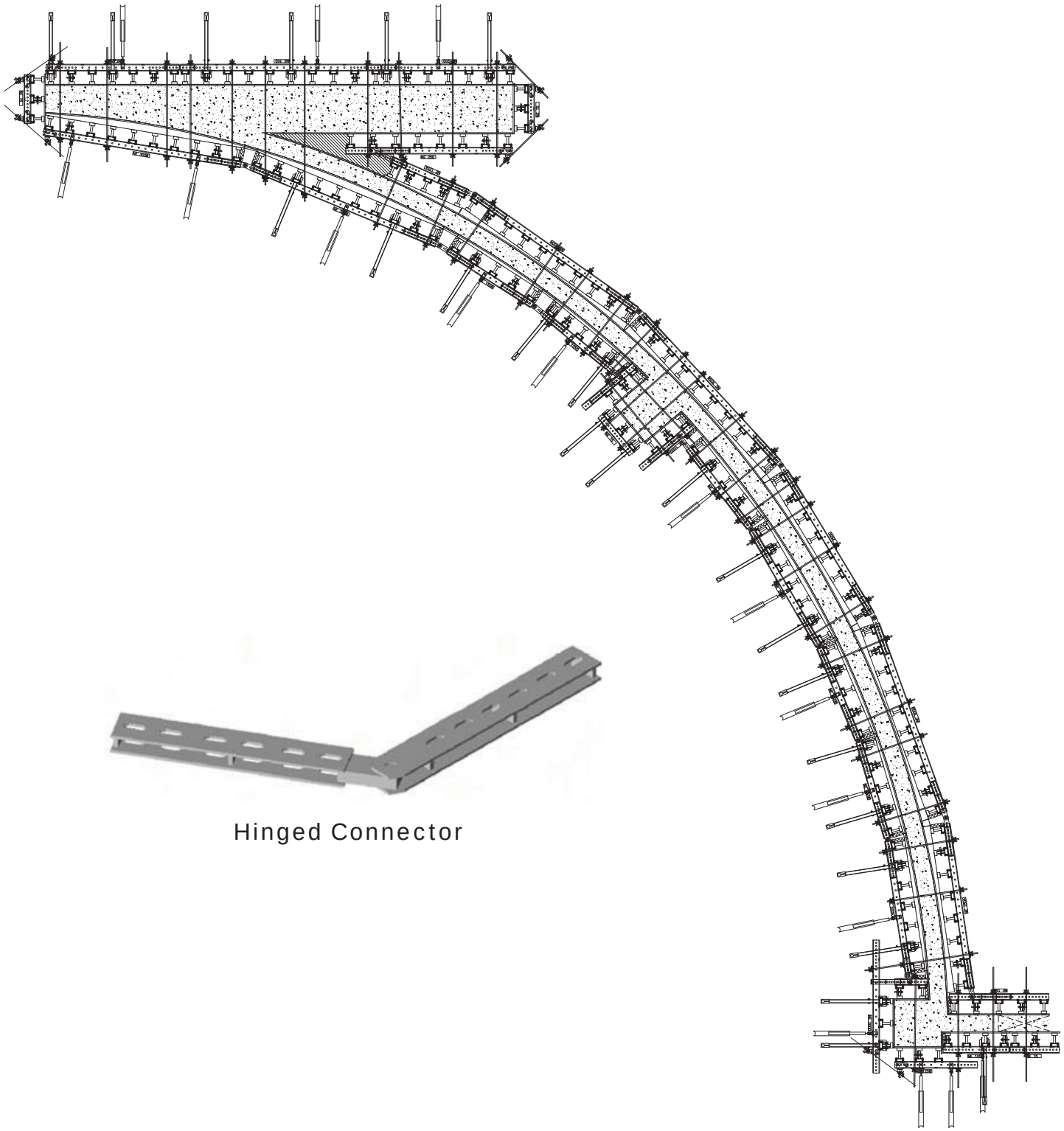
Joined beam ends





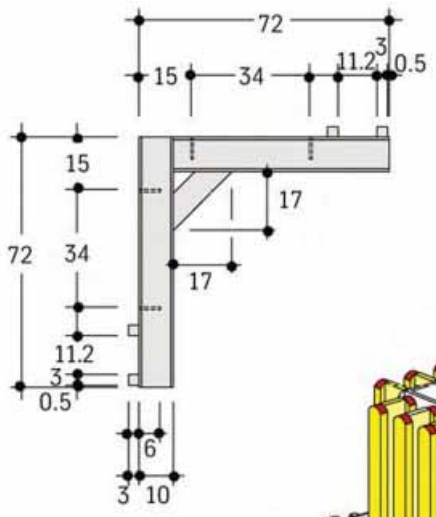
Circular Formwork Arrangement

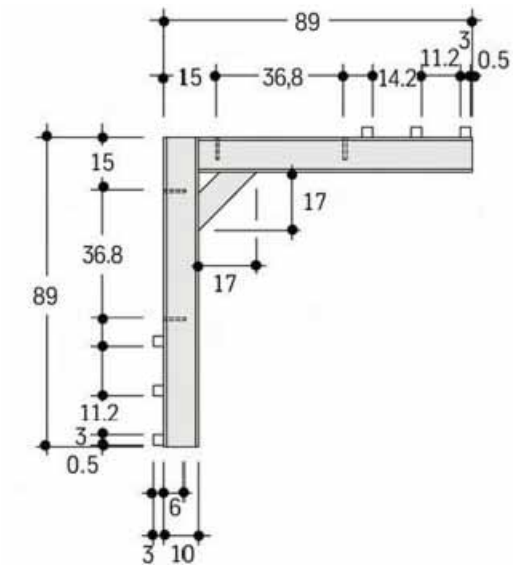
H20 Timber Beam elements arranged as circular wall shuttering can be connected by means of the Hinged Connector 65x65 secured by inserting the Joining Wedge in the Waler.

