2018

cold rolled products technical manual

Hi-SPAN

C1/SFB

(27) Hh2

JANUARY 2018

INTRODUCTION

COLD ROLLED PRODUCTS

are specifically designed for use within most types of buildings as secondary supports for cladding materials. Hi-SPAN offers a comprehensive range of Purlins, Rails, C-Channels, Eaves Beams and associated accessories. Hi-SPAN has for many years, maintained its position as one of the UK's leading suppliers of cold rolled products to the construction industry.

Design With over 50 years experience within the construction industry Hi-SPAN has been at the forefront of design and development of cold rolled products. An experienced Research and Development committee continually strive to improve and update the Hi-SPAN range of products and services. This together with a fully comprehensive Technical Helpdesk of experienced designers on hand to answer your queries, Hi-SPAN offer its clients the most economic solutions to cold rolled design. Contact technical@hi-span.com or telephone 01953 603081 to order your free design suite or for further information from the Technical Helpdesk.

Bespoke Sections For the past fifteen years Hi-SPAN as well as enhancing our existing product range has introduced a Bespoke Section service. 'Z' 'C' and Eaves sections can be produced (within certain guidelines) to customer's specific dimensions. In addition we have the capability of blanking and punching wide coil (1.0 – 3.0mm gauges) and press-braking profiles up to 4.000m in length to specific customer orders. On all sections, hole patterns can be punched to order and can be of varying sizes depending on the specification. Blanking cut lengths from wide coil is a very cost effective method of production and as a result we can offer very competitive prices on these products. Please contact the Sales team on sales@hi-span.com or telephone 01953 603081 for further information.

Detailing and Ordering Our own Hi-Detail software is available free of charge and is specifically aimed at clients who do not use the 3-D CAD detailing packages. Hi-Detail has been designed to be exceptionally user friendly and allows the user to detail our complete range of sections and accessories, which can then be emailed directly to us. A Cam data file is then generated and fed directly into the manufacturing system to further reduce customers' lead times. Hi-SPAN cold rolled sections are also available through the 3-D detailing packages, Tekla and Graitec - Autodesk Advanced Steel. Please contact the Sales team on sales@hi-span.com or telephone 01953 603081 for further information.

Quality, Service & CE Marking Hi-SPAN has earned a deserved reputation within the industry for its excellent personal service. Whilst having BS EN ISO 9001 quality managment certification, Hi-SPAN Ltd has implemented Factory Production Control system B and the category of Execution Class 4 to apply due dilligence to the necessary requirements of BS EN 1090-1, enabling Hi-SPAN Ltd to CE mark components for use in structures in compliance with the Construction Products Regulation.

Sustainability As members of the BCSA Sustainability Charter, Hi-SPAN is committed to supporting and furthering it's sustainable development throughout all departments and business activities. Steel is 100% recyclable. Use of recycled steel does not compromise the quality of new steel produced from it. By addressing key issues such as CO2 emissions, product design, recycling of unwanted or waste materials and prudent use of all resources, we intend to remain committed to effectively and responsibly managing our environmental and health and safety arrangements.

Software The new Hi-SPAN design software has been developed in conjunction with the SCI (Steel Construction Institute). All of the standard Hi-SPAN section sizes have had their properties updated in strict accordance with BS EN 1993-1-3. Equally all design methodology has been modernised and is fully compliant with the latest Eurocodes. Wind Load asessments to BS EN 1993-1-4, incorporating BReve databases, can directly apply loads to your design. Also Snow Drifts can be analysed to BS EN 1991-1-3 automatically positioning purlins to acheive the most economical designs.

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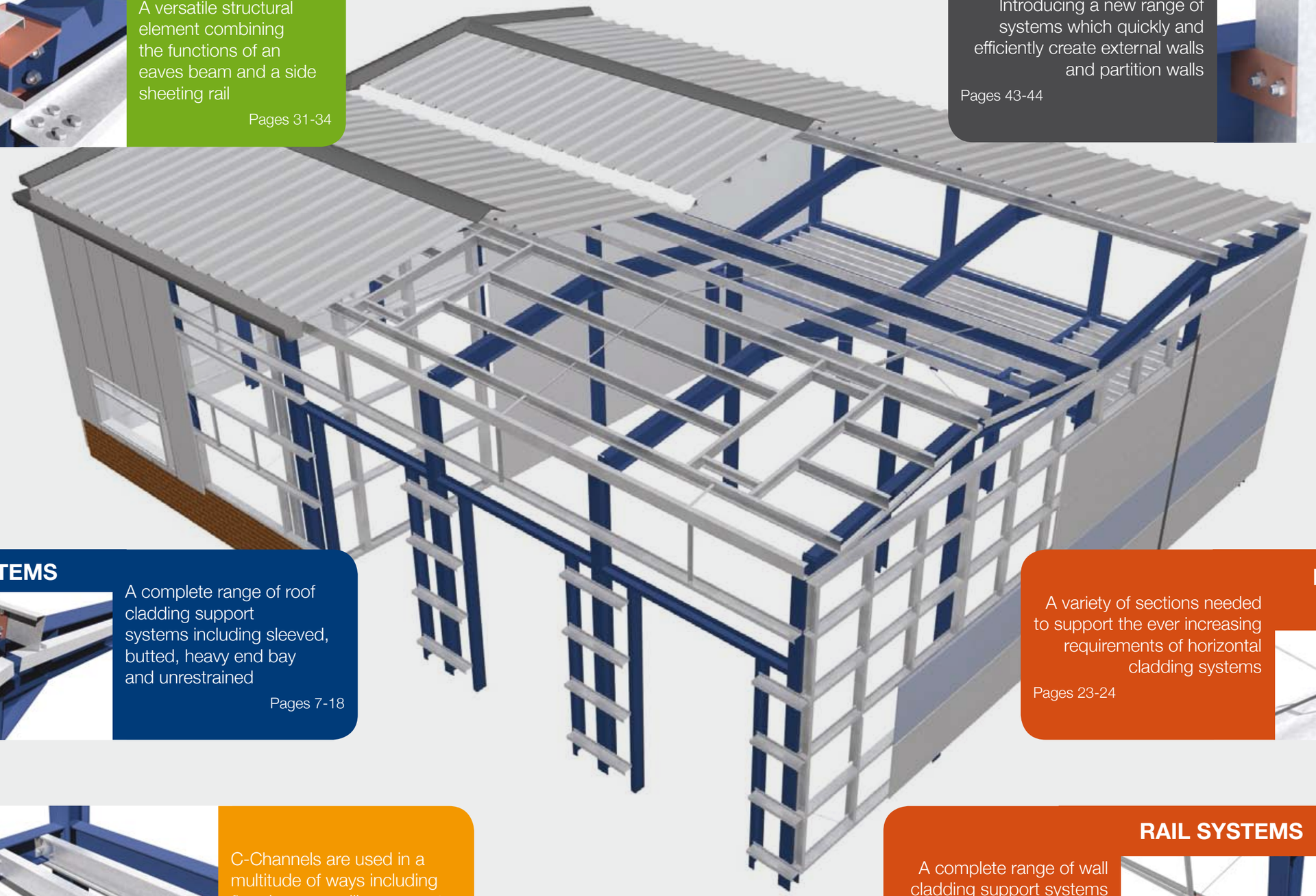

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A complete range of wall cladding support systems including all anti-sag requirements

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PURLIN SYSTEMS

The Sleeved Purlin System is by far the most popular of the zed purlin systems available from Hi-SPAN.
Purlins achieve a high degree of continuity over the supports by employing connecting sleeves over the joints. This means that design bending moments are distributed evenly along the building length, resulting in smaller section sizes and valuable economies achieved.
In the various possible arrangements of single and double span purlins, the Hi-SPAN sleeved system offers the customer low material costs, practical on-site advantages during erection, and excellent building performance thereafter.

Double Span Joint Arrangement

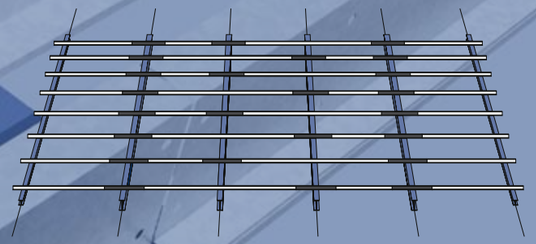
This system combines single and double span purlins with their joints staggered and sleeved. The provision of a sleeve at the un-jointed connections over the penultimate support is required.

Single Span Joint Arrangement

Apart from the penultimate support this system has sleeves at alternate joint positions. Purlins must be continuous over a minimum of two spans using a sleeve, in order to create an end bay situation. (Sleeve arrangement as shown, using single span purlins).

Non Standard Punching Patterns

Additional holes on the standard punchlines will be made as detailed.
Non standard punchlines can be incorporated at no extra charge.



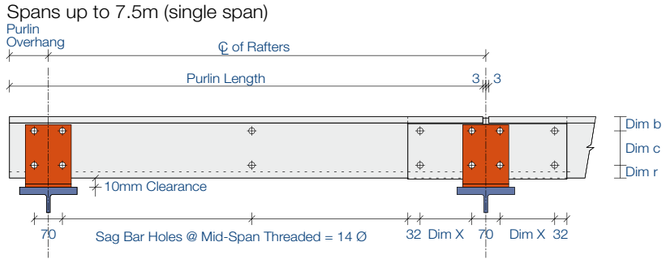
Detailers Notes

- Holes for threaded end sag bars, struts & apex ties are 14Ø, all others are 18Ø.
- There is a standard 10mm gap between the purlin & the rafter line.
- Sleeves are inverted purlin sections.
- Between two separate purlins there is always a 6mm gap.

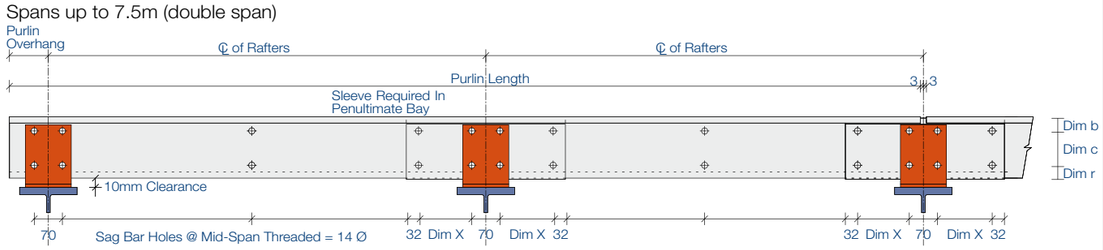
Standard Punching Patterns

These layouts do not imply that all sections are suitable.

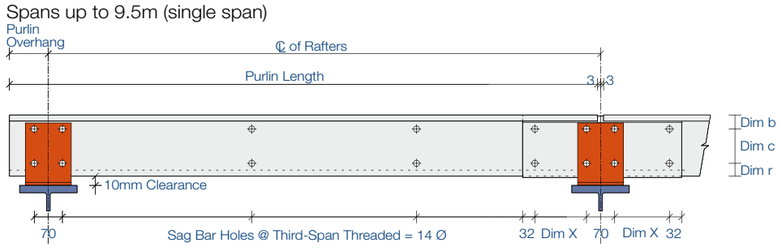
Spans up to 7.5m (single span)



Spans up to 7.5m (double span)



Spans up to 9.5m (single span)



For Anti Sag Details See Page 13 - 14
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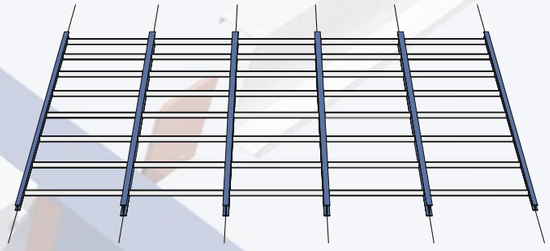
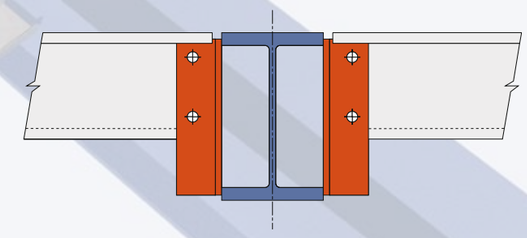
The Butted Purlin System requires no sleeves at the joints between the purlins and is the simplest form of purlin construction.

Utilising, in the main, single span purlins, this system is employed principally on agricultural buildings where design criteria, particularly with regards to deflection, are less onerous. In other classes of building when this form of construction cannot be avoided, appropriate consideraition should be given to this aspect at the design stage.

Butted Joint Arrangement

This system can occasionally involve notched end connections to the purlins due to height restrictions imposed by the Architect. Non-standard cleats are therefore required. Hi-SPAN are capable of incorporating notched ends to both Z sections and C channels, on receipt of details.





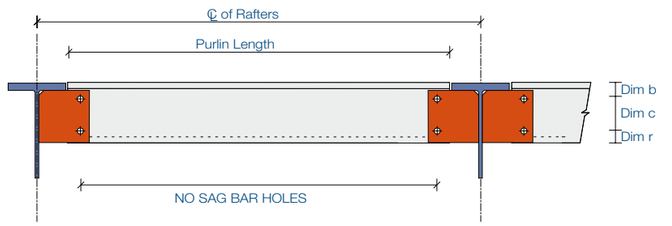
Standard Punching Patterns

These layouts do not imply that all sections are suitable.

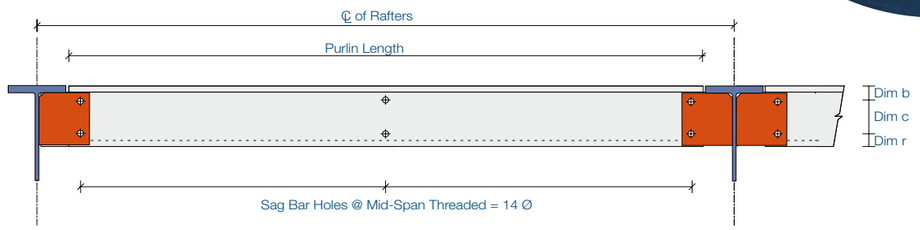
Detailers Notes

- Butted designs do not require continuity through sleeves.
- Cleats for butted purlins are non-standard and therefore produced by the fabricator.
- Maximum purlin length = 15m

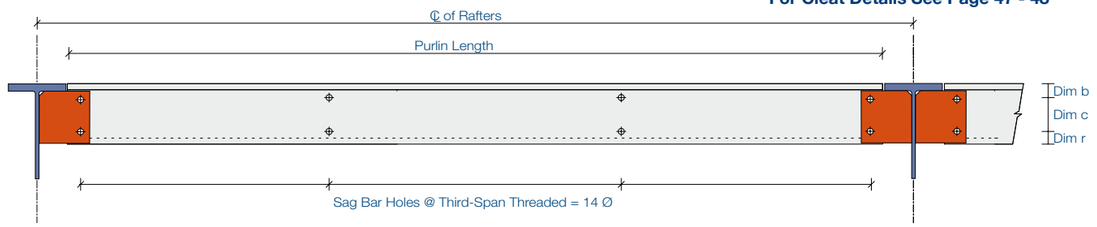
Spans up to 4.6m (duo-pitch only)



Spans Over 4.6m up to 7.6m

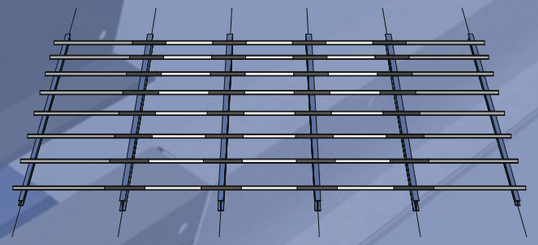


Spans Over 7.6m up to 10.0m



For Gauge Line Details See Page 49 - 51
For Cleat Details See Page 47 - 48

The Heavy End Bay System is the most cost effective purlin system to be made available from Hi-SPAN.
A minimum of five equal bays is required for the system to perform economically with the use of heavier end bay sections. Sleeves are required at every purlin/rafter connection, including any double span purlins.
The system offers a very economical solution to the user in long span multi-bay buildings, because considerable savings can be made in using lighter inner bay purlins, with the added advantage of simple erection procedure.



Single Span Joint Arrangement

End bay purlins and the penultimate sleeves are manufactured from heavier gauge material as shown. Greater end bay moments are then accommodated by the larger section sizes, allowing lighter gauge sections to be designed for the inner bays.

Non Standard Punching Patterns

Additional holes on the standard punchlines will be made as detailed. Non standard punchlines can be incorporated at no extra charge.

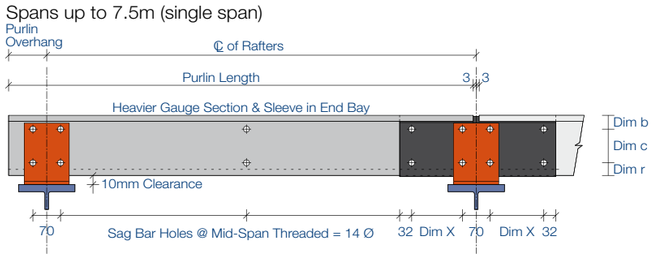
Detailers Notes

- A Heavy End Bay system requires sleeves at every joint.
- The sleeve at the penultimate bay must always be the largest section size.

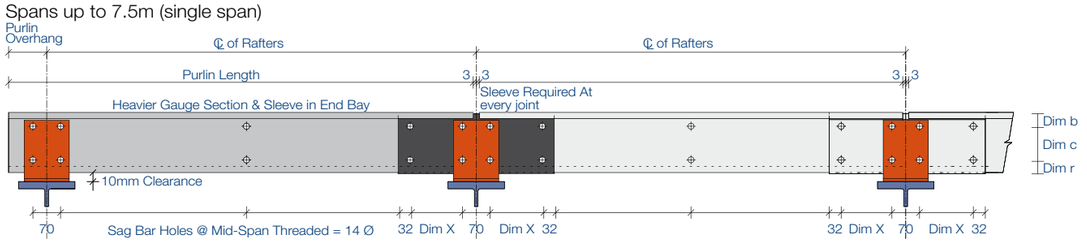
Standard Punching Patterns

These layouts do not imply that all sections are suitable.

