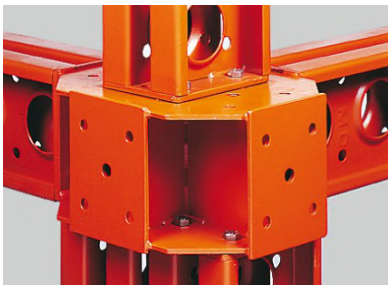
Technical Data Sheets

Metric Specification

SLIMSHOR

MODULAR STRUCTURAL SYSTEM



Contents (with hyperlinks)

Item Code Rapid Reference

Ref RMD	DescriptionRMD	Ref ACE	DescriptionACE	Weight	Page
AFX20003	Alform Clamp Plate	-	Plaque de fixation	0.09 kg	34
ALX10001	Universal Clamp	123-1055	Slim fixation / bride H20 bois	0.75 kg	57
ALX10002	Flange to flange wedge clamp M12	-	Brise poutre à clavette	0.51 kg	57
BNU10050	Prop Brace Pin M24/M20	-	Goupille étai TP M24/M20	0.43 kg	26
BNU12001	M12 Hexagon Nut gr8 BZP	-	Ecrou hex M12	0.01 kg	58
BNU12002	M12 Round Washer	-	Rondelle M12	0.01 kg	58
BNU16001	M16 Hexagon Nut gr8 BZP	125-9020	Ecrou hex M16	0.03 kg	18, 58
BNU16002	M16 Round Washer BZP	-	Rondelle M16	0.01 kg	58
BNU16007	M16 x 40 Set Pin gr 8.8 ZP	-	Vis hex M16 8.8 L40	0.09 kg	18,22, 24, 58
BNU16008	M16 x 40 C/Snk Set Pin gr 8.8 ZP M16	-	Vis tête fraisée M16 8.8 L40	0.05 kg	9, 31, 58
BNU16013	x 110 Bolt gr8.8 BZP	-	Vis hex M16 8.8 L110	0.20 kg	18, 19, 58
BNU20001	M20 Hexagon Nut gr8.8 ZP	124-2102	Ecrou hex M20	0.06 kg	24, 58
BNU20003	M20 Round Washer BZP	-	Rondelle M20	0.03 kg	28, 58
BNU20015	M20 x 100 Bolt gr8.8 BZP	124-2101	Vis hex M20 8.8 L100	0.32 kg	58
BNU24001	M24 Hexagon Nut gr 8.8 ZP	-	Ecrou hex M24	0.06 kg	23, 24, 58
BNX10005	M10 x 20 Set Pin gr8.8 BZP M12x40 C/	-	Vis hex M10 8.8 L20	0.03 kg	37
BNX12001	sk Plate gr8.8	-	Vis tête fraisée M12 8.8 L40	0.05 kg	58
BNX12002	M12 x 30 Set Pin gr8.8 BZP	-	Vis hex M12 8.8 L30	0.04 kg	34, 58
BNX12009	M12 x 25 Set Pin gr8.8 BZP	-	Vis hex M12 8.8 L25	0.04 kg	34, 58
BNX20030	M20 x 90 Bolt gr8.8 BZP	-	Vis hex M20 8.8 L90	0.28 kg	58
BNX20100	Megashor Pin High Yield	124-2070	Axe forte charge M20	0.41 kg	58
BNX24002	M24 x 110 Bolt gr8.8 BZP	123-2412	Vis M24 x 120	0.48 kg	58
BTU10009	Rapid Bar Tie Turnbuckle	-	Ridoir de tige de coffrage	2.07 kg	23, 24, 39
BTX10017	Nut – Hexagon 50mm	-	Ecrou hexa L50	0.16 kg	19, 43
BTX10030	Rapid Tie Bar Forkend	-	Fourche d'extrémité de tige	1.31 kg	41
RPX10005	B Clamp – Tube to Panel	123-1000	Slim bride tume	0.66 kg	58
RSX10001	Rapidshor U-Plate 8thk x 220mm wide	-	Rapidshor plaque de tête U 220x100x8	5.72 kg	35
RSX10003	Rapidshor Brace U Head 182mm wide	-	Rapidshor tête de fourche 182 mm	8.47 kg	35
RSX10008	Rapidshor U-Plate 8thk x 182mm wide	-	Rapidshor plaque de tête U 182x100x8	5.26 kg	35
-	Fixed coupler Ø49x49	152-0149	Collier D49x49 fixe (NF EN 74-1 CLAS A)	1.1 kg	41
-	Fixed coupler Ø49x60	152-0160	Collier D49x60 fixe (NF EN 74-1 CLAS A)	1.57 kg	41
-	Swivel coupler Ø49x49	152-0249	Collier D49x49 orien (NF EN 74-1 CLAS A)	1.34 kg	41
-	Swivel coupler Ø49x60	152-0260	Collier D49x60 orie (NF EN 74-1 CLAS A)	1.56 kg	41
SSU10003	Superslim 90 Degree Corner	123-1125	Slim connecteur 90°	8.69 kg	18
SSU10004	Superslim Prop Pivot Tube	123-1135	Slim tube pivot	1.81 kg	26
SSU10007	Superslim Prop Jack (LH)	123-1015	Slim verin etai TP G	13.6 kg	23
SSU10008	Superslim Prop Jack (RH)	123-1020	Slim verin etai TP D	13.7 kg	23
SSU10010	Superslim Joint Stiffener	123-1040	Slim renfort de joint	1.44 kg	18
SSU10011	Superslim R Clip 5 x 100mm	123-2075	Slim goupille cavalier	0.03 kg	58
SSU10012	Superslim Prop Spade End Link	123-1030	Slim connecteur TP slim/slim 65kN	3.06 kg	27
SSU10013	Superslim Prop Tube End Link	-	Slim connecteur TP slim/megashor 68kN	2.81 kg	27
SSU10019	Superslim Corner Pivot	123-1115	Slim pivot de coin	7.32 kg	36
SSU10023	Superslim Rocking Head 36mm	123-1105	Slim tête oscillante 36mm	4.35 kg	36
SSU10024	Superslim Tube Clamp	123-1010	Slim raccord orientable	1.33 kg	41, 56
SSU10025	Superslim Adjustable Base 365-515	123-1082	Slim verin de base 365-515mm	19.0 kg	33

Item Code Rapid Reference…...continued

Ref RMD	Description RMD	Ref ACE	Description ACE	Weight	Page
SSU10026	Superslim Adjustable Head 440-590mm	123-1083	Slim verin de tête 440-590mm	24.6 kg	34
SSU10029	Rocking Head Washer M10	-	Slim rondelle de tête oscillante	0.02 kg	36
SSU10032	Superslim Lifting Plate 15kN	123-1130	Slim plaque de levage poutre	3.19 kg	50
SSU10034	Superslim Tilt Plate	123-1025	Slim plaque à bascule	4.89 kg	23
SSU10036	Superslim Anchor Plate 15mm	123-0999	Slim plaque d'ancrage 15 mm	7.30 kg	20
SSU10038	Superslim Prop Connector 100KN	-	Slim connecteur TP slim/slim 100kN	6.82 kg	25
SSU10041	Superslim Prop Torque Handle	-	Slim rallonge serrage dynamométrique	6.19 kg	53
SSU10042	Superslim Prop Torque Socket	-	Slim douille serrage dynamométrique	2.17 kg	53
SSU20006	Multislim 6 Way Connector	123-1140	Slim connecteur simple 6D	24.9 kg	37
SSU20066	6 Way Double Connector	123-1145	Slim connecteur double 6D	42.0 kg	37
SSX10039	Porthole Bearing 20.8mm Dia Hole	123-1035	Slim portée trislim	1.22 kg	19
SSX10040	Superslim End Plate 10mm	123-0001	Slim plaque d'extrémité 10mm	2.90 kg	7
SSX10042	Superslim Form support plate	123-1065	Slim plaque profil bas	5.29 kg	9
SSX10046	Superslim 19mm Pin & R Clip	-	Axe Ø19 et goupille cavalier	0.29 kg	24
SSX10051	Superslim Short Prop Tube End Link	-	Slim connecteur TP slim/megashor 100kN	1.70 kg	28
SSX10052	Spreader Beam Adaptor Assembly	-	Slim plaque de levage palonnier	19.4 kg	52
SSX10062	Superslim Cast 100kN Tilt Plate	-	Slim plaque à bascule forgée 100 kN	5.00 kg	24
SSX10063	Superslim Lifting Plate Assembly 20kN	-	Slim plaque de levage assemblée	4.97 kg	50
SSX10090	Superslim Soldier 90mm	123-0009	Slim poutrelle 0.90	7.30 kg	7
SSX11800	Superslim Soldier 180mm	123-0018	Slim poutrelle 0.18	8.70 kg	7
SSX10360	Superslim Soldier 360mm	123-0036	Slim poutrelle 0.36	12.0 kg	7
SSX10540	Superslim Soldier 540mm	123-0054	Slim poutrelle 0.54	15.2 kg	7
SSX10720	Superslim Soldier 720mm	123-0072	Slim poutrelle 0.72	18.7 kg	7
SSX10900	Superslim Soldier 900mm	123-0090	Slim poutrelle 0.90	22.0 kg	7
SSX11800	Superslim Soldier 1800mm	123-0180	Slim poutrelle 1.80	38.8 kg	7
SSX12700	Superslim Soldier 2700mm	123-0270	Slim poutrelle 2.70	55.4 kg	7
SSX13600	Superslim Soldier 3600mm	123-0360	Slim poutrelle 3.60	72.2 kg	7
-	Scaffold Tube Ø48.3x3.2 galva L050D	151-0050	Tube acier Ø48.3x3.2 galva LG 0.50D	1.78 kg	41
-	Scaffold Tube Ø48.3x3.2 galva L100D	151-0100	Tube acier Ø48.3x3.2 galva LG 1.00D	3.56 kg	41
-	Scaffold Tube Ø48.3x3.2 galva L150D	151-0150	Tube acier Ø48.3x3.2 galva LG 1.50D	5.34 kg	41
-	Scaffold Tube Ø48 3x3.2 galva L200D	151-0200	Tube acier Ø48.3x3.2 galva LG 2.00D	7.12 kg	41
-	Scaffold Tube Ø48 3x3.2 galva L300D	151-0300	Tube acier Ø48.3x3.2 galva LG 3.00D	10.68 kg	41
-	Scaffold Tube Ø48 3x3.2 galva L350D	151-0350	Tube acier Ø48.3x3.2 galva LG 3.50D	12.46kg	41
-	Scaffold Tube Ø48 3x3.2 galva L450D	151-0450	Tube acier Ø48.3x3.2 galva LG 4.50D	16.2 kg	41
-	Scaffold Tube Ø48 3x3.2 galva L500D	151-0500	Tube acier Ø48.3x3.2 galva LG 5.00D	17.8 kg	41
-	Scaffold Tube Ø48 3x3.2 galva L550D	151-0550	Tube acier Ø48.3x3.2 galva LG 5.50D	19.58 kg	41
-	Scaffold Tube Ø48 3x3.2 galva L600D	151-0600	Tube acier Ø48.3x3.2 galva LG 6.00D	21.36 kg	41

Introduction

The Superslim Soldier is the definitive modular structural support system. Robust, easily assembled and having an unrivalled and growing range of accessories, the Superslim Soldier can be used in numerous temporary works applications such as wall formwork, static or travelling gantries, vertical and raking shores, spanning beams and trusses, façade retention, bridge cantilever edge & deck supports and safety screens for use in hi-rise construction.

Superslim and European Standards.

The majority of the Superslim components were designed before the conception of the EN design standards. Extensive use was made of BS449 backed up by load testing carried out by Birmingham University and in RMD Kwikform labs. Subsequent to the introduction of European Standards we have re-examined the main load-bearing components in the Superslim range using EC3 including the recommendation of EN 12812 to use a partial material factor of 1.1. Where appropriate technical data has been adjusted to suit the output of these calculations and in some instances further load testing in accordance with applicable EN standards has been carried out at University premises to justify published capacities.

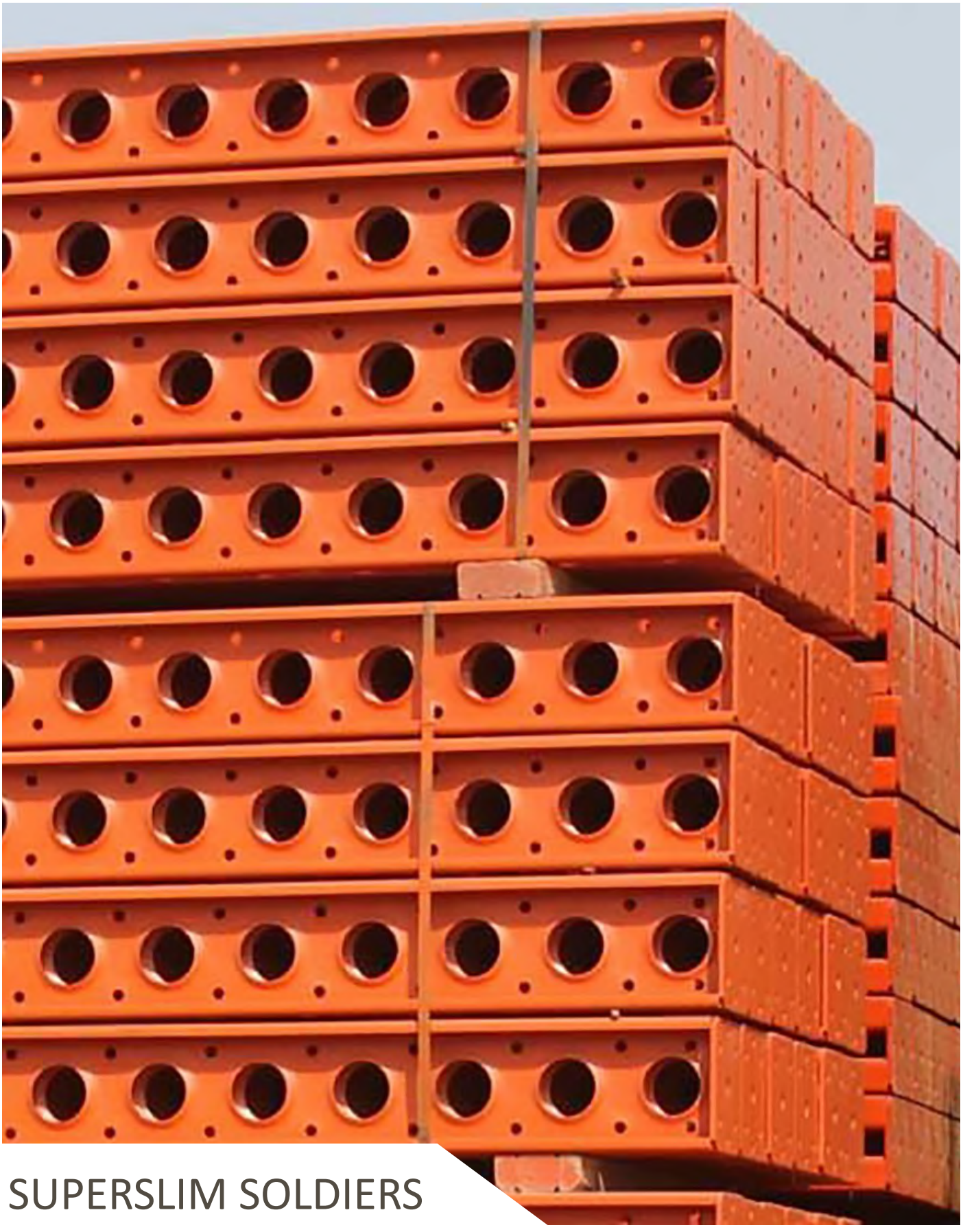
To facilitate design using established permissible load methods in accordance with BS5975, load performance data in this document is displayed as an 'Allowable Working Load'. Should Limit State Design be required, the Design Resistance may be obtained by multiplying the Allowable Working Load values by 1.5.

SUPERSLIM SOLDIER

MODULAR STRUCTURAL SYSTEM

ALTRAD
COFFRAGE
& ÉTAIEMENT
LOCATION
VENTE
MONTAGE

R·M·D KWIKFORM



SUPERSLIM SOLDIERS

SUPERSLIM SOLDIER

MODULAR STRUCTURAL SYSTEM

ALTRAD COFFRAGE & ÉTAIEMENT LOCATION VENTE MONTAGE

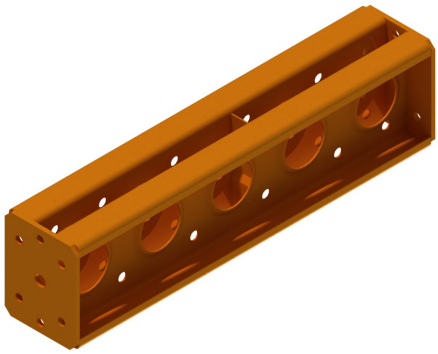
R•M•D KWIKFORM

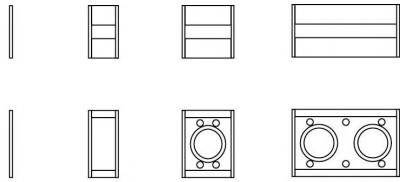
Superslim Soldier Shafts

Code	Description	Weight
SSX13600	Superslim Soldier 3600mm	72.2 kg
SSX12700	Superslim Soldier 2700mm	55.4 kg
SSX11800	Superslim Soldier 1800mm	38.8 kg
SSM11260	Superslim Soldier 1260mm	27.2 kg
SSX10900	Superslim Soldier 900mm	22.0 kg
SSX10720	Superslim Soldier 720mm	18.7 kg
SSX10540	Superslim Soldier 540mm	15.2 kg
SSX10360	Superslim Soldier 360mm	12.0 kg
SSX10180	Superslim Soldier 180mm	8.7 kg
SSX10090	Superslim Soldier 90mm	7.3 kg
SSX10040	Superslim End Plate 10mm	2.9 kg

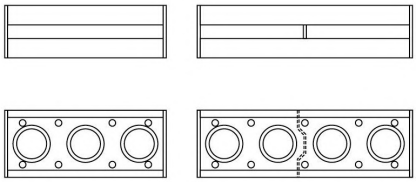
Hot dip galvanized Superslim Soldiers are also available on request.

Note! The positions of stiffener plates and 21Ø holes in hire fleet soldiers may vary. Soldiers shown are post 1994 version. If the position of the stiffeners and/or 21Ø holes is critical to the design then please specify 'As New Pattern Soldiers'

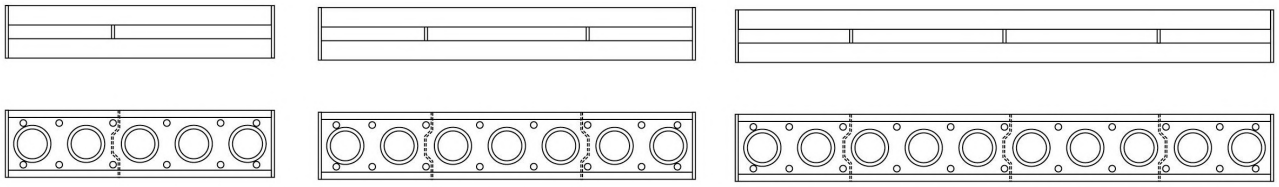




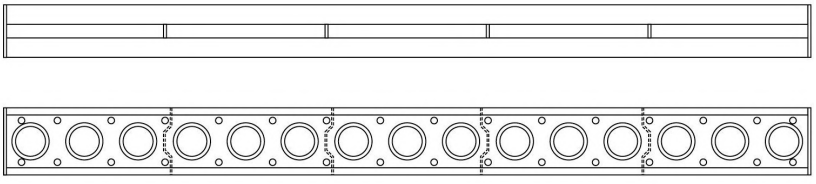
10mm 90mm 180mm 360mm



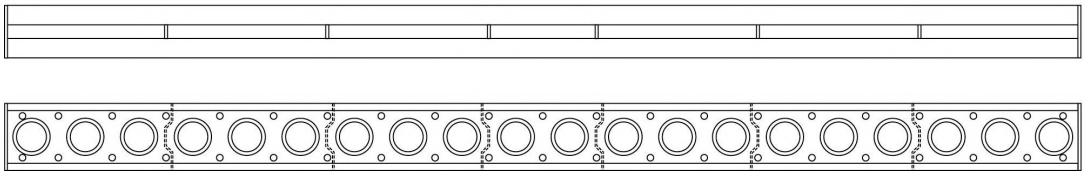
540mm 720mm



900mm 1260mm 1800mm

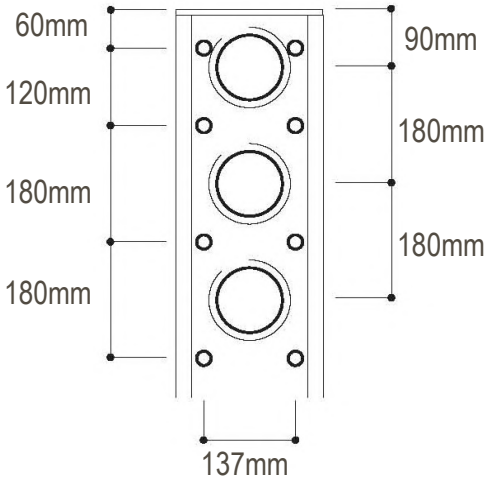


2700mm



3600mm

Punchings and Geometry

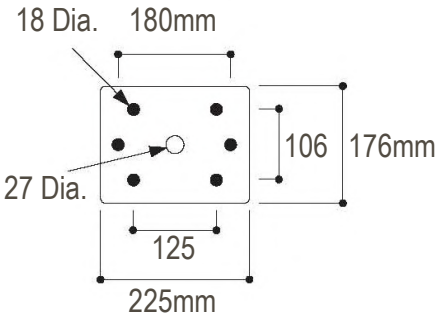


100mm dia porthole max bearing in hole pair 65kN

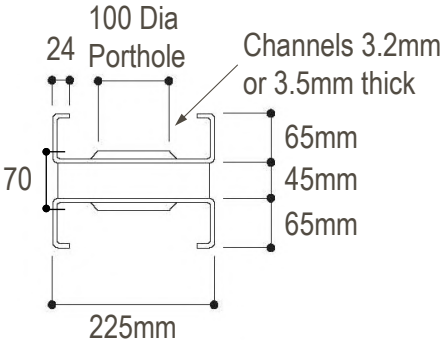
21mm dia max bearing in hole pair when used with:-

- M20 x 90 Bolt/Nut gr 8.8 (BNX20030+BNU20001) = 45kN
- M20 x 100 Bolt/Nut gr 8.8 (BNU20015+BNU20001) = 58.8kN
- Superslim 19mm Pin & R-clip (SSX10046) = 46kN

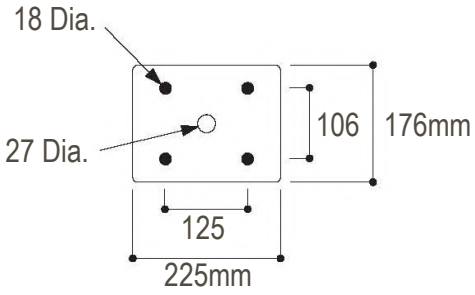
*It is possible to increase the allowable bearing loads in the 21mm Superslim web holes up to 90kN by placing M20 bright washers concentric to the holes within the channel pressing and welding them to the webs of the section.



Detail on End Plate
10mm thick - Post 1994 version



Typical Section



Detail on End Plate 8mm thick
Pre 1994 version

Note: The arrangement of holes in the end plates of hire fleet soldiers vary. If using soldiers bolted to Megashor please specify '7 hole end plate soldiers'.

Section Properties

Soldier Characteristics

Area: Gross	26.06 cm^2
Area: Nett	19.64 cm^2
I xx	1916 cm^4
I yy	658 cm^4
r xx	9.69 cm
r yy	5.70 cm
Z xx	161 cm^3
Z yy	61 cm^3
El xx	4020 kNm^2
El yy	300 kNm^2
GA xx	17350 kN
Vmax y (parallel to webs)	88kN min*
M max x	40 kNm
M max y	6.24 kNm
Mean Self weight for Analysis	0.235 kN/m run**

* limited by the value at the 100mm diameter porthole.

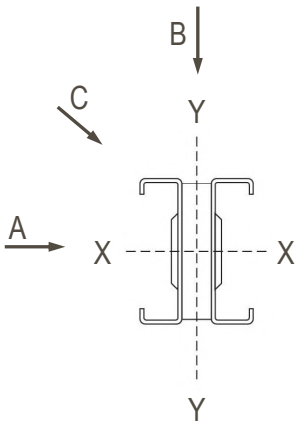
** Self weight varies depending on makeup / length - see sheet 9.

Bolted Joint Characteristics in X-X Axis - see sheet 19 for location of bolts

Number of Bolts	Maximum Moment	Maximum Shear	Maximum Tension
2 M16 gr 8.8 Bolts	9kNm	76kN	90kN
4 M16 gr8.8 Bolts	12kNm	88kN*	100kN
6 M16 gr 8.8 Bolts	18kNm	88kN*	140kN
6 M16 gr 8.8 Bolts & Joint Stiffeners	24kNm	88kN*	150kN

Effective area (Ae) for wind calculation purposes

Direction A	0.177 m^2/m
Direction B	0.130 m^2/m
Direction C	0.286 m^2/m



Beams with Compression Flanges Restrained

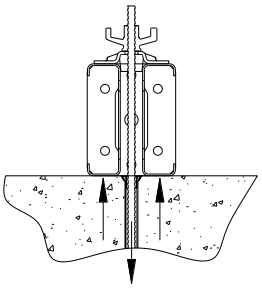
The Superslim Soldier is a lightweight member and it is not generally appropriate to use established design codes for beam analysis. Performance of the unit has been derived from a combination of calculation and extensive load testing. Due to the presence of various web perforations, performance is affected by both shear stiffness and the bending stiffness of the member. Analysis of beam deflection is complex, for deflection calculation by simplistic analysis, reduced EI value of 3200kNm^2 gives good correlation with the more rigorous analysis.

When used as a beam it is important that the soldier is restrained laterally at load points and supports. On a shutter this lateral restraint is provided by the face contact material, backing members and specified connections between the components acting as a stiff diaphragm to restrain the connected flange of the Superslim. Integral intermittent welded web stiffeners in the Superslim transfer this lateral restraint to the unconnected flanges. When used as an isolated beam it is normal to provide lateral restraint using scaffold tubes coupled to the flanges of the soldier. When lateral restraint is not provided refer to sheet 14 for Allowable Working Loads.

When bending in the weak axis, the soldier should be treated as two individual channel members, each with a moment of resistance of 3.12kNm. Individual loads act on the single channel and transfer the forces through the welded stiffeners to the other channel.