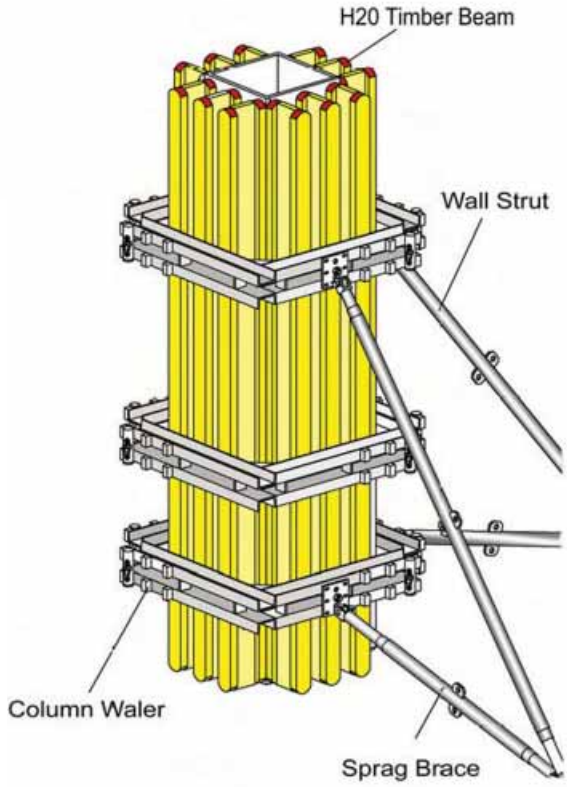


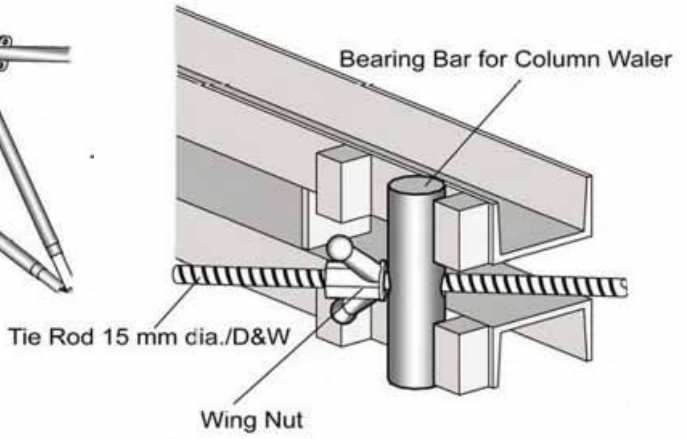
Hinged Connector

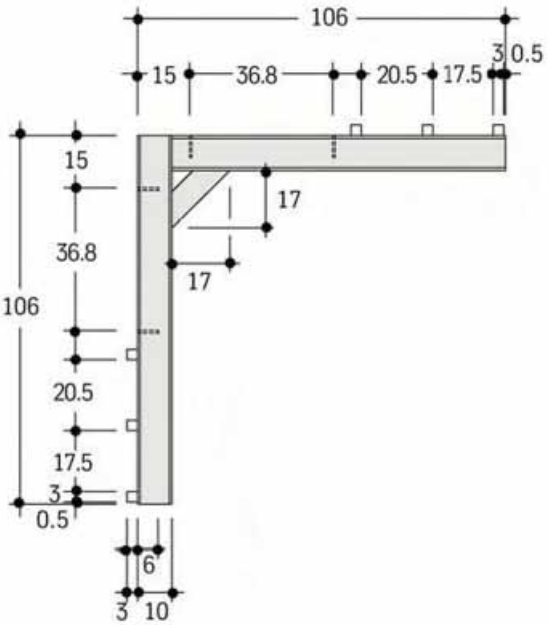
Column Formwork Arrangement

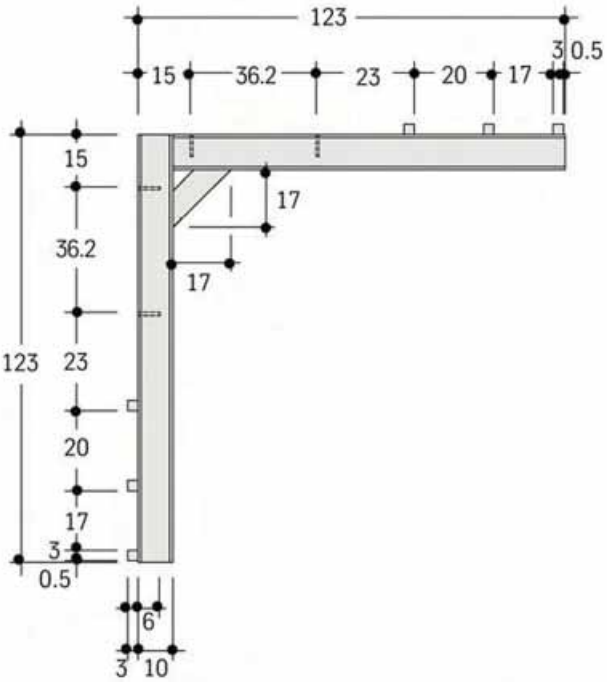








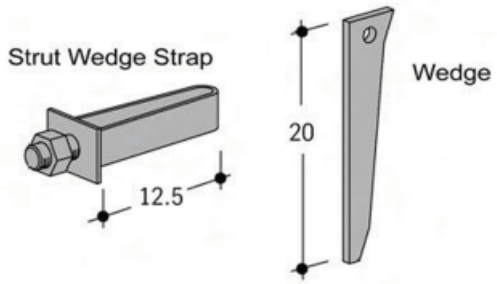


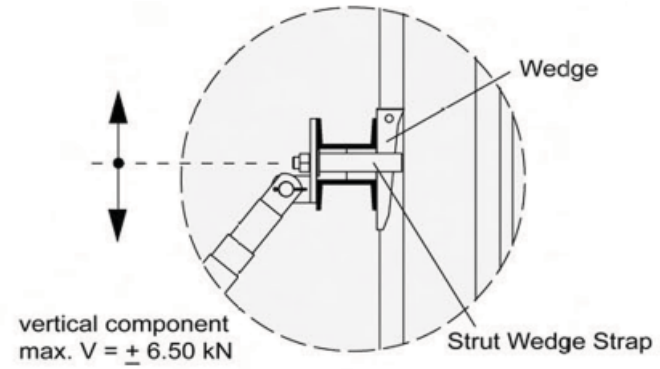


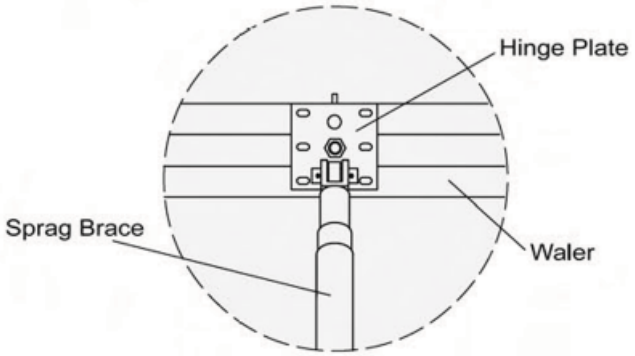
Aligning the Wall Formwork Elements

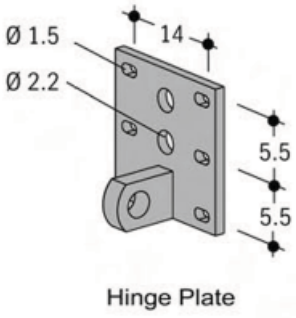
Arrangement of Wall Struts with Sprag Braces