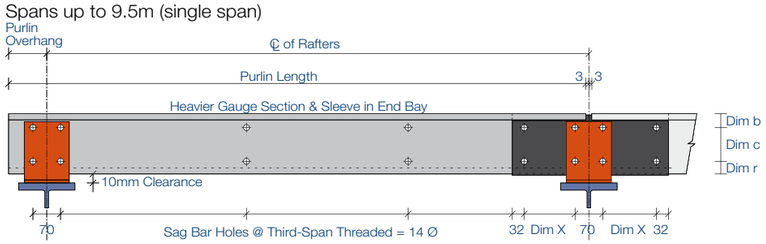
Spans up to 7.5m (single span)



Spans up to 7.5m (single span)



Spans up to 9.5m (single span)



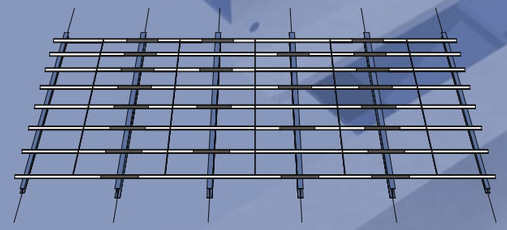
For Anti Sag Details See Page 13 - 14
For Sleeve Details See Page 49 - 51

The Unrestrained Purlin System caters for the wide range of standing-seam and secret-fix cladding systems now available that do not provide adequate lateral restraint to the top flange of the purlins, it is therefore necessary to replace standard sag bars with angle strut braces.
Used in conjunction with rigid apex ties in duo-pitched roofs and appropriate diagonal bracing in mono-pitch roofs, allowable loads for all purlin systems are given in the load tables which are available on the website.

Where a liner tray capable of providing adequate lateral restraint to the purlin top flange is used in conjunction with standing-seam cladding the standard sleeved system can be used.

Restraints

With non-restraining cladding sag bars must be replaced with rigid fix struts in order to restrain the top and bottom flange.



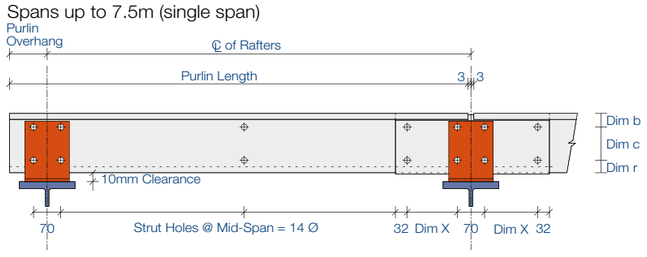
Detailers Notes

- The Unrestrained purlin system requires rigid-fix struts in place of all sag bars.
- Holes for struts and apex ties are 14Ø.

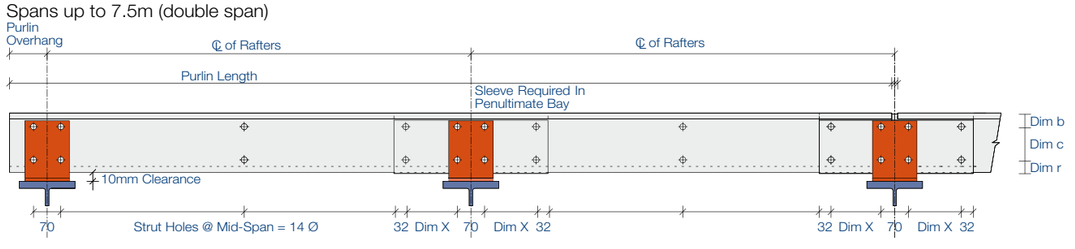
Standard Punching Patterns

These layouts do not imply that all sections are suitable.

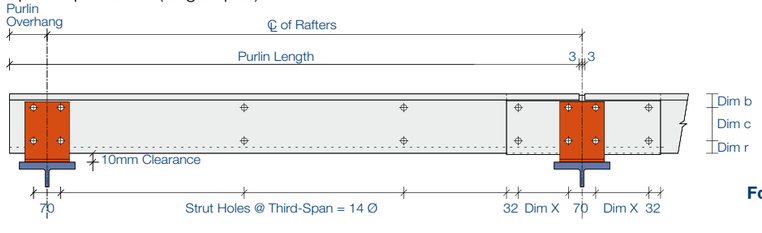
Spans up to 7.5m (single span)



Spans up to 7.5m (double span)



Spans up to 9.5m (single span)



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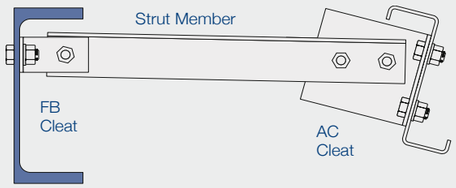
Monopitch Roof System 5 - 25°

If no support can be provided by connection between the uppermost purlin and the main steelwork at mid-span or third points (according to span), we recommend our standard diagonal tie wires are used, fixed at both ends with bracing brackets and a rigid-fix strut, between the top two purlins.

If a purlin spans greater than 3.50m on a monopitch roof system then restraints are necessary. Additional diagonal bracing may be required depending upon the length of the roof slope. Please see page 14 for further details.

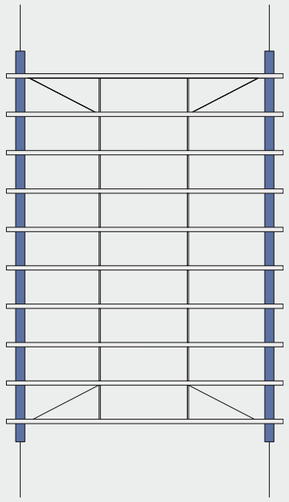
Positive-Fix Detail

Where there is an adequate hot rolled member at the eaves, Hi-SPAN strut members can be used utilising the flexibility of both FB and AC cleats, as shown. This alleviates the necessity for diagonal bracing.



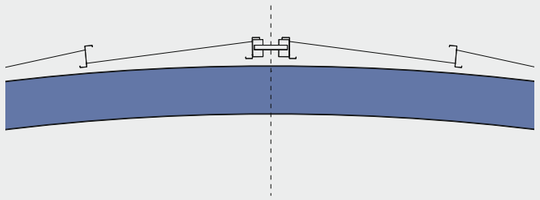
Flat Roof System 0 - 5°

When a roof pitch is less than 5 degrees, rigid-fix struts are used in place of sag bars as the more robust restraint is capable of resisting a small compressive force that may occur with this system. As a further precaution we recommend an additional set of diagonal braces with a reversed orientation as shown in the diagram below.

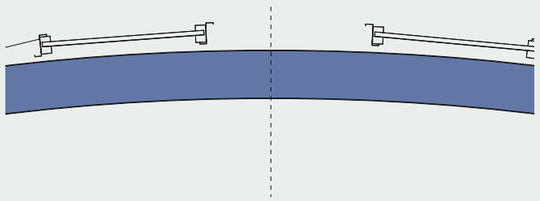


Curved Roofs

The bracing system required for a curved roof depends upon the purlin arrangement. Where the purlins are equally spaced about the ridge the standard bracing for a duo-pitch roof can be used. If the purlins are spaced unevenly, then the roof should be treated as two seperate mono-pitch systems. Therefore each side of the roof has its own set of struts and diagonals.

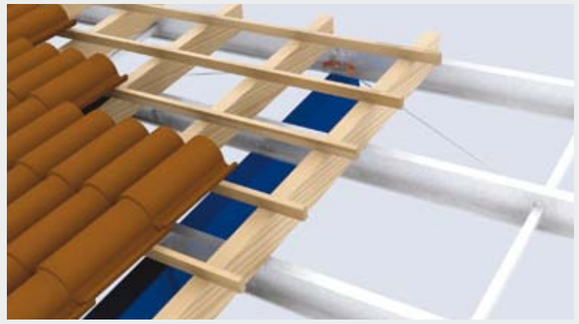


Purlins Spaced Evenly About the Ridge

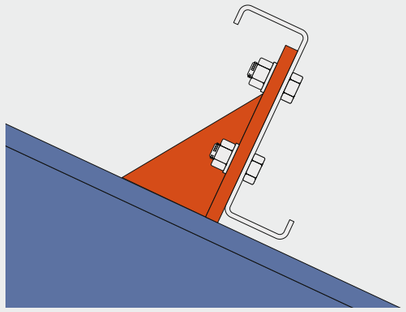


Purlins Spaced Unevenly About the Ridge

To Be Read In Conjunction With Anti-Sag Table on page 14



Stiffened Cleat Connection



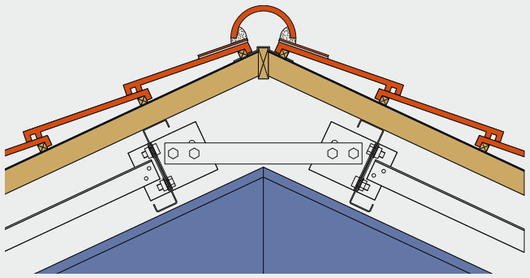
Steep Roof System + 25°

For roof pitches greater than 25° diagonal bracing members are mandatory. These are capable of transmitting the in-plane component of the load. All sag bars are to be replaced with rigid fix struts.
Standard purlin cleats may need to be stiffened or replaced by purpose-made cleats (by others) capable of supporting the in-plane shear load. In addition attention must be paid to the presence of adequate shear strength in the fixing between all the timber rafters and the supporting zed purlins.
Again rigid apex ties are required across the apex.

Tiled / Mansard / Green Roof Systems

Due to increased bi-axial bending caused by the weight of these finishes, we recommend using our rigid fix strut members in place of sag bars. The apex purlins should be tied using the rigid apex tie (see page 14). The top two purlins require diagonal tie wires and brackets. Additional bracing will be required for every 6.0m of roof.
Each timber rafter must be positively secured to each line of purlins by a bolted or screwed fixing detail capable of transmitting the appropriate in-plane shear load.
At the ridge, timber rafters should be joined across the apex or securely fixed to a suitable ridge board.

Rigid Apex Tie



Fibre Cement Sheets:

When designing supports for fibre cement sheets please consider an increased deflection limit of 1/220 as recommended by the manufacturers.

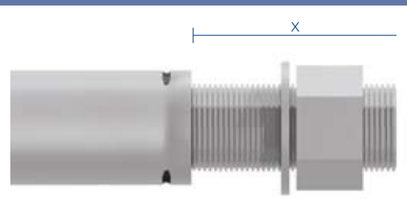
Please follow all the manufacturers installation procedures.

Tubular Sag Bars

Sag bars are used to restrain the bottom flange of a purlin in order to reduce its effective length when exposed to uplift conditions. Where download is critical, with a relatively small uplift the sag bars contribute very little to the structural integrity of the roof. In these situations it is possible to design the section without sag bars. When doing this, care should be taken during the erection of the cladding panels as the purlins are untied between supports, temporary bracing may then be necessary. This addition is left to the cladders discretion.

Threaded Sag Bars

These 19mm diameter flow-coat galvanised and lacquered seamless tubular sag bars are preferred by many consultants and structural engineers: not only for visual effect, but also from a structural point of view. For use with zed purlins up to and including 255 mm deep and on roof pitches of up to 25°. They are sturdy (0.9mm thick) and the zinc plated 12mm dia. threaded end spigots with nut and washer provide a positive fixing. (They are available in three standard lengths 20mm, 32mm and 100mm).



19mm dia

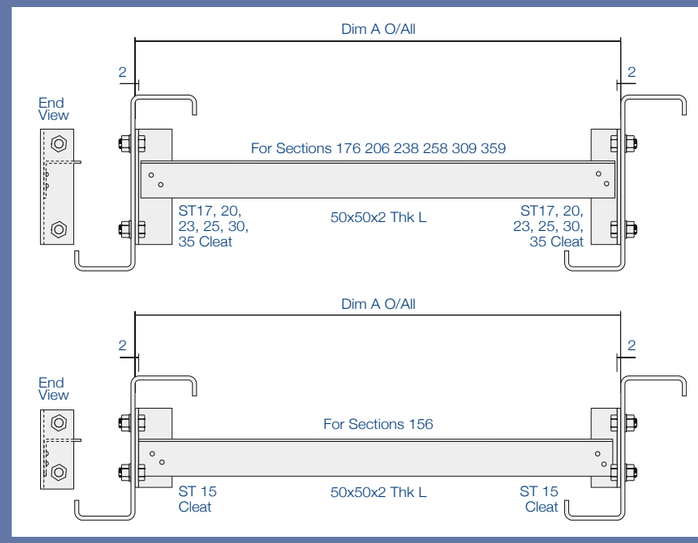
Dim X
20 mm
32 mm
100 mm

Rigid Fix Struts

Manufactured from sturdy 50 x 50 x 2mm thk angle sections with rivetted end cleats, the rigid fix struts can be used where additional lateral and torsional restraint to purlins and rails is necessary.

It is mandatory to employ the rigid fix strut in place of tubular sag bars in a variety of situations.

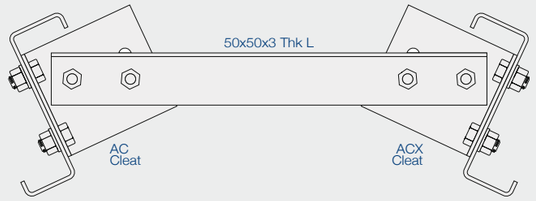
- Roof pitches less than 5 degrees
- Tiled or Green roof constuction
- Roof pitches above 25 degrees
- Unrestrained roofs
- Diagonally braced purlins
- Where purlin centres exceed 2.350m
- Section sizes above 255mm deep



For Gauge Line Details See Page 49 - 51
For Cleat Details See Page 47 - 48

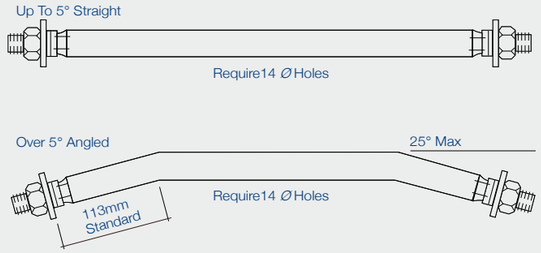
Rigid Apex Tie

The rigid apex tie is made from a thicker angle than the struts for added strength. AC cleats are used either end allowing for roof pitches up to 30°. For steeper roof slopes please contact our Technical Department. Please note, the rigid apex tie should always be used for the 309 and 359 purlin series.

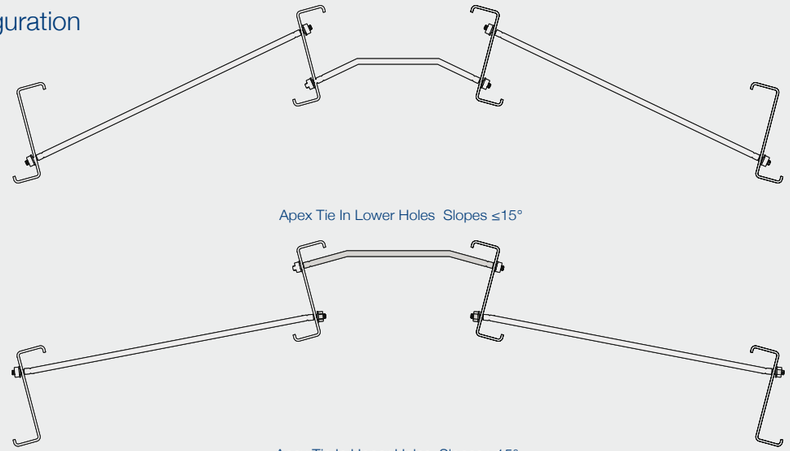


Tubular Apex Tie

These are made from the same material as our standard sag bars and are manufactured to suit the configuration of the ridge purlins. Please note that the minimum distance to a bend is 113mm, and that the maximum angle of bend is 25°.



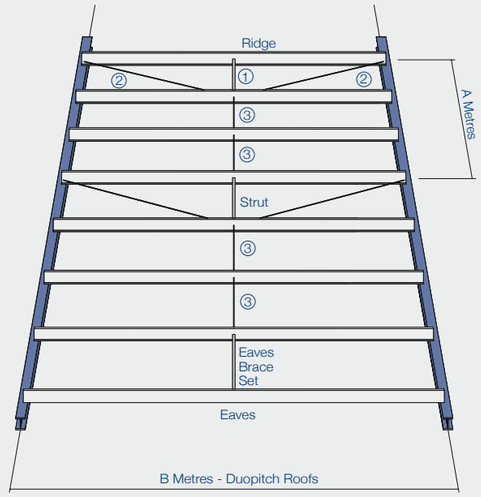
Sag Bar Configuration



Anti-Sag Requirements

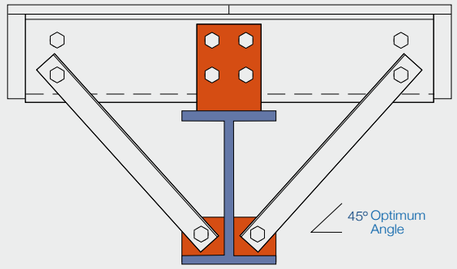
Roof Type	1	2	3	A metres	Apex
Flat	Strut	Diags	Strut	18	N/A
Duopitch 5 - 25°	Sag Bar	N/A	Sag Bar	18	Tubular
Unrestrained 5 - 25°	Strut	N/A	Strut	18	Rigid
Monopitch 5 - 25°	Strut	Diags	Sag Bar	18	N/A
Steep Slope 25°+	Strut	Diags	Strut	14	Rigid
Tiled & Green Roofs	Strut	Diags	Strut	6	Rigid

For Anti-Sag Requirements Per Span Please Contact Our Technical Department



Rafter Stays

Our standard 50 x 50 x 2mm thick angles are ideal for use as rafter stays in most situations and can be cut to any length up to a maximum of 3m. Standard sleeve holes should be used when fixing the stay to the purlin; however non-standard fixing holes can be added where necessary in order to achieve an optimum rafter stay angle of approximately 45°.
In situations where stays are used to restrain lattice girders or deep UB sections, it may be necessary to use larger angle sections. Please note all stay requirements are to be in accordance with the structural engineers design.