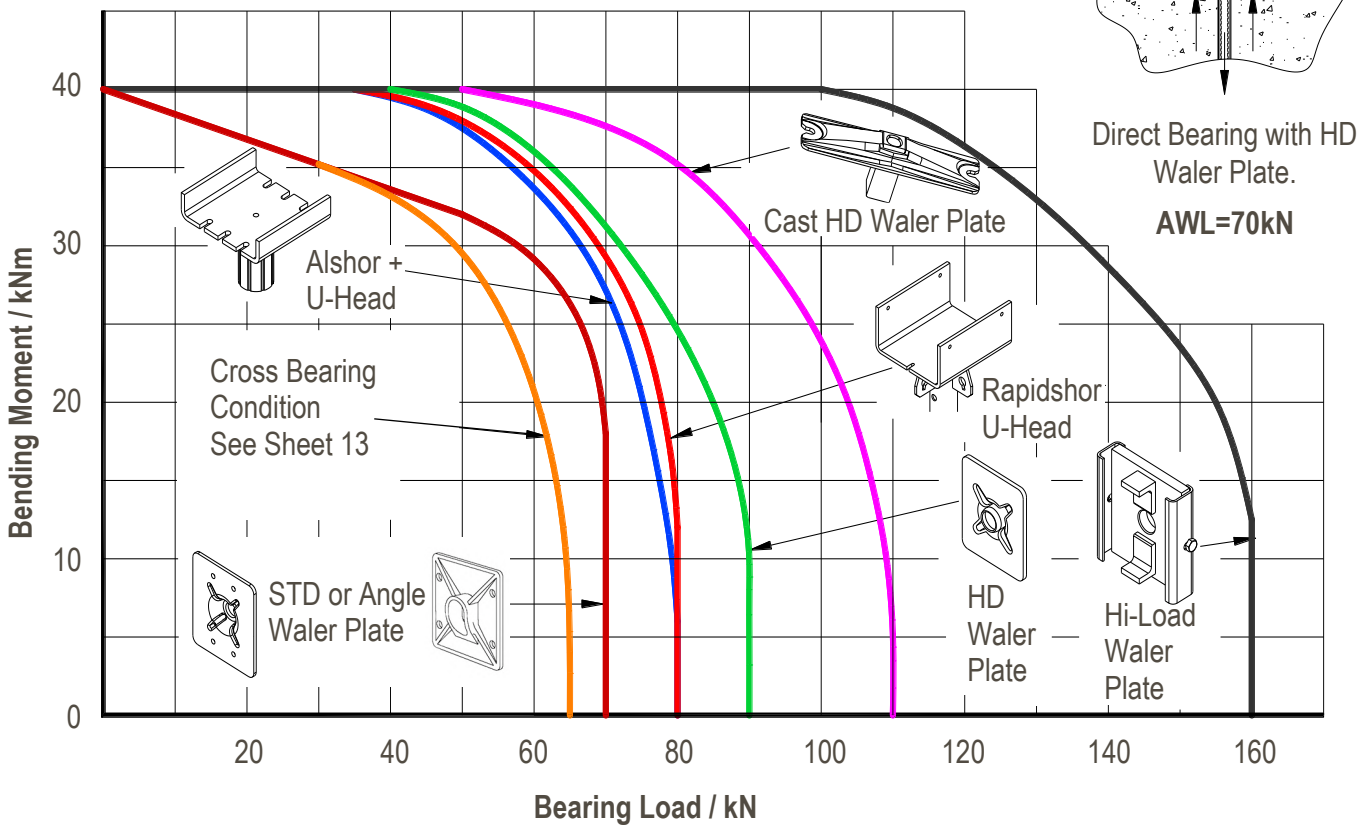
Combined Loading

Performance under conditions of combined bending, bearing and shear loading can be checked using the graph below and figure right for a range of connecting accessories and conditions.



Direct Bearing with HD Waler Plate.

AWL=70kN

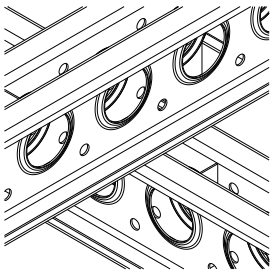


Cross Bearing Conditions

Cross bearing is the least favourable load case for Superslim Soldiers and exists under the following conditions:

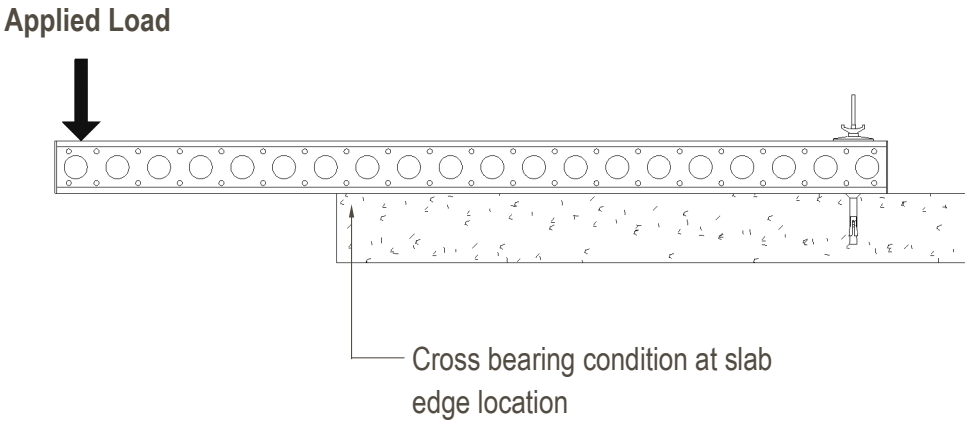
Crossing Superslim Soldiers

This condition occurs in wall formwork applications where the primary beams run vertically and a horizontal Superslim is added to the rear of the primary beams to pick up tie positions that do not line up with the vertical soldiers.



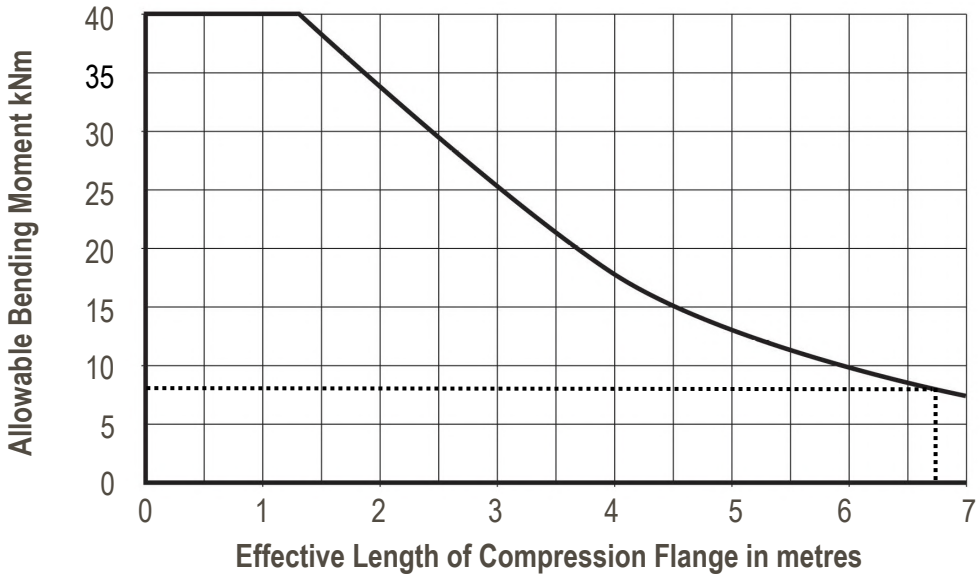
Cantilevering Superslim Soldiers

When Superslim Soldiers are used as cantilevers beams to support a load beyond a slab edge, the reaction between the Superslim and the slab edge is considered a cross bearing condition. For short cantilevers it may be possible to incorporate a bolted Soldier joint at this bearing location in which case the Superslim end plates act as load bearing stiffeners. In this case bearing need not be considered and the allowable working load is governed only by the bending moment capacity of the bolted joint.



Beams with Compression Flanges Unrestrained

The failure mode for long spanning beams without compression flange restraint tends to be by buckling sideways of the compression flanges, a phenomenon known as lateral torsional buckling. During the design of standard steel sections the permissible bending stress is de-rated from the maximum for the material to ensure that failure of this nature does not occur. Superslim Soldiers can also be susceptible to this kind of failure. The complex section is made up of twin channels welded together in a manner that makes them act in a partially composite manner. A mathematical study has been combined with load testing to produce the graph below.



Effective Length of Compression Flange

BS 5975 Annex K.3 may be used to determine the effective length of the compression flanges, e.g. an individual Super Slim soldier cantilevers 0.9m past a Rapidshor U Head.
Determine the maximum point load that may be carried on the top flange at the unrestrained tip.

From BS 5975 table K.3 the soldier is continuous with lateral restraint only. The effective length of the compression flange (in this case the lower flange) is 7.5 * 0.9m = 6.75m.

From the graph above the maximum allowable bending moment at 6.75m effective length = 8.0kNm.
Hence maximum point load at tip = 8.0kNm / 0.9m = 8.89kN.

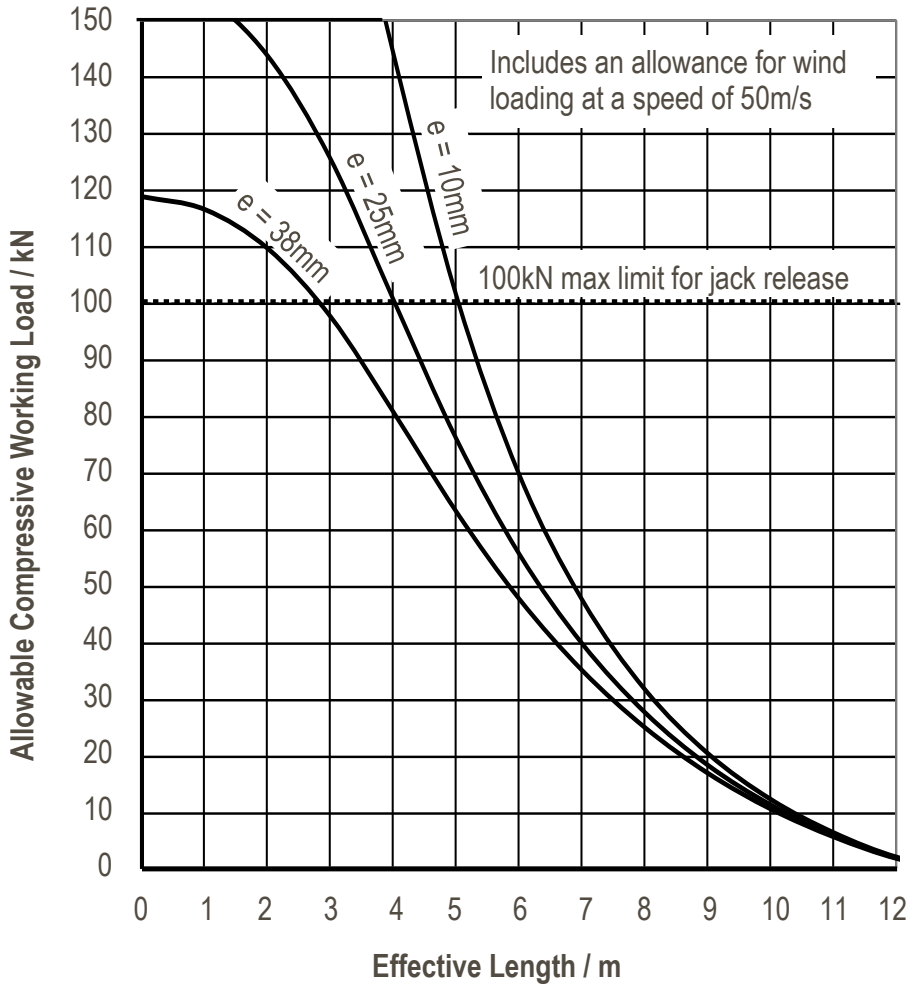
For more detailed information on the behaviour of Superslim Soldiers and further examples refer to the Appendix.

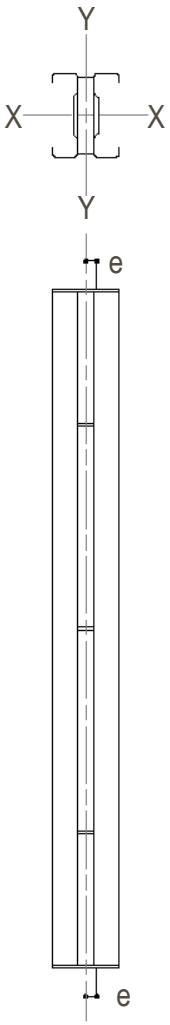
Vertical Struts – Buckling About the Y Axis

The Superslim Soldier has different loading characteristics about its two axes due to its asymmetric shape. The arrangement of the strut when erected may also dictate the method of bracing to obtain the required capacity. The lateral stability of the strut in each direction requires consideration, and graphs of safe load capacity against effective strut length are given below. The effective length of a strut is defined in BS 5975 table K1.

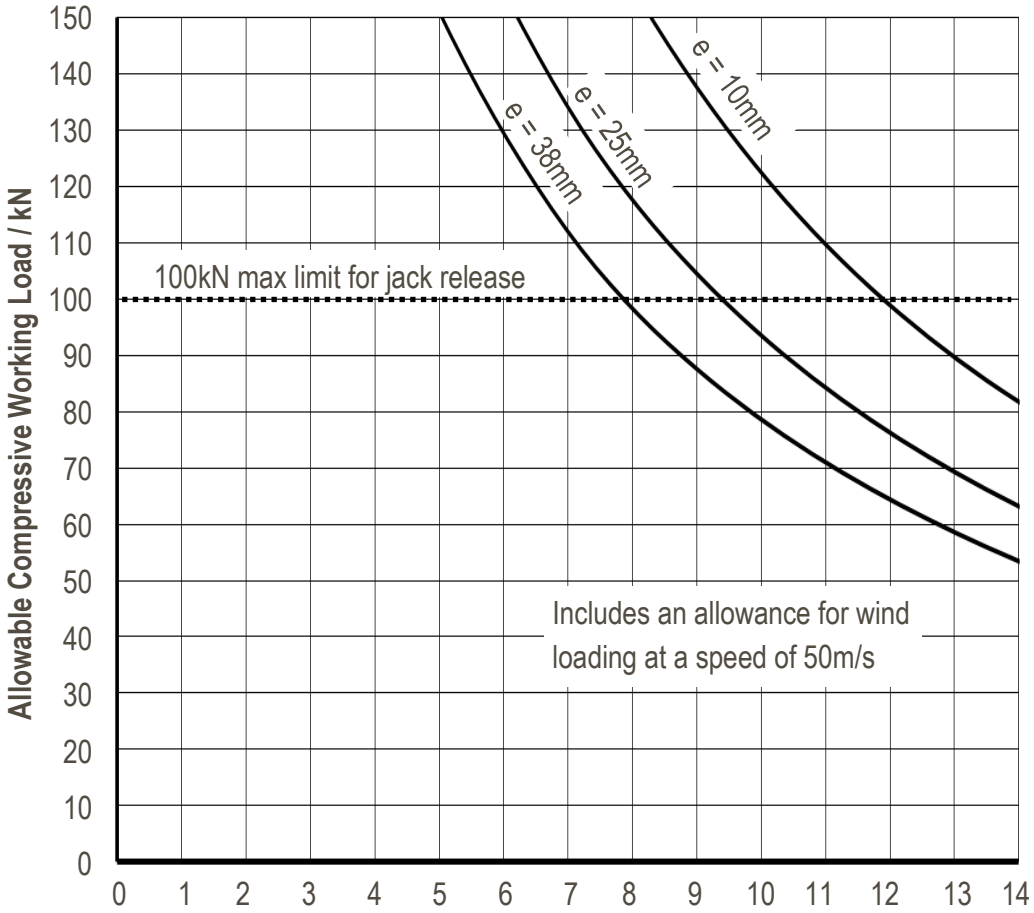
When using the rocking head the load is axial in one plane, but dependant upon site accuracy for the degree of eccentricity in the other plane. In the following graphs the permissible loads are given allowing for eccentricity due to assembly tolerance and a load eccentricity of 10mm, 25mm and 38mm.

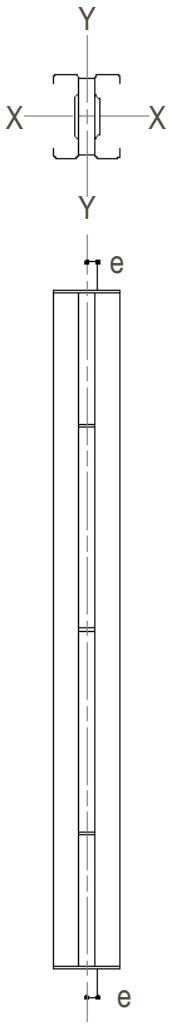
A load restriction of 100kN is placed on the soldier when the load is to be released through the Slimshor jack. Where the load is not to be released through jacks, the maximum allowable load can be increased to 150kN.





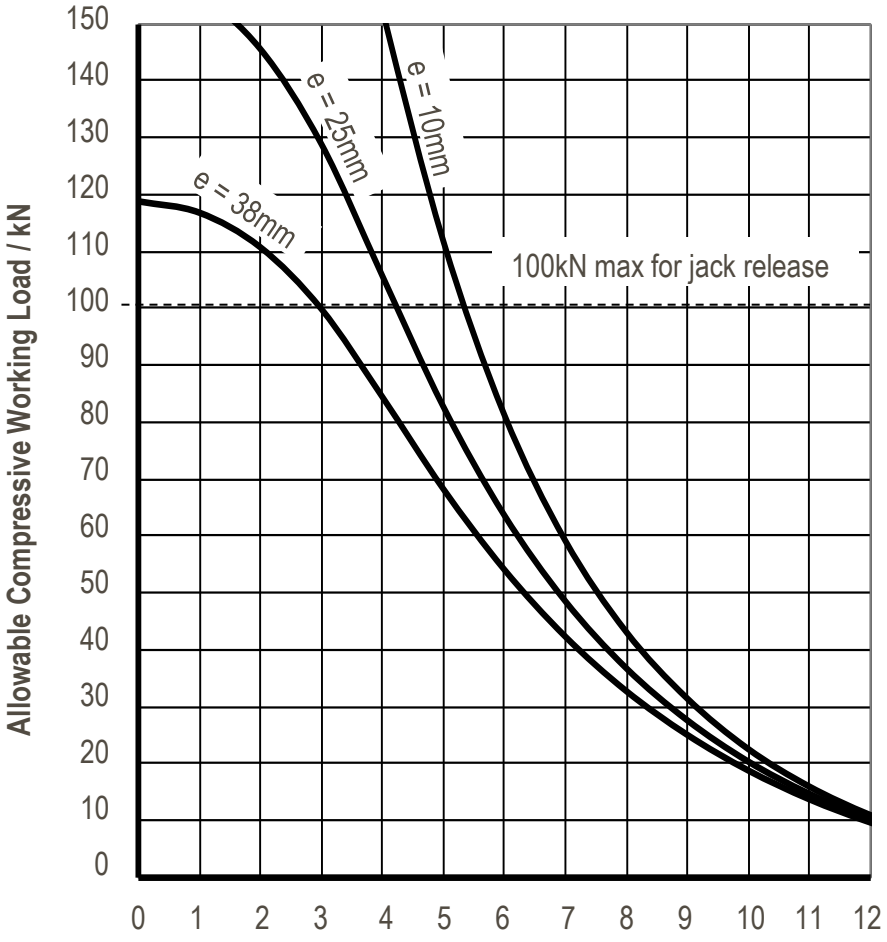
Vertical Struts – Buckling About the X Axis

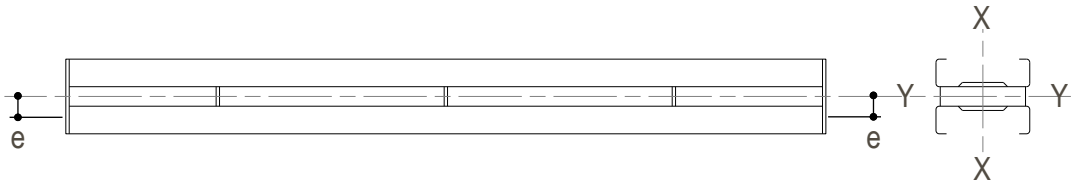




Horizontal Shores – Buckling About the Y Axis

The notes relating to vertical members in compression also apply to horizontal members in compression. An additional allowance for the self weight of the horizontal shore has been included. Wind load has been excluded for the orientation shown. When shores have intermediate vertical restraints, buckling about the x axis may be the limiting factor.

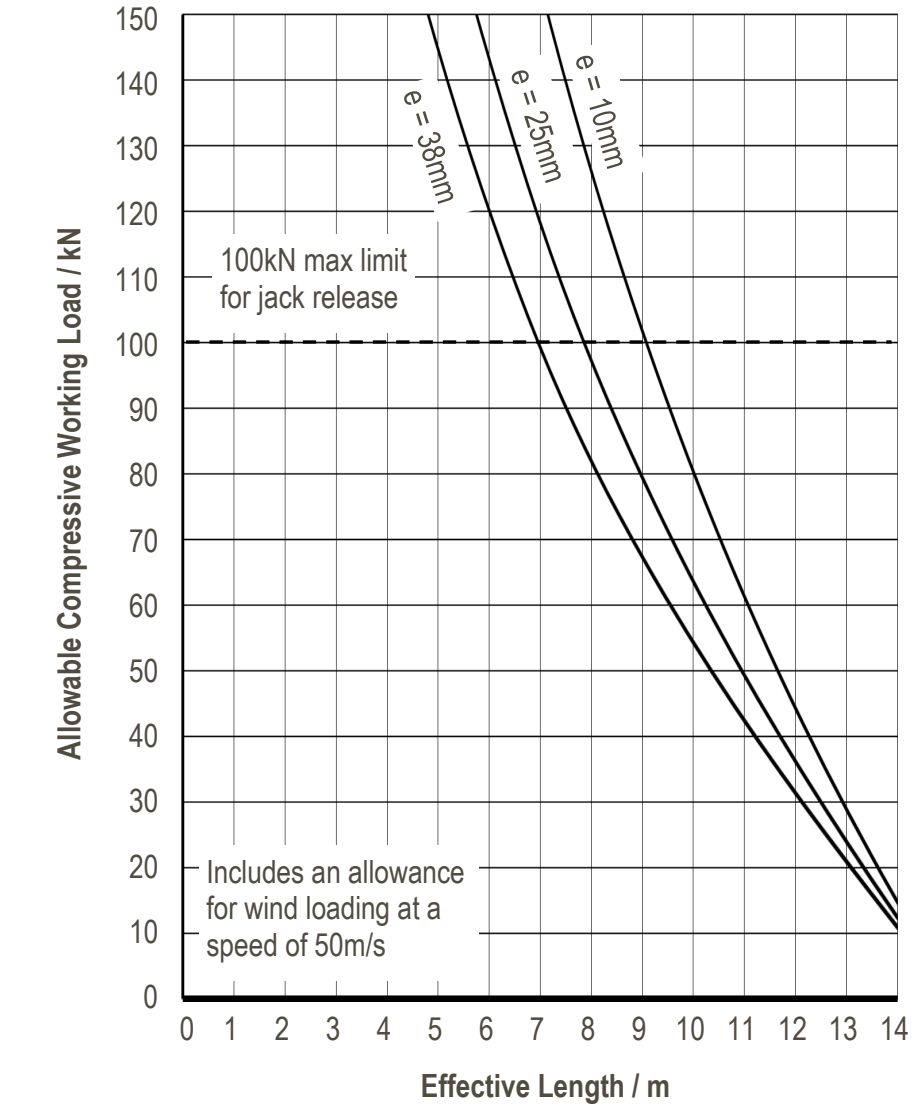


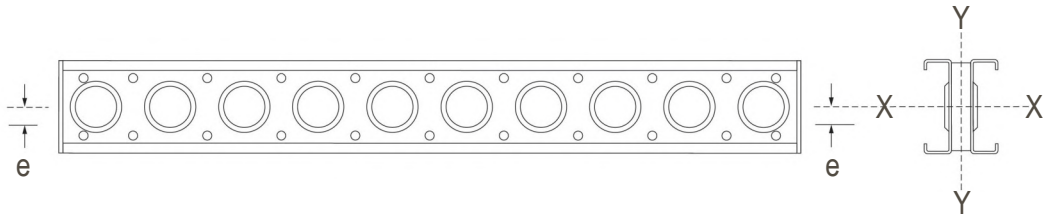


Note! The allowable working load for horizontal applications is shown as greater than for vertical applications due to the inclusion of wind loads in the vertical application graph (the effects of which exceed the effect of self weight in the horizontal orientation graph). If vertical plane wind loads are expected when designing struts with this orientation refer to RMD Kwikform for revised data.

Horizontal Shores – Buckling About the X Axis

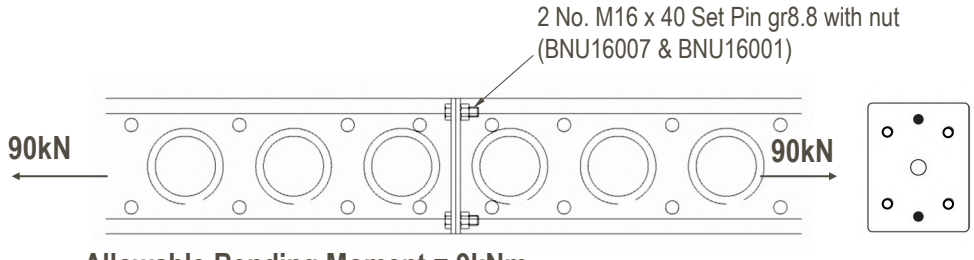
This graph assumes that the strut is effectively restrained against buckling in the Y axis by adequate intermediate lateral restraint.



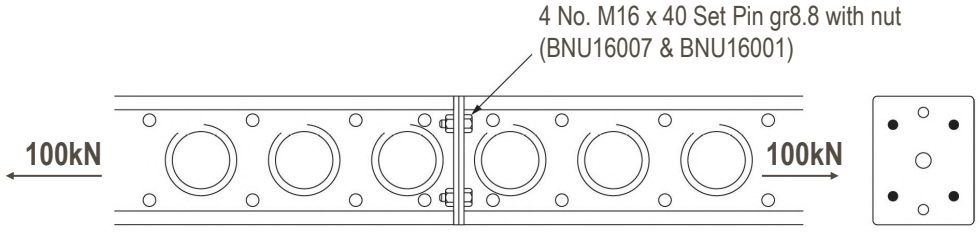


Bolted Joints

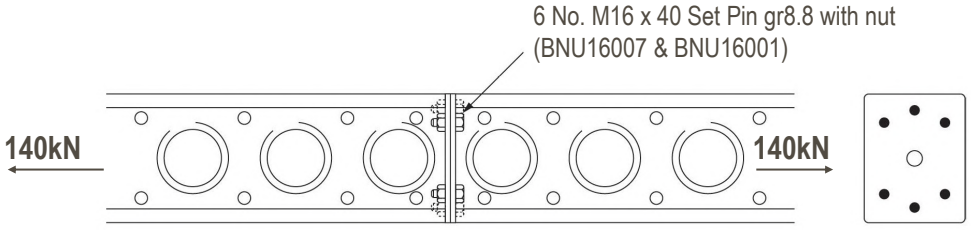
Various arrangements and capacities of bolted joints are available:



Allowable Bending Moment = 9kNm

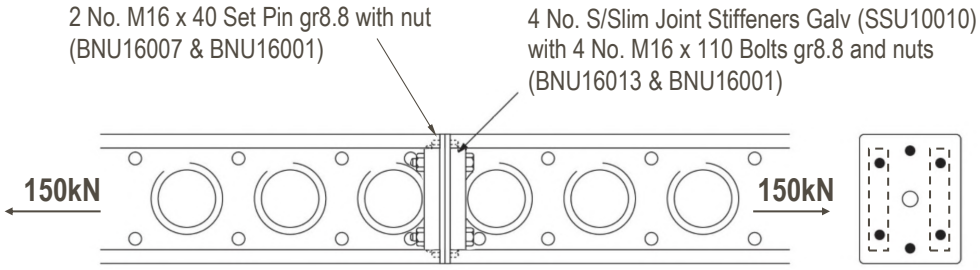


Allowable Bending Moment = 12kNm



Allowable Bending Moment = 18kNm

Using Joint Stiffeners



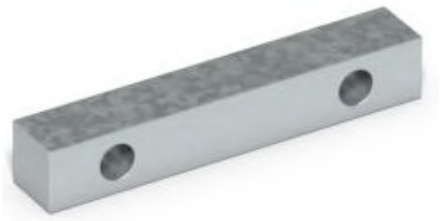
Allowable Bending Moment = 24kNm

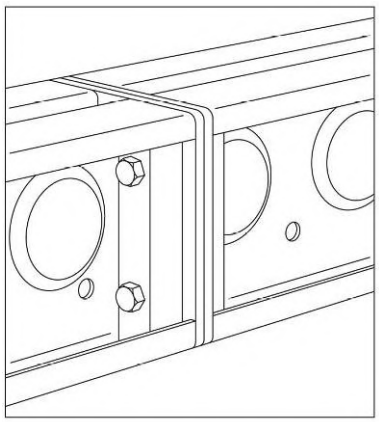
Combined Stresses - Tension & Bending must satisfy:-

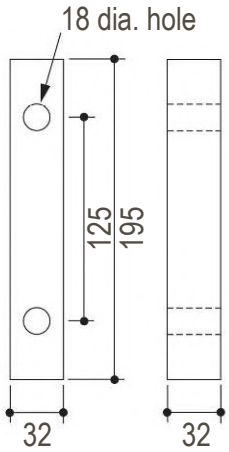
$$\frac{\text{Actual Tensile Load}}{\text{Allowable Tensile Load}} + \frac{\text{Actual Bending Moment}}{\text{Allowable Bending Moment}} \leq 1$$

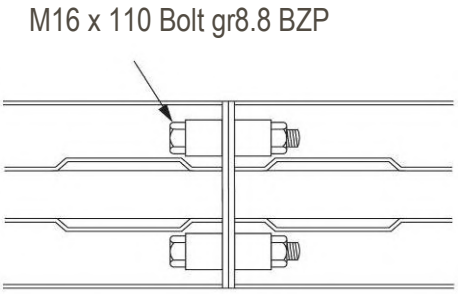
Superslim Joint Stiffeners

Used to Enhance the load bearing characteristics of a Soldier joint.
See sheet 19 for allowable working loads.