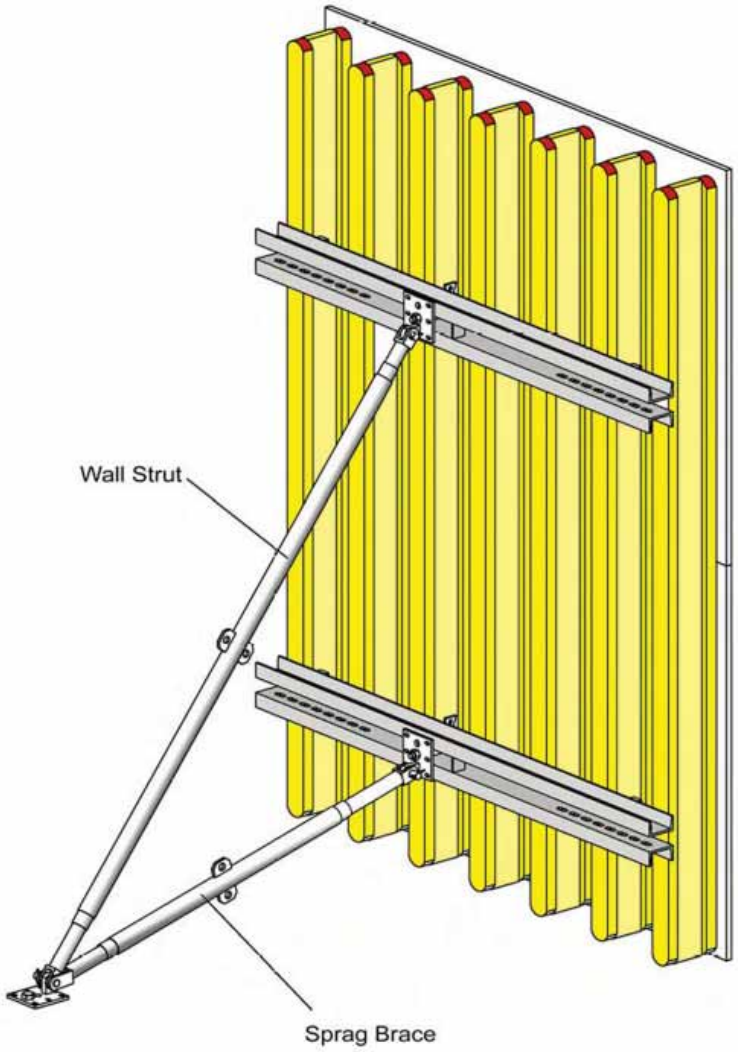
Using the Wall Strut and the Sprag Brace, the wall formwork elements can be properly aligned and supported. During the erection of the wall shuttering, arrangement of the Wall Struts with Sprag Braces is necessary in order to take over the wind loads. The compression and tension resistant connection to the Waler is made by Strut Wedge Strap and Wedge. Please note that the Wall Strut and Sprag Brace are to be ordered separately.











Wall Strut Size Varieties

Wall Strut	min. L (m)	perm. F (kN)	max. L (m)	perm. F (kN)
Wall Strut 1	1.76	40	2.40	26
Wall Strut 2	2.20	31	2.90	17
Wall Strut 3	2.70	20	3.40	13
Wall Strut 4	3.20	14	3.90	9
Wall Strut 5	4.20	10	4.90	7
Wall Strut 6	5.30	13	5.90	10

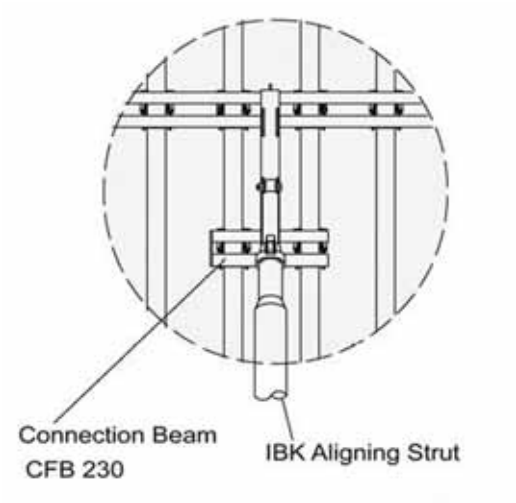
Sprag Brace Size Varieties

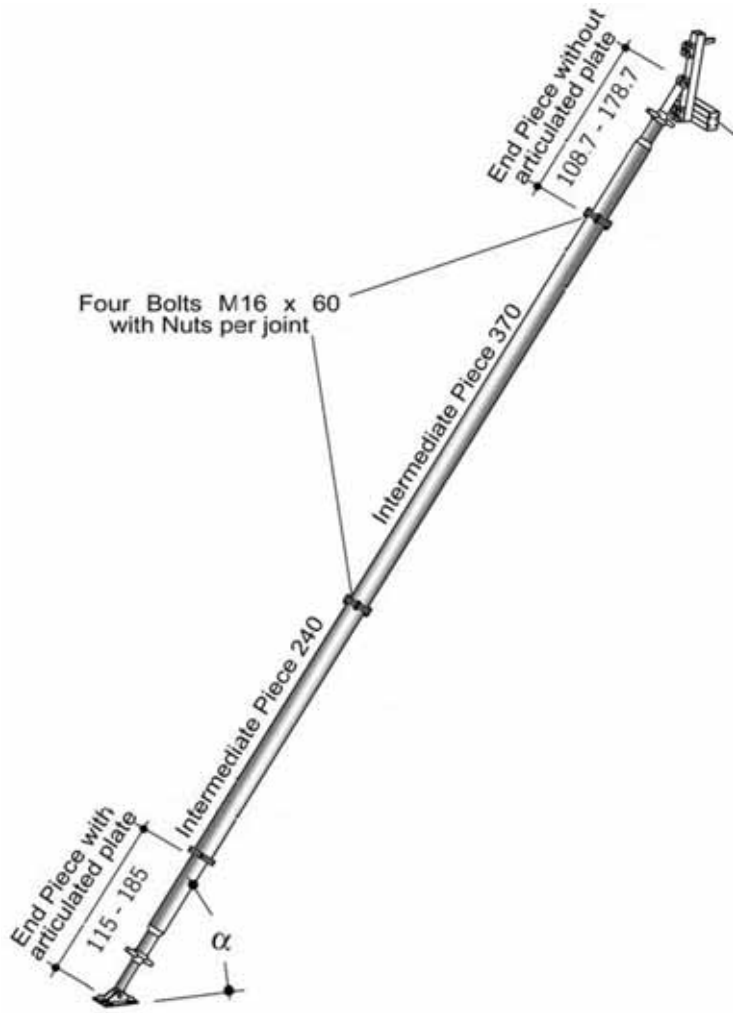
Sprag Brace	min. L (m)	perm. F (kN)	max. L (m)	perm. F (kN)
Sprag Brace 1	1.15	47	1.65	36
Sprag Brace 2	1.70	40	2.40	26