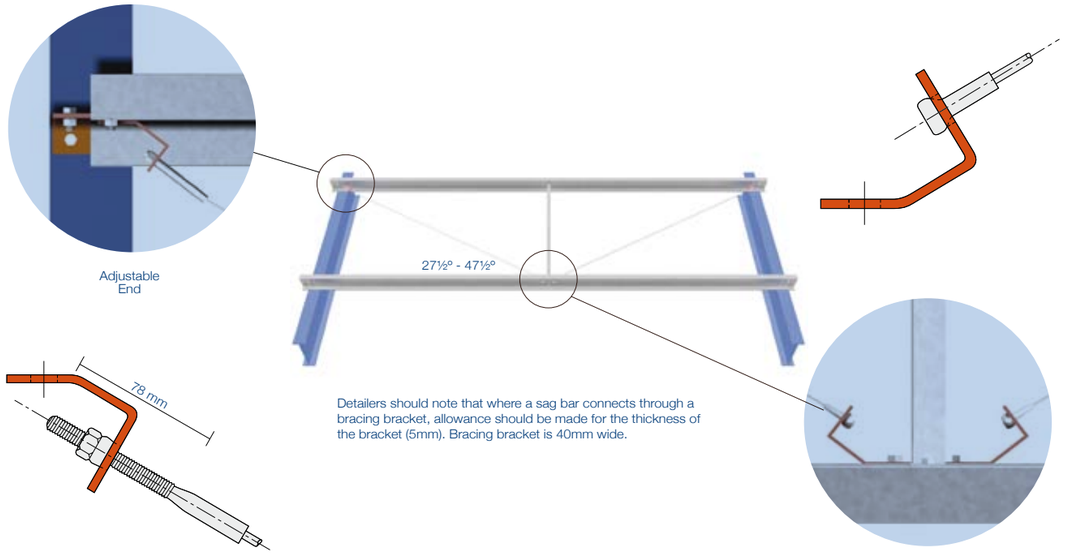


Typical Rafter Stay Application

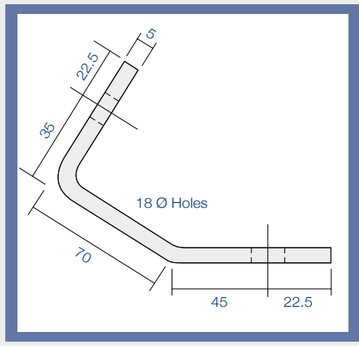
Diagonal Bracing

Diagonal braces are manufactured from seven separate strands of wire rope with an adjustable threaded end, and a fixed 'ball type'end swaged to the wires. For purlin systems diagonal braces are required for flat, monopitch, tiled, and steep roof systems. Where diagonal tie wires are needed struts must be used in place of sag bars to resist any compressive forces, should they occur.

As an alternative to the wire rope brace system, we can also offer a tubular diagonal brace system.
The bracing bracket fixed to the cleat attached to the rafter must use the holes closest to the rafter, whereas the bracket that fixes to the centre of the purlin should fix to the outer holes closest to the cladding.



Detailers should note that where a sag bar connects through a bracing bracket, allowance should be made for the thickness of the bracket (5mm). Bracing bracket is 40mm wide.

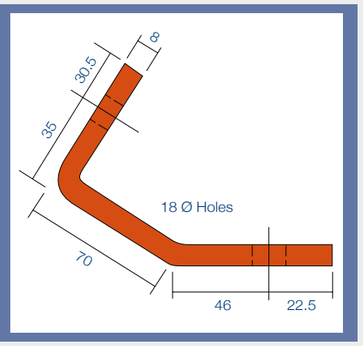


Bracing Bracket

Bracing brackets are manufactured to suit standard slopes of 37½°. When using the 'ball type' washer as per the above detail, the angle can be decreased to a minimum of 27½° or increased to a maximum of 47½°.

Rigid Bracing Bracket

Where there are excessive down slope loads due to high dead loads and steep pitches, 8mm thick material is used. Also where the diagonal angles exceed or are less than the specified max/min slope, rigid bracing brackets should be used.

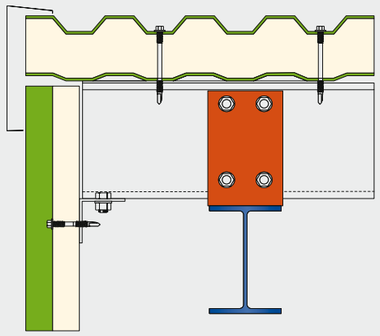


Cleader Rail

Manufactured from 2.0mm pre-galvanised material in 3050mm lengths, these are cut and punched to your requirements. Simple jointing sleeves complete with bolts are provided. All the holes are 18 diameter and are slotted for ease of erection.

Jointing Sleeve

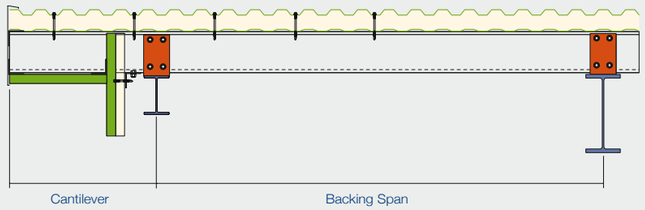
Cleader Rail Joint Detail



Gable End Detail

Cantilever Details

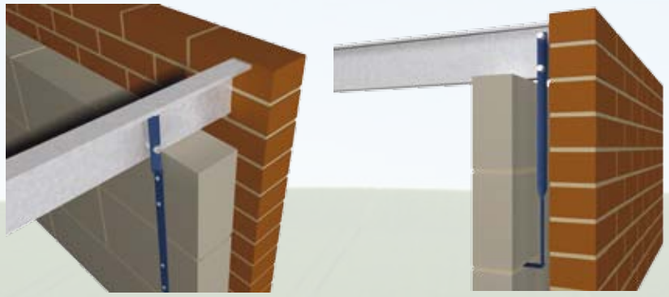
Cantilevered purlins can be used to create small canopies to gable end elevations. Where these are encountered the purlin member must be continuous over the backing span and the cantilever. This helps to minimise deflections to the recommended limits. Cleader angle fixed to the top and bottom of the cantilevered purlin will provide stability and resist rotation. For overhangs greater than 500mm please contact our Technical Department.



Brick Built Structures

Where purlins are to be supported directly on brick walls, particular care must be taken with regard to positioning and alignment of the purlins prior to being built-in. The use of false rafters, fitted with standard purlin cleats, is of considerable assistance in this respect. Sleeved joints should be used where purlins are continuous over intermediate walls. When single span purlins cannot be avoided, please consult our Technical Department.

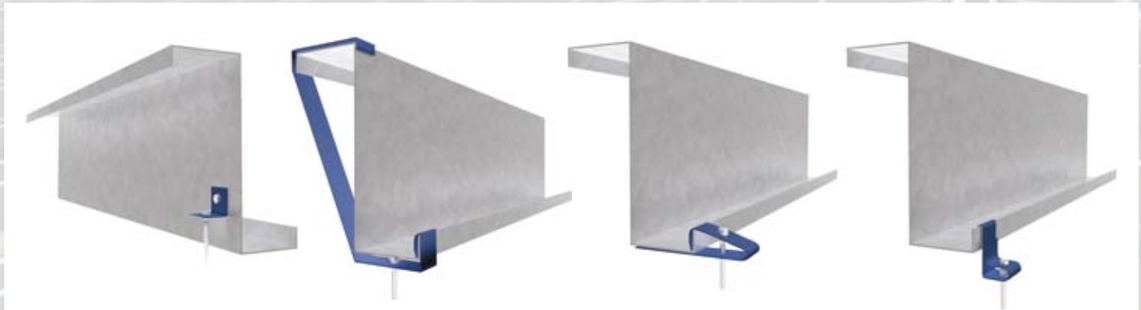
Provision should be made at all supports to restrain purlins against wind uplift by the use of rod or flat anchor straps. Particular attention should be given to gable verges, where 'local zone' values for wind uplift loading should be used for anchor strap design.



Bent flat supplied by others fixed to standard holes and either shotfired or built into blockwork by others. Straps need to be of adequate length with sufficient fixings to resist wind uplift.

Service Clips

Services are often hung from the secondary steelwork in a variety of ways. Hi-SPAN would recommend web fixings or wrap around fixings for loads in excess of 15kg for our sections ranging up to 1.8mm thk, and in excess of 30 kg for our heavier gauge range. When lighter loads require support various forms of clip are available, as shown below. Confirmation of the purlin capacity in a point load condition is always required.



Web Fix (Recommended) | Wraparound Fix | Flange Fix | Lip Fix

Please note clip load capacities published by the manufacturers may exceed the load capabilities of the section. Please contact our Technical Department for further information.

	Material Thickness mm	Weight kg/m²	Weight kN/m²
Steel Cladding			
Solid (Mild Steel)	1.00	7.90	0.077
	0.30	3.00	0.029
	0.40	4.00	0.039
	0.45	4.50	0.044
	0.50	5.00	0.049
	0.55	5.50	0.054
	0.60	6.00	0.059
	0.70	7.00	0.069
Double Skin Steel With Insulation Core		12.2	0.120
Aluminium Cladding			
	0.50	1.60	0.016
	0.70	2.60	0.026
	0.90	3.50	0.034
	1.20	4.10	0.040
Double Skin Aluminium With Insulation Core		6.10	0.060
Fibre-Cement Cladding			
Single Skin		17.00	0.167
9mm		24.00	0.235
Insulated Double Cladding With Battens		30.00	0.294
Over Purlin Linings			
Insulated Fibre Board On Steel Toes	12.50	4.40	0.043
Plasterboard On Steel Toes	9.50	8.30	0.081
	12.50	11.20	0.110
Mineral Insulation Board On Steel Toes	9.50	7.90	0.077
Polyurethane Foam	30	1.00	0.010
Glass Fibre	60	8.40	0.082
	80	11.20	0.110
	100	14.00	0.137
Woodwool Deck			
Channel Reinforcement	50	30.00	0.294
	75	45.00	0.441
Screed			
Sand / Cement	25	59.10	0.580
Vermiculite	25	12.20	0.120
Asphalt	12	26.53	0.260
	25	55.26	0.542
Bitumen Roofing Felts			
Mineral Sufaced Bitumen		3.50	0.034
3 Layers Including Chippings		29.60	0.290
Chippings		20.00	0.196
Timber Boarding	12	7.10	0.070
Chipboard	12	7.10	0.070
Plywood	12.70	8.90	0.087
	20.00	14.00	0.137
Tile Weights			
Plain Tiles (Concrete or Clay)		71.40	0.700
Interlocking		56.10	0.550
Natural Slate		30.60	0.300
Cambrane (Resin)		17.30	0.170
Blockwork			
Concrete, Solid (Stone Aggregates)	25	55.00	0.540
Concrete, Hollow	25	34.70	0.340
Aerated	25	15.00	0.147
Sedum / Green Roof			
Decking		24.16	0.237
Waterproof Membrane		4.50	0.044
Insulation		35.00	0.343
Roof Barrier		4.50	0.044
Drainage Layer		40.00	0.392
Sedum / Green Mat		44.00	0.432
Lead	2.5	30.00	0.294

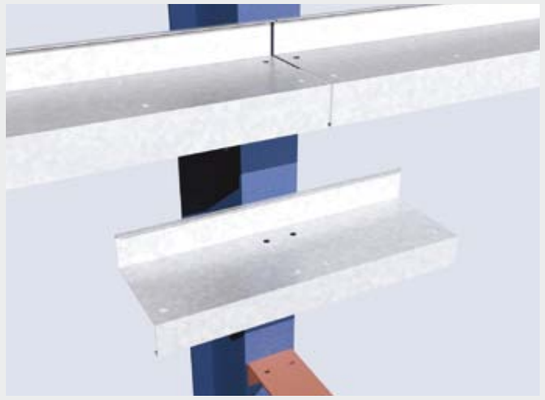
Timber Joists, Rafters & Battens Assumed Density 540kg/m³

Size of Timber mm	Spacing 400mm	450mm	600mm
38 x 50	0.03	0.02	0.02
38 x 100	0.05	0.04	0.03
38 x 150	0.08	0.07	0.05
50 x 75	0.05	0.04	0.03
50 x 100	0.07	0.06	0.04
50 x 150	0.10	0.09	0.07
50 x 200	0.13	0.12	0.09
75 x 200	0.20	0.18	0.13
75 x 225	0.22	0.20	0.15
75 x 250	0.25	0.22	0.17

kN/m2

The above information is for general guidance only and Hi-SPAN accept no liability for the accuracy of the figures. Where exact weights are required, reference to manufacturers' own data should be sought.

RAIL SYSTEMS



In the Sleeved Rail System the rails run past the faces of the columns. The section depth of the rail plus the clearance required for a standard fixing cleat determine the minimum dimension from the column face to the inside of the vertical cladding.
Joints in the rails are sleeved to give continuity, allowing the use of more economical sections and giving an improved deflection performance.

Double Span Joint Arrangement

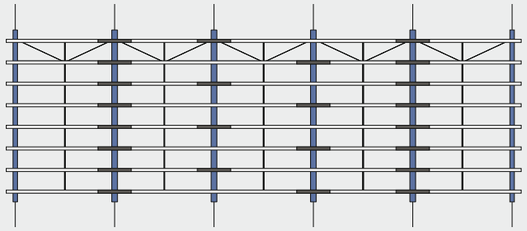
This system combines single and double span rails with their joints staggered and sleeved. The provision of a sleeve at the un-jointed connections over the penultimate support is required.

Single Span Joint Arrangement

Apart from the penultimate support this system has sleeves at alternate joint positions. Rails must be continuous over a minimum of two spans using a sleeve in order to create an end bay situation. (Sleeve arrangement as shown, using single span rails).

Non Standard Punching Patterns

Additional holes on the standard punch lines will be made as detailed. Non standard punch lines can be incorporated at no extra charge.



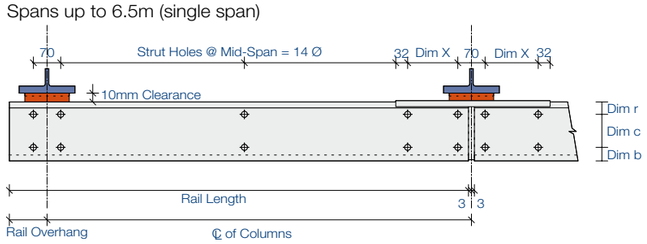
Detailers Notes

- Holes for struts & apex ties are 14Ø, all others are 18Ø.
- There is a standard 10mm gap between the rail & the column line.
- Sleeves are inverted rail sections.
- Between two separate rails there is always a 6mm gap.

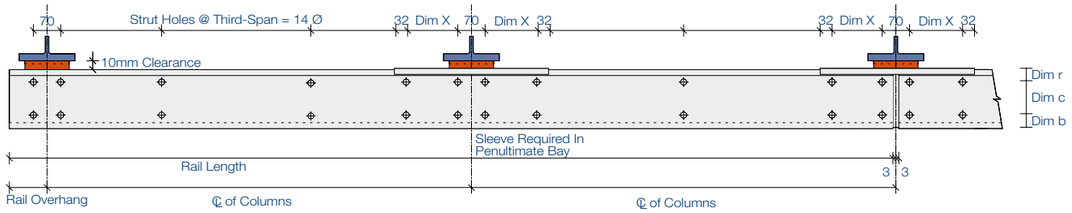
Standard Punching Patterns

These layouts do not imply that all sections are suitable.

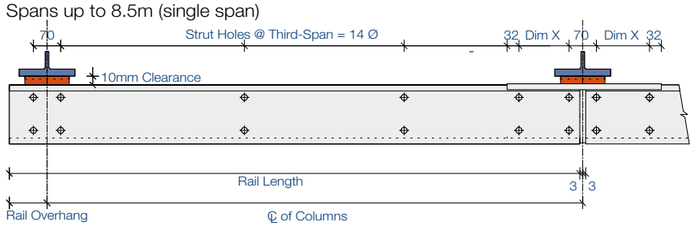
Spans up to 6.5m (single span)



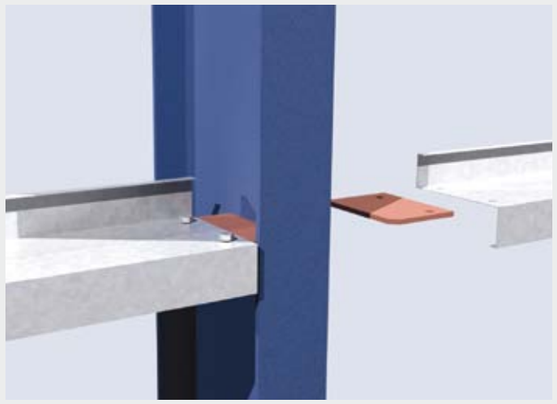
Spans up to 7.5m (double span)



Spans up to 8.5m (single span)



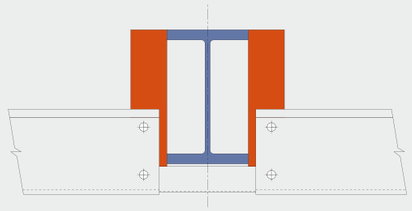
For Anti Sag Details See Page 27 - 28
For Sleeve Details See Page 49 - 51



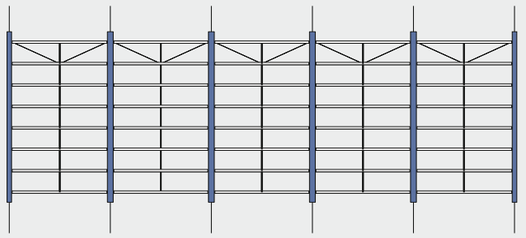
The Butted Rail System gives the engineer more freedom to specify the line of the vertical cladding in relation to the column face, regardless of the depth of the side rail. As the rails are single spans, simply supported between the columns, they can be positioned to suit architectural details, rather than be governed by the section depth of continuous rail systems that must pass across the column faces.
Note: Where damage to finishes might arise from the effects of deflection in side rails, or where rails are intended to provide lateral restraint to the tops of brick walls, deflection design checks should be carried out, with the use of the Hi-SPAN Design Suite.

Butted Joint Arrangement

This system can occasionally involve notched end connections to the rails due to width restrictions imposed by the Architect. Non standard cleats are therefore required. Alternatively an angle filler can be used to bridge the gap between the rails, as shown.



Angle Filler By Hi-SPAN



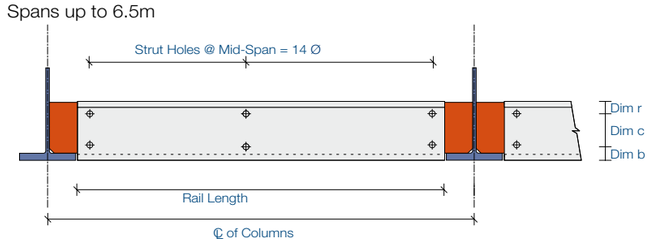
Detailers Notes

- Butted designs do not require continuity through sleeves .
- Cleats for butted rails are non-standard and therefore produced by the fabricator.

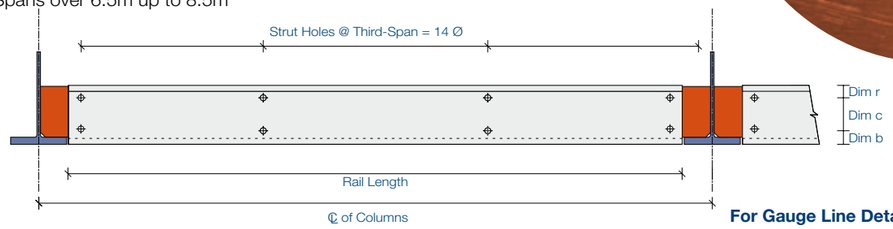
Standard Punching Patterns

These layouts do not imply that all sections are suitable.