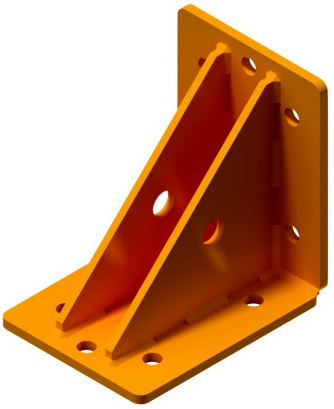


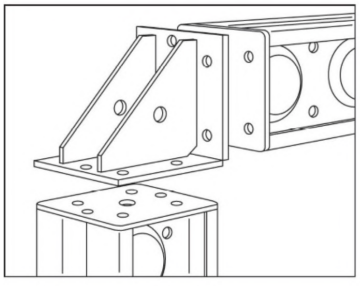


Code	Description	Weight
SSU10010	Superslim Joint Stiffener	1.44 kg
BNU16013	M16x110 Bolt gr8.8 BZP	0.20 kg
BNU16001	M16 Nut gr8 BZP	0.03 kg

Superslim 90 Degree Corner (SSU10003) weight 8.69kg

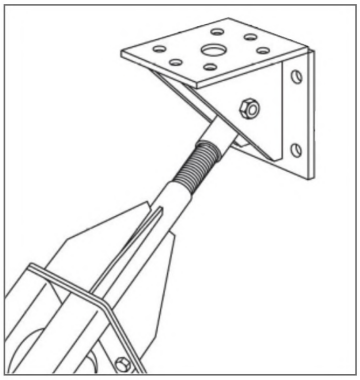
Used to connect Soldiers at right angles and/or enable connection of a Push Pull Prop.

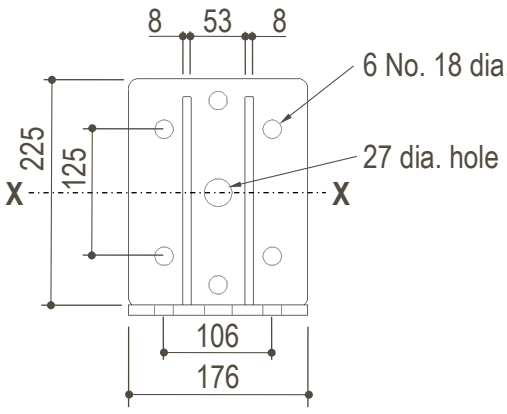


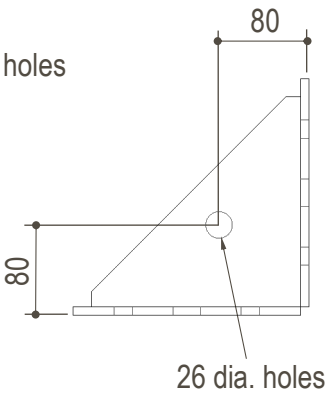


Maximum allowable load transmitted via a bolt passing through the two 26 dia. holes = ± 100kN.

Maximum allowable bending moment transferred through a soldier end plate about xx axis of the soldier = 12kNm



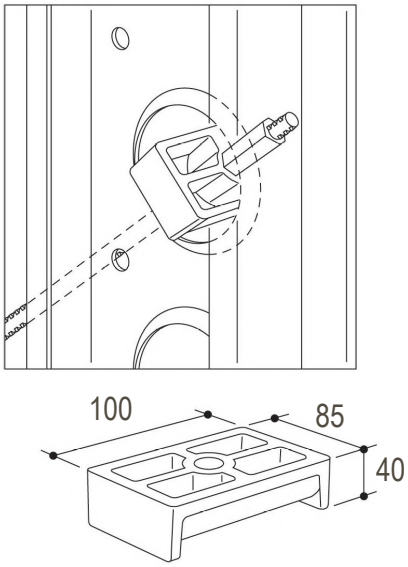




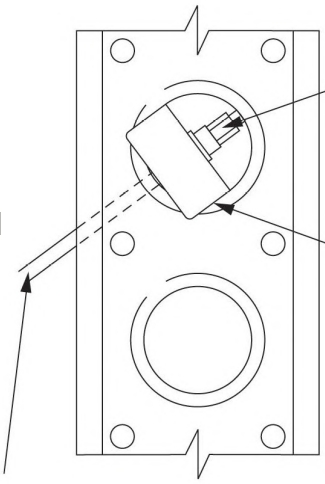
Porthole Bearing 20.8mm Dia Hole (SSX10039) weight 1.22kg

Enables connection of a tie rod to a Porthole at any angle.

Allowable Working Load 65kN tension



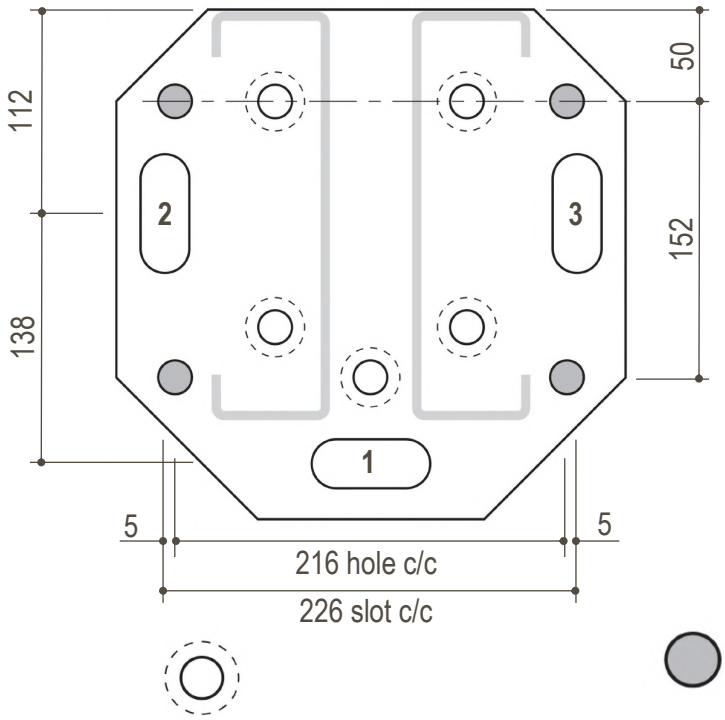
Note: M20 Allthread Rod but not 20 Ø Rapid Bar Tie may also be used



Superslim Anchor Plate 15mm (SSU10036) weight 7.30kg

Used for anchoring the ends of Soldiers to concrete or masonry.

Overall plate size
280 x 280 x 15 thick



5 holes 18 dia. Countersunk to suit M16 x 40 Set Pin gr8.8 BZP Csk and M16 Nut gr8 BZP (BNU16008 + BNU16001) for bolting to ends of Superslim Soldier

4 holes 18 dia. for M16 anchors (*but not M16 Screwbolt which requires a 19Ø hole*).

3 slots 27 dia. x 65 long for RMD Kwikform Propbolt 24R-50 (FAU10142).

Applications include:

- Connecting Megashor props to abutment walls.

Anchor Plate Design Data

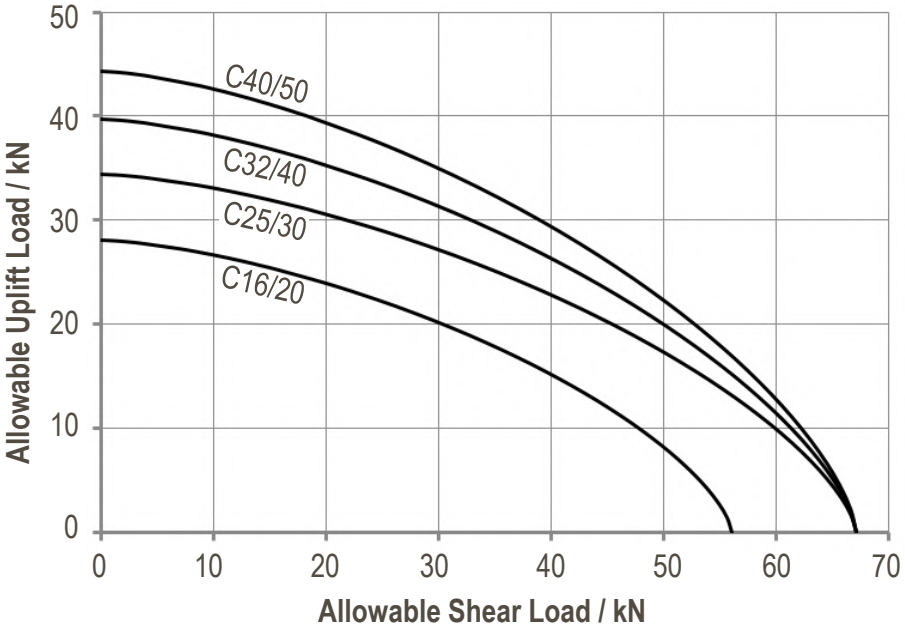
Allowable Working Loads with RMD Kwikform Propbolt 24-R50 (Code FAU10142)

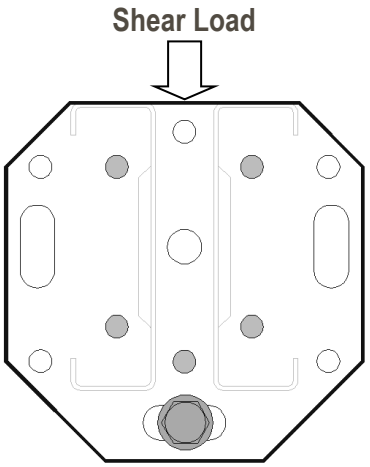
Commonly Propbolt 24-50 is used singly or in pairs to secure the Superslim Anchor Plate to a concrete foundation. The base of the Anchor Plate is 15mm thick and, when used in pairs the anchors are at 226mm centres which means that there is an interaction zone between the anchors due to their proximity .

The anchor plate is bolted to the underside of an assembled form before being placed. To allow for assembly and slab tolerances, a packed gap of 10mm is assumed between the plate and the foundation.

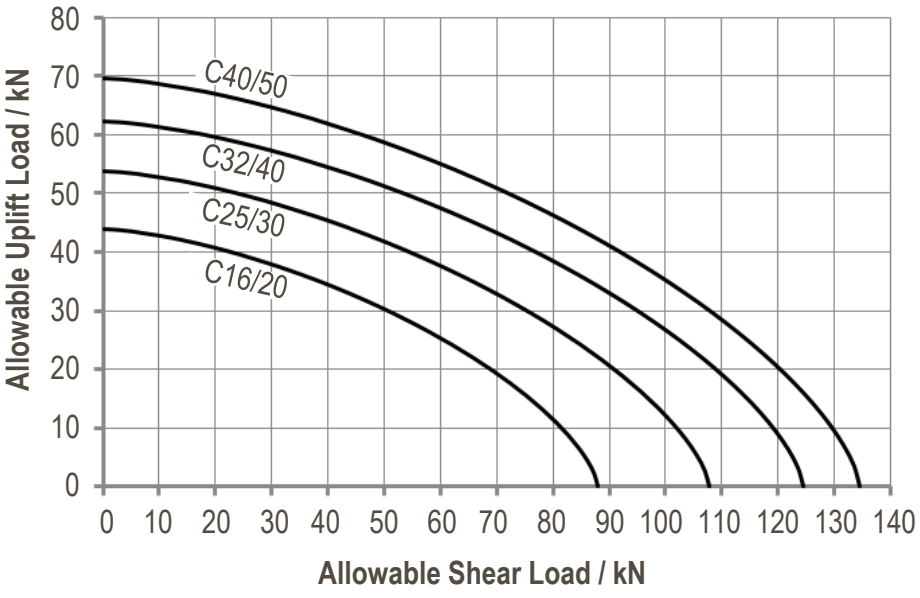
To aid quick checking of allowable loads in the anchor plate when using this configuration the graphs below may be used.

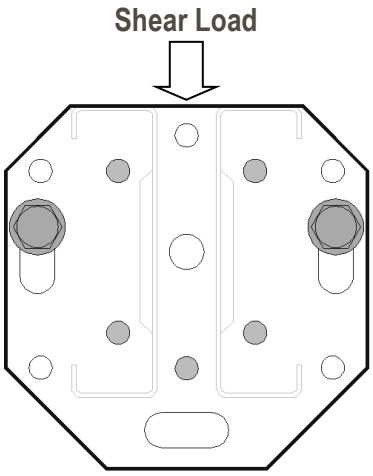
Un-Cracked Concrete





Single Anchor in Front Slot





Twin Anchors in Side Slots

SUPERSLIM SOLDIER

MODULAR STRUCTURAL SYSTEM

ALTRAD
COFFRAGE
& ÉTAIEMENT
LOCATION
VENTE
MONTAGE

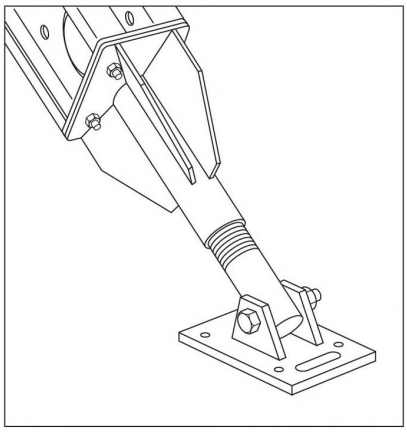
R·M·D KWIKFORM

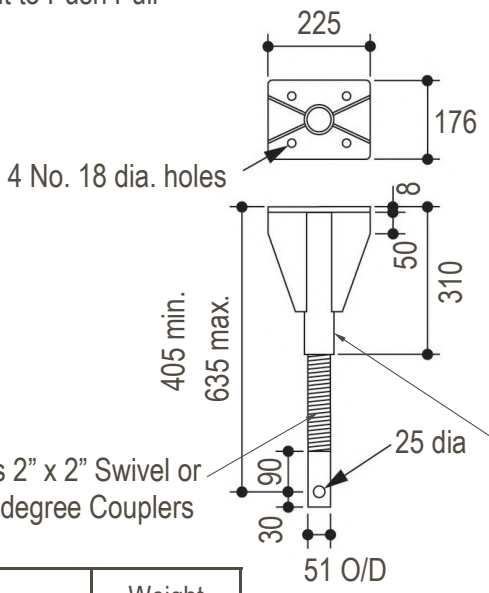
PUSH PULL PROPS

Superslim Prop Jacks

Used in pairs to provide length adjustment to Push Pull Props.

Allowable Working Load ± 100kN



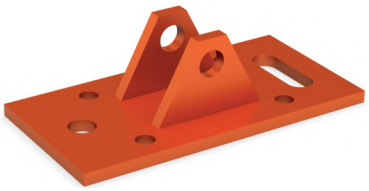


Fits 2 3/8" x 2" Swivel or Fixed Couplers

Code	Description	Weight
SSU10007	Superslim Prop Jack L.H. (green)	13.61 kg
SSU10008	Superslim Prop Jack R.H. (orange)	13.68 kg

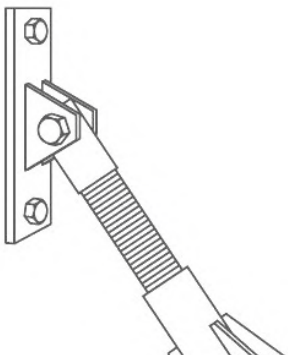
Superslim Tilt Plate

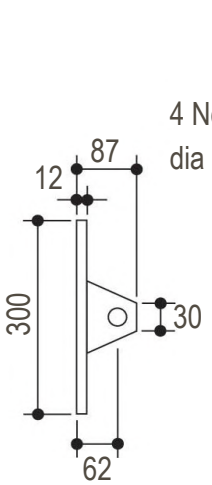
Used to connect a Push Pull Prop to a plane surface at any angle. Connect to foundation using either the large hole and slot with 2 No. M24 anchors or using the 4 No. smaller holes with M16 anchors.

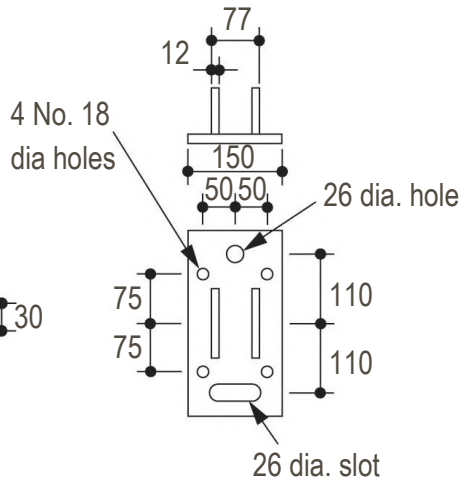


Allowable Working load Tension = 65kN* at any angle

Allowable Working Load Compression = 90kN* at any angle







Code	Description	Weight
SSU10034	Superslim Tilt Plate	4.89 kg
BNU24001	M24 Hex Nut gr8 BZP	0.06 kg
BNX24002	M24x110 Bolt gr8.8 BZP	0.48 kg

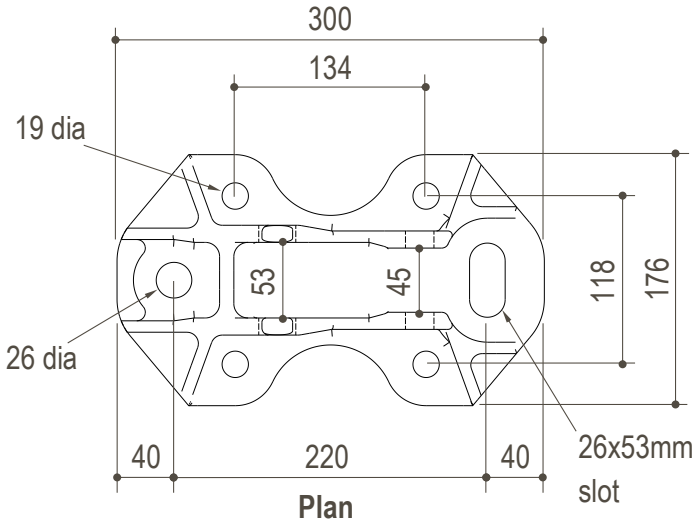
* Unless specific anchor design information has been provided, it is necessary to check the capacity of the anchors/ bolts connecting the unit as a separate process.

Superslim Cast 100kN Tilt Plate

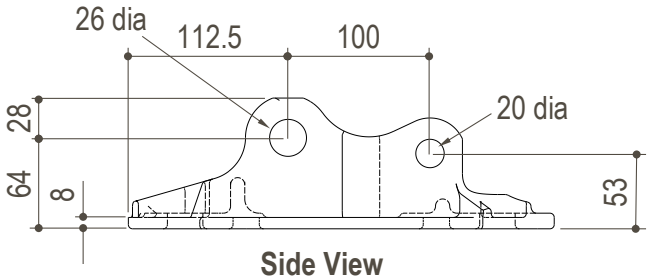
A higher performance tilt plate used to connect a Push Pull Prop to a plane surface at any angle.

Allowable Working Load when connected to a foundation using the larger hole and slot with 2 M24 anchors, +/-100kN at any angle. When connected to a foundation using the smaller holes and 4 M16 anchors, +/-100kN at any angle*.

AWL with 2 bolts diagonally opposed in smaller holes 50kN.



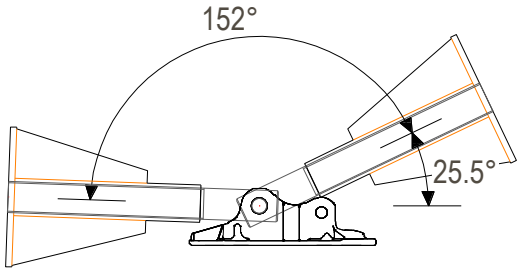
Plan



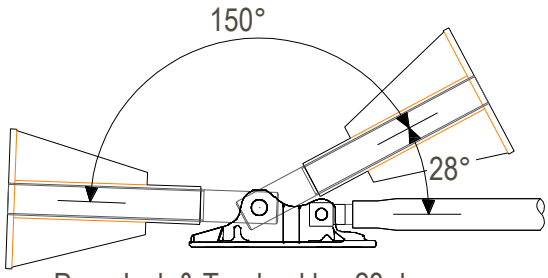
Side View

Code	Description	Weight
SSX10062	Superslim Cast 100kN Tilt Plate	5.00 kg
BNU24001	M24 Hex Nut gr8 BZP	0.06 kg
BNX24002	M24x110 Bolt gr8.8 BZP	0.48 kg
SSX10046	Superslim 19mm Pin & R Clip	0.29 kg

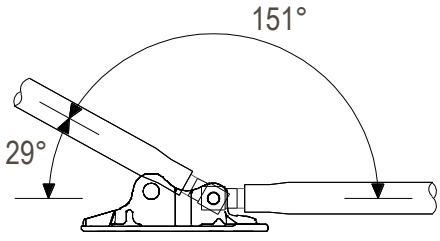
Prop Angle Ranges



Prop Jacks +2 degrees to –25.5 degrees



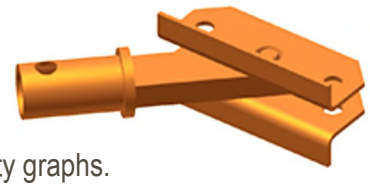
Prop Jack & Turnbuckle –28 degrees



Turnbuckle +29 degrees to –0 degrees

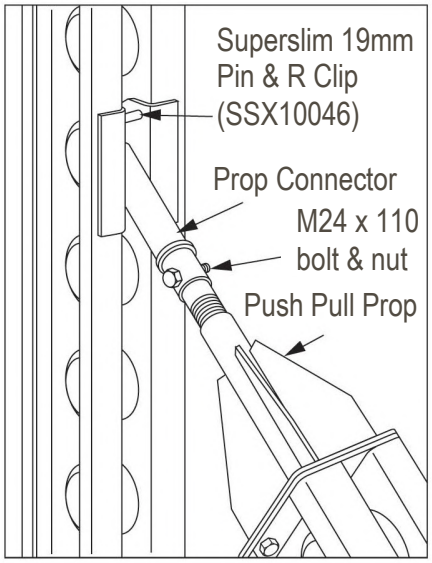
* Unless specific anchor design information has been provided, it is necessary to check the capacity of the anchors/ bolts connecting the unit as a separate process.

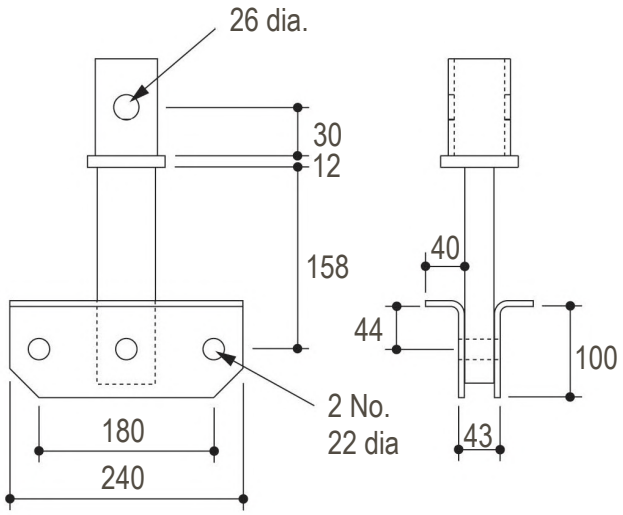
Superslim Prop Connector 100kN (SSU10038) Weight 6.82kg



Used to connect Push Pull Props to Soldiers where a load transfer of more than 65kN is required.

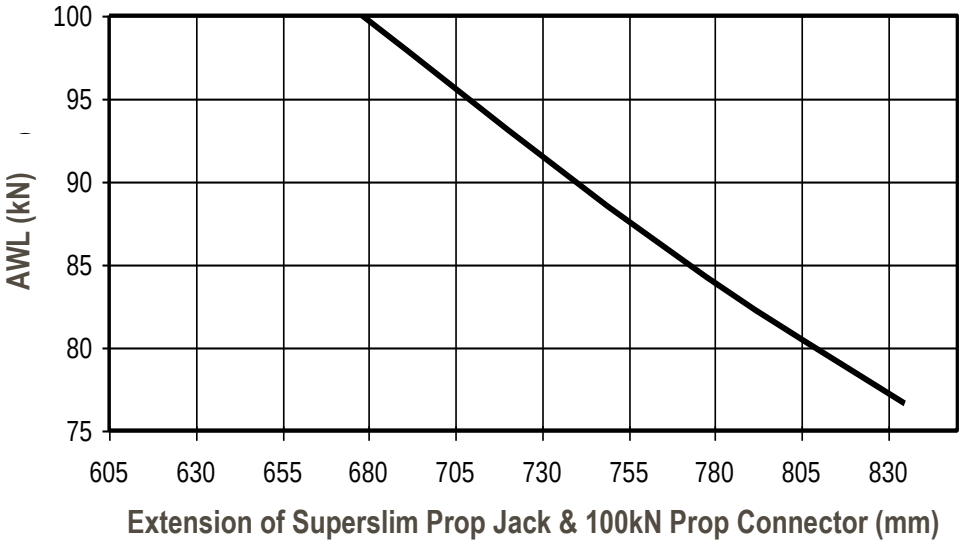
Allowable Working Load ± 100kN Refer to connector loading graph & soldier capacity graphs.





Note This component enables Push Pull Props to be installed on opposite sides of a Soldier in the same location.

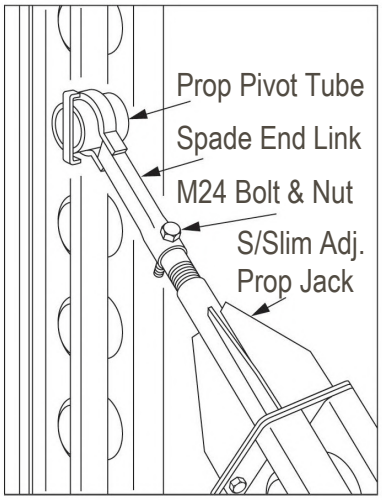
AWL for 100kN Prop Connector

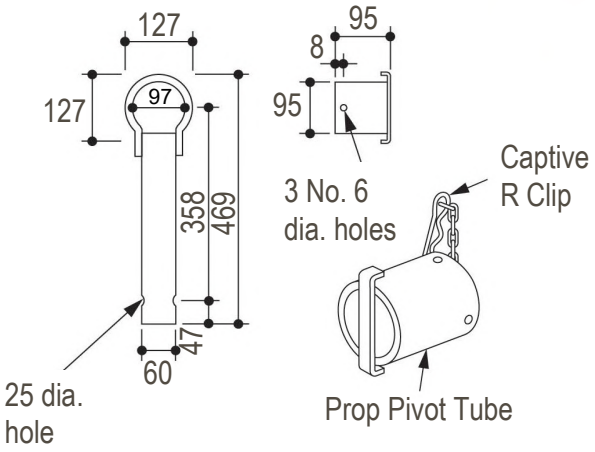


Prop Spade End Link & Prop Pivot Tube

Used to attach Push Pull Props to Soldiers. Connection to Soldier using 4 No. M16 x 40 Set Pin gr8.8 BZP & M16 Nut (BNU16007 & BNU16001).