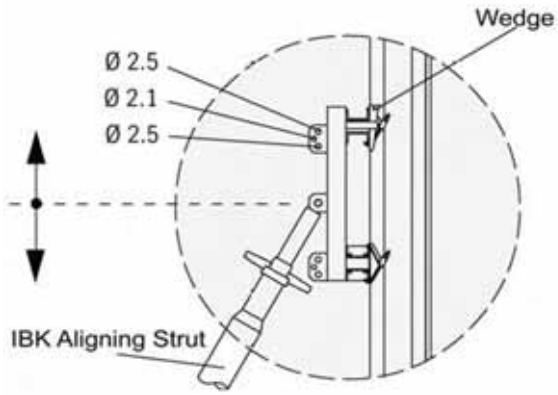
Special Aligning Strut Arrangement

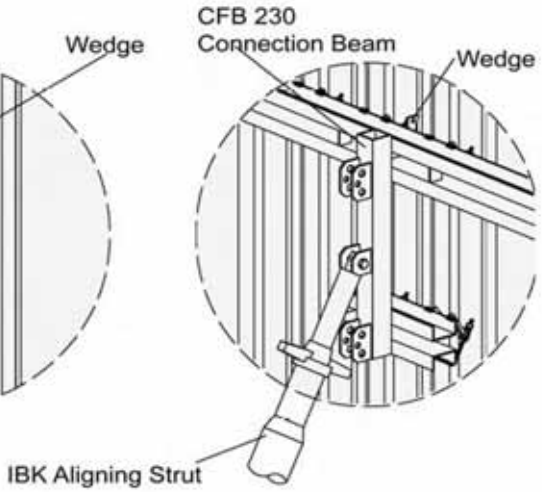
For aligning extremely high wall elements, combinable Aligning Strut IBK sections can be arranged for a tension and compression resistant bracing. The connection of the aligning strut to the wall elements is done by means of the Connection Beam CFB230.

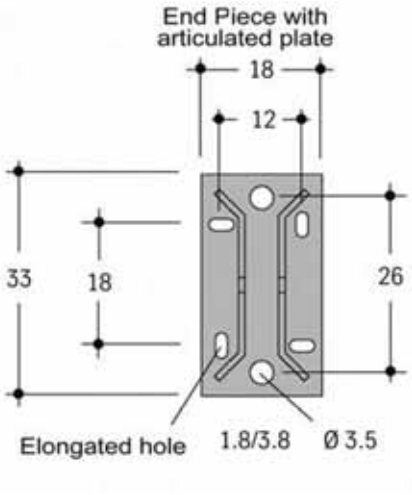
The Aligning Strut IBK is made up of several components which can form numerous combinations as illustrated below:











Type	Length in cm. min.	Length in cm. max.	Perm. Load kN extended fully	Qty. of End Piece with Hinged End Section	Qty. of End Piece without Hinged End Section	intermediate Piece Qty. 240cm.	intermediate Piece Qty. 370cm.
IBK 4	703.70	843.70	25	1 each	1 each	2	
IBK 5	833.70	973.70	22			1	1
IBK 6	963.70	1103.70	17.5				2
IBK 7	1073.70	1213.70	15			2	1

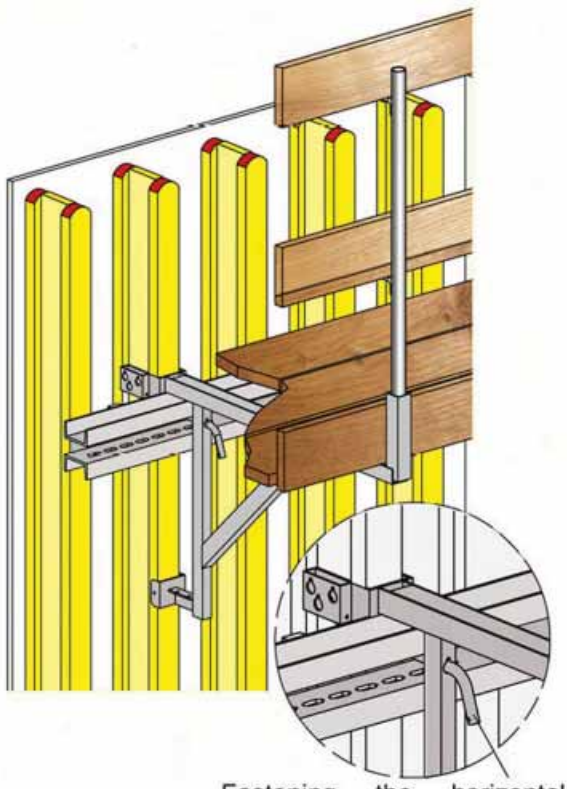
Note:

Vertical component max. v= ≤ 27.5kN

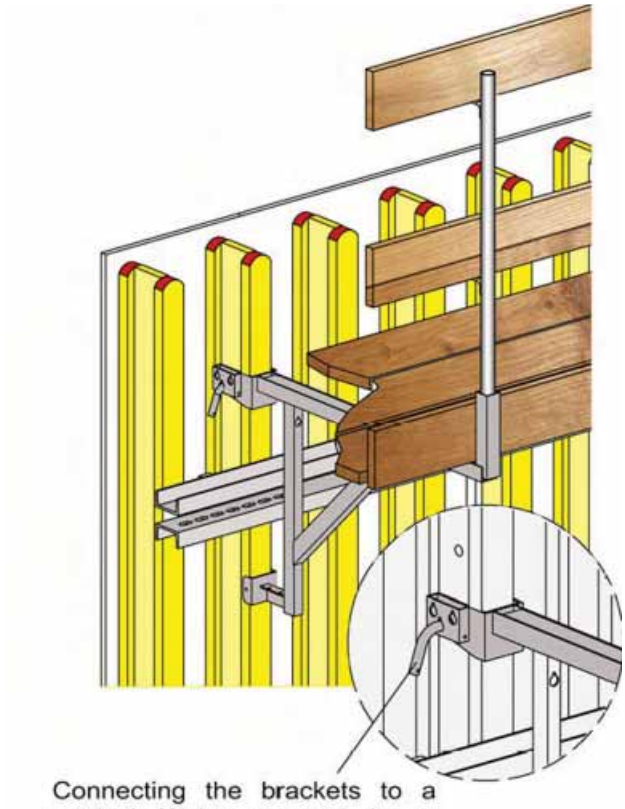
TB Walkway Bracket Arrangement

The TB Walkway 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 90 cm. It is equipped with an additional WB Railing Post which is ordered separately.