Spans up to 6.5m

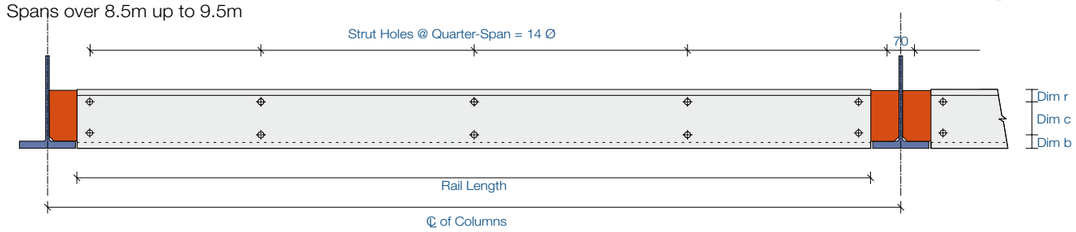


Spans over 6.5m up to 8.5m

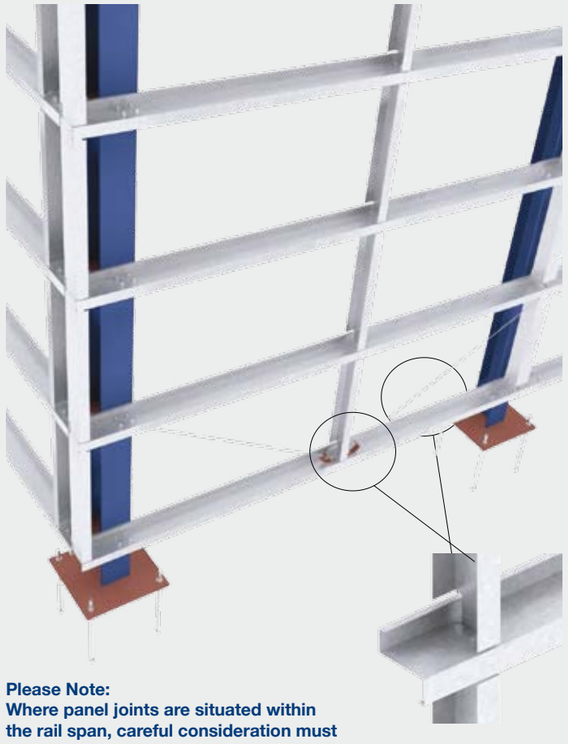


For Gauge Line Details See Page 49 - 51
For Cleat Details See Page 47 - 48

Spans over 8.5m up to 9.5m



All The Above Details Are Applicable To The C-Channel Butted Rail System



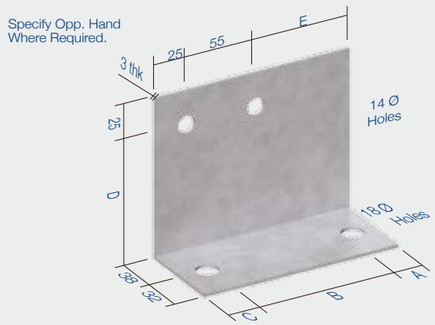
WCP Formed End

Please Note:
Where panel joints are situated within the rail span, careful consideration must be made to the bracing system. Please contact the Technical Department for further details

Vertical Cladding Rails

The Vertical Cladding Rail section used in conjunction with the Window Channel Pressing provide a suitable solution to the increasing need for horizontal cladding support.

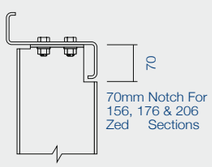
Whilst the WCP section acts as an intermediate support, the VCR has a larger 140mm fixing face to accommodate two panels at joint positions. These joints usually occur at column positions, where the VCR can be fixed directly to the column using hot rolled cleats, by others. Alternatively the following cleats can be arranged to suit any Hi-SPAN rail configuration. These are also used when the joint line falls within the span.

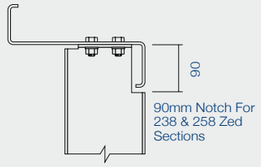


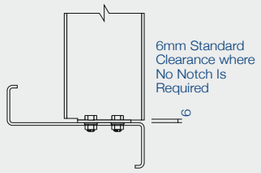
Cleat	DIM A	DIM B	DIM C	DIM D	DIM E
VR15	20	67	18	100	25
VR17	20	87	18	100	45
VR20	18	116	21	100	75
VR23	20	146	19	120	105
VR25	22	146	32	120	120
VR30	22	196	32	140	170
VR35	22	241	32	140	215

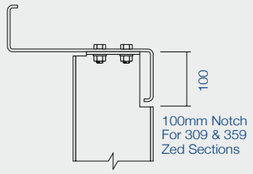
Notch Details

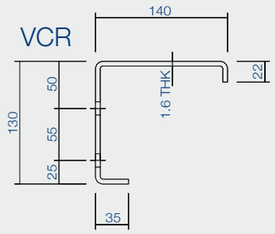
The details shown are our standard notch dimensions required when installing WCP's into any of the Hi-SPAN range of section sizes. Variations to these standard notches can also be manufactured upon receipt of details.

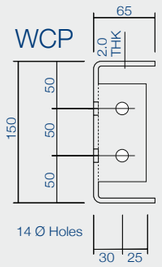












Maximum Span

The WCP and VCR section sizes have been designed to suit standard 1.8m rails centres. They have the capacity to span up to 2.0m but beyond this we recommend you consult our Technical Department.

Window Channel Pressings

The Window Channel Pressing has been introduced to provide an economic alternative to vertical channel sections with cleats.

The WCP is used to trim window openings, and also as an intermediate fixing face where vertical members have to remain within the rail zone for architects' requirements. Previously a standard vertical channel section with its respective cleats has been used in these situations.

The WCP's autoformed end removes the need for on-site assembly of cleats. The section also utilises a thicker material gauge, therefore removing the need for lips, which reduces manufacturing costs.

Non-Standard VCR's & WCP's are available upon request, please contact our Technical Department

Top Hat Sections

The Top Hat section offers a more economical solution for secondary supports to horizontal cladding. This is achieved by using a trapezoidal profiled section to span across multiple rails, to a maximum of 4.0m. After this the introduction of a sleeve is required.

Savings are made through reduction in cleats as the section bolts directly to the outer flange of the rails; cost effective profile with low manufacturing costs; and quicker erection procedures because of reduced member numbers.

The Top Hat section is available in two sizes, TH70 and TH140. The TH70 has a 70mm fixing face and is used for intermediate support to the cladding panels between joints. The TH140 has a 140mm fixing face as recommended by cladding manufacturers for panel joint connections.

Additional Restraint

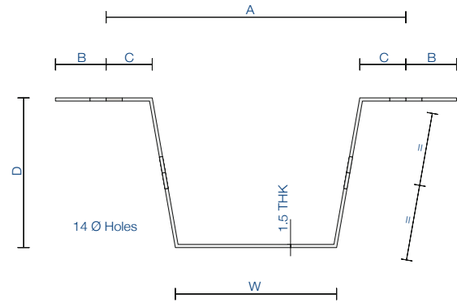
In order to provide restraint to the inner flange of the rail section strut members must be placed directly behind the Top Hat section. These are only required within the span.

Maximum Span

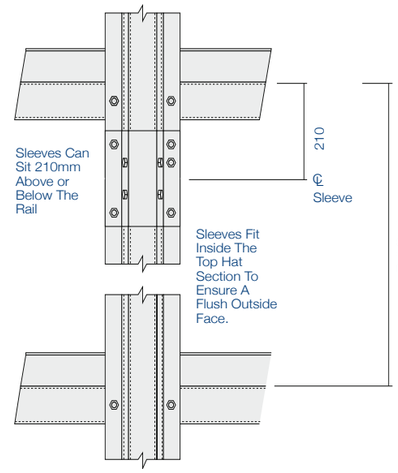
The Top Hat sections have been designed to suit standard 1.8m rails centres. They have the capacity to span up to 2.0m but beyond this we recommend you consult our technical department.

Non-Standard Top Hat's are available upon request, please contact our Technical Department

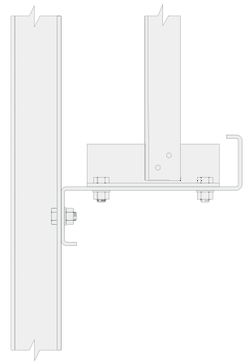
Top Hat



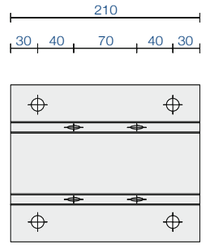
Section Ref.	DIM D	DIM W	Standard Punching Lines A	B	C
TH70	65	70	130	22	20
TH140	65	140	200	25	20
THSL70	65	64	130	22	23
THSL140	65	134	200	25	23



Sleeve Configuration



Top Hat Sleeves



Firewall Sleeves

To conform to the Building Regulations it is sometimes necessary to provide a fire resistant wall construction.

A number of wall cladding systems are available for use in this context, which can be used in conjunction with unprotected cold rolled side rails.

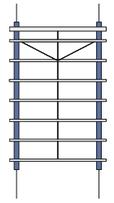
In order to minimise the effect of expansion of the rails on the integrity of the wall construction single span butted rails can be used with slotted cleat connections. Alternatively slots can be punched into the rail sections themselves with increased end clearance. By using this method savings are made on the cleat manufacture without compromising the effectiveness of the expansion mode.

To assist the expansion movement of the rail under fire conditions, thermoplastic washers should be fitted between the bolt head and the rail interface.

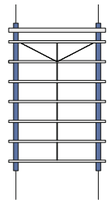
The wall cladding construction employed will determine the period of fire resistance. This information should be obtained from the appropriate cladding manufacturers. Please ensure that the cladding manufacturers requirements are adhered to.

For Gauge Line Details See Page 49 - 51

Eaves Beam Fire Protection



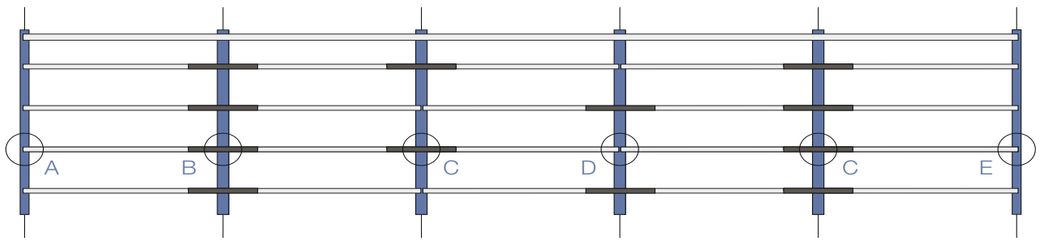
Where rails are affixed to the eaves beam the eaves member will require fire protection.



Where eaves beams do not provide support to the rails no further steps need to be taken.

Uneven Bay Layout

In situations where there is an uneven number of bays a single line of Hi-SPAN firewall sleeves will be required in order to achieve continuity and avoid expensive single span end bay rails. Even bays can adopt a standard single span sleeved system, with a slotted connection to the non-sleeved end.



Standard side rail cleat, M16 bolts and steel washers

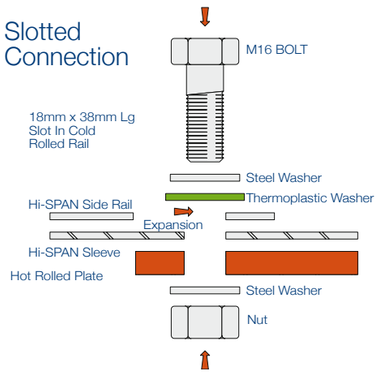
Slotted connection required at this joint to allow expansion in one end of each rail.

Standard sleeve to suit section size at rails, no slots are required at this joint

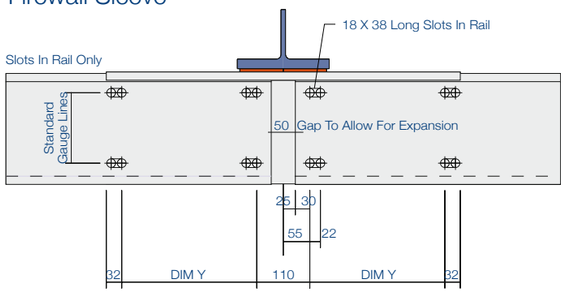
Slotted holes in Hi-SPAN rail

Slotted holes in Hi-SPAN rail

Slotted Connection



Firewall Sleeve



For Firewall Sleeve Dimensions See Page 49 - 51

Window Openings

When windows are called for in side and gable cladding, Hi-SPAN C-Channels provide an ideal solution for window headers, sills and trimmers.

Standard strut braces and diagonal ties form the load bearing system (above and below the window opening where necessary) and the use of special packing plates with countersunk holes at the strut/rail connections, and M12 countersunk fixing bolts, provides a flush finish and a clear dimension between rails.

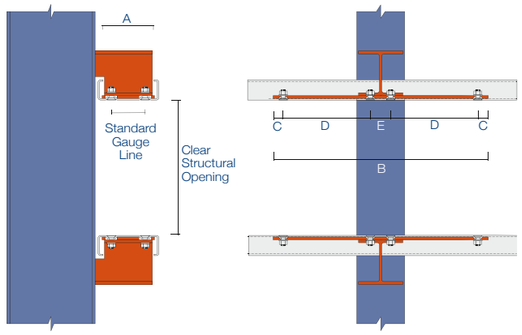
Fixing cleats for vertical trimmers using our range of TC cleats, are countersunk similarly to also maintain a clear opening width.

Cill Head Plate Detail

In situations where a window head/sill continues past the column face a standard channel sleeve cannot be used as the fixings will protrude into the clear opening. Continuity is still required across the face of the column, in order to distribute moments about the joints. This is achieved by introducing a hot rolled 'A' x 8mm FLT x 'B' long.

The hot rolled plate can achieve the same moment capacity as the cold rolled C-Channel assuring no failure will occur. It requires 8 No. 18 dia countersunk holes to continue the flush finish across the head/sill of the window.

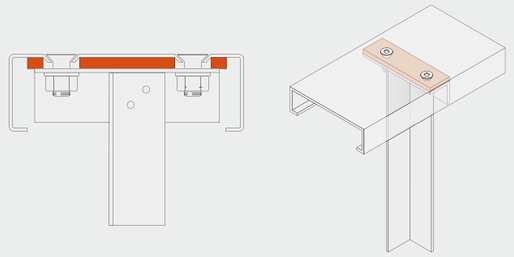
The detail shown is a recommended solution to overcome this particular situation; the dimensions are to suit standard punching holes. Final details and fabrication are not the responsibility of Hi-SPAN.



Series	A	B	C	D	E
156	130	590	35	225	70
176	150	590	35	225	70
206	180	740	35	300	70
238	210	740	35	300	70
258	210	940	35	400	70
309	260	1340	35	600	70
359	304	1530	35	695	70

Counter Formed Plate Detail

In order to avoid countersunk cleats to strut members above or below windows, CFP plates can be used. These plates have oversized 32mm diameter holes which accommodate a standard 18mm diameter counter formed hole in the channel section. The bolt thread continues through the plate to the strut cleat, where it is fixed.



Window Channel Pressings

For window jambs and headers. The Hi-SPAN WCP section is an ideal member. If rail centres exceed the height of the window, a WCP can be used to form a header or sill.

Anti-Sag Systems

These are necessary to ensure that the rails line level along the length of the building and also provide torsional restraint to the unrestrained flange. The system consists of a continuous line of struts at either mid, third or quarter points along the rail span. In order to support the rails against vertical deflection diagonal tie wires are required. Where a hot rolled structural member of adequate strength is used as an eaves beam, the anti-sag system can be suspended from it therefore removing the necessity of the wires.

Additional Diagonals

Further sets of diagonal bracings are required at the following dimensions.
Dim H = 10m for metal cladding and 7.5m for fibre cement.

Rigid-Fix Struts

Rigid-fix struts are manufactured from 2.0mm pre-galvanised material, which is connected either end to ST cleats.

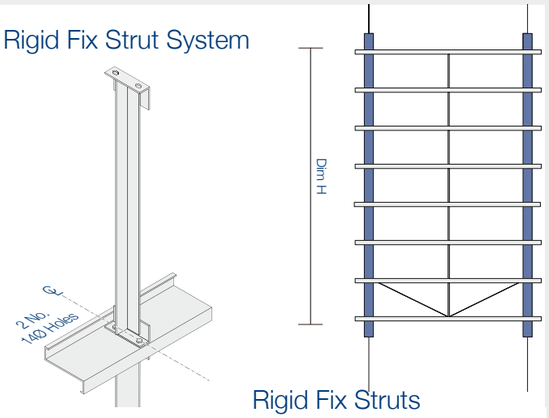
Anti-Sag Requirements

Restraints should be provided to suit the various span and sheeting conditions shown in the table below. For other forms of cladding please consult our Technical Department.

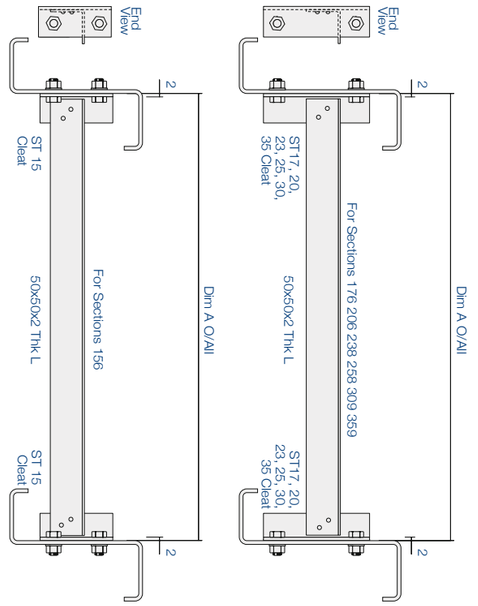
Spans Up To	Metal Sheeting	Fibre Cement Sheeting
3.0m	N/A	N/A
4.5m	Mid-Span	Mid-Span
6.5m	Mid-Span	⅓ span points
8.0m	⅓ span points	⅓ span points
10.0m	¼ span points	N/A

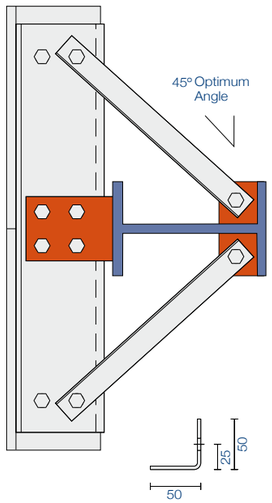
For Gauge Line Details See Page 49 - 51
For Cleat Details See Page 47 - 48

Rigid Fix Strut System



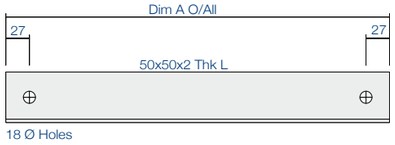
Rigid Fix Struts





Column Stays

Our standard 50 x 50 x 2mm thick angles are ideal for use as column stays in most situations, and can be cut to any length up to a maximum of 3m. Standard sleeve holes should be used when fixing the stay to the rail; however non-standard fixing holes can be added where necessary in order to achieve an optimum column stay angle of about 45°.
In situations where stays are used to restrain deep UB sections, it may be necessary to use larger angle sections. Please consult our Technical Department.