Allowable Working Load ± 65kN



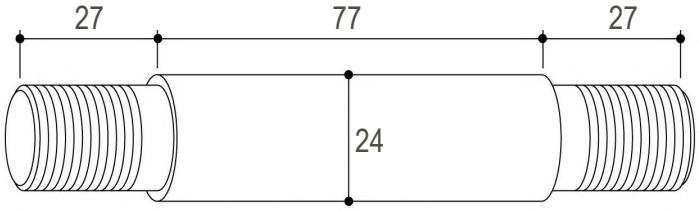


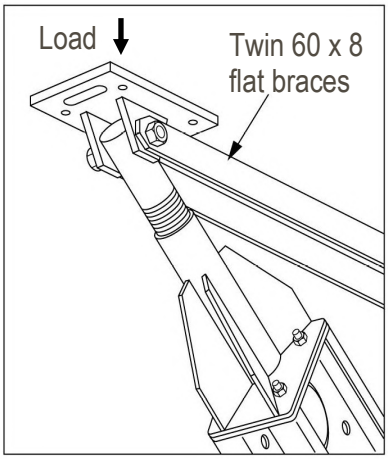
Code	Description	Weight
SSU10012	Superslim Prop Spade End Link	3.06 kg
SSU10004	Superslim Prop Pivot Tube	1.81 kg

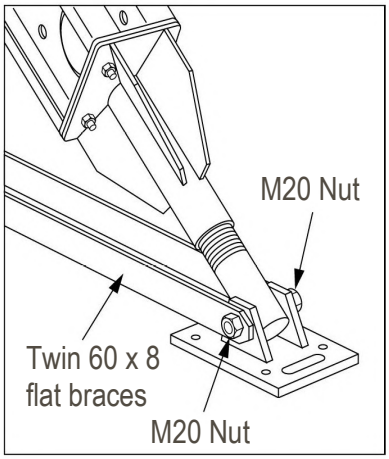
Prop Brace Pin – M24/M20 (BNU10050) Weight 0.43kg

Used to connect Push Pull Props and twin 60 x 8 flat braces through the same fastener.

Allowable Working Load in prop ± 100kN, in flat braces 80kN per pair tension only.



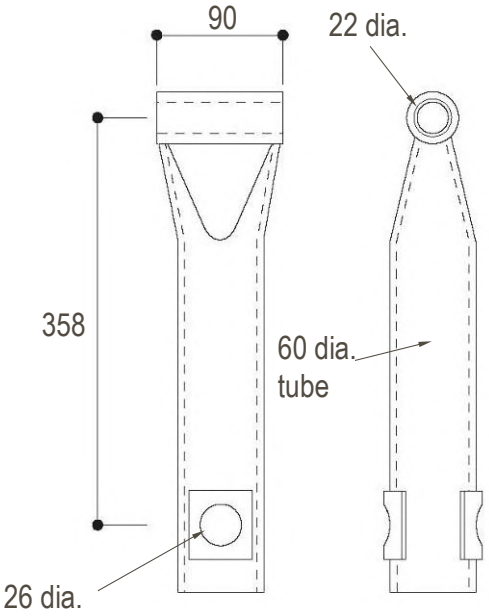


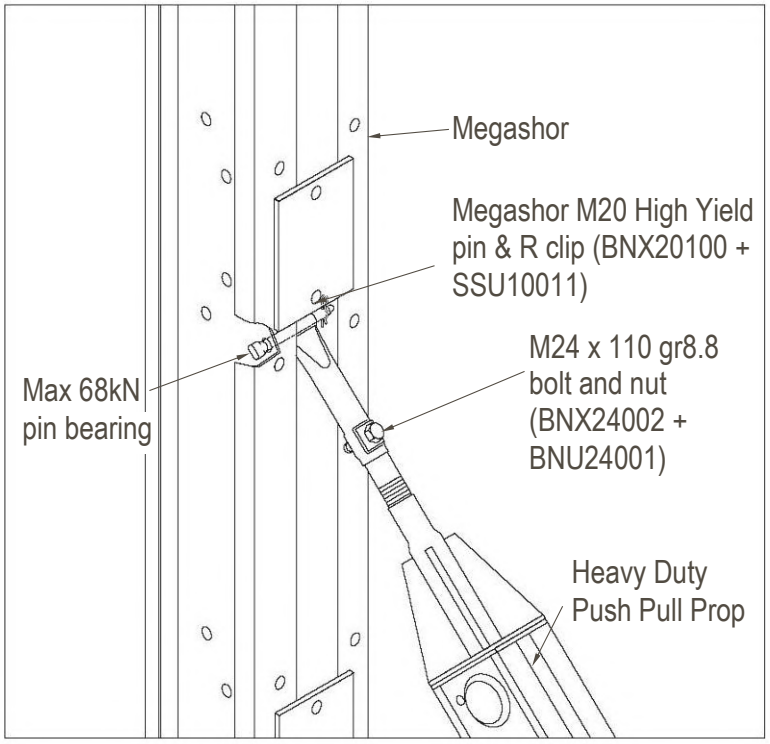


Superslim Prop Tube End Link (SSU10013) weight = 2.81kg

Used to connect Super Slim Push Pull Props to Megashor shafts or a pair of steel beam web stiffeners.

For Max allowable working load see graph (below)





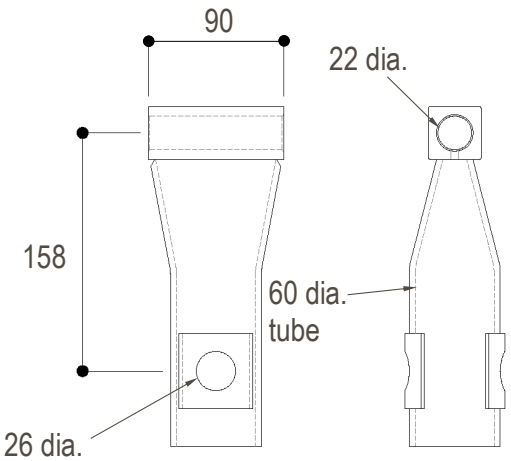
Note: A M20 washer can be welded to the Megashor webs in the channel to enhance the load bearing capacity to 100kN.

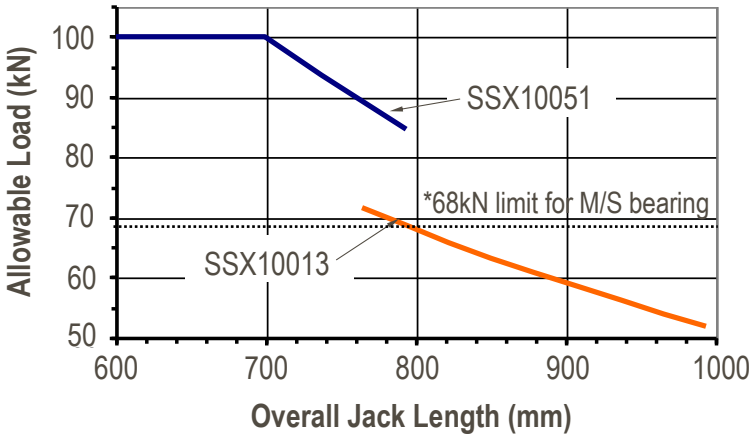
Superslim Short Prop Tube End Link (SSX10051) weight = 1.70kg

Used to connect Super Slim Push Pull Props to Megashor shafts when compression loads greater than can be provided by the above item are required. Connection to Megashor leg and s/slim jack as detailed above.

For Max allowable compressive load see graph (right)

Max allowable tension = 100kN



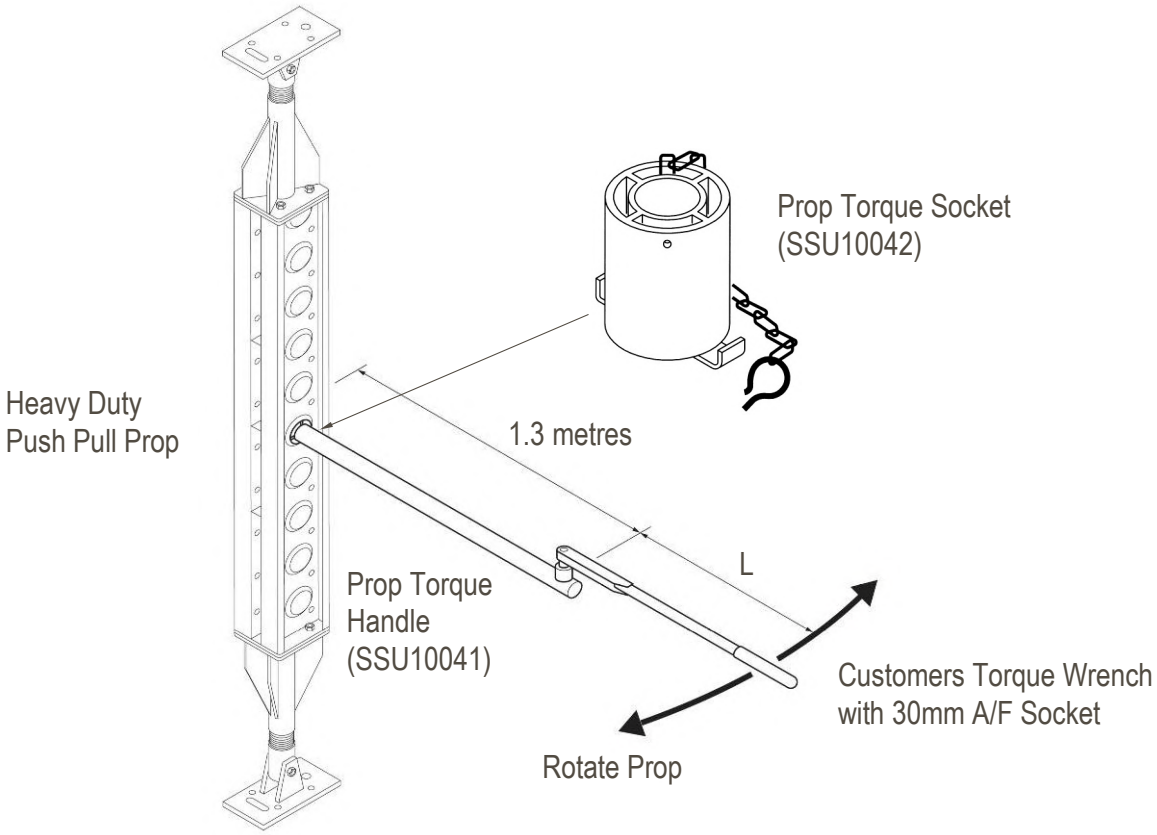


***Note:** Capacity of prop tube end link limited by bearing on Megashor to 68kN

Push Pull Props – Load Control

By application of a controlled torque to the Superslim body of a Heavy Duty Push Pull Prop, the load applied by the prop up to the full 100kN capacity can be applied or measured.

Alternatively the axial force in a loaded Push Pull Prop can be measured by determining the torque required to just tighten the prop (Note, further turning will increase the load).



Load in Push Pull Prop = W (kN)

Torque measured on Torque Wrench = Tw (Nm)

Torque applied to Push Pull Prop = Tp (Nm)

$Tp = 9W$

For applying prop load: $Tw = Tp \left(\frac{L}{1.3 + L} \right)$

For measuring prop load: $Tp = Tw \left(\frac{1.3 + L}{L} \right)$

e.g. To apply prop load of 60kN you need to apply a torque to the prop of 540Nm. This can be achieved by applying a 0.7m long torque wrench set to 189Nm to the M20 nut on the Prop Torque Handle.

Note: Prop threads must be fully greased before use to ensure reasonable accuracy.

Table P1 – Component make up for Push Pull Props with one Spade End and one Tilt Plate

	Length of prop 'L' (mm) (Working Dimensions)		SSX 10090	SSX 10540	SSX 10720	SSX 10900	SSX 11800	SSX 12700	SSX 13600	SSU 10004	SSU 10012	SSU 10007	SSU 10008	SSU 10034	BNX 24002	BNU 16007	BNU 16001	
			Sold 90	Sold 540	Sold 720	Sold 900	Sold 1800	Sold 2700	Sold 3600	Prop Pivot Tube	Spd End Link	Prop Jack (LH)	Jack Prop (RH)	Tilt Plate	M24 X 110 Bolt & Nut	M16 X 40 Set Pin	M16 Hex Nut	Weight kg
1	Min. 1230	Max. 1690	-	-	-	-	-	-	-	1	1	1	1	1	2	4	4	40
2	1410	1870	2	-	-	-	-	-	-	1	1	1	1	1	2	12	12	56
3	1770	2230	-	1	-	-	-	-	-	1	1	1	1	1	2	8	8	56
4	2130	2590	-	-	-	1	-	-	-	1	1	1	1	1	2	8	8	63
5	2490	2950	-	1	1	-	-	-	-	1	1	1	1	1	2	12	12	75
6	2850	3310	-	-	1	1	-	-	-	1	1	1	1	1	2	12	12	82
7	3030	3490	-	-	-	-	1	-	-	1	1	1	1	1	2	8	8	80
8	3390	3850	-	1	1	1	-	-	-	1	1	1	1	1	2	16	16	98
9	3750	4210	-	-	1	-	1	-	-	1	1	1	1	1	2	12	12	99
10	3930	4390	-	-	-	-	-	1	-	1	1	1	1	1	2	8	8	96
11	4290	4750	-	1	1	-	1	-	-	1	1	1	1	1	2	16	16	114
12	4650	5110	-	-	1	-	-	1	-	1	1	1	1	1	2	12	12	115
13	5010	5470	2	-	-	-	-	-	1	1	1	1	1	1	2	16	16	128
14	5370	5830	-	1	-	-	-	-	1	1	1	1	1	1	2	12	12	129
15	5730	6190	-	-	-	1	-	-	1	1	1	1	1	1	2	12	12	135
16	6090	6550	-	1	1	-	-	-	1	1	1	1	1	1	2	16	16	148
17	6450	6910	-	-	1	1	-	-	1	1	1	1	1	1	2	16	16	155
18	6810	7270	-	1	2	-	-	-	1	1	1	1	1	1	2	20	20	167
19	7170	7630	-	-	2	1	-	-	1	1	1	1	1	1	2	20	20	174
20	7530	7990	-	-	-	-	-	1	1	1	1	1	1	1	2	12	12	169
21	7890	8350	-	1	1	-	1	-	1	1	1	1	1	1	2	20	20	187
22	8250	8710	-	-	1	-	-	1	1	1	1	1	1	1	2	16	16	188
23	8430	8890	-	-	-	-	-	-	2	1	1	1	1	1	2	12	12	185
24	8790	9250	-	1	1	-	-	1	1	1	1	1	1	1	2	20	20	204
25	9150	9610	-	-	1	-	-	-	2	1	1	1	1	1	2	16	16	205

Table P2 – Component make up for Push Pull Props with a Tilt Plate at both ends

	Length of prop 'L' (mm) (Working Dimensions)		Sold 90	Sold 540	Sold 720	Sold 900	Sold 1800	Sold 2700	Sold 3600	Prop Pivot Tube	Spd End Link	Prop Jack (LH)	Jack Prop (RH)	Tilt Plate	M24 X 110 Bolt & Nut	M16 X 40 HT Set Pin	M16 Hex Nut	Weight kg
			SSX 10090	SSX 10540	SSX 10720	SSX 10900	SSX 11800	SSX 12700	SSX 13600	SSU 10004	SSU 10012	SSU 10007	SSU 10008	SSU 10034	BNX 24002	BNU 16007	BNU 16001	
1	934	1394	-	-	-	-	-	-	-	-	-	1	1	2	2	4	4	40
2	1114	1574	2	-	-	-	-	-	-	-	-	1	1	2	2	12	12	56
3	1474	1934	-	1	-	-	-	-	-	-	-	1	1	2	2	8	8	56
4	1834	2294	-	-	-	1	-	-	-	-	-	1	1	2	2	8	8	63
5	2194	2654	-	1	1	-	-	-	-	-	-	1	1	2	2	12	12	75
6	2554	3014	-	-	1	1	-	-	-	-	-	1	1	2	2	12	12	82
7	2734	3194	-	-	-	-	1	-	-	-	-	1	1	2	2	8	8	79
8	3094	3554	-	1	1	1	-	-	-	-	-	1	1	2	2	16	16	97
9	3454	3914	-	-	1	-	1	-	-	-	-	1	1	2	2	12	12	99
10	3634	4094	-	-	-	-	-	1	-	-	-	1	1	2	2	8	8	96
11	3994	4454	-	1	1	-	1	-	-	-	-	1	1	2	2	16	16	114
12	4354	4814	-	-	1	-	-	1	-	-	-	1	1	2	2	12	12	115
13	4714	5174	2	-	-	-	-	-	1	-	-	1	1	2	2	16	16	128
14	5074	5534	-	1	-	-	-	-	1	-	-	1	1	2	2	12	12	128
15	5434	5894	-	-	-	1	-	-	1	-	-	1	1	2	2	12	12	135
16	5794	6254	-	1	1	-	-	-	1	-	-	1	1	2	2	16	16	148
17	6154	6614	-	-	1	1	-	-	1	-	-	1	1	2	2	16	16	154
18	6514	6974	-	1	2	-	-	-	1	-	-	1	1	2	2	20	20	167
19	6874	7334	-	-	2	1	-	-	1	-	-	1	1	2	2	20	20	152
20	7234	7694	-	-	-	-	-	1	1	-	-	1	1	2	2	12	12	169
21	7594	8054	-	1	1	-	1	-	1	-	-	1	1	2	2	20	20	187
22	7954	8414	-	-	1	-	-	1	1	-	-	1	1	2	2	16	16	188
23	8134	8594	-	-	-	-	-	-	2	-	-	1	1	2	2	12	12	185
24	8494	8954	-	1	1	-	-	1	1	-	-	1	1	2	2	20	20	204
25	8854	9314	-	-	1	-	-	-	2	-	-	1	1	2	2	16	16	205

Table P3 – Component make up for Push Pull Props with a Spade End at both ends

	Length of prop 'L' (mm) (Working Dimensions)		SSX 10090	SSX 10540	SSX 10720	SSX 10900	SSX 11800	SSX 12700	SSX 13600	SSU 10004	SSU 10012	SSU 10007	SSU 10008	SSU 10034	BNX 24002	BNU 16007	BNU 16001	
			Sold 90	Sold 540	Sold 720	Sold 900	Sold 1800	Sold 2700	Sold 3600	Prop Pivot Tube	Spd End Link	Prop Jack (LH)	Jack Prop (RH)	Tilt Plate	M24 X 110 Bolt & Nut	M16 X 40 HT Set Pin	M16 Hex Nut	Weight kg
1	Min. 1526	Max. 1986	-	-	-	-	-	-	-	2	2	1	1	-	2	4	4	30
2	1706	2166	2	-	-	-	-	-	-	2	2	1	1	-	2	12	12	56
3	2066	2526	-	1	-	-	-	-	-	2	2	1	1	-	2	8	8	56
4	2426	2886	-	-	-	1	-	-	-	2	2	1	1	-	2	8	8	63
5	2786	3246	-	1	1	-	-	-	-	2	2	1	1	-	2	12	12	75
6	3146	3606	-	-	1	1	-	-	-	2	2	1	1	-	2	12	12	82
7	3326	3786	-	-	-	-	1	-	-	2	2	1	1	-	2	8	8	79
8	3686	4146	-	1	1	1	-	-	-	2	2	1	1	-	2	16	16	98
9	4046	4506	-	-	1	-	1	-	-	2	2	1	1	-	2	12	12	99
10	4226	4686	-	-	-	-	-	1	-	2	2	1	1	-	2	8	8	96
11	4586	5046	-	1	1	-	1	-	-	2	2	1	1	-	2	16	16	114
12	4946	5406	-	-	1	-	-	1	-	2	2	1	1	-	2	12	12	115
13	5306	5766	2	-	-	-	-	-	1	2	2	1	1	-	2	16	16	128
14	5666	6126	-	1	-	-	-	-	1	2	2	1	1	-	2	12	12	129
15	6026	6486	-	-	-	1	-	-	1	2	2	1	1	-	2	12	12	135
16	6386	6846	-	1	1	-	-	-	1	2	2	1	1	-	2	16	16	148
17	6746	7206	-	-	1	1	-	-	1	2	2	1	1	-	2	16	16	155
18	7106	7566	-	1	2	-	-	-	1	2	2	1	1	-	2	20	20	167
19	7466	7926	-	-	2	1	-	-	1	2	2	1	1	-	2	20	20	152
20	7826	8286	-	-	-	-	-	1	1	2	2	1	1	-	2	12	12	169
21	8186	8646	-	1	1	-	1	-	1	2	2	1	1	-	2	20	20	187
22	8546	9006	-	-	1	-	-	1	1	2	2	1	1	-	2	16	16	188
23	8726	9186	-	-	-	-	-	-	2	2	2	1	1	-	2	12	12	186
24	9086	9546	-	1	1	-	-	1	1	2	2	1	1	-	2	20	20	204
25	9446	9906	-	-	1	-	-	-	2	2	2	1	1	-	2	16	16	205

SUPERSLIM SOLDIER

MODULAR STRUCTURAL SYSTEM

ALTRAD
COFFRAGE
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LOCATION
VENTE
MONTAGE

R·M·D KWIKFORM

SLIMSHOR

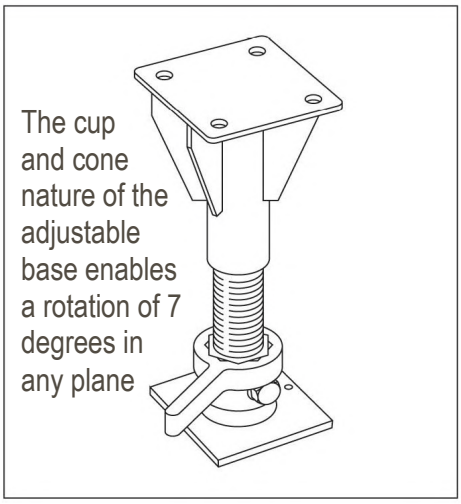
Superslim Adjustable Base 365-515 (SSU10025) weight 19.0kg

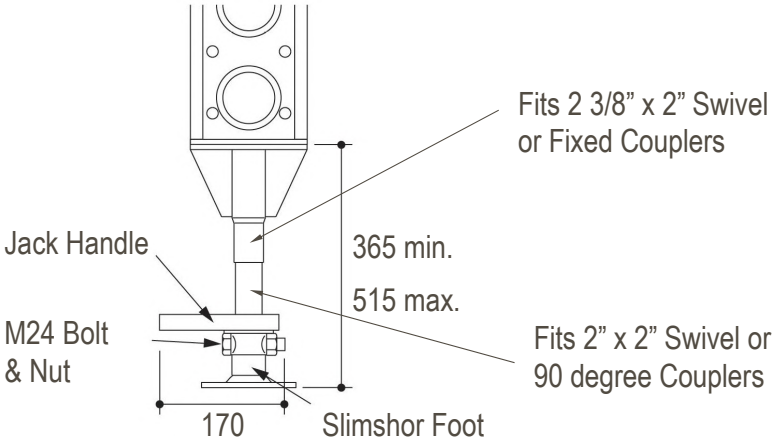
Used to provide base adjustment and spread load.

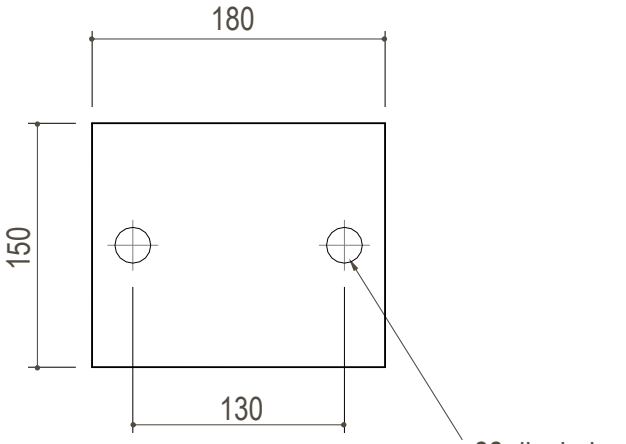
Allowable Working Load 150kN, 100kN if load is to be removed by rotation of the jack handle.

Not to be used in tension.

The maximum load that can be applied by rotating the jack handle is 40kN using a scaffold tube extension when the threads have been well greased.







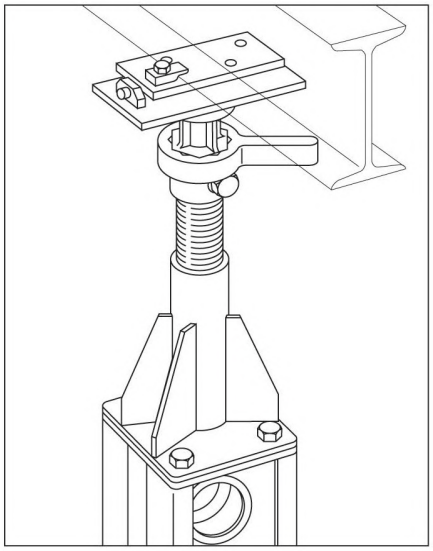
Base Plate Detail

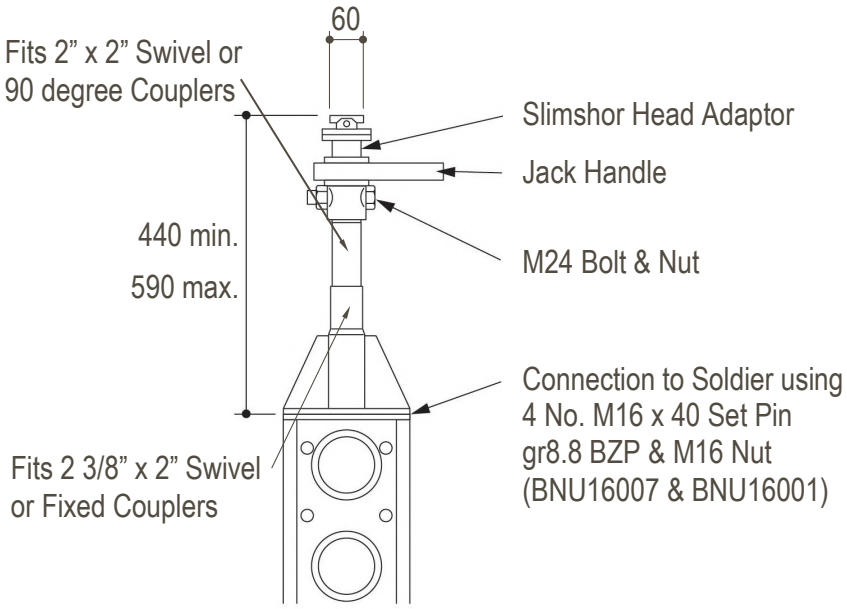
Superslim Adjustable Head 440-590mm (SSU10026) weight 24.6kg

Allowable Working Load 150kN, 100kN if load is to be removed by rotation of the jack handle (subject to design verification of steelwork).

Not to be used in tension.

The maximum load that can be applied by rotating the jack handle is 40kN using a scaffold tube extension when the threads have been well greased.