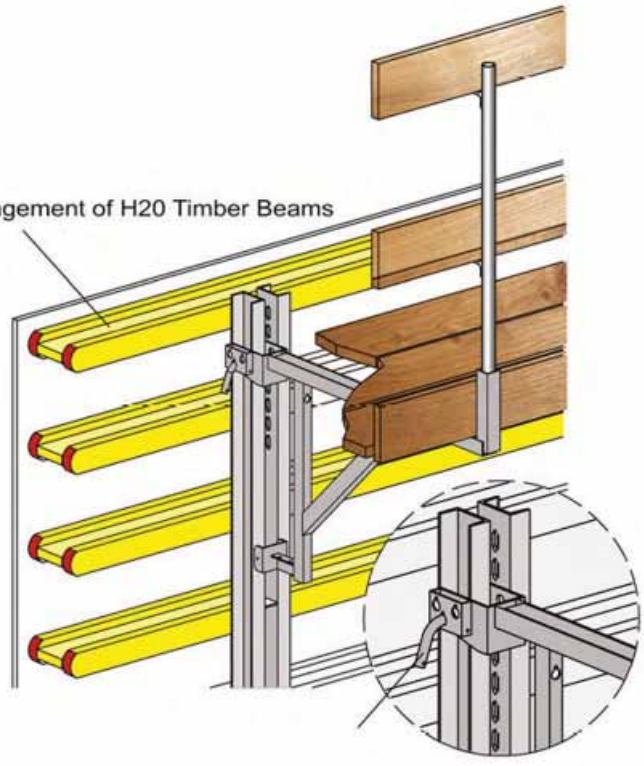
Prior to pre-assembly of the standard elements, holes with 2 mm diameter have to be drilled in the middle axis of the H20 Timber Beam web. These holes allows fastening of the TB Walkway Bracket using the Safety Pin.



Fastening the horizontal Waler secured by a Safety Pin.



Connecting the brackets to a vertical Waler secured by a Safety Pin.

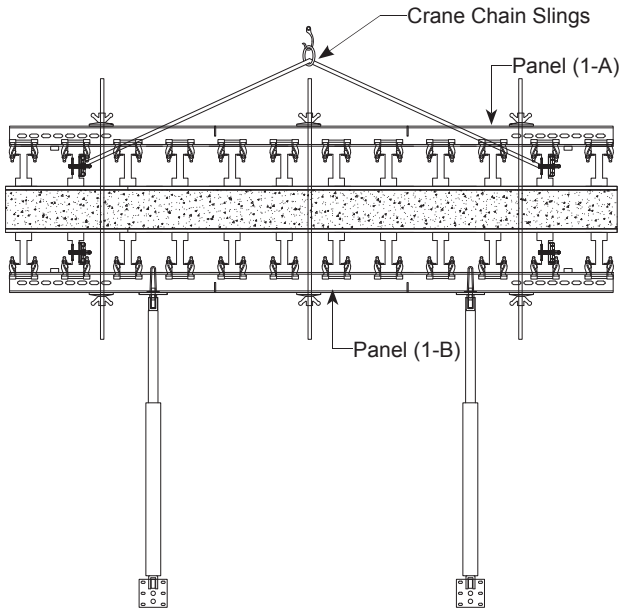


Please note that the board thickness as well as dimension of the planks for the platform and railing should be in line with the specific construction and safety regulations on the site. The maximum distance of two TB Walkway Brackets should not exceed 1.50 m.

De-shuttering Wall Formwork

Step-1

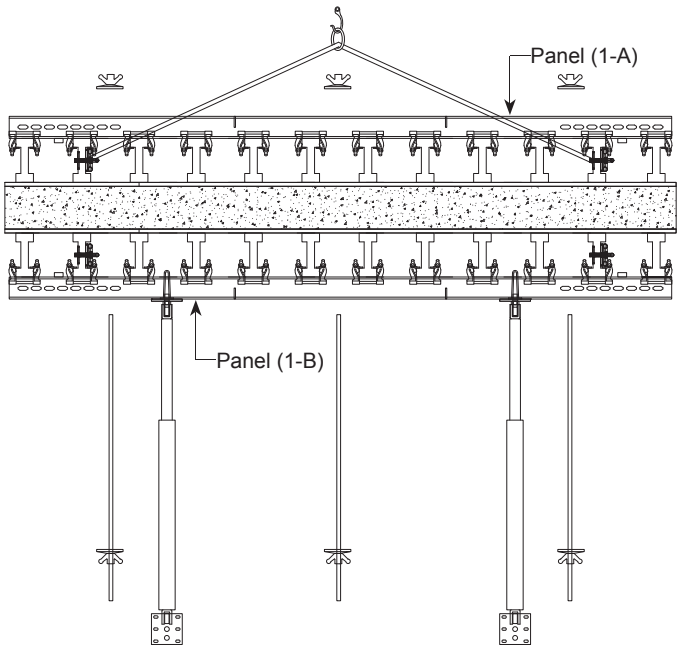
Fix the crane chain slings to H20 Panel (1-A) not attached to the Wall Struts Side. Ensure slings angle does not exceed 60°



Step-2

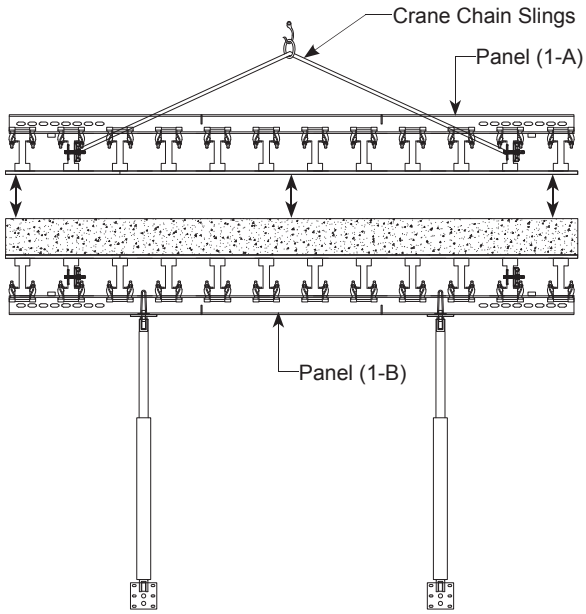
Remove tie rods from the H20 Panel that requires de-shuttering

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



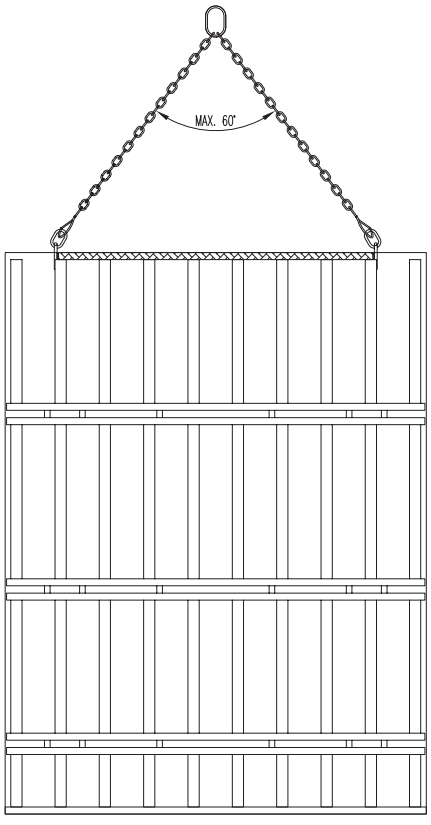
Step-3

Retract H20 panel (1-A) from the wall.