Typical Column Stay Application

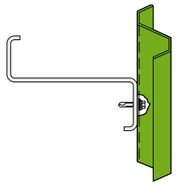


Diagram 1
For metal sheeting fixed with self-tapping screws.

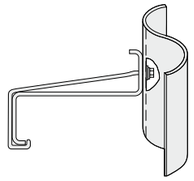


Diagram 2
For fibre cement or similar cladding using cranked or close bent hook bolts

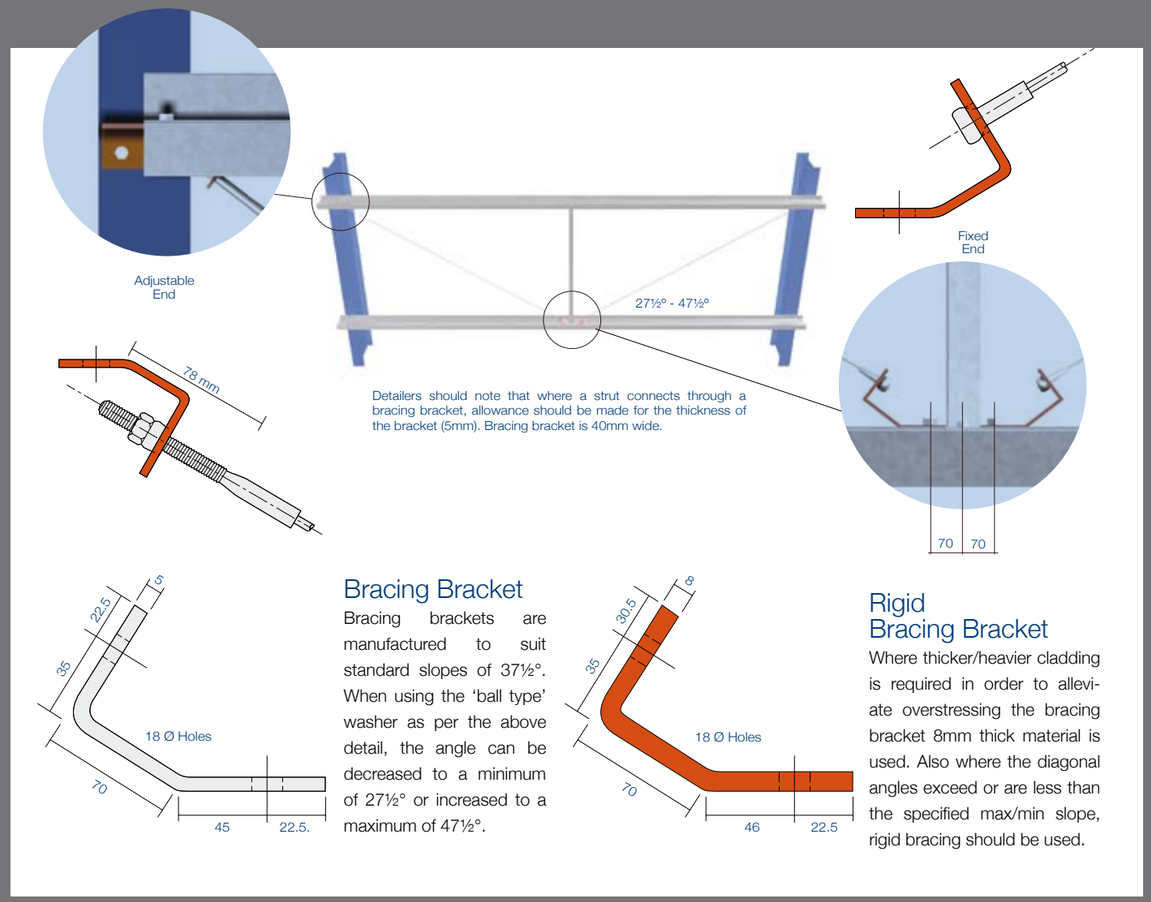
Rail Configuration

Metal sheeting is normally fixed using self tapping screws, as shown. Where fibre cement sheeting is specified, rails should always be fixed with the external flange facing upwards, in order for the hook bolts to wrap around the inner flange.

Diagonal Bracing

Diagonal braces are manufactured from seven separate strands of wire rope with an adjustable threaded end and a fixed 'ball type' end swaged to the wires. For all rail systems diagonal braces are required to support the rails against sagging under their own self-weight about the minor axis. Where struts can be fixed back to an adequate hot rolled eaves member, the diagonal braces are not required. With a strut anti sag system the diagonals can be placed anywhere in the bay, but we recommend between the bottom lines of rails as this will aid erection.

Additional sets of diagonal braces are needed according to the meterage of cladding they must support. As a rule each set can support up to 10m of metal cladding, or 7.5m of fibre cement sheeting. After this further braces are required. (As an alternative to the wire rope brace system, we can also offer a tubular diagonal brace system).
The bracing bracket fixed to the cleat attached to the column must use the holes closest to the column, whereas the bracket that fixes to the centre of the rail should fix to the outer holes closest to the cladding.



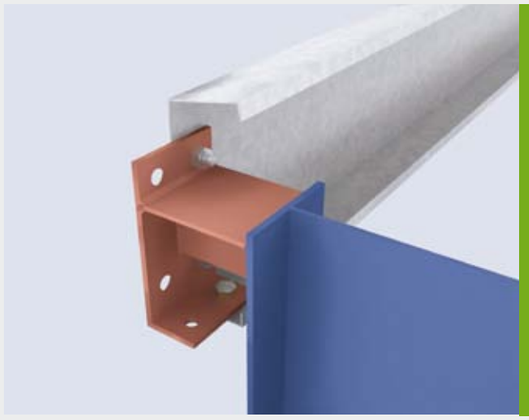
Bracing Bracket

Bracing brackets are manufactured to suit standard slopes of 37½°. When using the 'ball type' washer as per the above detail, the angle can be decreased to a minimum of 27½° or increased to a maximum of 47½°.

Rigid Bracing Bracket

Where thicker/heavier cladding is required in order to alleviate overstressing the bracing bracket 8mm thick material is used. Also where the diagonal angles exceed or are less than the specified max/min slope, rigid bracing should be used.

EAVES BEAM SYSTEMS



Eaves Beams

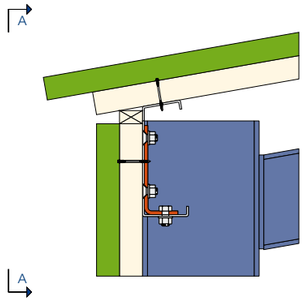
The Hi-SPAN Eaves Beam is a versatile structural element combining the functions of an eaves purlin and a side sheeting rail, column tie and gutter support.

Designed to cater for spans up to 12.0m, it is available in four depths of varying thicknesses with an angled top flange giving a choice of roof slopes 0°, 5°, 10°, 15°, 22.5°, and 30°.

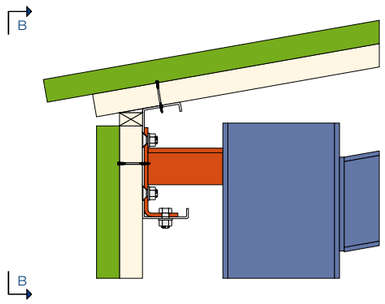
All design calculations are based on a single span condition therefore removing any need for continuity between spans. Loading combinations and section properties are all calculated in accordance with BS 5950: Part 5: 1998.

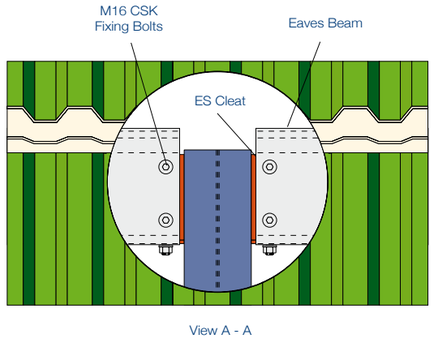
Web and flange holes can be manufactured with counter formed holes in order to suit flush face details.

Flush Face Detail

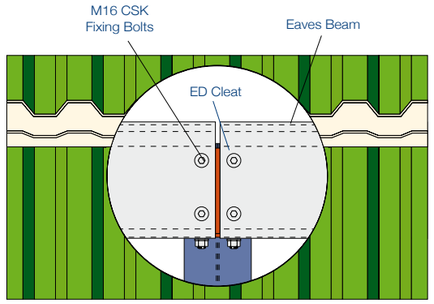


Outstand Detail





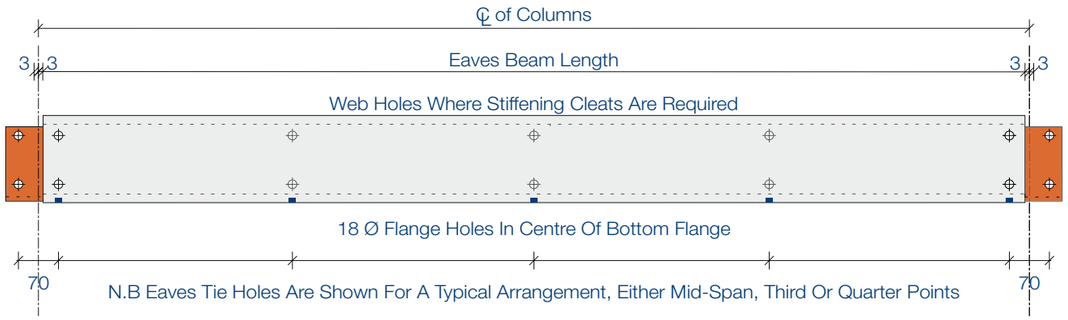
View A - A



View B - B

Standard Punching Patterns

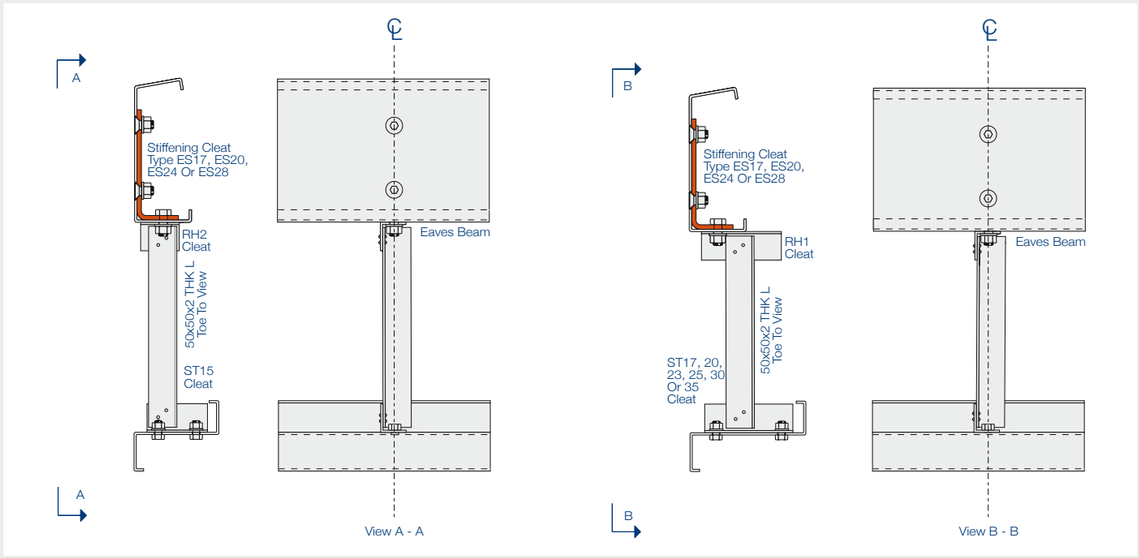
This layout does not imply that all sections are suitable



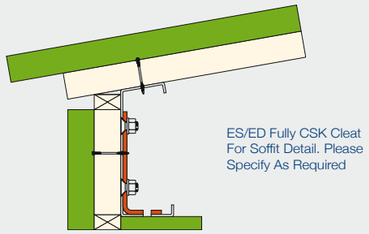
Eaves Hanger Struts

Side rail systems are normally supported on their weak axis by the inclusion of diagonal tie wires. Occasionally it is possible to hang side rails from the bottom flange of the eaves beam, therefore removing the necessity for the wires. For this reason a stiffening cleat is incorporated in the Eaves Brace Set, see page 33. When an eaves beam is used to support the side rail system, it becomes an essential part of the wall system, and therefore will require fire protection in a fire boundary wall situation.

Typically the hanger strut is used where there is only one number side rail below the eaves beam, and it is not possible to incorporate the diagonal tie wire system.



Eaves Soffit Detail



Eaves Soffit

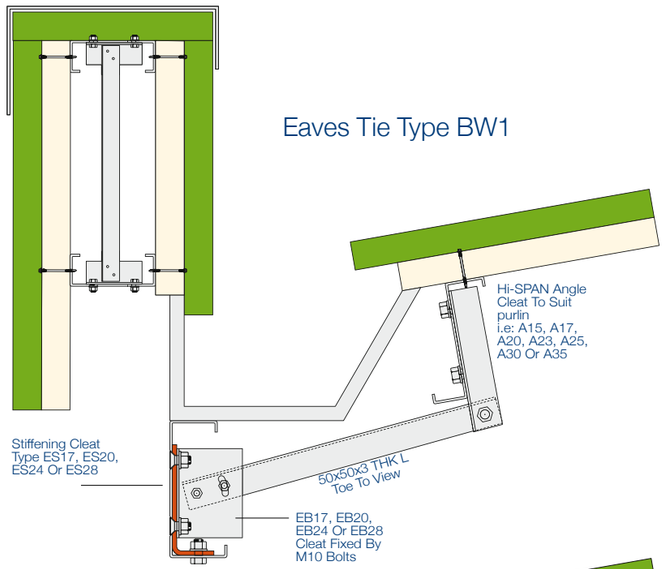
When a situtuaiton arises that requires a flush finish to the soffit it may be necessary to omit the bolt in the bottom flange hole. The stiffening cleat provides additional strength to the eaves member when supporting vertical loads as explained above. If the soffit detail is flush with the bottom flange of the eaves beam there is no longer a vertical load to support and therefore the fixing is no longer required.

For Gauge Line Details See Page 51
For Cleat Details See Page 34

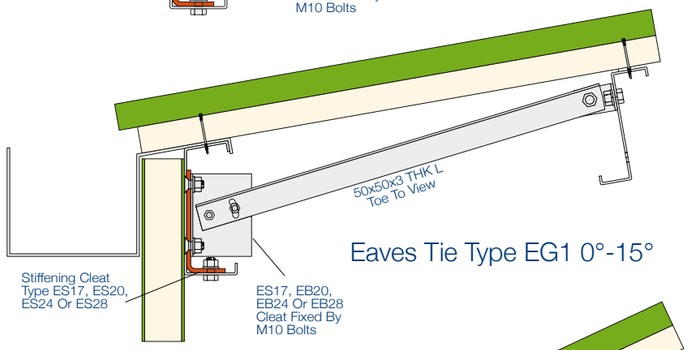
Eaves Brace Sets

Restraint to the eaves beam is required within the span, either at mid-span, third or quarter points according to design requirements. This can be evaluated using the Hi-SPAN Design Suite. With each brace set a stiffening cleat is needed to provide rigidity to the web of the member. The eaves brace member is fixed back to the first purlin up the slope, this construction reduces the effective span of the eaves member against horizontal wind forces. The inclusion of the brace set also helps to resist torsion on the eaves beam when the gutter is positioned outside of the building envelope. Section sizes calculated using the Hi-SPAN Design Suite assume that the compression flange of the eaves beam is fully restrained by the sheeting or gutter member.

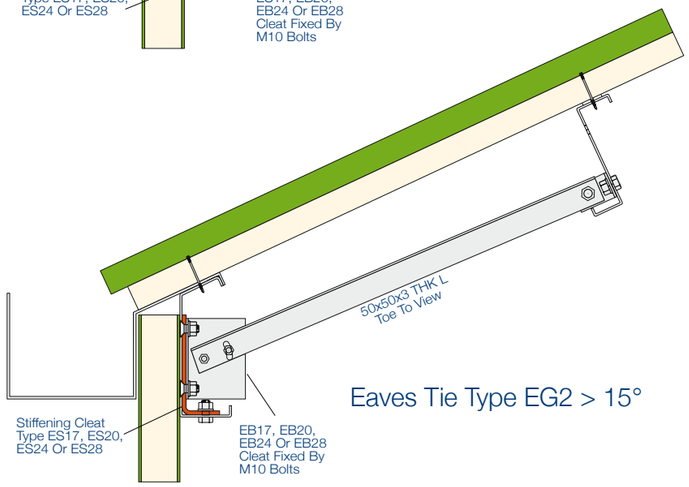
Eaves Tie Type BW1



Eaves Tie Type EG1 0°-15°



Eaves Tie Type EG2 > 15°



Eaves Tie Type BW1

The eaves tie type BW1 is suitable where there is a boundary wall gutter directly on top of the eaves beam. Due to the nature of this construction the standard restraint between the eaves beam and the purlin is no longer possible. An additional angle cleat is required in order to offset the restraint member below the gutter sole. This particular detail can vary greatly between jobs and it is ultimately the detailers responsibilty to ensure that the sole of the gutter does not clash with the restraint member.

Eaves Tie Type EG1

The eaves gutter 1 restraint is a suitable eaves beam restaint where the gutter sits on the outer face of the building envelope. This particular restraint is suitable for roof pitches up to and including 15°.