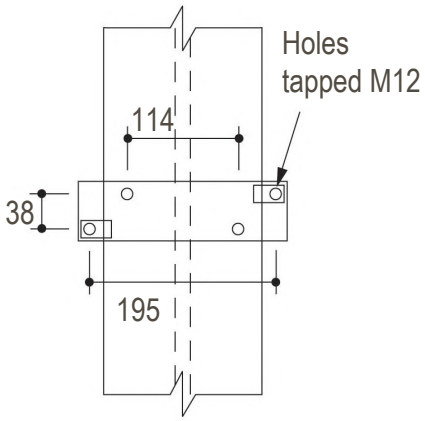


Clamp header beams in place using Clamp plates with M12 set pins. Use M12 x 25 set pins for flanges up to 12mm thick. Use M12 x 30 set pins for flanges between 12 & 20mm thick.

Code	Description	Weight
AFX20003	Clamp Plate	0.09 kg
BNX12009	M12x25 Set Pin gr8.8 BZP	0.04 kg
BNX12002	M12x30 Set Pin gr8.8 BZP	0.04 kg

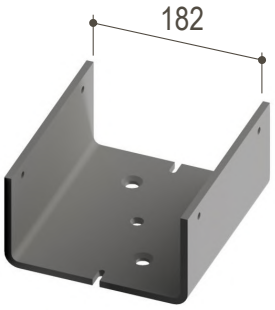
Clamp plates in 114mm c/c holes for flange widths up to 102mm.
Clamp plates in 195mm c/c holes for flange widths up to 171mm.
The head should be twisted to suit varying beam widths.

Note: When twisted the head is not suitable for sloping applications.



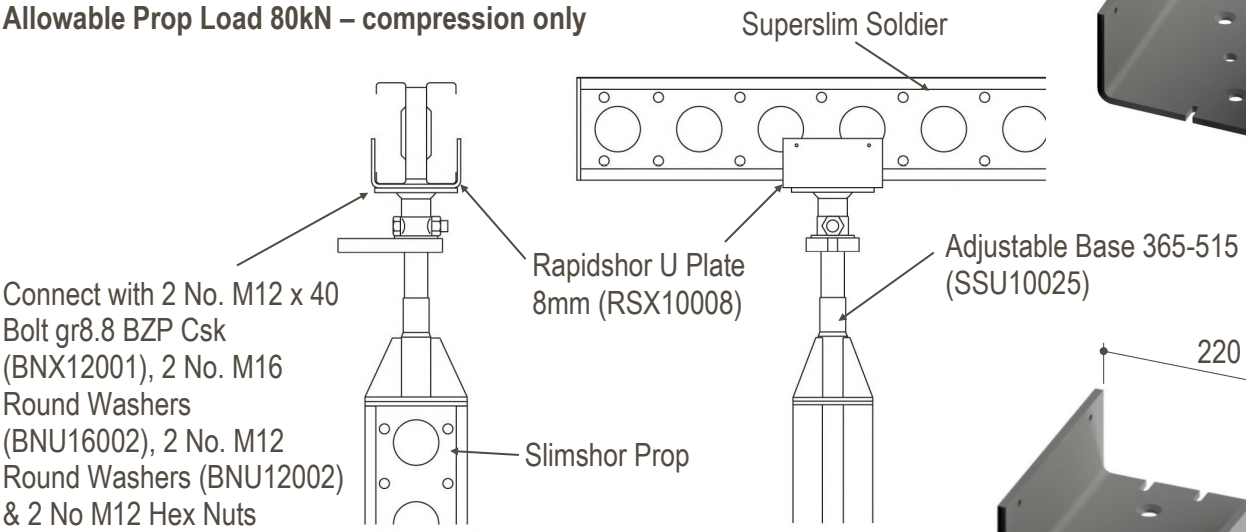
Max beam flange width = 171mm

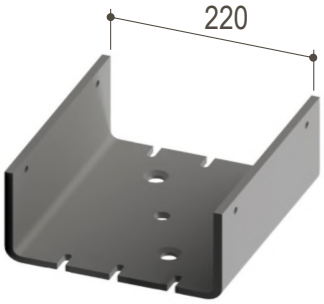
Rapidshor U-Plate 8thk x 182mm wide (RSX10008) weight 5.26kg



Used with Slimshor Props to support a Soldier header beam.
For angles > 6 degrees use neoprene pad in U-Plate.

Allowable Prop Load 80kN – compression only



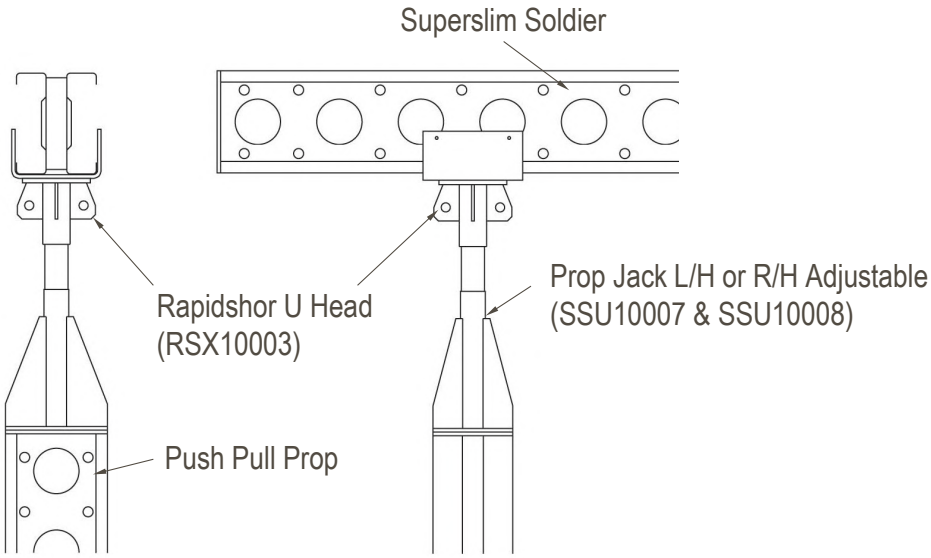


Note: Use Rapidshor U-Plate 8 thk x 220mm wide (RSX10001) with 203 UC Beams.

Rapidshor Brace U Head 182mm wide (RSX10003) weight 8.47kg

Used with Push Pull Props to support a Soldier header beam.

Allowable Prop Load 80kN – compression only

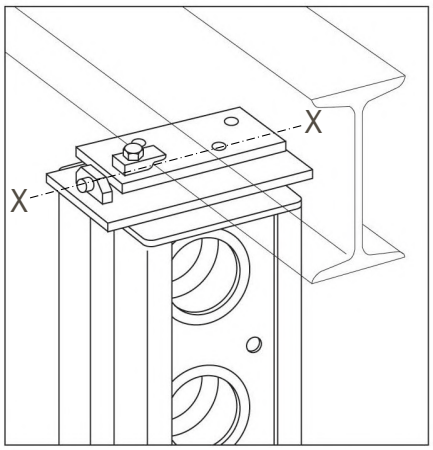


Note: The body of the Push Pull Prop requires to be rotated to raise or lower the prop, where bracing Is required to reduce effective prop length use the Slimshor Prop with the 8mm U Plate.

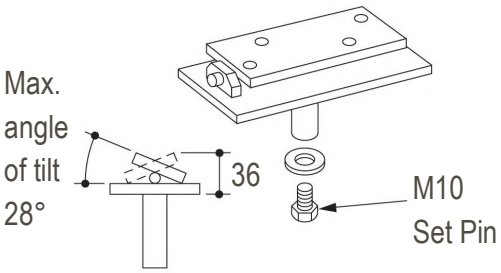
Superslim Rocking Head 36mm

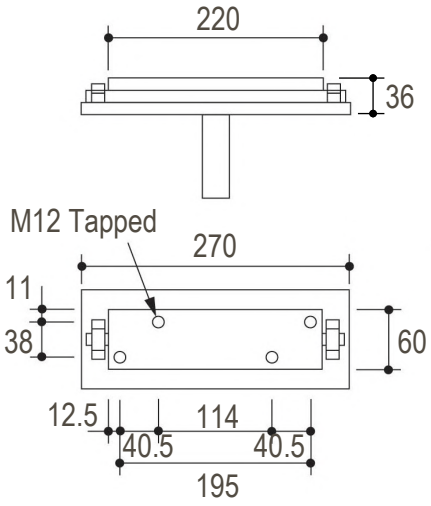
Used to attach header beams onto soldier props. Only to be used in the orientation shown below (i.e. parallel to Superslim X-X axis).

Allowable Working Load 150kN (subject to design verification of steelwork).
Not to be used in tension. For connection to header beams see sheet 77.



Code	Description	Weight
SSU10023	Superslim Rocking Head 36mm	4.35 kg
BNX10005	M10x20 Set Pin gr8.8 BZP	0.03 kg
SSU10029	Rocking Head Washer M10	0.02 kg





Clamp plates in 114mm c/c holes for flange widths up to 102mm.

Clamp plates in 195mm c/c holes for flange widths up to 171mm.

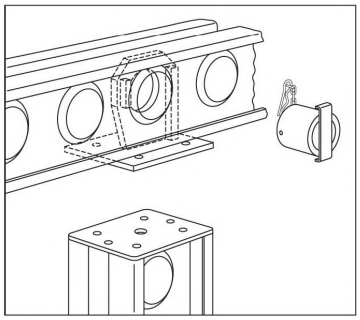
The head should be twisted to suit varying beam widths.

Note: When twisted the head is not suitable for sloping applications.

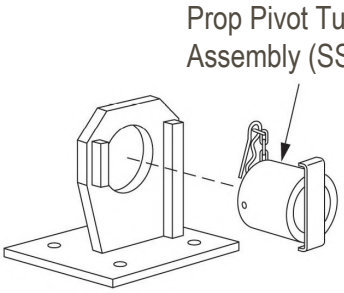
Superslim Corner Pivot (SSU10019) weight 7.32kg

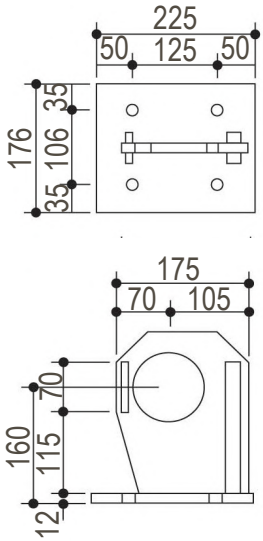
Used to attach Soldiers at right angles and permits limited rotation. Connection to Soldier using 4 No. M16 x 40 Set Pin gr8.8 BZP & M16 Nut (BNU16007 + BNU16001).

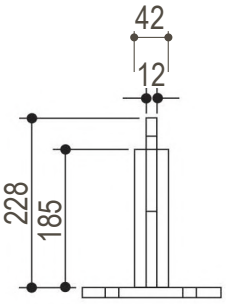
Allowable Working Load ± 65kN



Horizontal Soldier can be tilted up to 15° from the horizontal



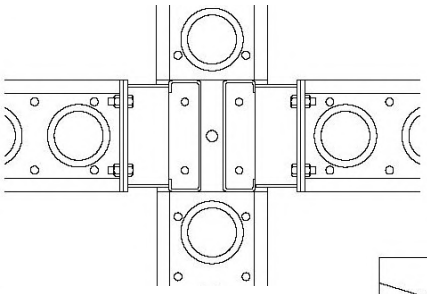




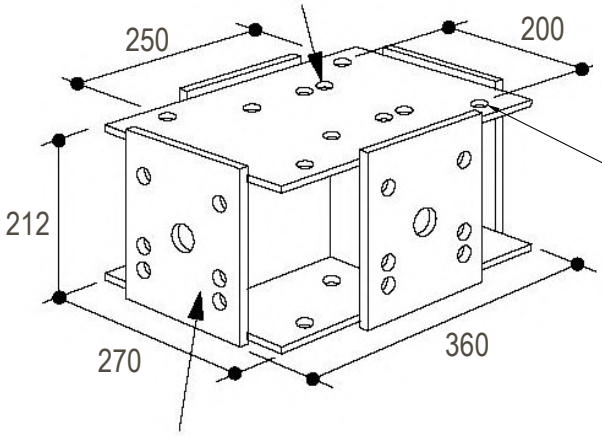
Multislim 6-Way Connector (SSU20006) weight 24.9kg

Enables 6 Soldiers to be connected at a node.

For allowable working Load see sheet 85.

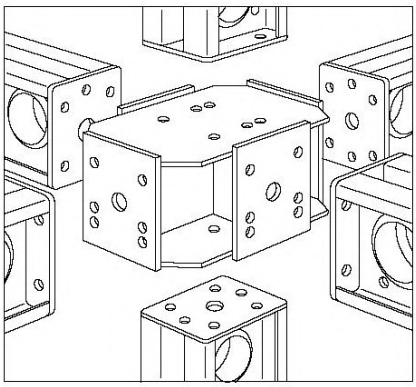


Each soldier bolted to connector using 4 No M16x40 Set Pin gr8.8 & M16 Hex Nut (BNU16007 + BNU16001)



4 No 18Ø holes to accept plan bracing.

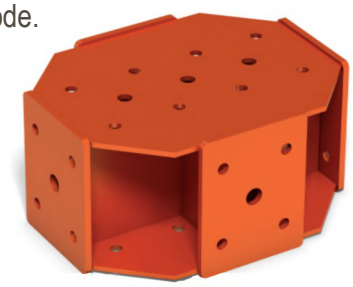
AWL for plan brace 20kN



225x176x10mm End Plates

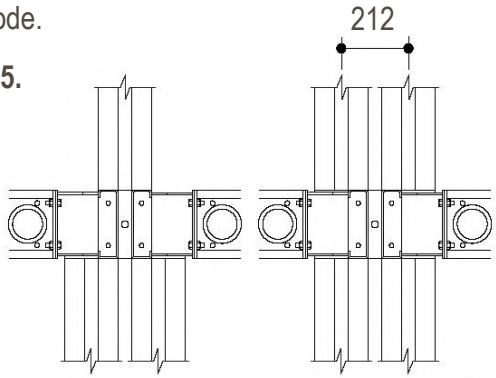
Note: All Plates are drilled to accept either 6 No Superslims or 6 No Minislims at each node.

6-Way Double Connector (SSU20066) weight 42.0kg

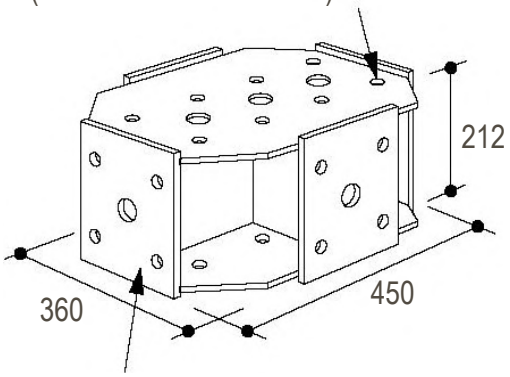


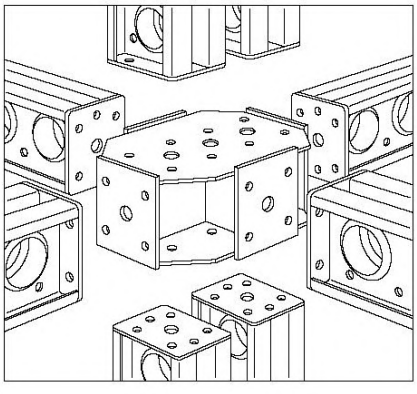
Enables 8 Soldiers to be connected at a node.

For allowable working Load see sheet 85.



Each soldier bolted to connector using 4 No M16x40 Set Pin gr8.8 & M16 Hex Nut (BNU16007 + BNU16001)





225x176x10mm End Plates

6-Way Connectors in use

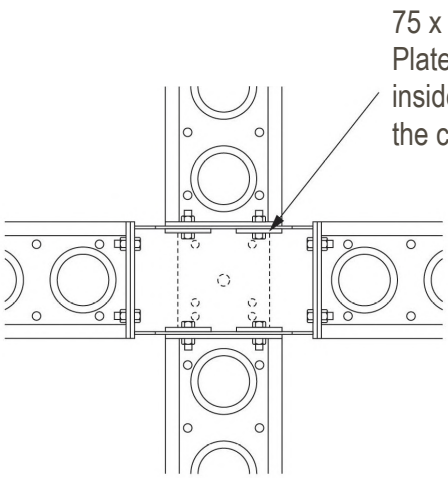
The Six Way Connector allows Soldiers to be connected at node, and provides an effective component In making up frame structures with Superslim Soldiers. For particular high concentrations of leg loads a twin 6 Way Connector is also available.

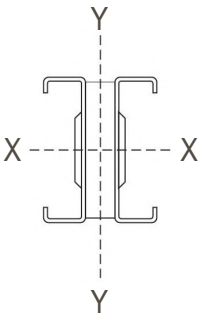
The allowable bending moment at the connector is dependant upon the direction of the axes of the applied load.

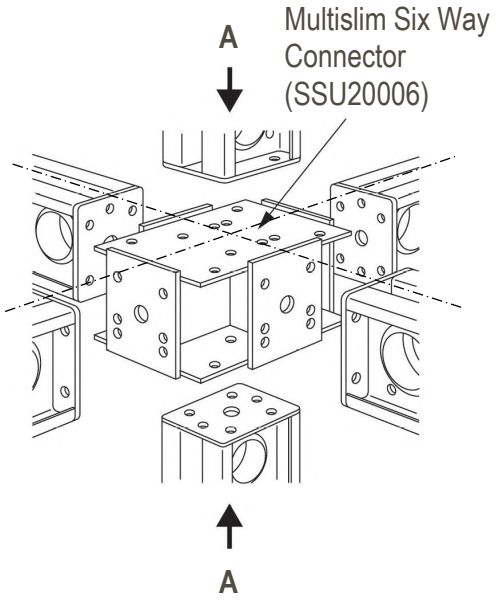
Moment about x-x axis (strong way) on sides	**7.6kNm**
Moment about x-x axis on top or bottom	**4.4kNm**
Moment about y-y axis on top, bottom or sides	**3.6kNm**

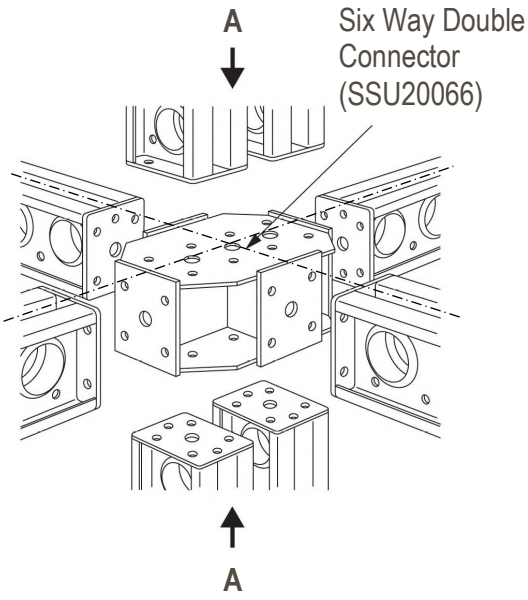
Axial loads in direction of arrow 'A'

SSU20006	**150kN Compression**
	80kN Tension
SSU20066	**300kN Compression**
	160kN Tension









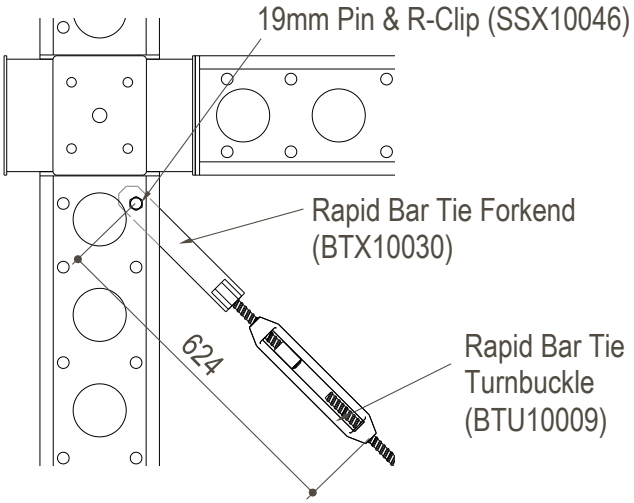
The allowable tensile load on the Superslim 6 Way Connector or Multislim 6 Way Connector can be increased to 100kN by using 75 x 75 x 12mm Plate Washers on the inside of the members as illustrated above.

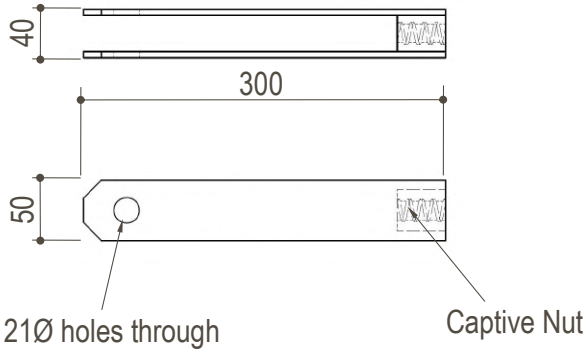
Rapid Bar Tie Forkend (BTX10030) weight 1.31kg

Used in conjunction with the Rapid Bar Tie Turnbuckle (BTU10009) to brace Slimshor Towers. The Rapid Bar Tie Forkend pins into the 21mm dia holes in the Superslim Soldier using a 19mm Pin & R-Clip (SSX10046) and connects to the captive Rapid Tie in the Turnbuckle via a captive Rapid Tie Hexagon Nut.

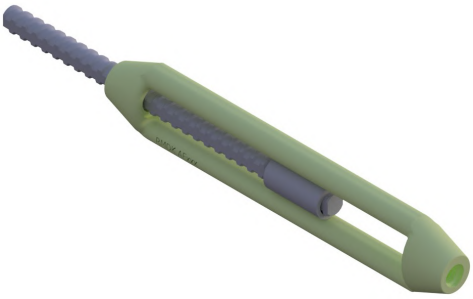
AWL +/-46kN when connected with 19mm Pin & R-Clip.

AWL +/-50kN when connected with M20x100 gr8.8 Bolt & M20 gr8 Hex Nut.





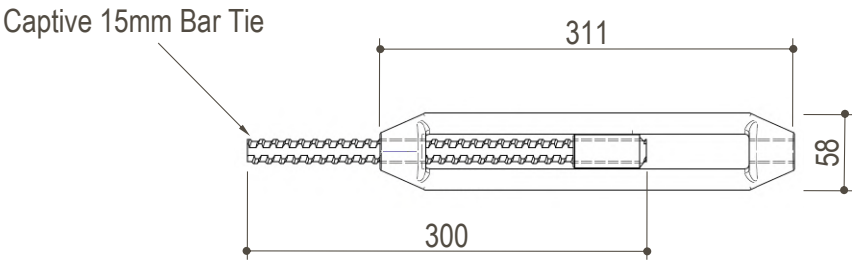
Rapid Bar Tie Turnbuckle (BTU10009) weight 2.07kg



Used in conjunction with the Rapid Bar Tie Forkend (BTX10030) to brace Slimshor Towers. The Rapid Bar Tie Turnbuckle connects to the captive Rapid Tie Hexagon Nut in the Rapid Bar Tie Forkend.

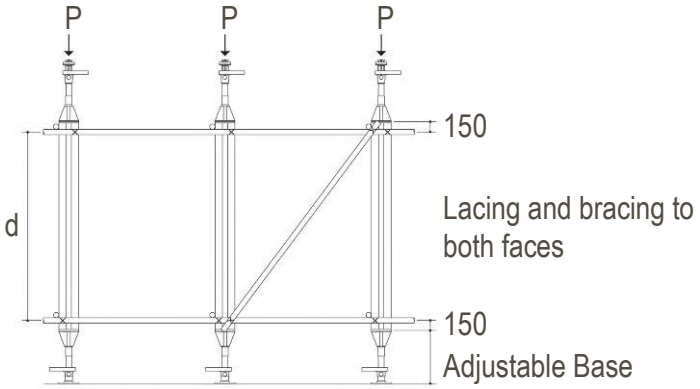
AWL +/-46kN when connected with 19mm Pin & R-Clip.

AWL +/-50kN when connected with M20x100 gr8.8 Bolt & M20 gr8 Hex Nut.



Superslim Propping and Shoring Design

Superslim incorporated in a falsework structure will require design checks in accordance with BS 5975 for lateral and overall stability. Generally the falsework structure will be freestanding and bracing may be required for erection, lateral stability, overall stability or node point stability for the designed strut effective length. Fitting of bracing for one of these reasons will often satisfy the other bracing requirements. See below for a typical falsework arrangement incorporating Superslim.



The vertical dimension (d) between horizontal lacing when using scaffold tube, is a function of the following:-

(A) Effective strut length from sheets 13 or 14 or to give required working capacity.

(B) Adequacy of the couplers and tube lacing and bracing to safely transmit the restraint forces.

(C) Physical limitations on operatives fitting lacing and bracing.

(D) Sequence and method of erection.

Where the shores are used with existing stable structures, such as in backpropping, then the shores could be inserted without bracing. For larger heights bracing for strut node stabilisation may be needed if the applied load exceeds that stated for length of shore used.

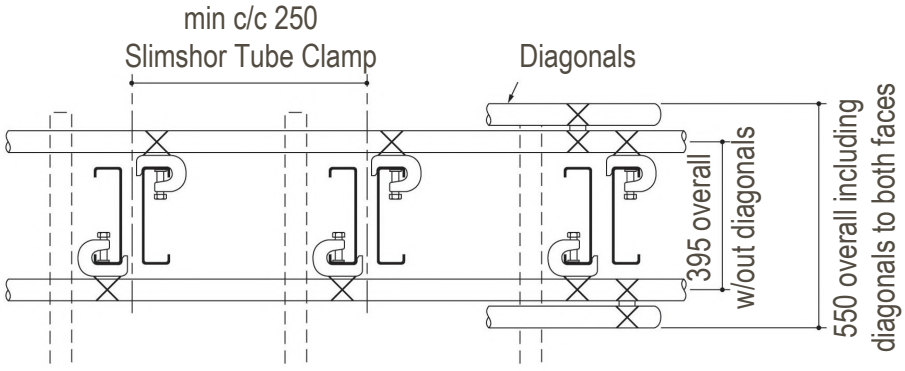
Assembly and Erection

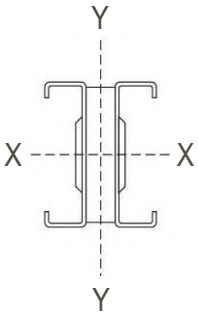
The simplicity of the Superslim Prop with only a few parts makes assembly easy with only four M16 Set Pins per joint. It is suggested that on vertical shores the bolts are placed downwards with the nut underneath. The shores can be assembled on a flat clean surface and then lifted up to position using the lifting plate. Once in position some erection bracing will be necessary to ensure stability during final alignment and setting. If tube and fittings are used for bracing, the tube clamps can be pre-fitted to the soldier sections.

One alternative method of assembly is to erect the shores piece by piece. This method normally requires tube and fittings bracing, with the horizontal lacing fitted below joints between soldier sections. For ease of handling it is suggested that the longer lengths of soldier be at the bottom of the make-up. Diagonal tubes should be fitted as the erection proceeds.

Superslim Bracing Using Scaffold Tube

In many applications where bracing to the shores is required, scaffold tube will be used for the Horizontal and diagonal members. The horizontal tubes are connected to the Superslim Props with the Slimshor Tube Clamp.