Step-4

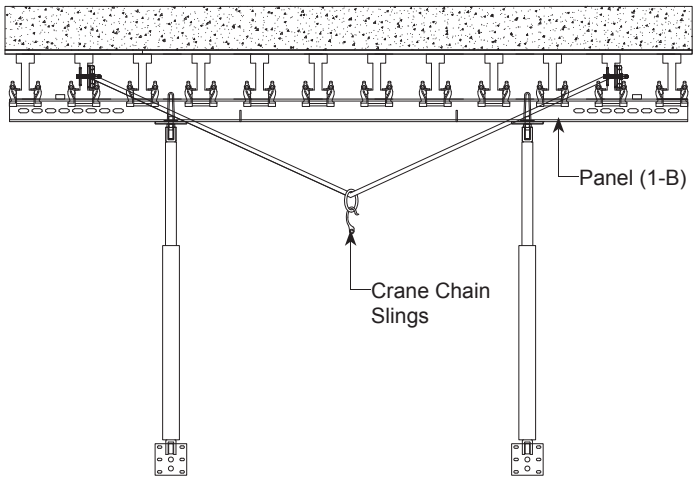
Lift and remove the retracted panel



De-shuttering Wall Formwork

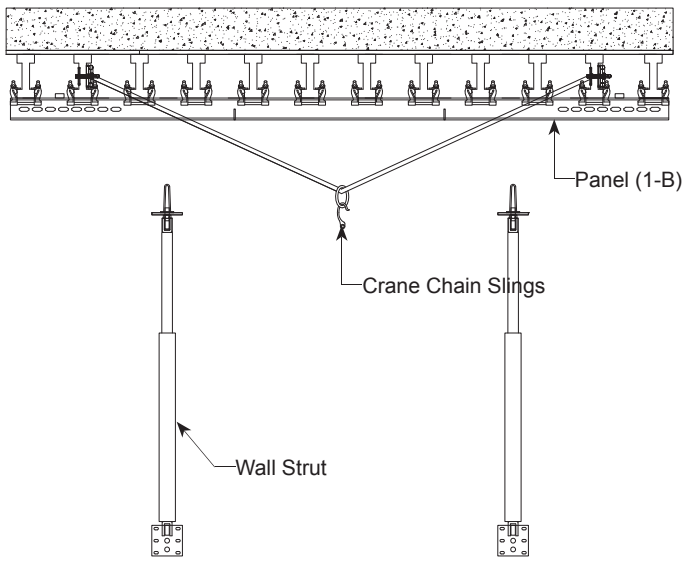
Step-5

Fix the crane chain sling to H20 Panel (1-B) attached to the Wall Strut. 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)



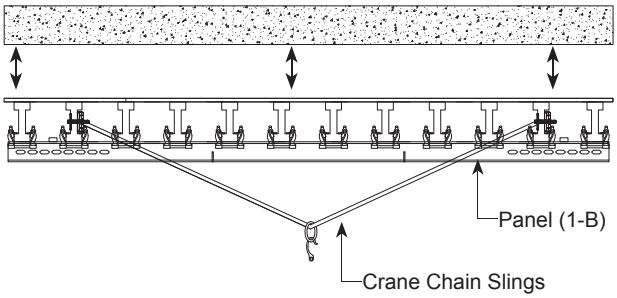
Step-6

Remove Wall Strut.



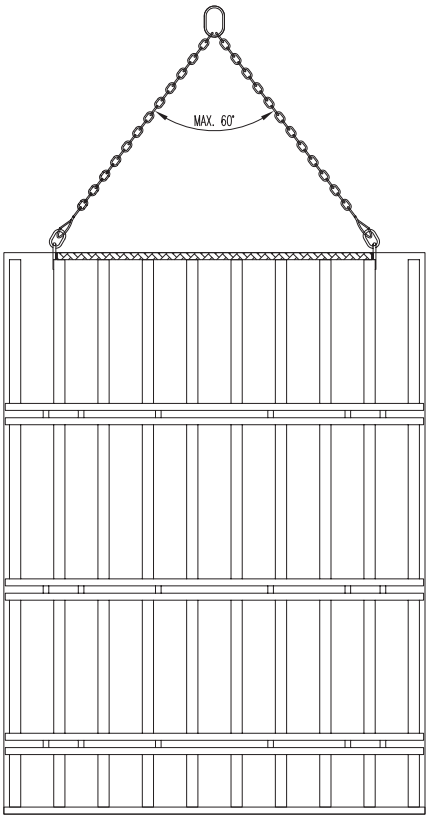
Step-7

Retract H20 panel (1-B) from wall.