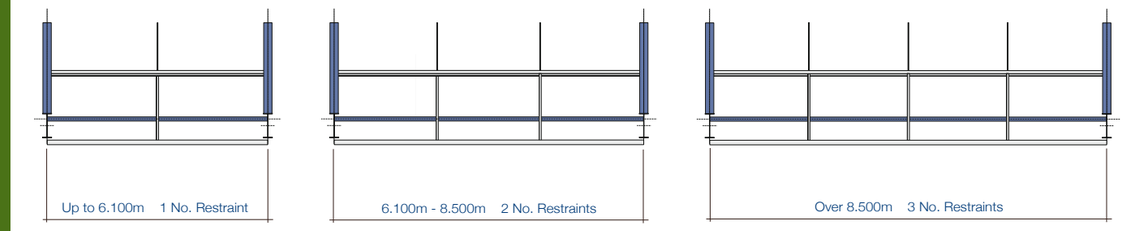
Eaves Tie Type EG2

Where the roof pitch exceeds 15° the eaves gutter 2 restraint is required. This suits the sag bar configuration as shown on page 14, where the sag bars are positioned from the top gauge line holes to the bottom.

For further Eaves Beam details please contact the Hi-SPAN Technical Department

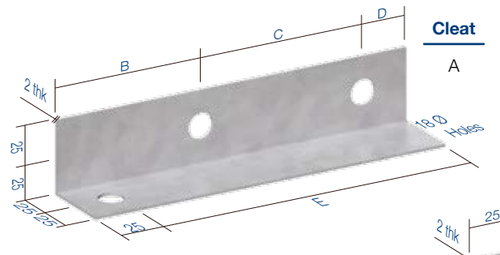
Eaves Beam Restraint Requirement

The restraint requirement for each eaves beam situation is displayed on the calculation sheet provided by the Hi-SPAN Design Suite. If this information is not available the following recommendations should be adhered to.

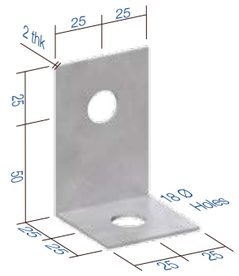


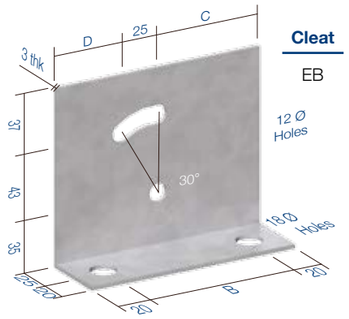
Eaves Beam Brace Set Cleats

The following cleats used in various combinations can develop the strut systems shown on the opposite page. These are capable of restraining roof slopes up to 30°, beyond this please consult our Technical Department.

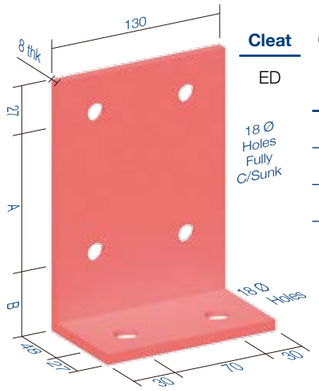


Cleat	DIM B	DIM C	DIM D	DIM E
A15	100	67	33	175
A17	100	87	33	195
A20	103	116	31	225
A23	100	146	34	255
A25	112	146	32	265
A30	112	196	32	315
A35	112	241	32	360

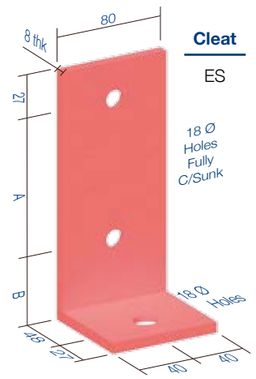




Cleat	DIM B	DIM C	DIM D
EB17	84	62	37
EB20	100	70	45
EB24	116	78	53
EB28	146	93	68



Cleat	DIM A	DIM B
ED17	84	42
ED20	100	53
ED24	116	53
ED28	146	53



Cleat	DIM A	DIM B
ES17	84	42
ES20	100	53
ES24	116	53
ES28	146	53

CHANNEL SYSTEMS

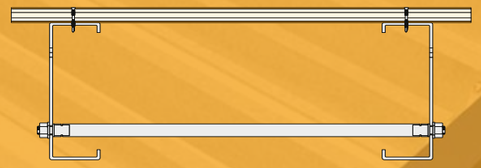
Mezzanine Floor Beams

Hi-SPAN C-Channels are a comprehensive range of channels for a diversity of applications. Primarily for use within mezzanine floors, C-Channel sections can also be applied in many other circumstances such as door framing, roof trimming, window trimming, brickwork restraints, parapet rails and side rails.

The mezzanine floor beam depths of 127, 220, 270, and 290mm are all catered for within the range, together with C-Channel depths of 150, 170, 205, 230, 255, 305 and 350mm, which are fully compatible with our 'Z' purlin and rail sections. While the mezzanine floor beams are normally punched with 18 diameter holes as standard, 14 diameter holes are also available in these sections, together with the option of counter formed holes.

Restraint Requirements

As the bottom flange of the C-Channel is usually unrestrained we recommend that a Hi-SPAN tubular sag rod is fitted. Where possible the channels should face toe to toe with the restraint situated in the lower gauge line holes. (Typically spans less than 3.50m do not require restraints).

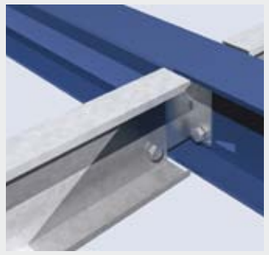


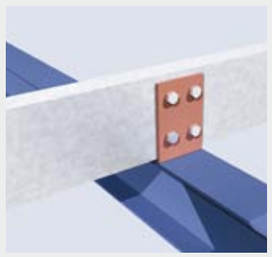
Single Span Design

The single span design is more commonly used than the double span design due to floor depth restrictions. Please ensure that the holes in the standard MFB cleat project far enough beyond the flange of the hot rolled member to provide an adequate fixing to the C-Channel. Non standard cleats are available.

Double Span Design

The double span design is used when there is no depth restrictions within the floor zone. The benefit of a continuous member is reduced deflections, which in turn can reduce the section size and therefore cost. Standard purlin cleats can be used for this system, please see page 47-48 for details.

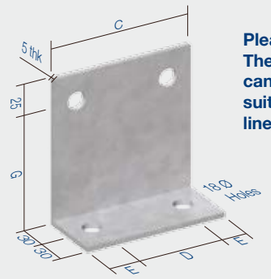




MFB Floor Cleats

When Hi-SPAN C-Channels are used as mezzanine floor beams the MFB cleats should be used at the supports. The cleats are manufactured from a thicker material than the trimmer cleats to support the higher shear loads associated with floors.

When a double span system is used, hot rolled cleats are needed in order to support the web of the channel. Fixings directly through the bottom flange of the channel to the supporting member is not recommended. PC Cleats can be utilised for this.



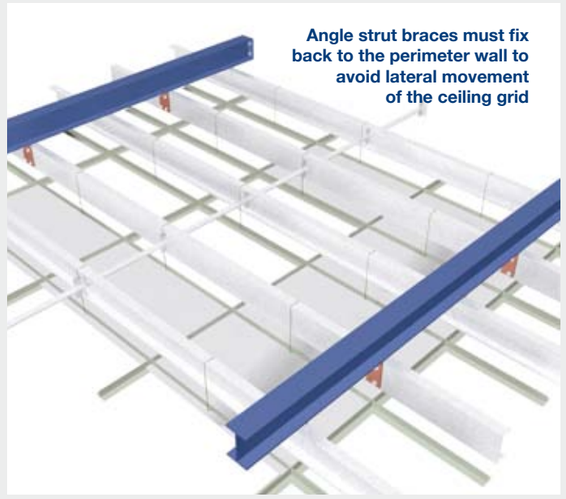
Please Note:
The MFB50 cleat can be used to suit the gauge lines of a WCP

Cleat	DIM C	DIM D	DIM E	DIM G
MFB50	94	50	22	110
MFB67	111	67	22	110
MFB87	131	87	22	110
MFB116	160	116	22	120
MFB146	190	146	22	120
MFB196	240	196	22	130
MFB241	285	241	22	130

Please ensure Dim G less 32mm clears the flange of the primary beam

Threaded Sag Bars

These 19mm diameter flow-coat galvanised and lacquered seamless tubular sag bars are preferred by many consultants and structural engineers: not only for visual effect, but also from a structural point of view. They are sturdy (0.9mm thick) and the zinc plated 12mm dia. threaded end spigots with nut and washer provide a positive fixing. (They are available in three standard lengths 20mm, 32mm and 100mm).



Angle strut braces must fix back to the perimeter wall to avoid lateral movement of the ceiling grid

Ceiling Channels

In response to the frequent use of Hi-SPAN channels as part of the ceiling support grid, load tables have been prepared for single span ceiling channels (available on the Hi-SPAN Design Disc). These provide maximum allowable loads (based on a load factor of 1.6) restricted to the deflection limits indicated.

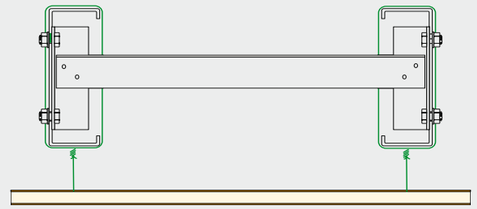
As with non-restraining cladding systems, the top flanges of ceiling channels are unrestrained, and lateral restraint must be provided by the use of angle strut braces. (See page 13 for details).

Where ceiling channels can be continuous, i.e. fixed to the underside of the supporting steelwork, the sleeved system may be adopted, and allowable loads taken from the values given in the load tables for purlins carrying non-restraining cladding.

If channels are to be used in ceiling support grids suspended from pitched roof portal frames, or other high level steelwork by means of hangers, please consult our Technical Department.

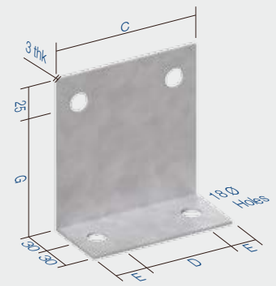
Restraint Requirements

As neither the top flange or the bottom flange of a ceiling support channel is restrained, we recommend using a rigid-fix strut between members. These are situated at either mid-span or third points, according to bay size.



Trimming Cleats

When additional trimming channels are needed Hi-SPAN TC cleats can be used at supports. They are referenced by the standard gauge line of the section size being used.



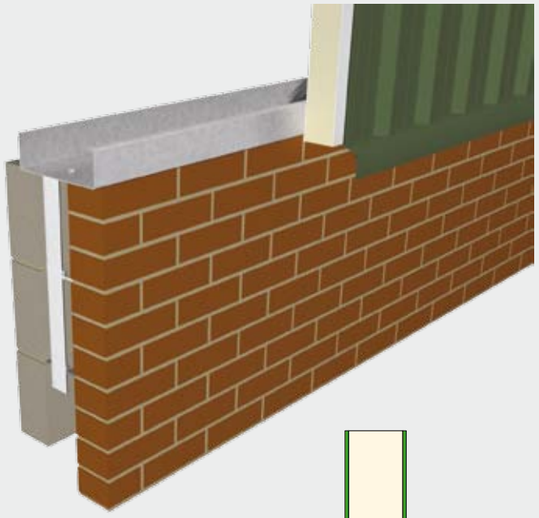
Please Note:
The C127 series require off-gauge punching and the TC50 cleat when used as trimmers

Cleat	DIM C	DIM D	DIM E	DIM G
TC50	94	50	22	110
TC67	111	67	22	110
TC87	131	87	22	110
TC116	160	116	22	110
TC146	190	146	22	130
TC196	240	196	22	130
TC241	285	241	22	130

Brickwork Restraints

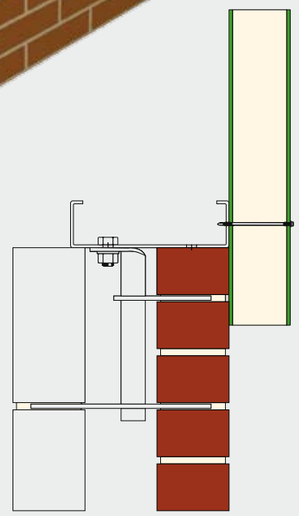
Hi-SPAN C-Channels can be used to restrain small block/brickwork walls. The channels sit directly on top of the wall and are connected using sliding anchors. The wall will provide support to the channel about its weak axis, and the channel will restrain the wall against horizontal wind forces. Where walls are erected after the channels, temporary propping will be needed until the wall is in place.

When designing brickwork restraints using the Hi-SPAN Design Suite, consideration must be made to the higher deflection limits required by both block and brickwork walls.
Restraint must be provided to the outer flange of the channel by a positive fixing to the overlapping cladding.



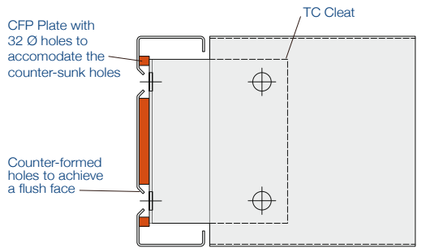
Parapet Channels

Many buildings are designed to incorporate a parapet to the perimeter to hide the ridge from view. The parapet has a horizontal coping which can require fixing to the internal face, external face and over the top of the parapet. Hi-SPAN C-Channels are capable of fulfilling all of this criteria. They come in a range of depths to suit practically all parapet dimensions. Horizontal C-Channels can be designed and detailed using the Hi-SPAN Design and Detailing Suite. To order your free copy please visit our website at www.hi-span.com



Compound Sections

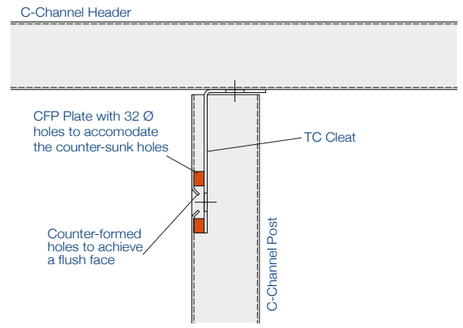
Back to back channels can be used in a variety of applications. For example eaves ties, bracing members and posts. Valuable cost and weight savings can be made when utilising these light weight members.
The entire C-Channel range can be used for any of these purposes offering a variety of solutions, please contact our Technical Department for further information.



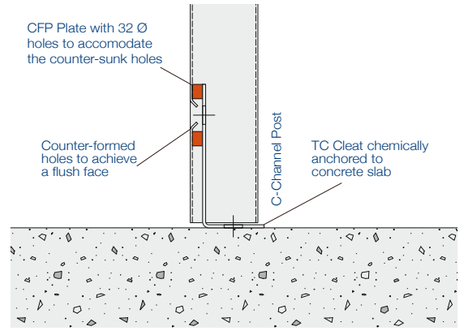
Rail to Post Connection

Door & Window Trimmers

C-Channel sections are ideal members for framing both doors & windows. With the web orientated towards the opening a flush clean surface is available to affix the door and window frames.
By using standard trimmer cleats that suit the C-Channel gauge lines, accompanied by CFP plates to accomodate the counter-sunk holes, various arrangements are achievable.



Door Post to Header Connection



Door Post to Slab Connection

Hi-WALL SYSTEMS

External Walls

The Hi-Wall stud framing system utilises the strength and versatility of the C-Channel section. The system comprises of a series of vertical 'stud' members, which are encapsulated by a series of 'header rail' and 'base rail' members. In combination these sections can rapidly create an external wall envelope that allows early construction of the internal liner, creating a weathertight environment.

There are two main methods of application for the stud system, firstly there is the infill wall panel system that sits directly between the structural frame and secondly studs are fixed continuously to the outside of the structural frame. Both methods are quick and easy to install offering further advantages over traditional timber / masonry construction.

Typically the infill panel and the continuous panel are designed as non load bearing structures resisting only lateral wind forces which are transferred back to the structural frame. A variety of external cladding systems can be fixed to and restrained by either framing system. Brickwork, blockwork, metal insulated cladding panels and timber weatherboarding are to name but a few systems that benefit from being fixed to Hi-Wall panels.

Studs and Header sections can be ordered as blank lengths and sent to site for cutting and fitting. Alternatively clients can send drawings detailing their requirements to Hi-SPAN for manufacture. Sections will then be cut, punched and marked with an individual panel reference prior to delivery to site. This method has the advantage of reducing time spent on site and allows the inclusion of additional works such as service holes.

Infill Panel System

Infill Panel System

The Infill Panel System is designed to sit between the structural frame. Header rails and base rails are fixed directly to the frame with vertical studs spanning between them.

Header and base rails are pressed members and are available in up to 4.00m lengths. Stud members are predominantly rolled sectons and are available in up to 15.0m lengths.

With non-load bearing panels a slotted deflection rail is required in place of the header rail. This member has vertical slots along its length which allow movement of the rail about the stud fixing when the structural frame deflects. Slotted deflection headers are available throughout the entire range of stud sections. A slotted hole should be specified when detailling these members.

Where openings occur in a panel it may be necessary to stiffen the framing members. Compound members can be manufactured by fitting a stud member inside a header rail. For further details please contact the Technical Department.

Continuous Panel System

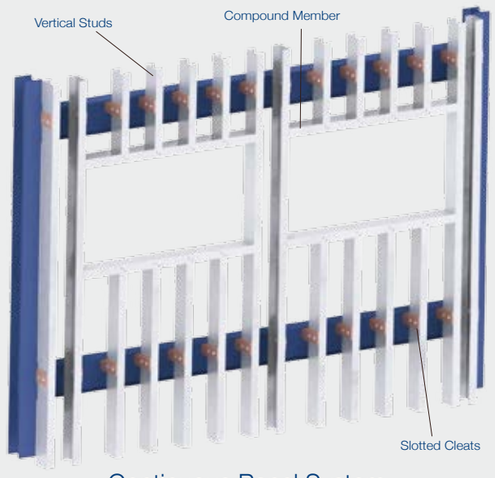
The Continuous Panel System requires vertical studs fixed to cleats on the outside of the structural frame. As with the infill panels the studs are designed to carry lateral wind loads only.

Deflection of the structural frame is not transferred to the studs by the inclusion of vertical slots on the hot rolled cleats (by others).

This system offers greater speed of erection as the studs can be supplied in up to 15m lengths. Header and base rail sections can also be supplied as necessary to form a capping to the studs which may be needed as an additional fixing face for the cladding system.

Hi-SPAN recommend indicating positions of service holes on detailed drawings to be included in stud manufacture. Holes of up to 23mm dia can be incorporated on the mill line, other sizes are available, please contact the sales office for further information.

Where openings occur compound sections can be used to construct the framework. Additional cold rolled cleats may be required to fix the studs to the flush face of the compound member.