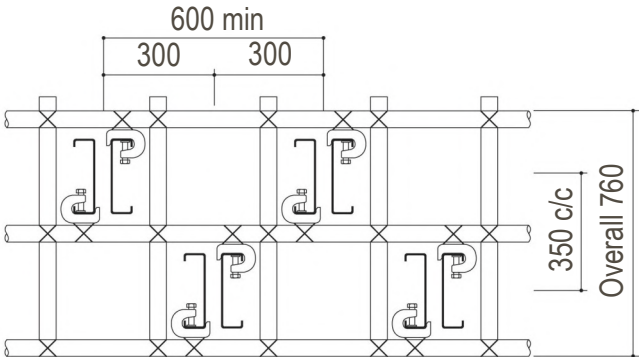


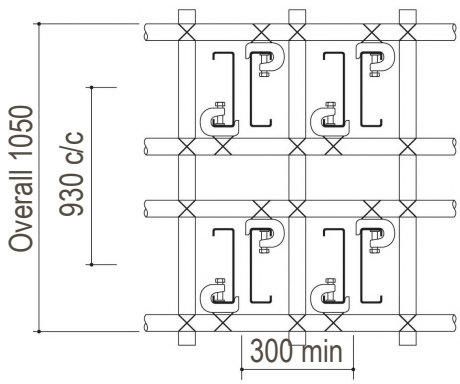


Plan of a single braced row of Superslim props

When connecting together rows of Superslim Props, it is recommended that twin tubes are used horizontally. The diagonals may be fitted to these tubes with swivel couplers. If clearance requirements demand it, then diagonals can also be attached to the Superslim Props with the Slimshor tube clamp.

The arrangement shown braces the shores about their YY axis. During erection and for overall stability, some restraint about the XX axis may be necessary. This may be done by connecting additional tubes, shown dotted, to suitable points of restraint The diagrams below shown the minimum spacing between groups to give full access to all the fittings.





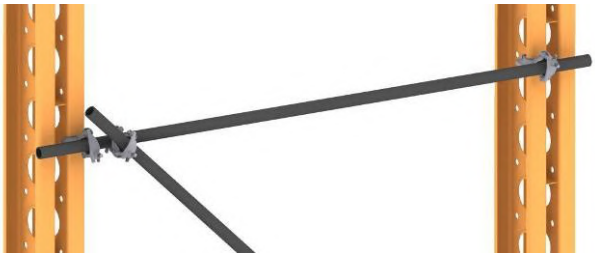
Code	Description	Weight
151-0050	Scaffold Tube 48.3x3.2 galva L050D	1.78 kg
151-0100	Scaffold Tube 48.3x3.2 galva L0100D	3.56 kg
151-0150	Scaffold Tube 48.3x3.2 galva L0150D	5.34 kg
151-0200	Scaffold Tube 48.3x3.2 galva L0200D	7.12 kg
151-0300	Scaffold Tube 48.3x3.2 galva L0300D	10.68 kg
151-0350	Scaffold Tube 48.3x3.2 galva L0350D	12.46 kg
151-0450	Scaffold Tube 48.3x3.2 galva L0450D	16.02 kg
151-0500	Scaffold Tube 48.3x3.2 galva L0500D	17.8 kg
151-0550	Scaffold Tube 48.3x3.2 galva L0550D	19.58 kg
151-0600	Scaffold Tube 48.3x3.2 galva L600D	21.36 kg
123-1010	Superslim Tube Clamp	1.33 kg
152-0149	Fixed coupler Ø49x49	1.1 kg
152-0160	Fixed coupler Ø49x60	1.57 kg
152-0249	Swivel coupler Ø49x49	1.34 kg
152-0260	Swivel coupler Ø49x60	1.56 kg

Bracing Using Scaffold Tube continued…...

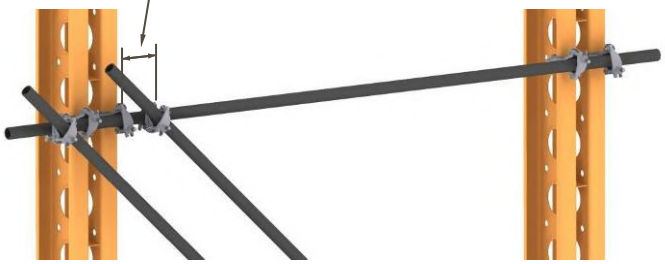
Where tube and fittings are used to lace and brace Superslim structures the following details shall be used. Checks should be made to ensure that couplers fixing ledger tubes to the Superslim have the required slip capacity along the Superslim. Options A,C and E use single clamps to connect ledger tubes to the Superslim. Options B and D use twin clamps. Option C uses twice as many lacing tubes as option B.

Important in ALL cases!
Swivel coupler should be positioned max 160mm from adjacent Slimshor Tube Clamp

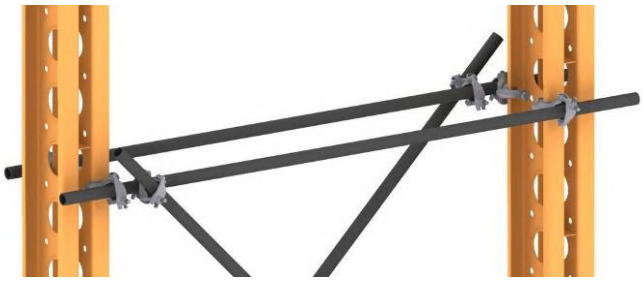
A



B

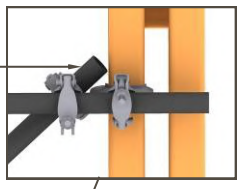


C

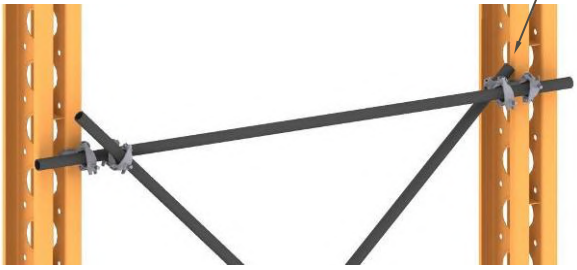


D

Note! This tube will have to be accurately cut to length to enable the 160mm dimension to be satisfied.



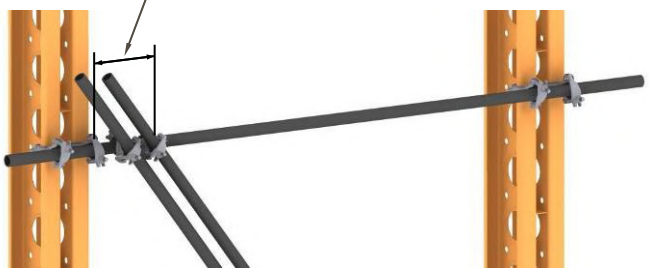
E



Non preferred arrangement

Note! 2nd tube coupler is greater than 160mm from adjacent Slimshor tube clamp.

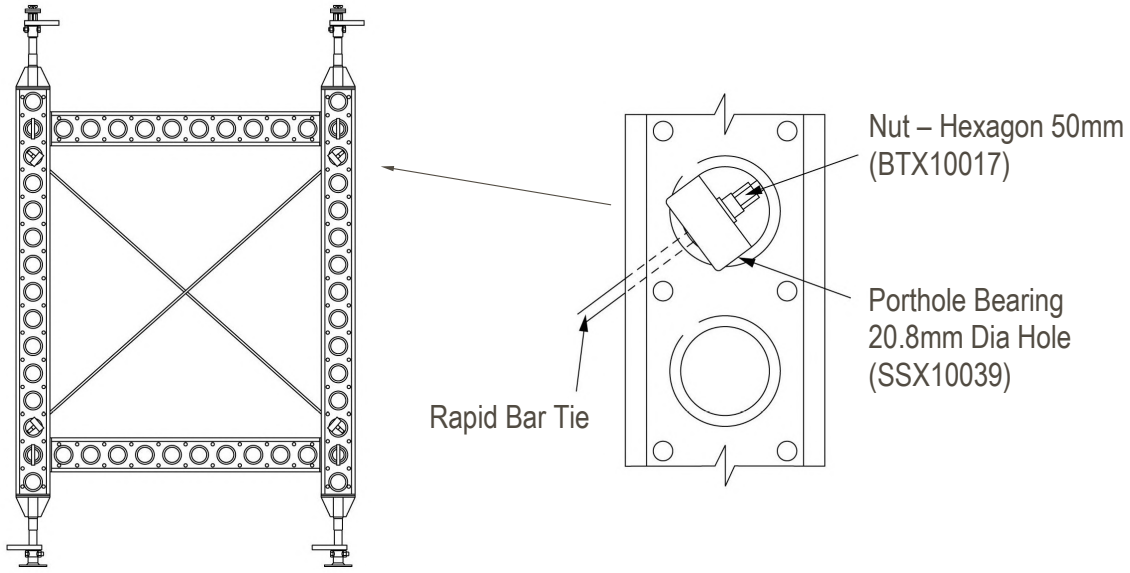
F



Do not use this arrangement

Superslim Bracing Using Rapid Bar Tie

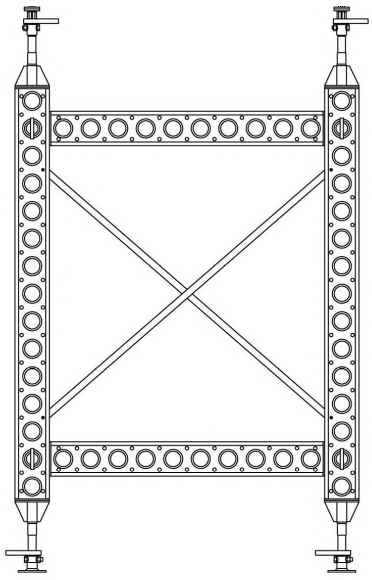
One alternative method of bracing Superslim is to use crossed diagonal tension rods, usually 15mm Rapid Bar Tie with connectors. The tie connects directly to the Porthole bearing which fits into the 100mm diameter hole in the webs of the Soldier. This arrangement only provides tension restraint between shores and suitable members to act as struts are needed to complete the structure. The tension force in the Rapid Bar Tie when used in this situation is limited to 65kN.

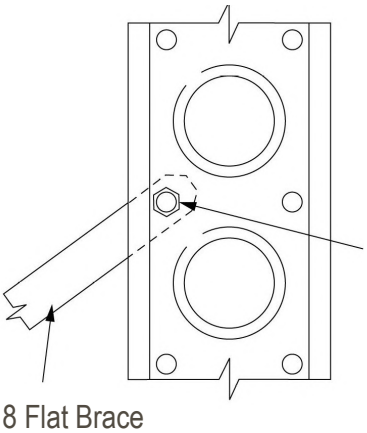


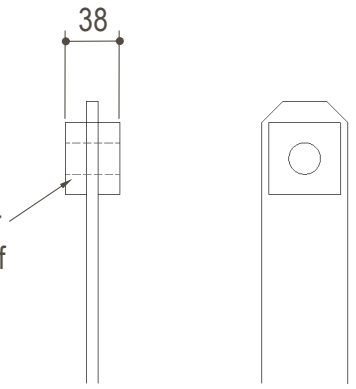
2.1.3. Superslim Bracing with 60 x 8 Flat Braces

Allowable Tensile Load = 30kN (bolt bending/web loading governs).

To improve to 50kN use 'hammer head' type braces - see right.







Superslim Jack Bracing

The Superslim Adjustable Base and Adjustable Head will safely transmit a horizontal force of 2.5kN or 2½ % of a maximum axial force of 100kN. If the horizontal force to be transmitted is greater than this, then jack bracing will be needed. The table below shows the allowable horizontal force compared to jack extension for both Head and Base. When jack bracing is required, usually a tube is attached to the threaded part of the jack and diagonals fitted to it. See below Typical Arrangement of Jack Bracing.

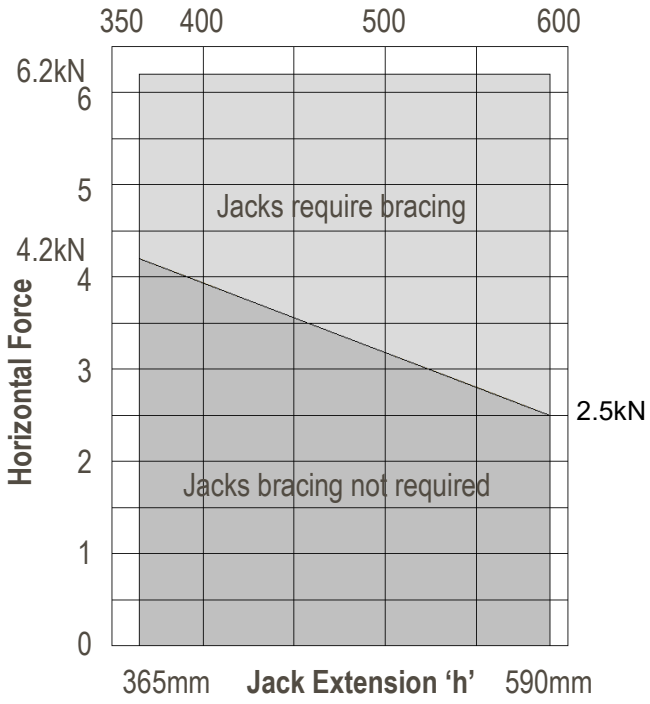
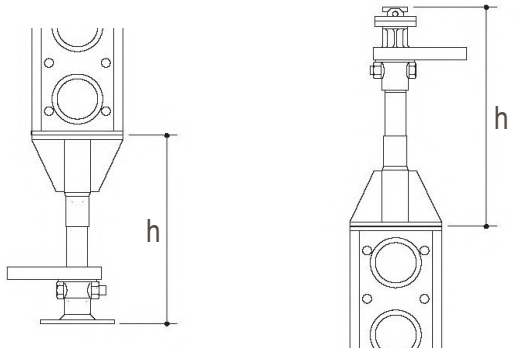
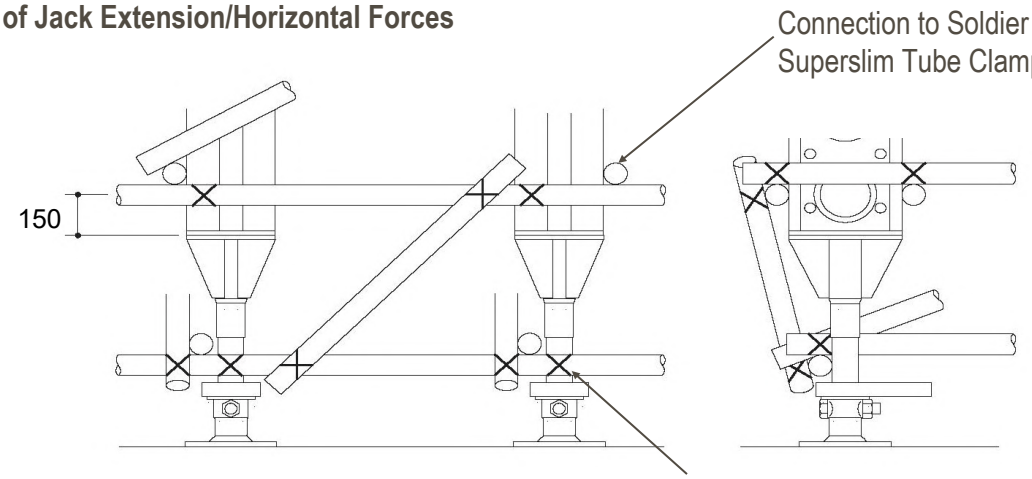


Table of Jack Extension/Horizontal Forces



Note: when jack bracing is required and Dim "h" = 435 - 515 for Base Jacks or 510 - 590 for Adj Rocking Heads, connections using 2"x2" 90 deg couplers (SFX10002) to Jack thread are required. For dimensions less than these, 2"x2.3/8" 90 deg couplers (SFX10004) should be connected to the jack stem.



Typical Arrangement of Jack Bracing

Table S1 – Component make up for Slimshor Prop with an Adjustable Head and an Adjustable Base

	Length of prop 'L' (mm) (Working Dimensions)		SSX 10090	SSX 10540	SSX 10720	SSX 10900	SSX 11800	SSX 12700	SSX 13600	SSU 10025	SSU 10026	BNU 16007	BNU 16001	
			Sold 90	Sold 540	Sold 720	Sold 900	Sold 1800	Sold 2700	Sold 3600	Adj Base Assy	Adj Rocking Head Assy	M16 X 40 HT Set Pin	M16 Hex Nut	Weight kg
1	Min. 805	Max. 1105	-	-	-	-	-	-	-	1	1	4	4	39.5
2	1075	1375	3	-	-	-	-	-	-	1	1	16	16	62.9
3	1345	1645	-	1	-	-	-	-	-	1	1	8	8	55.2
4	1525	1825	-	-	1	-	-	-	-	1	1	8	8	58.7
5	1705	2005	-	-	-	1	-	-	-	1	1	8	8	61.9
6	1795	2095	1	-	-	1	-	-	-	1	1	12	12	69.7
7	2065	2365	-	1	1	-	-	-	-	1	1	12	12	74.4
8	2245	2545	-	-	2	-	-	-	-	1	1	12	12	77.9
9	2425	2725	-	-	1	1	-	-	-	1	1	12	12	81.2
10	2605	2905	-	-	-	2	-	-	-	1	1	12	12	78.7
11	2785	3085	-	2	-	1	-	-	-	1	1	16	16	93.4
12	2965	3265	-	-	3	-	-	-	-	1	1	16	16	97.1
13	3145	3445	-	-	2	1	-	-	-	1	1	16	16	100.4
14	3325	3625	-	-	1	2	-	-	-	1	1	16	16	98.0
15	3505	3805	-	-	-	-	-	1	-	1	1	8	8	95.3
16	3685	3985	-	-	4	-	-	-	-	1	1	20	20	116.3
17	3865	4165	-	-	3	1	-	-	-	1	1	20	20	119.6
18	4045	4345	-	1	-	-	-	1	-	1	1	12	12	111.0
19	4225	4525	-	-	1	-	-	1	-	1	1	12	12	114.4
20	4405	4705	-	-	-	-	-	-	1	1	1	8	8	112.1
21	4585	4885	-	2	-	-	-	1	-	1	1	16	16	126.8
22	4765	5065	-	1	1	-	-	1	-	1	1	16	16	130.3
23	4945	5245	-	1	-	-	-	-	1	1	1	12	12	127.8
24	5125	5425	-	-	1	-	-	-	1	1	1	12	12	131.3
25	5305	5605	-	-	-	1	-	-	1	1	1	12	12	134.6
26	5485	5785	-	2	-	-	-	-	1	1	1	16	16	143.6
27	5665	5965	-	1	1	-	-	-	1	1	1	16	16	147.1
28	5845	6145	-	-	2	-	-	-	1	1	1	16	16	150.6
29	6025	6325	-	-	1	1	-	-	1	1	1	16	16	153.8
30	6205	6505	-	-	-	-	-	2	-	1	1	12	12	151.2
31	6385	6685	-	1	2	-	-	-	1	1	1	20	20	166.3
32	6565	6865	-	1	1	1	-	-	1	1	1	20	20	169.5
33	6745	7045	-	1	-	-	-	2	-	1	1	16	16	166.9

Table S2 – Component make up with a Slimshor Prop an Adjustable Base and a Fixed Rocking Head

	Length of prop 'L' (mm) (Working Dimensions)		SSX 10090	SSX 10540	SSX 10720	SSX 10900	SSX 11800	SSX 12700	SSX 13600	SSU 10025	SSU 10023	BNX 10005	SSU 10029	BNU 16007	BNU 16001	
			Sold 90	Sold 540	Sold 720	Sold 900	Sold 1800	Sold 2700	Sold 3600	Adj Base Assy	Rocking Head	M10x20 Set Pin	Rocking Head Washer	M16 X 40 HT Set Pin	M16 Hex Nut	Weight kg
	Min.	Max.														
1	491	641	1	-	-	-	-	-	-	1	1	1	1	8	8	32.0
2	581	731	2	-	-	-	-	-	-	1	1	1	1	12	12	39.8
3	671	821	3	-	-	-	-	-	-	1	1	1	1	16	16	47.6
4	761	911	4	-	-	-	-	-	-	1	1	1	1	20	20	55.4
5	851	1001	5	-	-	-	-	-	-	1	1	1	1	24	24	63.2
6	941	1091	-	1	-	-	-	-	-	1	1	1	1	8	8	39.9
7	1031	1181	1	1	-	-	-	-	-	1	1	1	1	12	12	47.7
8	1121	1271	-	-	1	-	-	-	-	1	1	1	1	8	8	43.4
9	1211	1361	1	-	1	-	-	-	-	1	1	1	1	12	12	51.2
10	1301	1451	-	-	-	1	-	-	-	1	1	1	1	8	8	46.6
11	1391	1541	1	-	-	1	-	-	-	1	1	1	1	12	12	54.4
12	1481	1631	-	2	-	-	-	-	-	1	1	1	1	12	12	55.6
13	1571	1721	1	2	-	-	-	-	-	1	1	1	1	16	16	63.4
14	1661	1811	-	1	1	-	-	-	-	1	1	1	1	12	12	59.1
15	1751	1901	1	1	1	-	-	-	-	1	1	1	1	16	16	66.9
16	1841	1991	-	-	2	-	-	-	-	1	1	1	1	12	12	62.9
17	1931	2081	1	-	2	-	-	-	-	1	1	1	1	16	16	70.4
18	2021	2171	-	-	1	1	-	-	-	1	1	1	1	12	12	65.9
19	2111	2261	1	-	1	1	-	-	-	1	1	1	1	16	16	73.7
20	2201	2351	-	-	-	-	1	-	-	1	1	1	1	8	12	69.1
21	2291	2441	1	-	-	-	1	-	-	1	1	1	1	12	16	76.9
22	2381	2531	-	1	2	-	-	-	-	1	1	1	1	16	16	78.3
23	2471	2621	1	1	2	-	-	-	-	1	1	1	1	20	20	86.1
24	2561	2711	-	-	3	-	-	-	-	1	1	1	1	16	16	81.8
25	2651	2801	1	-	3	-	-	-	-	1	1	1	1	20	20	89.6
26	2741	2891	-	1	-	-	1	-	-	1	1	1	1	12	16	84.8
27	2831	2981	1	1	-	-	1	-	-	1	1	1	1	16	20	92.9
28	2921	3071	-	-	1	-	1	-	-	1	1	1	1	12	16	88.3
29	3011	3161	1	-	1	-	1	-	-	1	1	1	1	16	20	96.1
30	3101	3251	-	-	-	-	-	1	-	1	1	1	1	8	8	80.0
31	3191	3341	1	-	-	-	-	1	-	1	1	1	1	12	12	87.8
32	3281	3431	-	2	-	-	1	-	-	1	1	1	1	16	20	100.9
33	3371	3521	1	2	-	-	1	-	-	1	1	1	1	20	24	108.4
34	3461	3611	-	-	3	1	-	-	-	1	1	1	1	20	20	104.3
35	3551	3701	1	-	3	1	-	-	-	1	1	1	1	24	24	112.1
36	3641	3791	-	1	-	-	-	1	-	1	1	1	1	12	12	95.7

Table S2 – Continued

	Length of prop 'L' (mm) (Working Dimensions)		SSX 10090	SSX 10540	SSX 10720	SSX 10900	SSX 11800	SSX 12700	SSX 13600	SSU 10025	SSU 10023	BNX 10005	SSU 10029	BNU 16007	BNU 16001	
	Min.	Max.	Sold 90	Sold 540	Sold 720	Sold 900	Sold 1800	Sold 2700	Sold 3600	Adj Base Assy	Rocking Head	M10x20 Set Pin	Rocking Head Washer	M16 X 40 HT Set Pin	M16 Hex Nut	Weight kg
37	3731	3881	1	1	-	-	-	1	-	1	1	1	1	16	16	103.5
38	3821	3971	-	-	1	-	-	1	-	1	1	1	1	12	12	99.2
39	3911	4061	1	-	1	-	-	1	-	1	1	1	1	16	16	107.0
40	4001	4151	-	-	-	-	-	-	1	1	1	1	1	8	8	96.8
41	4091	4241	1	-	-	-	-	-	1	1	1	1	1	12	12	104.6
42	4181	4331	-	2	-	-	-	1	-	1	1	1	1	16	16	111.5
43	4271	4421	1	2	-	-	-	1	-	1	1	1	1	20	20	119.3
44	4361	4511	-	1	1	-	-	1	-	1	1	1	1	16	16	115.0
45	4451	4601	1	1	1	-	-	1	-	1	1	1	1	20	20	122.8
46	4541	4691	-	1	-	-	-	-	1	1	1	1	1	12	12	112.5
47	4631	4781	1	1	-	-	-	-	1	1	1	1	1	16	16	120.3
48	4721	4871	-	-	1	-	-	-	1	1	1	1	1	12	12	116.0
49	4811	4961	1	-	1	-	-	-	1	1	1	1	1	16	16	123.8
50	4901	5051	-	-	-	1	-	-	1	1	1	1	1	12	12	119.3
51	4991	5141	1	-	-	1	-	-	1	1	1	1	1	16	16	127.1
52	5081	5231	-	2	-	-	-	-	1	1	1	1	1	16	16	128.3
53	5171	5321	1	2	-	-	-	-	1	1	1	1	1	20	20	136.1
54	5261	5441	-	1	1	-	-	-	1	1	1	1	1	16	16	131.8
55	5351	5501	1	1	1	-	-	-	1	1	1	1	1	20	20	139.6
56	5441	5591	-	1	-	1	-	-	1	1	1	1	1	16	16	135.0
57	5531	5681	1	1	-	1	-	-	1	1	1	1	1	20	20	142.8
58	5621	5771	-	-	1	1	-	-	1	1	1	1	1	16	16	138.5
59	5711	5861	1	-	1	1	-	-	1	1	1	1	1	20	20	146.3
60	5801	5951	-	-	-	-	-	2	-	1	1	1	1	12	12	135.9
61	5891	6041	1	-	-	-	-	2	-	1	1	1	1	16	16	143.7
62	5981	6131	-	1	2	-	-	-	1	1	1	1	1	20	20	151.0
63	6071	6221	1	1	2	-	-	-	1	1	1	1	1	24	24	158.8
64	6161	6311	-	-	3	-	-	-	1	1	1	1	1	20	20	154.8
65	6251	6401	1	-	3	-	-	-	1	1	1	1	1	24	24	162.3
66	6341	6491	-	1	-	-	-	2	-	1	1	1	1	16	16	151.6
67	6431	6581	1	1	-	-	-	2	-	1	1	1	1	20	20	159.4
68	6521	6671	-	-	1	-	-	2	-	1	1	1	1	16	16	155.1
69	6611	6761	1	-	1	-	-	2	-	1	1	1	1	20	20	162.9
70	6701	6851	-	-	-	-	-	1	1	1	1	1	1	12	12	152.7
71	6791	6941	1	-	-	-	-	1	1	1	1	1	1	16	16	160.5
72	6881	7031	-	2	-	-	-	2	-	1	1	1	1	20	20	167.3

Table S3 – Component make up for a Slimshor Prop with an Adjustable Base at each end

	Length of prop 'L' (mm) (Working Dimensions)		SSX 10090	SSX 10540	SSX 10720	SSX 11800	SSX 10900	SSX 12700	SSX 13600	SSU 10018	SSU 10023	BNX 10005	SSU 10029	BNU 16007	BNU 16001	
	Min.	Max.	Sold 90	Sold 540	Sold 720	Sold 1800	Sold 900	Sold 2700	Sold 3600	Adj Base Assy	Rocking Head	M10x20 Set Pin	Rocking Head Washer	M16 X 40 HT Set Pin	M16 Hex Nut	Weight kg
1	730	1030	-	-	-	-	-	-	-	2	-	-	-	4	4	38.4
2	1000	1300	3	-	-	-	-	-	-	2	-	-	-	16	16	61.8
3	1270	1570	-	1	-	-	-	-	-	2	-	-	-	8	8	54.1
4	1450	1750	-	-	1	-	-	-	-	2	-	-	-	8	8	57.6
5	1630	1930	-	-	-	-	1	-	-	2	-	-	-	8	8	60.9
6	1720	2020	1	-	-	-	1	-	-	2	-	-	-	12	12	68.7
7	1990	2290	-	1	1	-	-	-	-	2	-	-	-	12	12	73.4
8	2170	2470	-	1	-	-	1	-	-	2	-	-	-	12	12	76.6
9	2350	2650	-	-	1	-	1	-	-	2	-	-	-	12	12	80.1
10	2530	2830	-	-	-	1	-	-	-	2	-	-	-	8	12	77.7
11	2710	3010	-	1	2	-	-	-	-	2	-	-	-	16	16	92.6
12	2890	3190	-	-	3	-	-	-	-	2	-	-	-	16	16	96.1
13	3070	3370	-	-	2	-	1	-	-	2	-	-	-	16	16	99.3
14	3250	3550	-	-	1	1	-	-	-	2	-	-	-	12	16	96.9
15	3430	3730	-	-	-	-	-	1	-	2	-	-	-	8	8	94.3
16	3610	3910	-	-	4	-	-	-	-	2	-	-	-	20	20	115.3
17	3790	4090	-	-	3	-	1	-	-	2	-	-	-	20	20	118.6
18	3970	4270	-	1	-	-	-	1	-	2	-	-	-	12	12	110.0
19	4150	4450	-	-	1	-	-	1	-	2	-	-	-	12	12	113.5
20	4330	4630	-	-	-	-	-	-	1	2	-	-	-	8	8	111.1
21	4510	4810	-	2	-	-	-	1	-	2	-	-	-	16	16	125.7
22	4690	4990	-	1	1	-	-	1	-	2	-	-	-	16	16	129.2
23	4870	5170	-	1	-	-	-	-	1	2	-	-	-	12	12	126.8
24	5050	5350	-	-	1	-	-	-	1	2	-	-	-	12	12	130.3
25	5230	5530	-	-	-	-	1	-	1	2	-	-	-	12	12	133.6
26	5410	5710	-	2	-	-	-	-	1	2	-	-	-	16	16	142.5
27	5590	5890	-	1	1	-	-	-	1	2	-	-	-	16	16	146.0
28	5770	6070	-	-	2	-	-	-	1	2	-	-	-	16	16	149.5
29	5950	6250	-	-	1	-	1	-	1	2	-	-	-	16	16	152.8
30	6130	6430	-	-	-	-	-	2	-	2	-	-	-	12	12	150.1
31	6310	6610	-	1	2	-	-	-	1	2	-	-	-	20	20	165.2
32	6490	6790	-	-	3	-	-	-	1	2	-	-	-	20	20	168.7
33	6670	6970	-	1	-	-	-	2	-	2	-	-	-	16	16	165.9
34	6850	7150	-	-	1	-	-	2	-	2	-	-	-	16	16	167.4

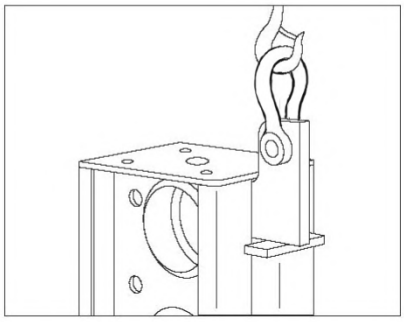
LIFTING ACCESORIES

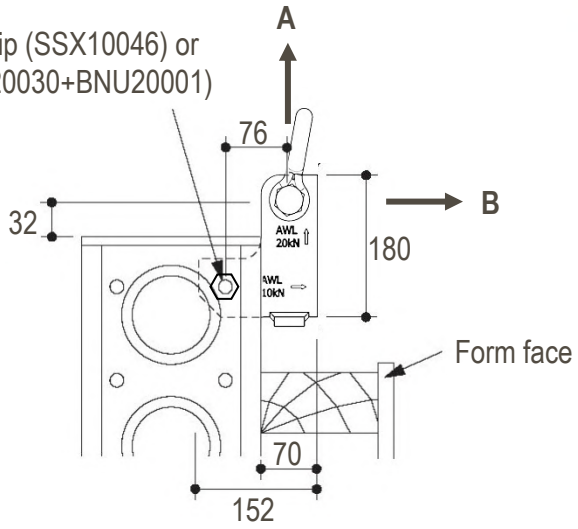
Superslim Lifting Plate Assembly 20kN (SSX10063) weight 4.97kg (F.O.S >3.0)

Used in pairs for lifting formwork panels up to 40kN. Supplied with captive shackle. Lift vertically to avoid applying side loads to the shackle.