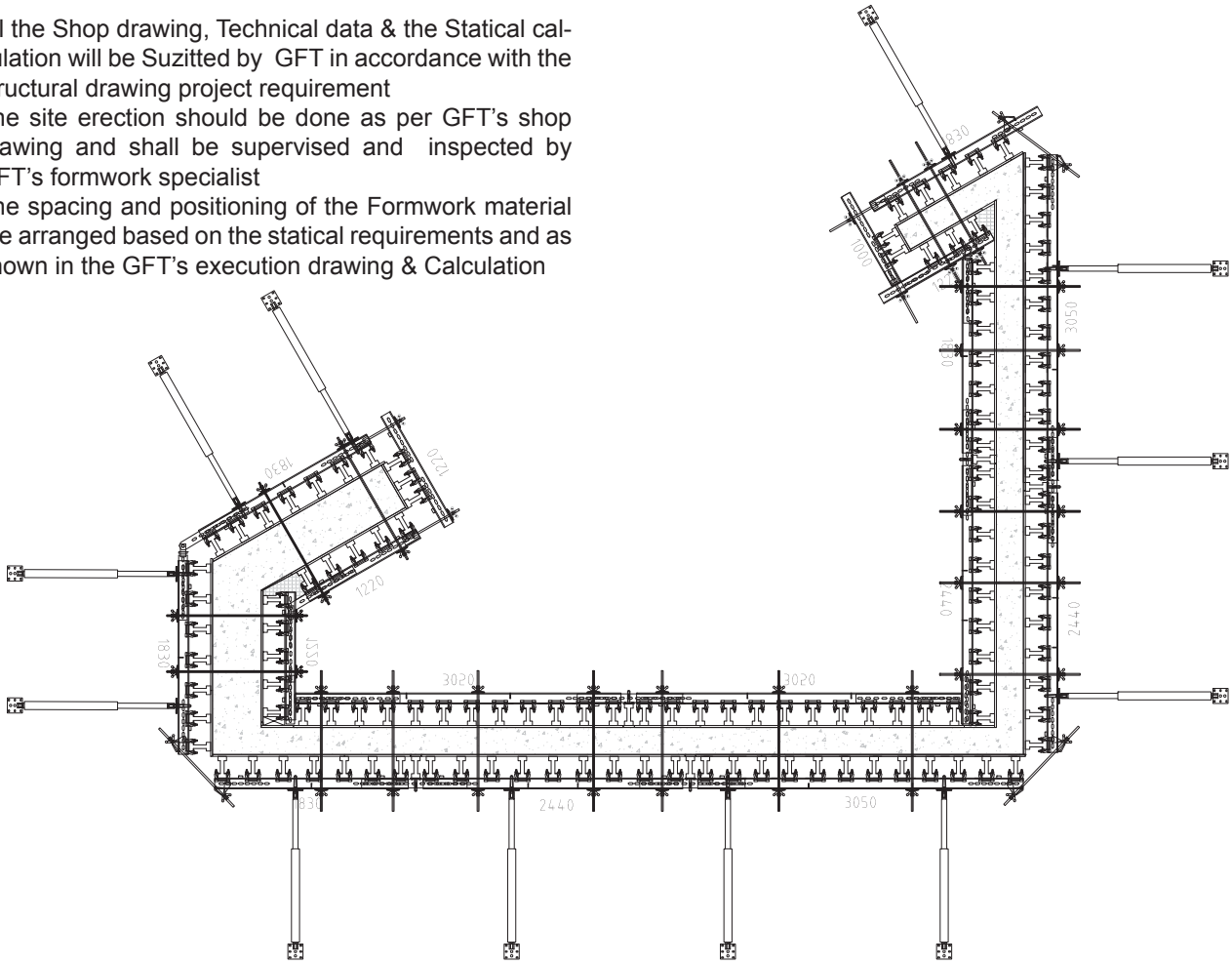
Step-8

Lift and remove the retracted panel

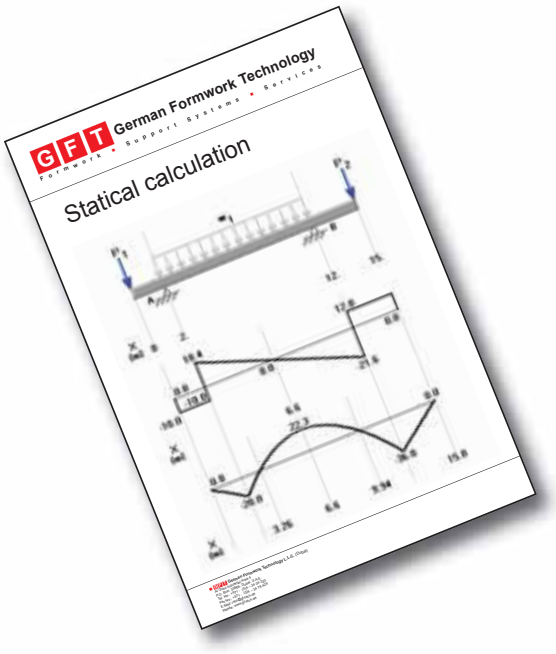


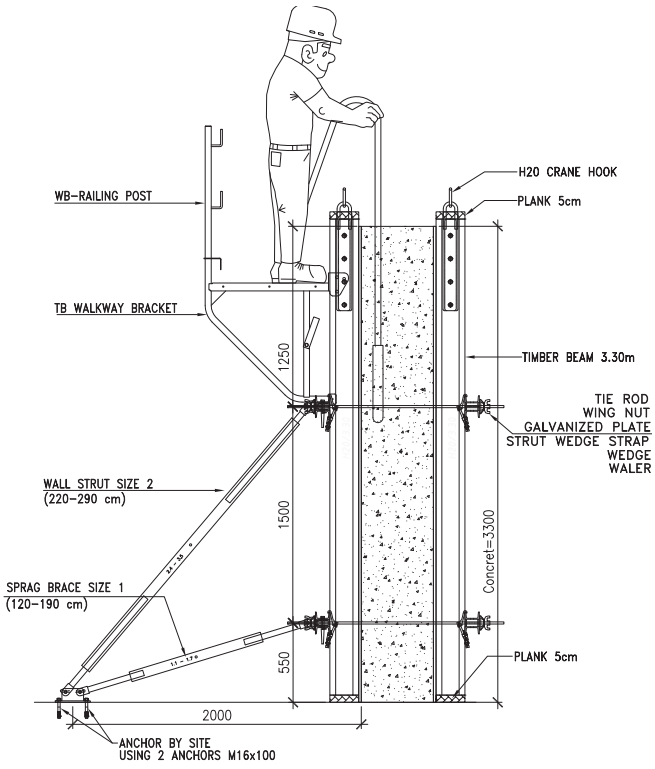
Repeat the above steps for the Adjacent H20 Panels