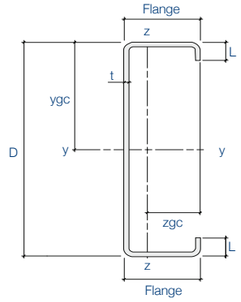


Continuous Panel System

Internal Partitions

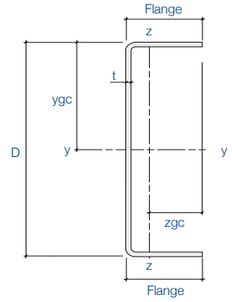
The above panel systems can both be used to create lightweight internal partitions. The system is quick to erect and both load bearing and non-load bearing partitions can be designed. By ordering pre-fabricated sections delivered directly to site, essential time savings are made compared to the more traditional timber stud wall.

For further information on Hi-Wall stud systems and recommended installers please contact the Hi-SPAN Technical Department.



S Section

The S section stud range is well suited to many different wall types and depths. Each depth has its own range of flange widths and thicknesses, ensuring the most economical design solution can be achieved for each situation.



U Section

The U section range is a complimentary section to the standard stud range. These sections are used as both trak and header members within the Hi-WALL panel. By specifying slots to the members marked *, deflection headers members can be manufactured.

Section Dimensions

Section Ref.	Depth mm	Flange mm	Lip mm	t mm	Weight kg/m	Area cm²
S705012	70	50	12	1.2	1.72	2.19
S705015	70	50	13	1.5	2.18	2.77
S705020	70	50	15	2.0	2.95	3.76
S706612	70	66	12	1.2	2.01	2.57
S706615	70	66	13	1.5	2.54	3.24
S706620	70	66	15	2.0	3.45	4.39
S1005012	100	50	12	1.2	2.00	2.54
S1005015	100	50	13	1.5	2.52	3.21
S1005020	100	50	15	2.0	3.42	4.35
S1006612	100	66	12	1.2	2.29	2.91
S1006615	100	66	13	1.5	2.89	3.68
S1006620	100	66	15	2.0	3.91	4.98
S1505012	150	50	12	1.2	2.45	3.12
S1505015	150	50	13	1.5	3.09	3.94
S1505020	150	50	15	2.0	4.18	5.33
S1506612	150	66	12	1.2	2.74	3.49
S1506615	150	66	13	1.5	3.46	4.41
S1506620	150	66	15	2.0	4.68	5.96
S2006612	200	66	15	1.2	3.25	4.14
S2006614	200	66	15	1.4	3.80	4.85
S2006616	200	66	16	1.6	4.38	5.58
S2006620	200	66	18	2.0	5.54	7.06
S2256614	225	66	15	1.4	4.07	5.19
S2256616	225	66	16	1.6	4.69	5.97
S2256620	225	66	18	2.0	5.92	7.55
S2558014	255	80	18	1.4	4.76	6.06
S2558016	255	80	18	1.6	5.44	6.94
S2558020	255	80	18	2.0	6.82	8.68

Section Ref.	Depth mm	Flange mm	Lip mm	t mm	Weight kg/m	Area cm²
U756512	75	65	-	1.2	1.84	2.35
* U756515	75	65	-	1.5	2.32	2.95
* U756520	75	65	-	2.0	3.09	3.94
* U1054420	105	44	-	2.0	2.91	3.70
U1056512	105	65	-	1.2	2.12	2.70
* U1056515	105	65	-	1.5	2.66	3.39
* U1056520	105	65	-	2.0	3.55	4.53
* U1556212	155	62	-	1.2	2.52	3.21
* U1556215	155	62	-	1.5	3.16	4.03
U1556220	155	62	-	2.0	4.23	5.39
* U2054012	205	40	-	1.2	2.57	3.28
* U2057015	205	70	-	1.5	3.92	4.99
U2057020	205	70	-	2.0	5.25	6.68
* U2304012	230	40	-	1.2	2.80	3.57
U2306520	230	65	-	2.0	5.48	6.98
* U2604012	260	40	-	1.2	3.07	3.92
U2607020	260	70	-	2.0	6.09	7.76

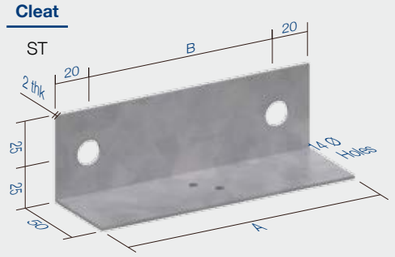
Section Properties

Section Ref.	Iy cm⁴	Iz cm³	Wy cm⁴	Wz cm³	iy cm	iz cm	ygc mm	zgc mm	Mcy kNm	Mcz kNm
S705012	18.75	7.80	5.45	2.57	2.92	1.89	35.00	30.93	2.018	1.057
S705015	23.40	9.89	6.83	3.31	2.90	1.89	35.00	30.62	2.730	1.373
S705020	30.98	13.52	9.11	4.66	2.87	1.90	35.00	30.00	3.807	1.935
S706612	23.15	15.25	6.73	3.90	3.00	2.44	35.00	39.74	2.298	1.600
S706615	28.88	19.33	8.43	5.00	2.99	2.44	35.00	39.39	2.998	2.082
S706620	38.24	26.40	11.25	7.00	2.95	2.45	35.00	38.71	4.460	2.936
S1005012	42.03	8.83	8.51	2.69	4.07	1.86	50.00	33.46	3.189	1.088
S1005015	52.68	11.20	10.70	3.46	4.05	1.87	50.00	33.16	4.522	1.418
S1005020	70.33	15.35	14.35	4.86	4.02	1.88	50.00	32.57	6.069	2.009
S1006612	51.09	17.27	10.34	4.09	4.19	2.43	50.00	42.80	3.372	1.644
S1006615	64.01	21.91	13.00	5.25	4.17	2.44	50.00	42.47	4.934	2.146
S1006620	85.39	29.99	17.43	7.35	4.14	2.45	50.00	41.82	7.004	3.043
S1505012	107.03	10.03	14.39	2.80	5.85	1.79	75.00	36.42	4.938	1.123
S1505015	134.57	12.74	18.12	3.60	5.84	1.80	75.00	36.14	7.124	1.467
S1505020	180.72	17.52	24.42	5.06	5.82	1.81	75.00	35.59	10.468	2.087
S1506612	127.58	19.74	17.15	4.30	6.04	2.38	75.00	46.55	5.208	1.695
S1506615	160.32	25.07	21.59	5.51	6.03	2.38	75.00	46.24	7.620	2.219
S1506620	215.06	34.39	29.06	7.71	6.01	2.40	75.00	45.63	12.277	3.158
S2006612	252.95	23.13	25.45	4.84	7.81	2.36	100.00	48.42	7.216	1.893
S2006614	295.13	26.85	29.72	5.63	7.80	2.35	100.00	48.41	9.449	2.236
S2006616	339.14	31.19	34.19	6.59	7.80	2.36	100.00	48.13	11.843	2.649
S2006620	427.42	40.15	43.17	8.62	7.78	2.39	100.00	47.58	17.103	3.515
S2256614	388.99	27.75	34.79	5.69	8.66	2.31	112.50	49.51	10.724	2.256
S2256616	447.13	32.26	40.03	6.66	8.66	2.32	112.50	49.24	13.446	2.673
S2256620	563.90	41.54	50.57	8.71	8.64	2.35	112.50	48.71	19.429	3.548
S2558014	594.39	48.93	46.88	8.35	9.91	2.84	127.50	59.32	12.782	3.254
S2558016	679.18	55.67	53.61	9.51	9.90	2.83	127.50	59.31	16.226	3.760
S2558020	846.75	68.80	66.94	11.81	9.88	2.81	127.50	59.28	23.331	4.757

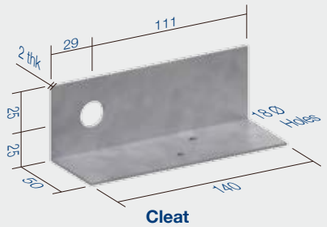
Section Ref.	Iy cm⁴	Iz cm³	Wy cm⁴	Wz cm³	iy cm	iz cm	ygc mm	zgc mm	Mcy kNm	Mcz kNm
U756512	24.23	10.81	6.57	2.46	3.21	2.14	37.50	44.53	1.256	1.055
* U756515	30.17	13.50	8.21	3.08	3.20	2.14	37.50	44.56	1.719	1.359
* U756520	39.79	17.90	10.90	4.10	3.18	2.13	37.5	44.62	2.590	1.798
* U1054420	62.56	6.85	12.15	2.06	4.11	1.36	52.50	34.22	3.892	0.902
U1056512	51.06	12.08	9.84	2.59	4.35	2.12	52.50	47.17	1.836	1.080
* U1056515	63.74	15.09	12.32	3.25	4.34	2.11	52.50	47.21	2.786	1.392
* U1056520	84.40	20.02	16.39	4.33	4.32	2.10	52.50	47.27	4.208	1.903
* U1556212	119.41	11.94	15.53	2.50	6.10	1.93	77.50	48.37	2.841	1.018
* U1556215	149.36	14.92	19.46	3.13	6.09	1.92	77.50	48.41	4.303	1.312
U1556220	198.45	19.80	25.94	4.17	6.07	1.92	77.50	48.47	7.294	1.802
* U2054012	176.74	3.74	17.34	1.10	7.34	1.07	102.50	34.51	3.771	0.463
* U2057015	311.89	22.51	30.65	4.08	7.90	2.12	102.50	55.98	5.949	1.672
U2057020	415.30	29.91	40.92	5.43	7.88	2.12	102.50	56.04	10.097	2.304
* U2304012	235.41	3.82	20.58	1.11	8.12	1.04	115.00	34.95	4.298	0.466
U2306520	519.64	25.03	45.58	4.77	8.63	1.89	115.00	53.49	11.419	2.022
* U2604012	320.62	3.91	24.78	1.12	9.05	1.00	130.00	35.40	4.941	0.469
U2607020	730.62	31.72	56.64	5.57	9.70	2.02	130.00	57.98	13.198	2.341

TECHNICAL SECTION

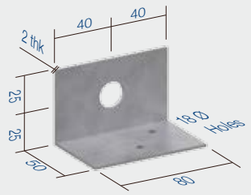
Cleat ST



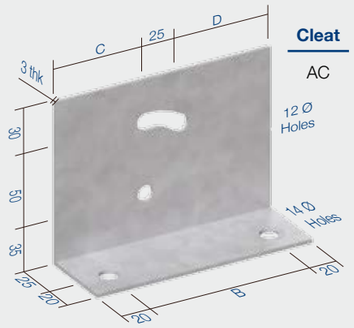
Cleat	DIM A	DIM B
ST15	107	67
ST17	127	87
ST20	156	116
ST23	186	146
ST25	186	146
ST30	236	196
ST35	281	241



Cleat RH1

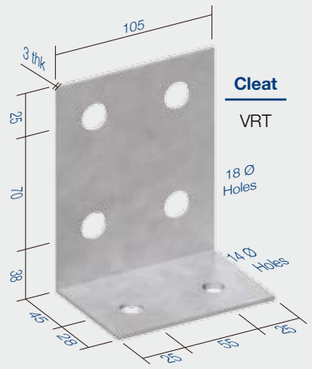


Cleat RH2

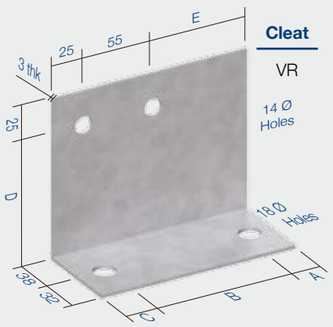


Cleat AC

Cleat	DIM B	DIM C	DIM D
AC15	67	41	41
AC17	87	51	51
AC20	116	65	66
AC23	146	80	81
AC25	146	80	81
AC30	196	105	106
AC35	241	128	128

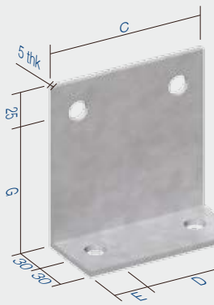


Cleat VRT



Cleat VR

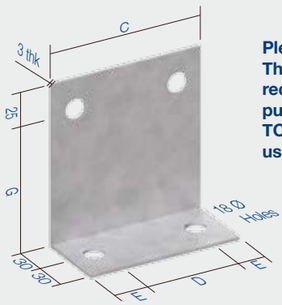
Cleat	DIM A	DIM B	DIM C	DIM D	DIM E
VR15	20	67	18	100	25
VR17	20	87	18	100	45
VR20	18	116	21	100	75
VR23	20	146	19	120	105
VR25	22	146	32	120	120
VR30	22	196	32	140	170
VR35	22	241	32	140	215



Cleat MFB

Please Note:
The MFB50 cleat can be used to suit the gauge lines of a WCP

Cleat	DIM C	DIM D	DIM E	DIM G
MFB50	94	50	22	110
MFB67	111	67	22	110
MFB87	131	87	22	110
MFB116	160	116	22	120
MFB146	190	146	22	120
MFB196	240	196	22	130
MFB241	285	241	22	130

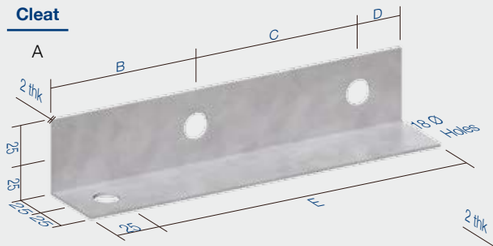


Cleat TC

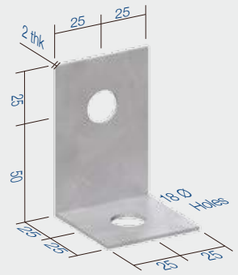
Please Note:
The C127 series require off-gauge punching and the TC50 cleat when used as trimmers

Cleat	DIM C	DIM D	DIM E	DIM G
TC50	94	50	22	110
TC67	111	67	22	110
TC87	131	87	22	110
TC116	160	116	22	110
TC146	190	146	22	130
TC196	240	196	22	130
TC241	285	241	22	130

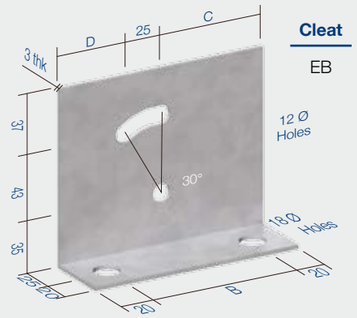
Cleat A



Cleat	DIM B	DIM C	DIM D	DIM E
A15	100	67	33	175
A17	100	87	33	195
A20	103	116	31	225
A23	100	146	34	255
A25	112	146	32	265
A30	112	196	32	315
A35	112	241	32	360

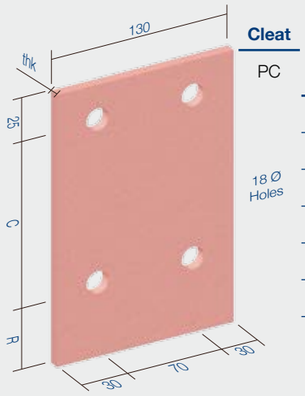


Cleat FB



Cleat EB

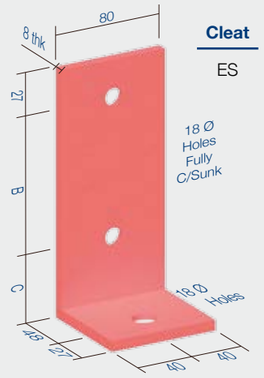
Cleat	DIM B	DIM C	DIM D
EB17	84	62	37
EB20	100	70	45
EB24	116	78	53
EB28	146	93	68



Cleat PC

(Supplied as untreated steel)

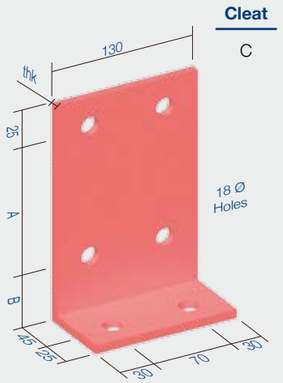
Cleat	DIM C	DIM R	THK
PC15	67	50	6mm
PC17	87	50	6mm
PC20	116	53	8mm
PC23	146	50	8mm
PC25	146	62	8mm
PC30	196	62	10mm
PC35	241	62	10mm



Cleat ES

(Galvanised after manufacture)

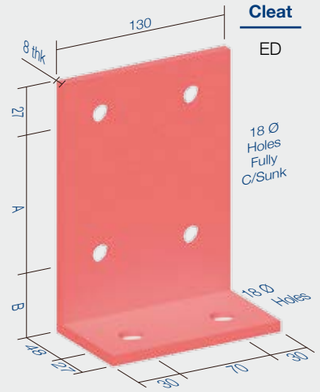
Cleat	DIM B	DIM C
ES17	84	42
ES20	100	53
ES24	116	53
ES28	146	53



Cleat C

(Galvanised after manufacture)

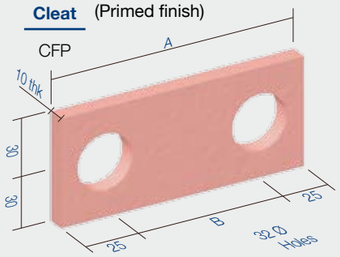
Cleat	DIM A	DIM B	THK
C15	67	50	6mm
C17	87	50	6mm
C20	116	53	8mm
C23	146	50	8mm
C25	146	62	8mm
C30	196	62	10mm
C35	241	62	10mm



Cleat ED

(Supplied as untreated steel)

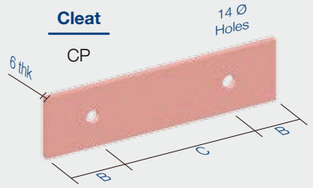
Cleat	DIM A	DIM B
ED17	84	42
ED20	100	53
ED24	116	53
ED28	146	53



Cleat CFP (Primed finish)

Cleat	DIM A	DIM B
CFP50	100	50
CFP67	117	67
CFP87	137	87
CFP116	166	116
CFP146	196	146
CFP196	246	196
CFP241	291	241

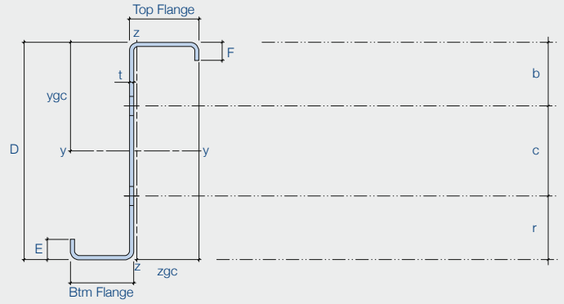
(Primed finish)