Allowable Working Load on arrow 'A' 20 kN
Allowable Working Load on arrow 'B' 10 kN

Item also exists without shackle as Superslim Lifting Plate 15kN (SSU10032) - stamped for Allowable Working Loads reduced by 25%.

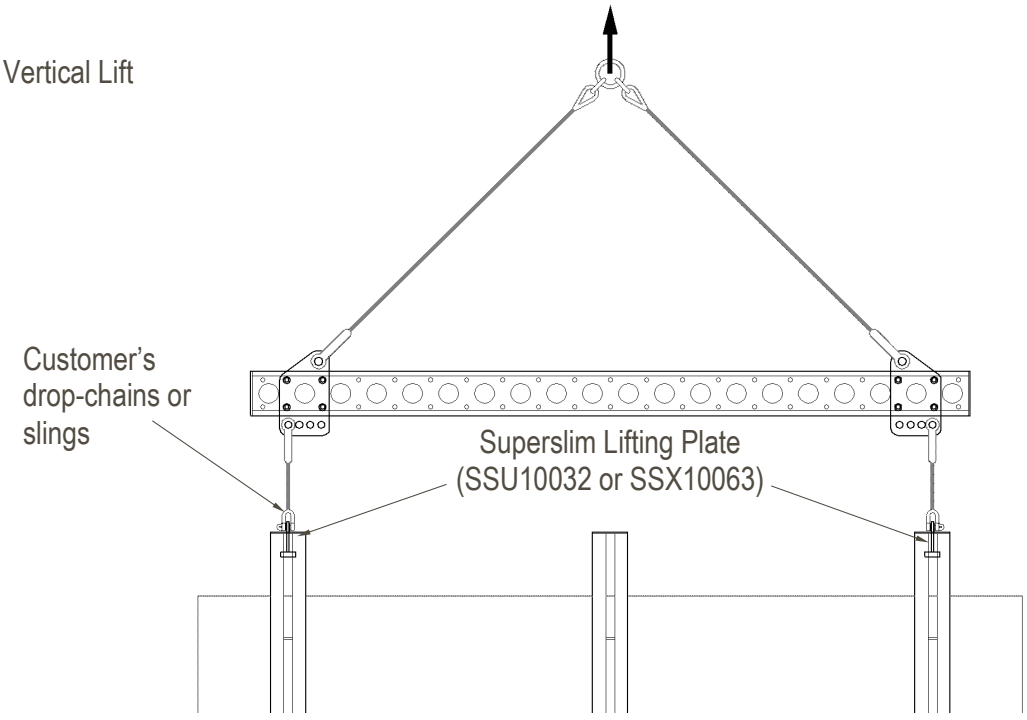




Lifting – Forms up to 4 Tonnes

The Superslim Spreader Beam Assembly is used in combination with a pair of Lifting Plates (SSU10032 or SSX10063). Some equipment is required to be supplied by the customer.

Note: Vertical Lift

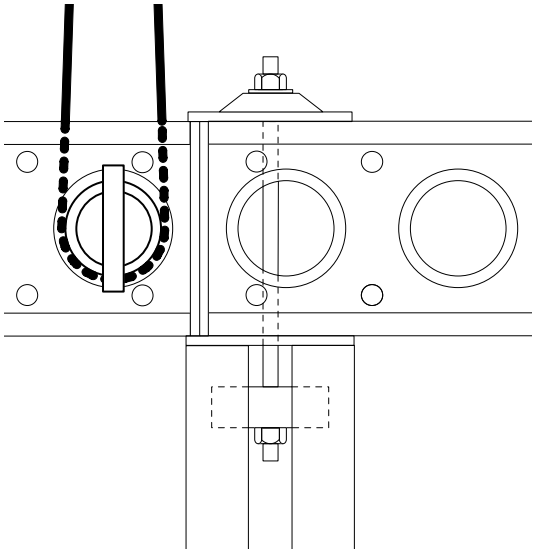


Superslim Form Support Plate (SSX10042) should be used on the bottoms of soldiers which contain lifting plates.

Lifting – Forms up to 9 Tonnes

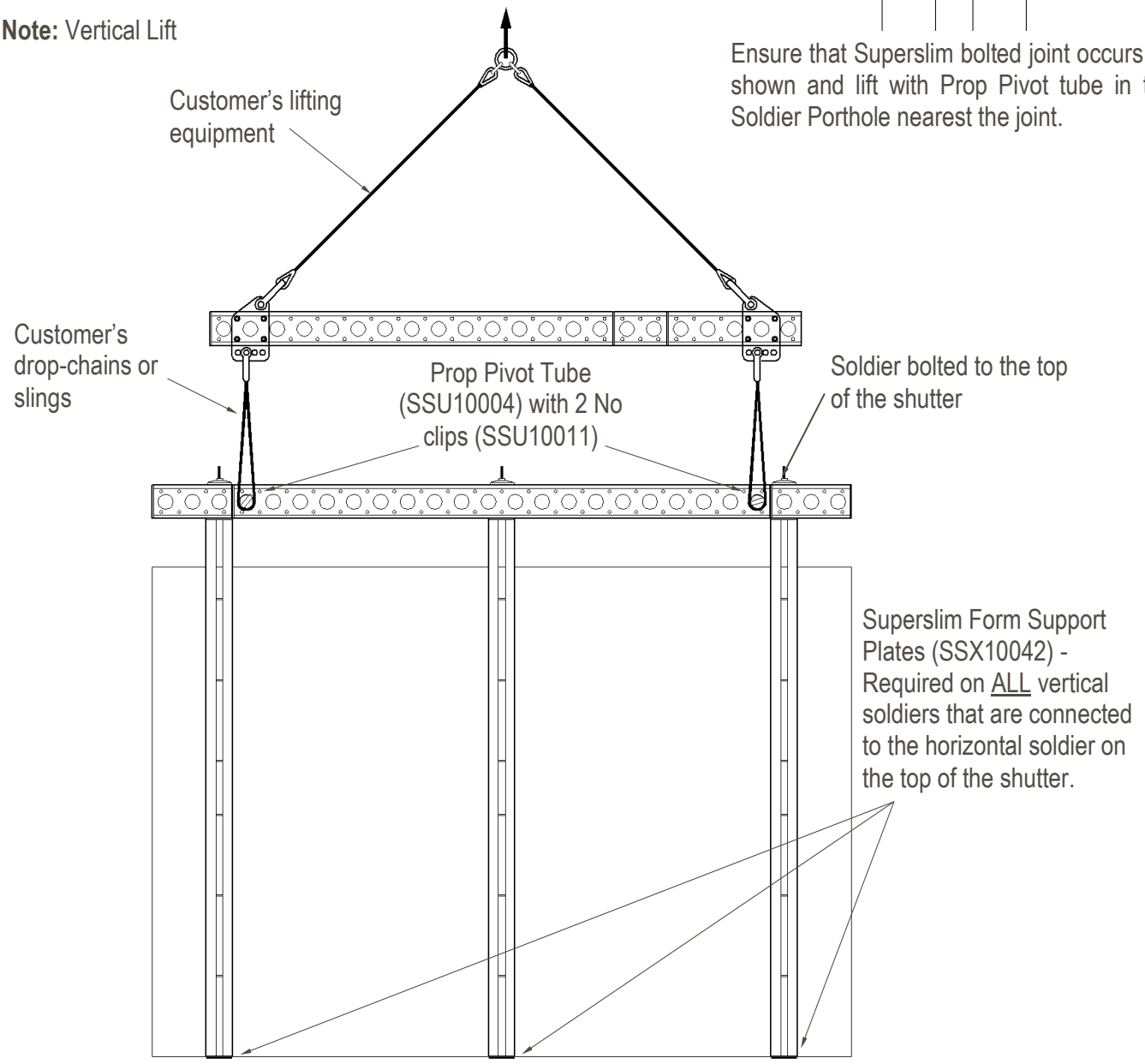
When bolting Soldiers to the top of shutters as shown below remember to check bending moments induced. Some equipment is required to be supplied by the customer.

Connect Superslims with M20 gr8.8 ATR 450mm long, 2 M20 nuts (BNU20001), M20 round washer (BNU20003). Porthole Bearing (SSX10039) and Standard Waler Plate (BTX10021).

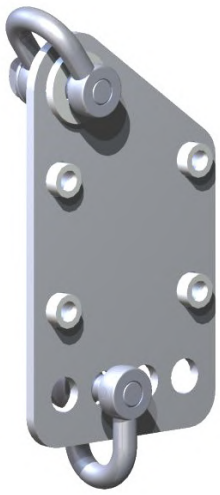


Ensure that Superslim bolted joint occurs as shown and lift with Prop Pivot tube in the Soldier Porthole nearest the joint.

Note: Vertical Lift

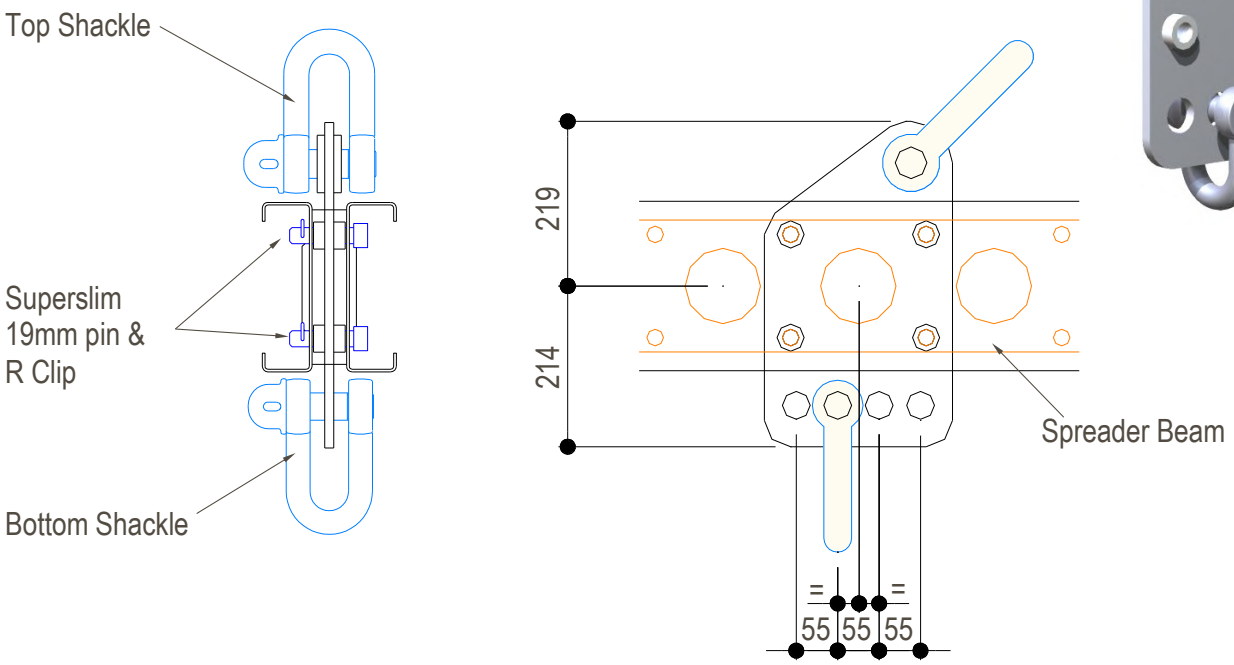


Lifting - Spreader Beam Adaptor Assembly (SSX10052) weight 19.4kg



Used in pairs with a Superslim Soldier to make an economical spreader beam for lifting loads of up to 9 tonnes. Includes top and bottom shackles ready for connection to customers slings and lifting equipment.

Each Spreader Beam Adaptor Assembly comprises:- 1 No Spreader Beam Adaptor, 4 No Superslim 19mm pin & R Clip & 2 No Shackles



Each spreader beam plate fits into the web of the Soldier and allows for 55mm adjustment in lifting length. The maximum dimension between lifting points on a unit is 3060mm when using a single 3600mm Soldier.

The spreader beam plate has been designed in accordance with The Construction (Lifting Operations) Regulations 1961. Each plate is Individually numbered and tested to twice working load and stamped.

A certificate of testing is available from RMD Kwikform on request.

A table of maximum lifted load related to the internal angle of the slings is given in the graph on sheet 100. The user will need to supply the correct two legged chains or slings.

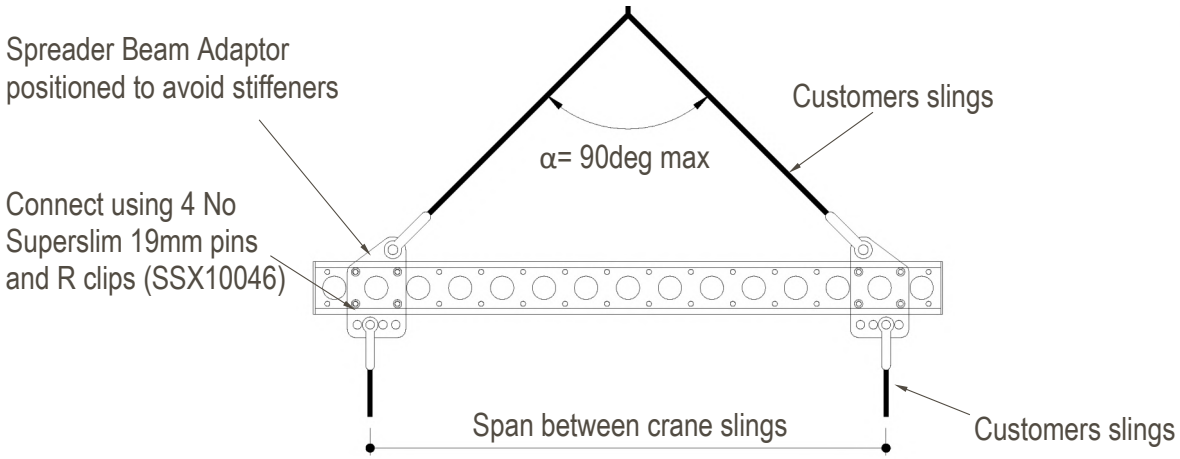
SUPERSLIM SOLDIER

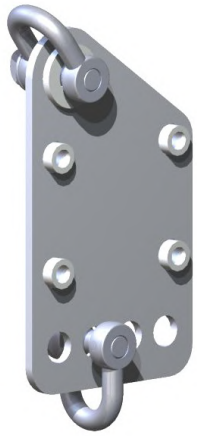
MODULAR STRUCTURAL SYSTEM

ALTRAD COFFRAGE & ÉTAIEMENT LOCATION VENTE MONTAGE

R•M•D KWIKFORM

Lifting – Spreader Beams



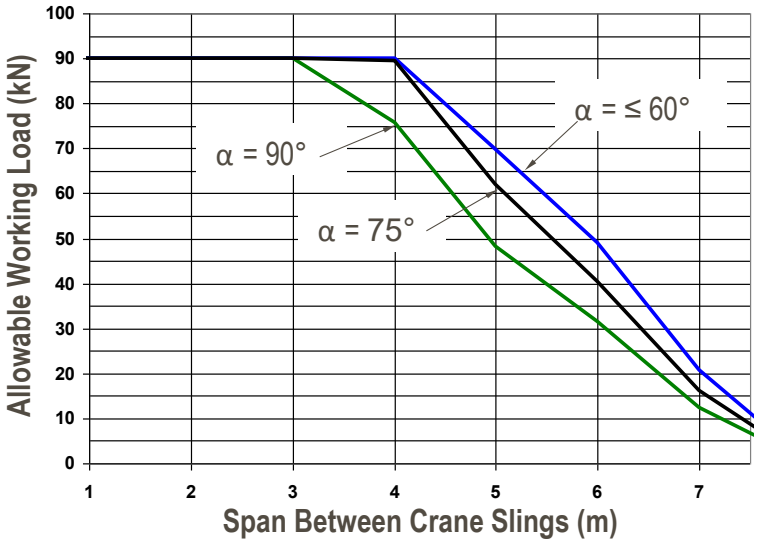


- Use the Spreader Beam Adapter only in the orientation shown with the row of four holes positioned at the bottom of the unit.
- Ensure that the lower slings are vertical by moving the position of the unit along the Superslim, fine adjustment is afforded by moving the lower shackle between the four hole positions. Never use less than four 19mm pins and clips to connect the unit to the Superslim.
- Where Superslim sections are joined to make longer spreader beams, ensure that soldiers with seven hole end plates are used and connect sections together using 6 No. M16x40 grade 8.8 set pins and nuts torqued to 120Nm. Never use more than three Superslims in the makeup.
- Do not use with damaged Superslim Soldiers

For further instructions on safe use refer to the Equipment Guidance Notes supplied with the equipment or available on request.

Spreader Beam Load Duty Chart

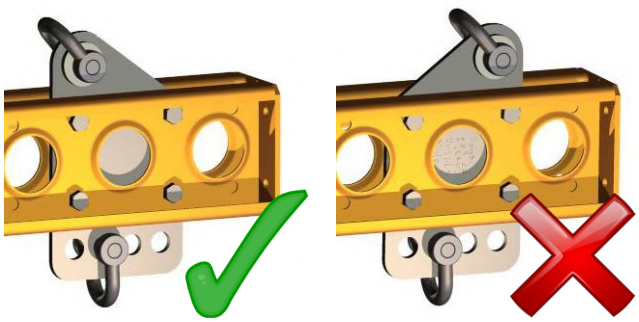
Minimum global factor of safety = 2.9.



Assembly Orientation

Ensure adaptor plates are orientated as shown below and check Superslim stiffener positions are avoided when detailing.

Note: The unit can not be used in 1800mm Superslims in the position detailed below.

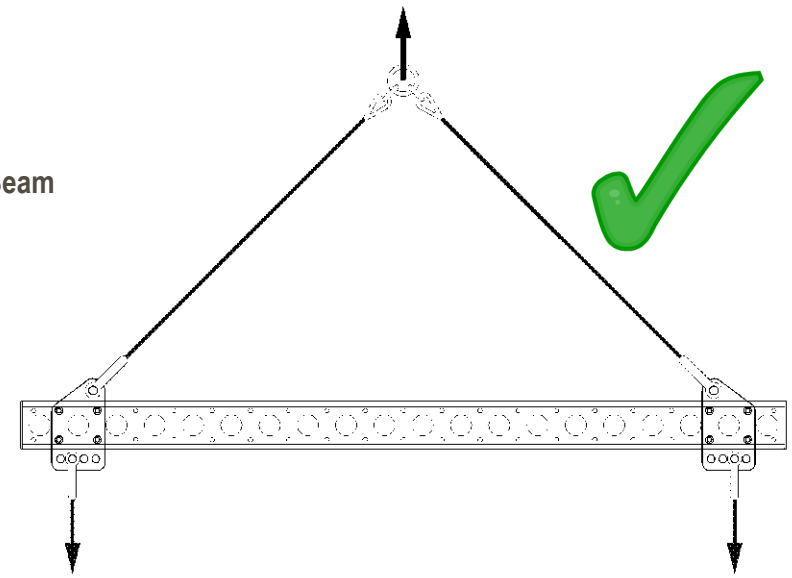


Lifting – Spreader Beams continued

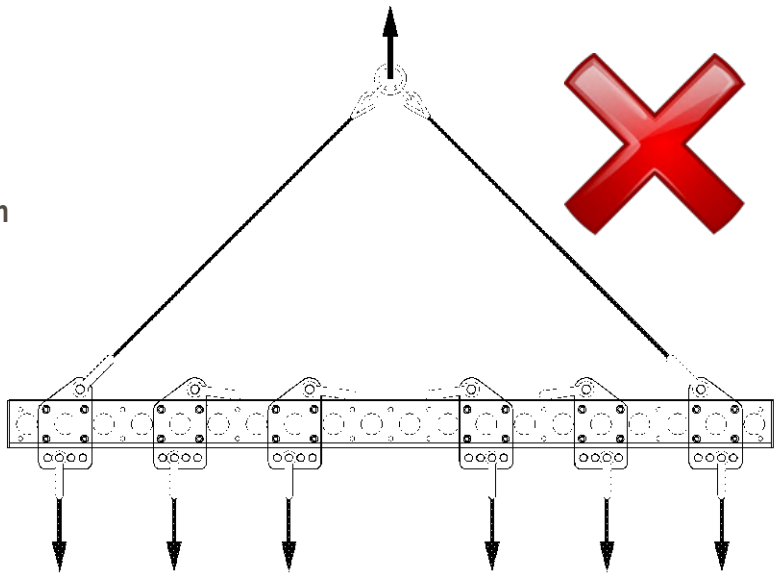
Superslim Soldiers can be used as spreader beams by the addition of spreader beam plates and prop pivot tubes.

RMD Kwikform Superslim Soldiers cannot be used as lifting beams, unless the assembly is tested by an Independent lifting equipment test house. The difference is shown below.

Spreader Beam



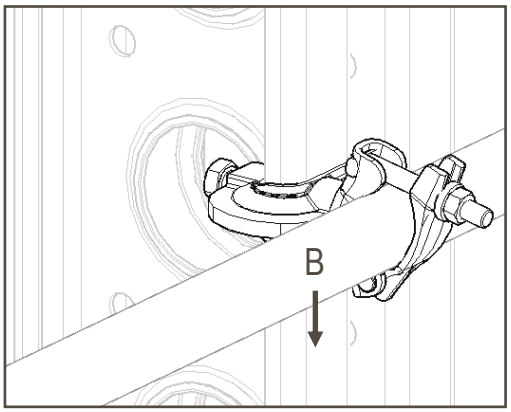
Lifting Beam



CLIPS, CLAMPS & FASTENERS

Slimshor Tube Clamp (SSU10024) weight 1.33kg

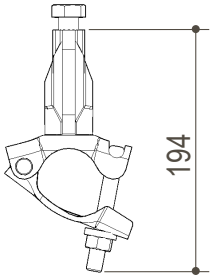
Used to connect scaffold tube to Soldiers at any angle.

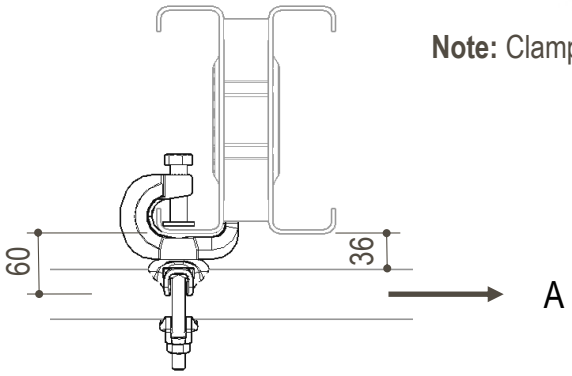


'A' Allowable Working Load = 6.1kN
(slip of tube through coupler)

'B' Allowable Working Load = 4.0kN
(slip of coupler along soldier)

Note: Clamp is a swivel fitting.

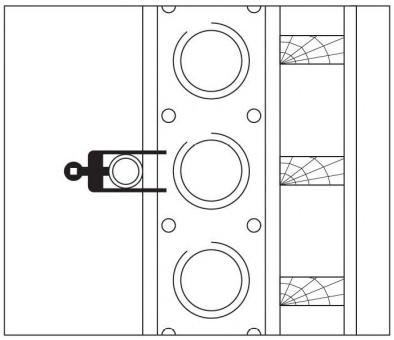


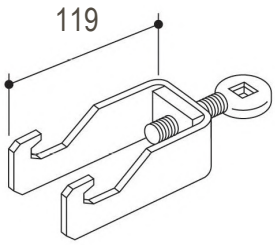


'B' Clamp - Tube to Panel (RPX10005) weight 0.66kg

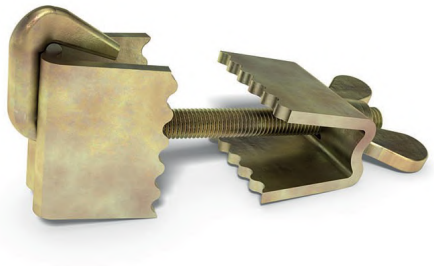
Used to connect scaffold tube to Soldiers at right angles.