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

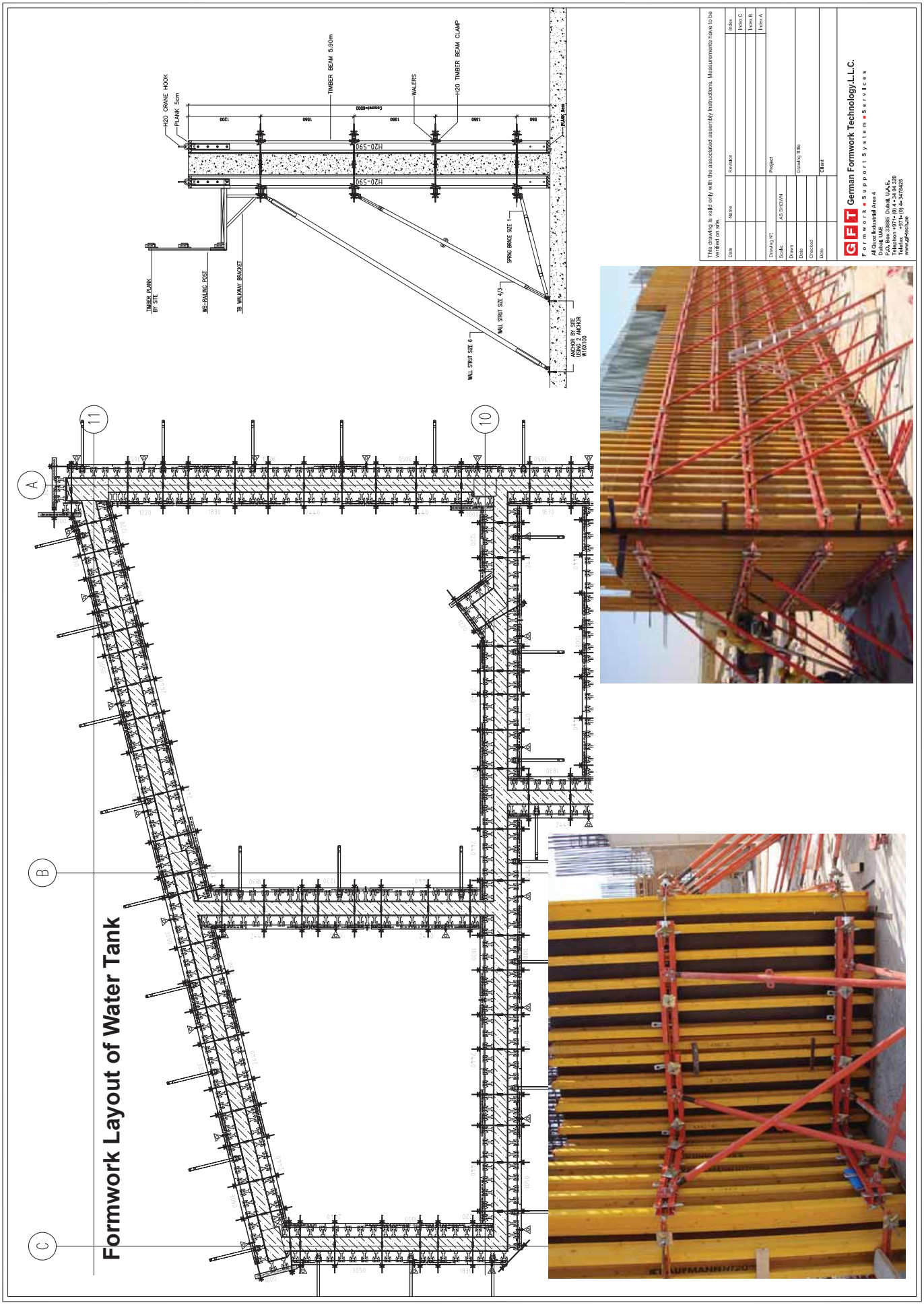


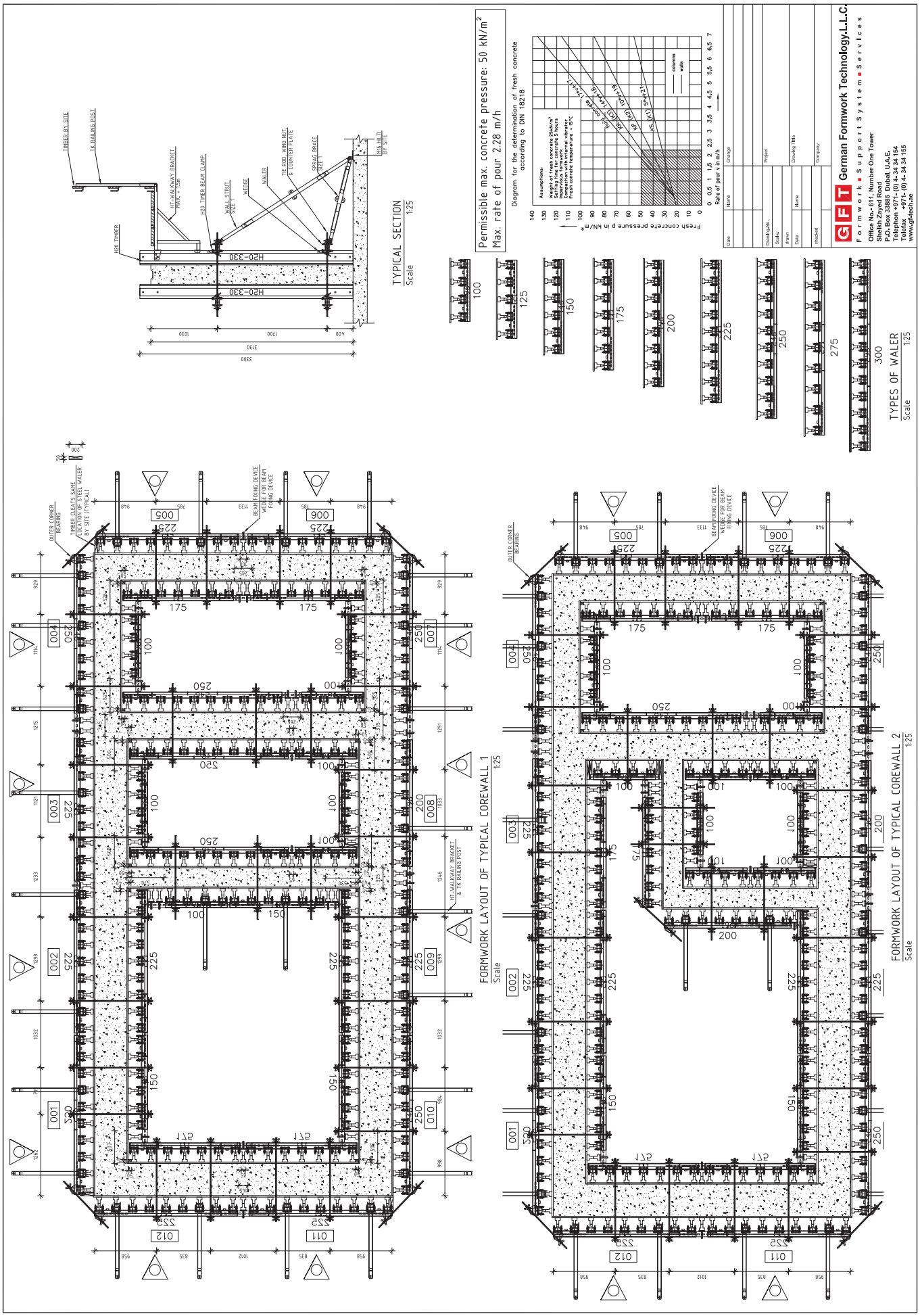
Formwork Layout For Core wall





Typical Section


H20 CRANE HOOK
PLANK 5cm
TIMBER BEAM 5.90m
WALERS
H20 TIMBER BEAM CLAMP
H20-590
H20-590
TIMBER PLANK BY SITE
RB-RAILING POST
TB WALKWAY BRACKET
SPRAG BRACE SIZE 1
WALL STRUT SIZE 4/3
WALL STRUT SIZE 6
ANCHOR BY SITE USING 26 MCHR W16X100
This drawing is valid only with the associated assembly instructions. Measurements have to be verified on site.
Index
Index C
Index B
Index A
Date
Name
Redden
Project
Drawing Nº:
Scale:
AS SHOWN
Drawn
Date
Checked
Date
Drawing Title
GBest
German Formwork Technology L.L.C.
Formwork • Support System • Services
Al Quoz Industrial Area 4
Dubai UAE
P.O. Box 33885 Dubai U.A.E.
Telephon +971- (0) 4 - 34 84 320
Telefax +971- (0) 4 - 34 84 321
www.gftech.ae
A
B
C
10
11
Formwork Layout of Water Tank


TYPICAL SECTION
Scale 1:25
Permissible max. concrete pressure: 50 kN/m²
Max. rate of pour 2.28 m/h
Diagram for the determination of fresh concrete according to DIN 18218
TYPES OF WALER
Scale 1:25
FORMWORK LAYOUT OF TYPICAL COREWALL 1
Scale 1:25
FORMWORK LAYOUT OF TYPICAL COREWALL 2
Scale 1:25
German Formwork Technology,L.L.C.
Formwork • Support System • Services
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www.gf-tech.ae

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