When pairs of 'B' clamps are used on a tube to soldier connection an allowable working load of 3.25kN may be used in any direction.





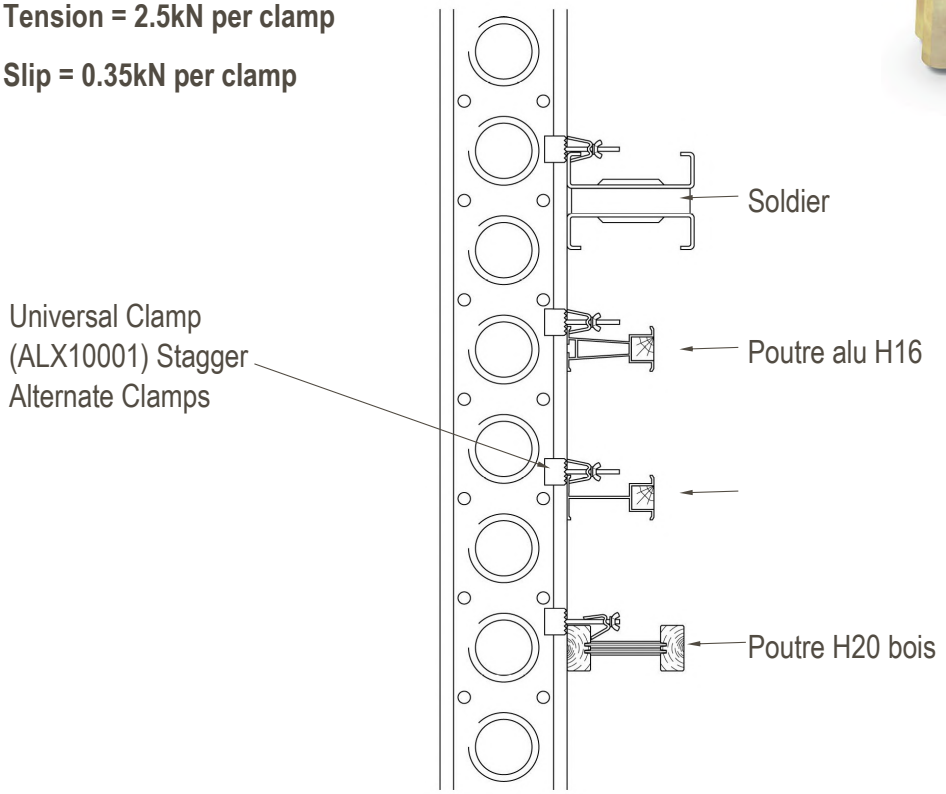
Universal Clamp (ALX10001) weight 0.75kg



A light duty clamp with many uses. Note: The clamp is to be fixed hand tight plus 1/4 turn.

AWL Tension = 2.5kN per clamp

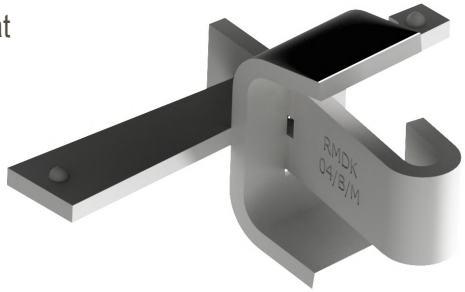
AWL Slip = 0.35kN per clamp

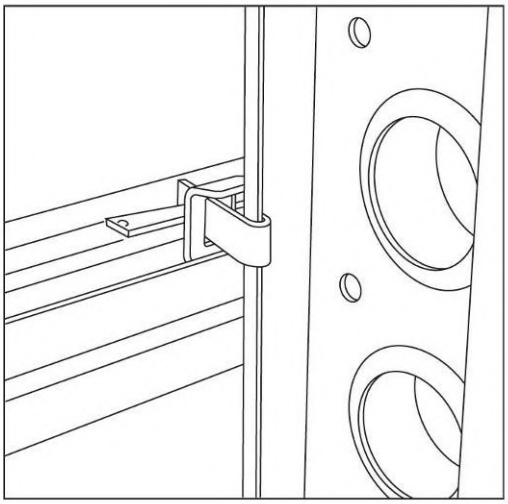


Flange to Flange Wedge Clamp (ALX10002) Weight 0.51kg

A wedge fixed clamp that enables aluminium beams to be clamped to Soldiers at 90 degrees in static soffit applications.

AWL Slip = 1kN per pair of clamps

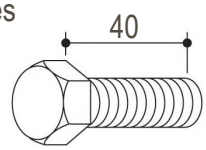




Nuts, Bolts and Set Pins

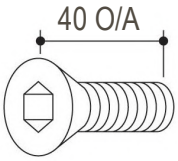
M16 x 40mm H.T. Set Pin

For general use to connect the end plates of Soldiers and accessories



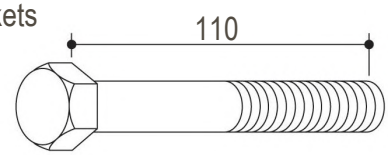
M16 x 40 HT CSK Set Pin ZP

For use with Half Couplers and Anchor Plates



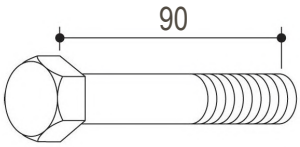
M16 x 110 8.8 Bolt Plated

For use with Joint Stiffeners and Ultraguard Soldier Sockets



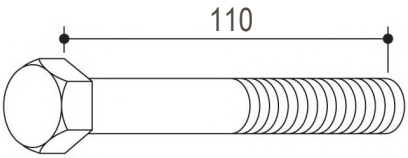
M20 x 90mm Bolt

For use with Turnbuckle & Wind Tie instead of a Superslim 19mm Pin & R Clip



M24 x 110mm Bolt

For use with Tilt Plates and Push Pull Props

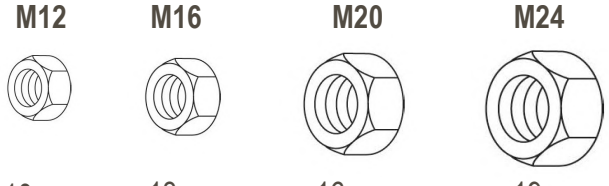


Code	Description	Weight
BNX12009	M12x25 Set Pin gr8.8 BZP	0.04 kg
BNX12002	M12x30 Set Pin gr8.8 BZP	0.04 kg
BNX12001	M12x40 Bolt gr8.8 BZP CSK	0.05 kg
BNU12001	M12 Hex Nut gr8 BZP	0.01 kg
BNU12002	M12 Round Washer BZP	0.01 kg
BNU16007	M16x40 Set Pin - gr 8.8 BZP	0.09 kg
BNU16013	M16x110 Bolt - gr 8.8 BZP	0.20 kg
BNU16008	M16x40 Set Pin gr8.8 BZP	0.05 kg
BNU16001	M16 Hex Nut gr 8 BZP	0.03 kg
BNU16002	M16 Round Washer BZP	0.10 kg
BNU20001	M20 Hex Nut gr 8 BZP	0.06 kg
BNU20002	M20 Nyloc Nut gr8 BZP	0.06 kg
BNX20030	M20x90 Bolt - gr 8.8 BZP	0.28 kg
BNX24001	M24x45 Set Pin gr8.8 BZP	0.26 kg
BNU24001	Hex Nut gr 8 BZP	0.06 kg
SSX10046	Superslim 19mm Pin & R Clip	0.29 kg
BNX20100	M20 High Yield Pin	0.41 kg
SSU10011	Superslim R Clip 5x100mm	0.03 kg

Thread run-out max:
M12 - 4mm, M16 - 5mm, M20 - 6mm, M24 - 7mm

Bolt thread length:
2d+6 <125mm, 2d+12 >125mm<200mm, 2d+25 >200mm

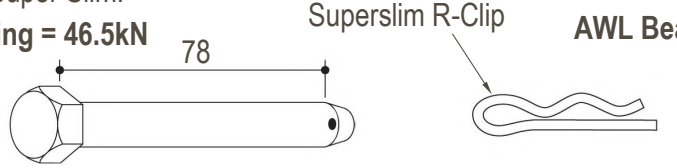
Hex Nuts Grade 8.8 & Nyloc Nuts



Superslim 19mm Pin & R Clip Assembly

Used instead of a bolt for connection to the 21mm dia holes in a Super Slim.

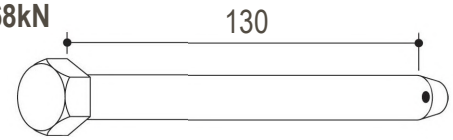
AWL Bearing = 46.5kN



M20 High Yield Pin

Used with a Superslim R Clip to secure a Tube End Link to a Soldier.

AWL Bearing = 68kN



SUPERSLIM SOLDIER

MODULAR STRUCTURAL SYSTEM

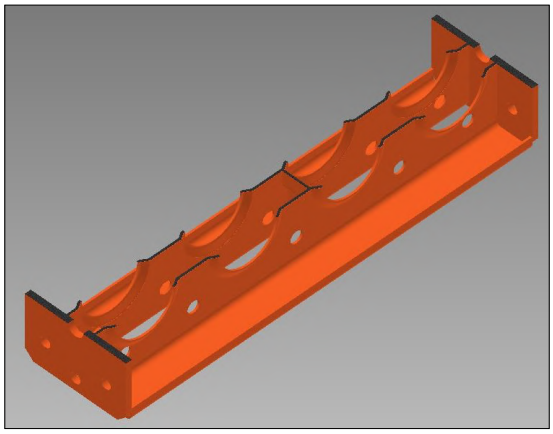
ALTRAD COFFRAGE & ÉTAIEMENT LOCATION VENTE MONTAGE

R•M•D KWIKFORM

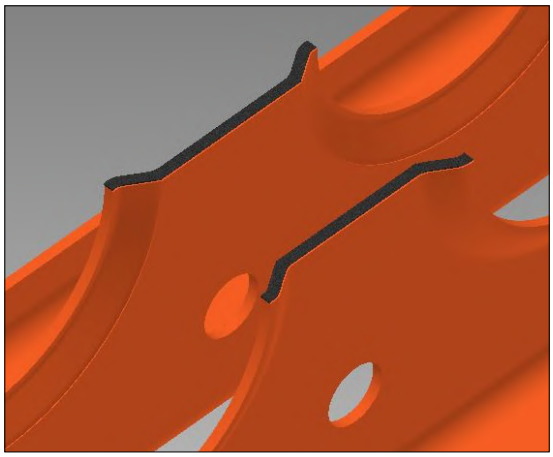
APPENDIX

Appendix

Superslim Soldiers are lightweight members made from a pair of 3.5mm thick grade Q345 or S355 folded steel lipped channels with the lips acting to stiffen and strengthen the flanges. At intervals along the beam, welded web stiffener plates connect the two channels together and both improve torsion resistance of the composite beam and force a certain degree of composite action between the channels in their weak axes. The channels are further connected together at the ends by 10mm thick welded end plates with holes enabling units to be bolted end to end. The gap between the twin channels provides a convenient location for ties to pass through the beam in almost any location.



100mm diameter 'portholes' perforate both webs at 180mm intervals and lighten the beam. The raised lip around the perimeter of the portholes is a detail borrowed originally from aircraft construction and stiffens the webs when a Superslim is subject to shear, bearing or axial compressive loads. These portholes, as well as the smaller 21mm diameter holes in the web and end plate holes, enable the connection of an unrivalled range of accessories which combine to help keep the Superslim product system as the industry benchmark for the versatile construction of modular structures.



Behaviour as a Beam

The strength and stiffness of a Superslim is very much less when considered about the 'weaker' axis perpendicular to the plane of the webs than the other 'stronger' axis despite the presence of the twin channels and integral web stiffeners, this means that lateral torsional buckling (LTB) needs to be considered during the design of Superslim beams. LTB can occur when an unrestrained compression flange in a beam subjected to bending becomes unstable resulting in unwanted sideways movement of the compression flange, twisting of the beam about its central axis and possibly total failure of the beam at a bending moment significantly lower than the maximum allowable bending moment for the fully restrained section. For a brief video concerning LTB click on this link.

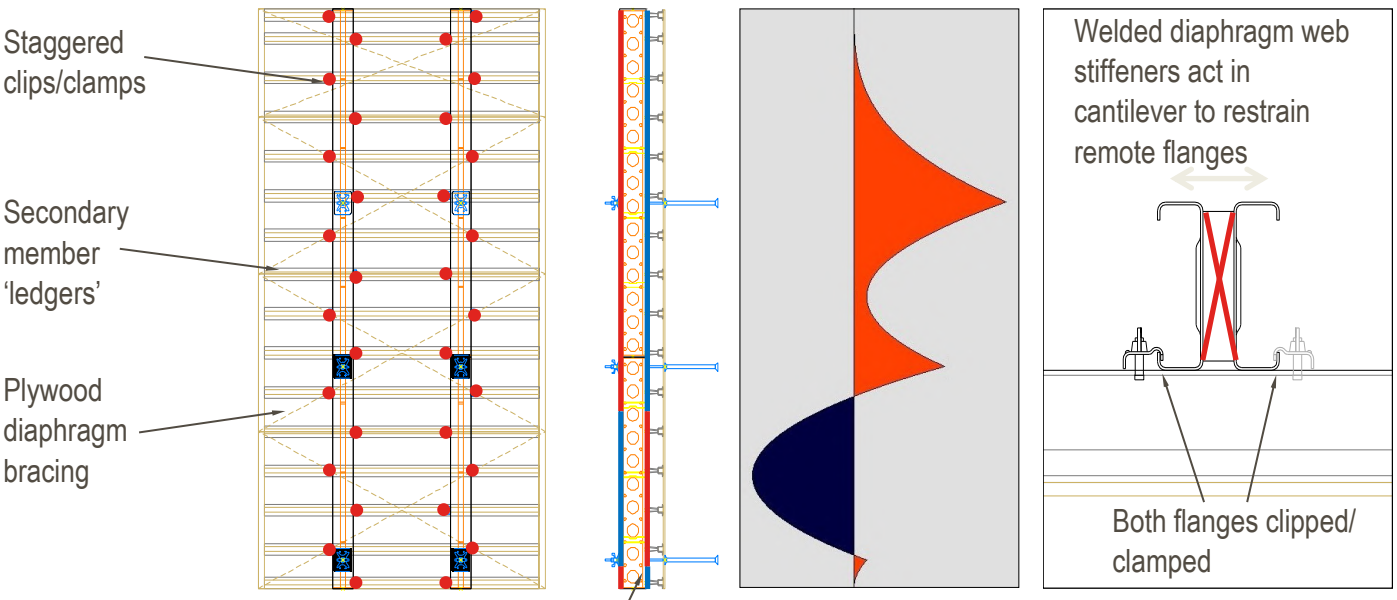
Lateral torsional buckling of bridge girders under self weight only during assembly due to lack of K bracing.

Fully Restrained Beam Design

The Superslim was first developed for use as a formwork 'soldier' for use in formwork panels assembled by the user from individual components to form a structural 'grillage'. The concrete pressure is applied to plywood or composite face sheeting spanning between, supported by and fixed to originally timber and more usually now aluminium 'secondary' beams; in some markets these are called 'backing members'. These in turn span between and are supported by Superslim 'primary beams' or soldiers which act to span between formwork ties that connect to the opposite form face thus balancing the concrete pressure loads. The loads are transferred between the Superslim and the formwork ties by one of various 'waler plates' which create bearing loads in the Superslim beam additional to the bending moments and shear. Soffit formwork constructed using Superslim soldiers as primary beams act in the same manner except the ties and waler plates are replaced by falsework U-heads.

In these applications the flanges of the Superslim in contact with the secondary beams are connected at each intersection using one of a variety of proprietary clips or clamps. Clips/clamps along the length of the Superslim are staggered so that every other clip is fitted to one of the Superslim channels and the remainder are fitted to the other channel. This relatively frequent connection to both channels prevents the Superslim from twisting about its axis and prevents the flange in connection with the secondary beams from moving sideways.

The intermittent diaphragm stiffeners now act as cantilevers and effectively provide lateral restraint to the flanges not connected to the secondary beams. The multiple restraint created in this manner, together with the bracing 'diaphragm action' of the form face sheeting and its fixings to the secondary beams, fully restrains both flanges of the Superslim beam regardless of whether the beam experiences sagging bending moments (between the ties) or hogging moments (near/at the tie locations).

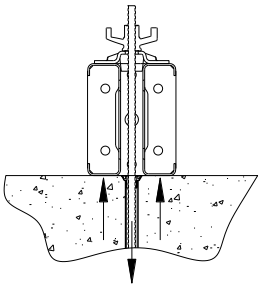


Combined Loading

At the tie locations, the Superslim soldier is subjected to a combination of bending, shear and bearing stresses and this most onerous combination of loading will usually govern the design of the beam. Safe performance envelopes of tie load and bending moment have been determined by extensive load testing. To facilitate design, shear and bearing stresses have been combined into a single variable - 'bearing load'. This enables a single graph to contain performance envelopes covering the behaviour of the Superslim beam used in conjunction with multiple accessories such as Rapidshor and Alshor U-heads in falsework construction. Also included is the least favourable case when two Superslim beams are crossed and bear on each other. In this mode, the two webs of both soldiers act like knife edges and bearing is transferred though only four small areas of contact.

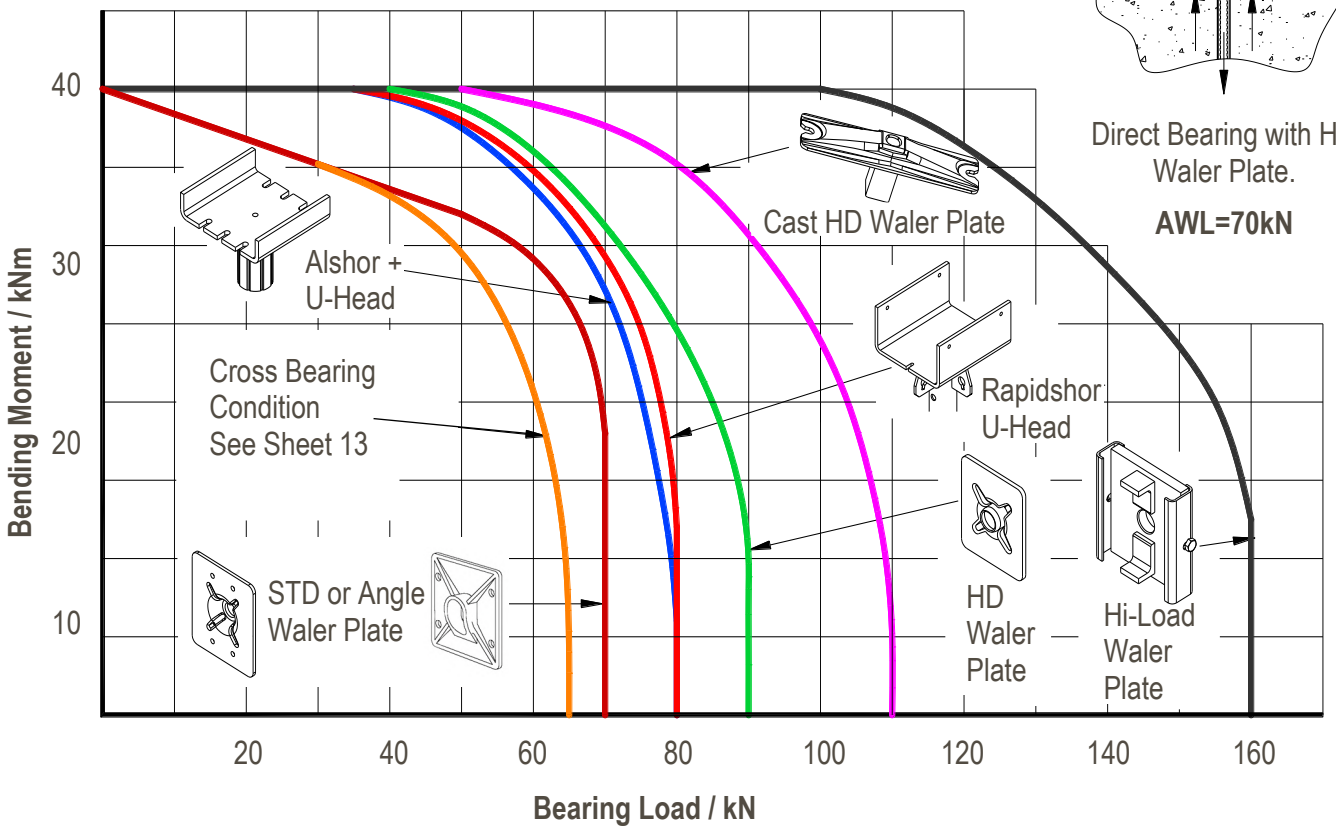
The Adequacy of the Superslim beam between the ties/supports also needs to be checked as part of the design. In formwork applications the reactions from the Alforms/timbers are comparatively low and can be ignored. As a result checks are restricted to bending moment and deflection of the Superslim beam section and bending moment at any joints between individual Superslim beams where the allowable bending moment capacity is reduced and varies depending on how many bolts are used to secure the connection. Where high concentrated loads are present mid span, these need to be taken into account during the design process.

Performance under conditions of combined bending, bearing and shear loading can be checked using the graph below and figure right for a range of connecting accessories and conditions. Direct bearing performance is reduced compared to bearing one side as the Superslim webs are eccentrically loaded on both flanges.



Direct Bearing with HD Waler Plate.

AWL=70kN



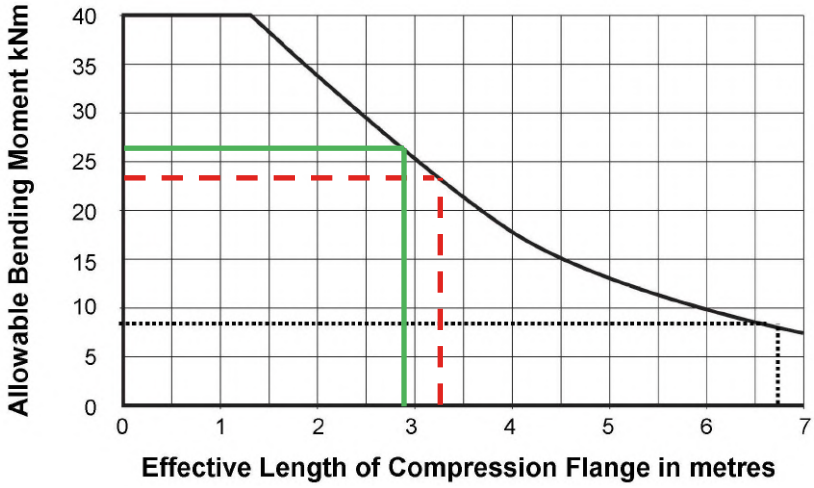
Design of Beams without Lateral Restraint

For applications other than standard formwork, the Superslim will likely be less well restrained. The important thing to determine here is the 'effective length of the compression flange'. To which the allowable bending moment is related using the graph below.

The effective length of the compression flange depends on three factors:

- Whether the load is de-stabilising or not—see below for definition
- The degree of lateral and torsional (twisting) restraint at the supports
- For cantilevers the lateral and torsional restraint at the tip

The destabilising load condition is unusual and applies when the load is applied to the top flange and both the top flange and the load are free to move sideways.



Effective lengths for compression flanges of various beam arrangements are shown in the table right (BS5975).

Conditions of restraints at supports		Loading Conditions*	
		Normal	Destabilizing
Beam restrained against torsion at supports	Compression flange fully restrained against rotation in plan at the supports	0.70L	0.85L
	Compression flange partially restrained against rotation in plan at the supports	0.875L	1.05L
	Compression flange not restrained against rotation in plan at the supports	1.0L	1.2L
Torsional restraint at support given:	Only by positive connection of bottom flange to the support	1.0L+2D	1.2L+2D
	Only by dead bearing of bottom flange to the support	1.2L+2D	1.4L+2D

Example an Individual Superslim Soldier is used to support an un-braced Rapidshor base jack loaded to 53kN over a 2m void in a slab. What conditions are needed to safely achieve this? Base jack extension is 500mm.

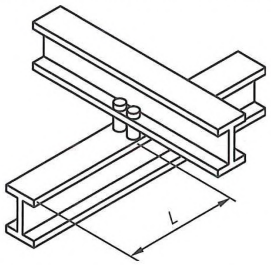
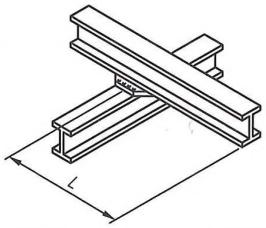
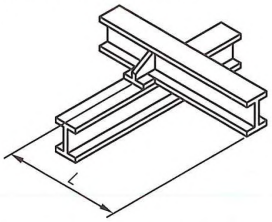
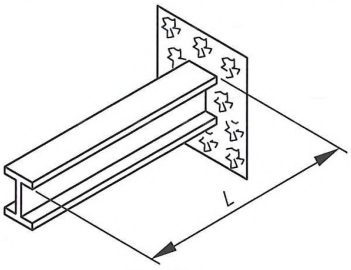
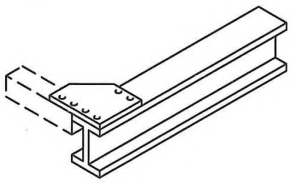
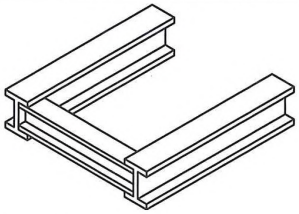
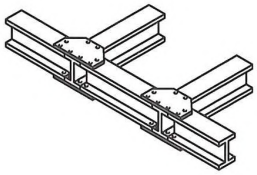
The long un-braced base jack is quite flexible laterally so it could be argued that the load is de-stabilising.

At the supports torsional restraint is by dead bearing on the ends so effective length of the compression flange is 1.4L+2D = 3.25m. Allowable bending moment is 22.5kNm.

Applied bending moment = WL/4 = 26.5kNm > 22.5kNm does not satisfy.

If the base jack extension were short or a jack brace is added perpendicular to the Superslim the load is not de-stabilising. Effective length is 1.2L+2D = 2.85m. Allowable bending moment = 27kNm > 26.5kNm—satisfies.

Effective Length of Compression Flanges for Cantilevers

Restraint conditions		Loading conditions	
At support	**At tip**	**Normal**	**Destabilizing[A)]**
Continuous with lateral support	Free	3.0*L*	7.5*L*
	Laterally restrained on top flange only	2.7*L*	7.5*L*
	Tortionally restrained only	2.4*L*	4.5*L*
	Laterally and tortionally restrained	2.1*L*	3.6*L*
Continuous with partial tortional restraint	Free	2.0*L*	5.0*L*
	Laterally restrained on top flange only	1.8*L*	5.0*L*
	Tortionally restrained only	1.6*L*	3.0*L*
	Laterally and tortionally restrained	1.4*L*	2.4*L*
Continuous with lateral and tortional restraint	Free	1.0*L*	2.5*L*
	Laterally restrained on top flange only	0.9*L*	2.5*L*
	Tortionally restrained only	0.8*L*	1.5*L*
	Laterally and tortionally restrained	0.7*L*	1.2*L*
Built-in laterally and tortionally	Free	0.8*L*	1.4*L*
	Laterally restrained on top flange only	0.7*L*	1.4*L*
	Tortionally restrained only	0.6*L*	0.6*L*
	Laterally and tortionally restrained	0.5*L*	0.5*L*
Braced laterally in at least one bay			Braced laterally in at least one bay
			
Top flange restraint	Torsional restraint		Lateral and torsional restraint

NOTE L is the projecting length of the cantilever.

A) The destabilizing loading condition exists when the load is applied on the top flange and both the load and the flange are free to move laterally.