Cleat CP

Cleat	DIM B	DIM C
CP156	36	67
CP176	36	87
CP206	40	116
CP238	34	146
CP258	47	146
CP309	44	196
CP359	44	241

SECTION PROPERTIES Z Section



Gauge Line Details

Section Series	Dim b mm	Dim c mm	Dim r mm
156	43	67	40
176	43	87	40
206	46	116	43
238	44	146	40
258	57	146	52
309	57	196	52
359	57	241	52

Lip Dimensions

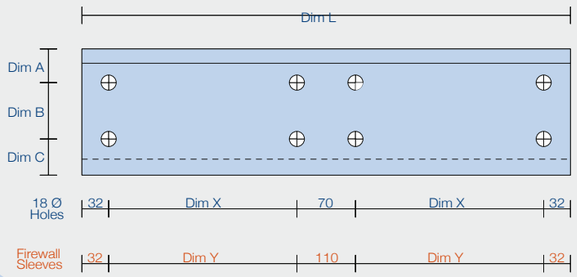
Section Series	Dim F mm	Dim E mm
156	17	19
176	17	19
206	17	19
238	17	19
258	17	19
309	20	22
359	20	22

Section Dimensions

Section Ref.	Depth mm	Top Flange	Bottom Flange	t mm	Weight kg/m	Area cm²
Z15613	150	66	60	1.3	3.03	3.87
Z15614	150	66	60	1.4	3.27	4.17
Z15615	150	66	60	1.5	3.51	4.47
Z15616	150	66	60	1.6	3.74	4.77
Z15618	150	66	60	1.8	4.21	5.36
Z15620	150	66	60	2.0	4.68	5.96
Z17613	170	66	60	1.3	3.23	4.12
Z17614	170	66	60	1.4	3.48	4.44
Z17615	170	66	60	1.5	3.74	4.76
Z17616	170	66	60	1.6	3.99	5.08
Z17618	170	66	60	1.8	4.49	5.72
Z17620	170	66	60	2.0	4.99	6.35
Z17624	170	66	60	2.4	5.97	7.61
Z20613	205	66	60	1.3	3.58	4.56
Z20614	205	66	60	1.4	3.86	4.92
Z20615	205	66	60	1.5	4.14	5.27
Z20616	205	66	60	1.6	4.42	5.63
Z20618	205	66	60	1.8	4.97	6.33
Z20620	205	66	60	2.0	5.52	7.04
Z20624	205	66	60	2.4	6.62	8.43
Z20629	205	66	60	2.9	7.98	10.16
Z23815	230	83	75	1.5	4.79	6.10
Z23816	230	83	75	1.6	5.11	6.51
Z23818	230	83	75	1.8	5.76	7.34
Z23820	230	83	75	2.0	6.40	8.15
Z23824	230	83	75	2.4	7.68	9.78
Z23830	230	83	75	3.0	9.57	12.20
Z25816	255	83	75	1.6	5.42	6.90
Z25818	255	83	75	1.8	6.10	7.78
Z25820	255	83	75	2.0	6.79	8.64
Z25824	255	83	75	2.4	8.14	10.37
Z25830	255	83	75	3.0	10.15	12.94
Z30920	305	94	86	2.0	7.99	10.17
Z30925	305	94	86	2.5	9.98	12.72
Z30929	305	94	86	2.9	11.57	14.74
Z35925	350	94	86	2.5	10.85	13.83
Z35929	350	94	86	2.9	12.58	16.03

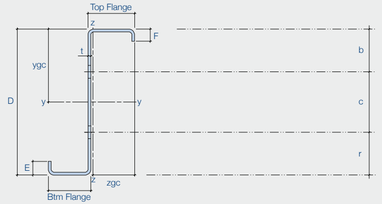
Section Properties

Ref.	Iy cm⁴	Iz cm³	Wy cm⁴	Wz cm³	iy cm	iz cm	ygc mm	zgc mm	Mcy kNm	Mcz kNm
Z15613	139.38	36.41	18.48	5.73	6.00	3.07	73.92	64.21	6.071	2.291
Z15614	150.02	39.09	19.90	6.16	6.00	3.06	73.92	64.16	6.924	2.562
Z15615	160.60	41.74	21.32	6.59	6.00	3.06	73.92	64.11	7.813	2.842
Z15616	171.11	44.35	22.73	7.01	5.99	3.05	73.92	64.06	8.693	3.128
Z15618	191.96	49.50	25.53	7.85	5.98	3.04	73.92	63.96	10.492	3.384
Z15620	212.56	54.52	28.31	8.67	5.97	3.02	73.91	63.86	12.012	3.719
Z17613	186.12	36.42	21.77	5.72	6.72	2.97	83.86	64.28	6.957	2.295
Z17614	200.36	39.09	23.45	6.15	6.72	2.97	83.86	64.23	7.928	2.566
Z17615	214.53	41.74	25.12	6.58	6.71	2.96	83.86	64.18	8.950	2.845
Z17616	228.62	44.36	26.79	7.00	6.71	2.96	83.86	64.13	9.958	3.131
Z17618	256.57	49.50	30.10	7.84	6.70	2.94	83.86	64.03	12.014	3.390
Z17620	284.22	54.53	33.38	8.66	6.69	2.93	83.86	63.93	14.169	3.727
Z17624	338.60	64.23	39.86	10.27	6.67	2.91	83.86	63.74	16.994	4.374
Z20613	288.02	36.42	27.94	5.72	7.95	2.83	101.28	64.38	8.521	2.302
Z20614	310.14	39.10	30.10	6.14	7.94	2.82	101.28	64.33	9.718	2.572
Z20615	332.16	41.75	32.26	6.57	7.94	2.81	101.28	64.28	10.963	2.850
Z20616	354.07	44.37	34.40	6.99	7.93	2.81	101.28	64.23	12.196	3.134
Z20618	397.57	49.51	38.67	7.83	7.92	2.80	101.28	64.13	14.714	3.398
Z20620	440.65	54.54	42.90	8.65	7.91	2.78	101.27	64.04	17.348	3.739
Z20624	525.54	64.24	51.26	10.26	7.89	2.76	101.27	63.84	21.986	4.393
Z20629	629.28	75.73	61.53	12.19	7.87	2.73	101.27	63.59	26.350	5.160
Z23815	496.66	75.70	42.83	9.46	9.02	3.52	113.28	80.81	12.932	3.813
Z23816	529.59	80.52	45.68	10.07	9.02	3.52	113.28	80.76	14.430	4.197
Z23818	595.03	90.03	51.37	11.29	9.01	3.50	113.28	80.66	17.513	4.913
Z23820	659.92	99.36	57.02	12.49	9.00	3.49	113.27	80.56	20.786	5.631
Z23824	788.05	117.49	68.21	14.84	8.98	3.47	113.27	80.37	27.789	6.403
Z23830	976.16	143.37	84.71	18.25	8.95	3.43	113.27	80.07	36.164	7.781
Z25816	673.91	80.53	52.45	10.06	9.88	3.42	125.70	80.84	16.121	4.201
Z25818	757.37	90.04	58.99	11.28	9.87	3.40	125.70	80.74	19.568	4.917
Z25820	840.16	99.37	65.48	12.48	9.86	3.39	125.70	80.64	23.225	5.634
Z25824	1003.76	117.50	78.36	14.83	9.84	3.37	125.70	80.45	31.050	6.413
Z25830	1244.24	143.39	97.35	18.23	9.81	3.33	125.69	80.15	41.705	7.800
Z30920	1402.98	150.00	91.50	16.54	11.74	3.84	150.67	91.67	29.517	7.180
Z30925	1746.35	184.58	114.08	20.47	11.72	3.81	150.67	91.43	42.277	8.896
Z30929	2016.84	211.21	131.92	23.52	11.70	3.79	150.67	91.23	53.336	10.162
Z35925	2420.58	184.61	137.79	20.45	13.23	3.65	173.07	91.53	49.034	8.912
Z35929	2796.91	211.24	159.39	23.50	13.21	3.63	173.07	91.34	61.874	10.187



Z Sleeve Gauge Line Details

Section Series	Dim L mm	Dim X mm	Dim A mm	Dim B mm	Dim C mm	Dim Y mm
156	584	225	40	67	43	205
176	584	225	40	87	43	205
206	734	300	43	116	46	280
238	734	300	40	146	44	280
258	934	400	52	146	57	380
309	1334	600	52	196	57	580
359	1524	695	52	241	57	675



Gauge Line Details

Section Series	Dim b mm	Dim c mm	Dim r mm
156	43	67	40
176	43	87	40
206	46	116	43
238	44	146	40
258	57	146	52
309	57	196	52
359	57	241	52

Lip Dimensions

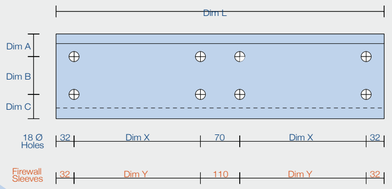
Section Series	Dim F mm	Dim E mm
156	17	19
176	17	19
206	17	19
238	17	19
258	17	19
309	20	22
359	20	22

Section Dimensions

Section Ref.	Depth mm	Top Flange	Bottom Flange	t mm	Weight kg/m	Area cm²
Z15613	150	66	60	1.3	3.03	3.87
Z15614	150	66	60	1.4	3.27	4.17
Z15615	150	66	60	1.5	3.51	4.47
Z15616	150	66	60	1.6	3.74	4.77
Z15618	150	66	60	1.8	4.21	5.36
Z15620	150	66	60	2.0	4.68	5.96
Z17613	170	66	60	1.3	3.23	4.12
Z17614	170	66	60	1.4	3.48	4.44
Z17615	170	66	60	1.5	3.74	4.76
Z17616	170	66	60	1.6	3.99	5.08
Z17618	170	66	60	1.8	4.49	5.72
Z17620	170	66	60	2.0	4.99	6.35
Z17624	170	66	60	2.4	5.97	7.61
Z20613	205	66	60	1.3	3.58	4.56
Z20614	205	66	60	1.4	3.86	4.92
Z20615	205	66	60	1.5	4.14	5.27
Z20616	205	66	60	1.6	4.42	5.63
Z20618	205	66	60	1.8	4.97	6.33
Z20620	205	66	60	2.0	5.52	7.04
Z20624	205	66	60	2.4	6.62	8.43
Z20629	205	66	60	2.9	7.98	10.16
Z23815	230	83	75	1.5	4.79	6.10
Z23816	230	83	75	1.6	5.11	6.51
Z23818	230	83	75	1.8	5.76	7.34
Z23820	230	83	75	2.0	6.40	8.15
Z23824	230	83	75	2.4	7.68	9.78
Z23830	230	83	75	3.0	9.57	12.20
Z25816	255	83	75	1.6	5.42	6.90
Z25818	255	83	75	1.8	6.10	7.78
Z25820	255	83	75	2.0	6.79	8.64
Z25824	255	83	75	2.4	8.14	10.37
Z25830	255	83	75	3.0	10.15	12.94
Z30920	305	94	86	2.0	7.99	10.17
Z30925	305	94	86	2.5	9.98	12.72
Z30929	305	94	86	2.9	11.57	14.74
Z35925	350	94	86	2.5	10.85	13.83
Z35929	350	94	86	2.9	12.58	16.03

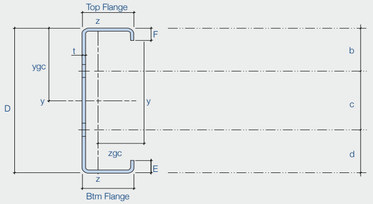
Section Properties

Section Ref.	Iy cm⁴	Iz cm³	Wy cm⁴	Wz cm³	iy cm	iz cm	ygc mm	zgc mm	Mcy kNm	Mcz kNm
Z15613	139.38	36.41	18.48	5.73	6.00	3.07	73.92	64.21	6.071	2.291
Z15614	150.02	39.09	19.90	6.16	6.00	3.06	73.92	64.16	6.924	2.562
Z15615	160.60	41.74	21.32	6.59	6.00	3.06	73.92	64.11	7.813	2.842
Z15616	171.11	44.35	22.73	7.01	5.99	3.05	73.92	64.06	8.693	3.128
Z15618	191.96	49.50	25.53	7.85	5.98	3.04	73.92	63.96	10.492	3.384
Z15620	212.56	54.52	28.31	8.67	5.97	3.02	73.91	63.86	12.012	3.719
Z17613	186.12	36.42	21.77	5.72	6.72	2.97	83.86	64.28	6.957	2.295
Z17614	200.36	39.09	23.45	6.15	6.72	2.97	83.86	64.23	7.928	2.566
Z17615	214.53	41.74	25.12	6.58	6.71	2.96	83.86	64.18	8.950	2.845
Z17616	228.62	44.36	26.79	7.00	6.71	2.96	83.86	64.13	9.958	3.131
Z17618	256.57	49.50	30.10	7.84	6.70	2.94	83.86	64.03	12.014	3.390
Z17620	284.22	54.53	33.38	8.66	6.69	2.93	83.86	63.93	14.169	3.727
Z17624	338.60	64.23	39.86	10.27	6.67	2.91	83.86	63.74	16.994	4.374
Z20613	288.02	36.42	27.94	5.72	7.95	2.83	101.28	64.38	8.521	2.302
Z20614	310.14	39.10	30.10	6.14	7.94	2.82	101.28	64.33	9.718	2.572
Z20615	332.16	41.75	32.26	6.57	7.94	2.81	101.28	64.28	10.963	2.850
Z20616	354.07	44.37	34.40	6.99	7.93	2.81	101.28	64.23	12.196	3.134
Z20618	397.57	49.51	38.67	7.83	7.92	2.80	101.28	64.13	14.714	3.398
Z20620	440.65	54.54	42.90	8.65	7.91	2.78	101.27	64.04	17.348	3.739
Z20624	525.54	64.24	51.26	10.26	7.89	2.76	101.27	63.84	21.986	4.393
Z20629	629.28	75.73	61.53	12.19	7.87	2.73	101.27	63.59	26.350	5.160
Z23815	496.66	75.70	42.83	9.46	9.02	3.52	113.28	80.81	12.932	3.813
Z23816	529.59	80.52	45.68	10.07	9.02	3.52	113.28	80.76	14.430	4.197
Z23818	595.03	90.03	51.37	11.29	9.01	3.50	113.28	80.66	17.513	4.913
Z23820	659.92	99.36	57.02	12.49	9.00	3.49	113.27	80.56	20.786	5.631
Z23824	788.05	117.49	68.21	14.84	8.98	3.47	113.27	80.37	27.789	6.403
Z23830	976.16	143.37	84.71	18.25	8.95	3.43	113.27	80.07	36.164	7.781
Z25816	673.91	80.53	52.45	10.06	9.88	3.42	125.70	80.84	16.121	4.201
Z25818	757.37	90.04	58.99	11.28	9.87	3.40	125.70	80.74	19.568	4.917
Z25820	840.16	99.37	65.48	12.48	9.86	3.39	125.70	80.64	23.225	5.634
Z25824	1003.76	117.50	78.36	14.83	9.84	3.37	125.70	80.45	31.050	6.413
Z25830	1244.24	143.39	97.35	18.23	9.81	3.33	125.69	80.15	41.705	7.800
Z30920	1402.98	150.00	91.50	16.54	11.74	3.84	150.67	91.67	29.517	7.180
Z30925	1746.35	184.58	114.08	20.47	11.72	3.81	150.67	91.43	42.277	8.896
Z30929	2016.84	211.21	131.92	23.52	11.70	3.79	150.67	91.23	53.336	10.162
Z35925	2420.58	184.61	137.79	20.45	13.23	3.65	173.07	91.53	49.034	8.912
Z35929	2796.91	211.24	159.39	23.50	13.21	3.63	173.07	91.34	61.874	10.187



Z Sleeve Gauge Line Details

Section Series	Dim L mm	Dim X mm	Dim A mm	Dim B mm	Dim C mm	Dim Y mm
156	584	225	40	67	43	205
176	584	225	40	87	43	205
206	734	300	43	116	46	280
238	734	300	40	146	44	280
258	934	400	52	146	57	380
309	1334	600	52	196	57	580
359	1524	695	52	241	57	675



Gauge Line Details

Section Series	Dim b mm	Dim c mm	Dim d mm
156	42	67	41
176	42	87	41
206	45	116	44
238	42	146	42
258	55	146	54
309	55	196	54
359	55	241	54

Lip Dimensions

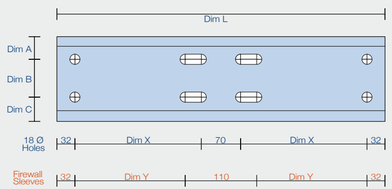
Section Series	Dim F mm	Dim E mm
156	15	15
176	15	15
206	15	15
238	18	18
258	18	18
309	21	21
359	21	21

Section Dimensions

Section Ref.	Depth mm	Top Flange	Bottom Flange	t mm	Weight kg/m	Area cm²
C15613	150	66	66	1.3	3.03	3.87
C15614	150	66	66	1.4	3.27	4.17
C15615	150	66	66	1.5	3.51	4.47
C15616	150	66	66	1.6	3.74	4.77
C15618	150	66	66	1.8	4.21	5.36
C15620	150	66	66	2.0	4.68	5.96
C17613	170	66	66	1.3	3.23	4.12
C17614	170	66	66	1.4	3.48	4.44
C17615	170	66	66	1.5	3.74	4.76
C17616	170	66	66	1.6	3.99	5.08
C17618	170	66	66	1.8	4.49	5.72
C17620	170	66	66	2.0	4.99	6.35
C17624	170	66	66	2.4	5.97	7.61
C20613	205	66	66	1.3	3.58	4.56
C20614	205	66	66	1.4	3.86	4.92
C20615	205	66	66	1.5	4.14	5.27
C20616	205	66	66	1.6	4.42	5.63
C20618	205	66	66	1.8	4.97	6.33
C20620	205	66	66	2.0	5.52	7.04
C20624	205	66	66	2.4	6.62	8.43
C20629	205	80	80	2.9	7.98	10.16
C23815	230	80	80	1.5	4.81	6.13
C23816	230	80	80	1.6	5.14	6.55
C23818	230	80	80	1.8	5.79	7.37
C23820	230	80	80	2.0	6.43	8.19
C23824	230	80	80	2.4	7.71	9.83
C23830	230	80	80	3.0	9.62	12.25
C25816	255	80	80	1.6	5.44	6.94
C25818	255	80	80	1.8	6.13	7.81
C25820	255	80	80	2.0	6.82	8.68
C25824	255	80	80	2.4	8.18	10.42
C25830	255	80	80	3.0	10.20	12.99
C30920	305	90	90	2.0	7.99	10.17
C30925	305	90	90	2.5	9.98	12.72
C30929	305	90	90	2.9	11.57	14.74
C35925	350	90	90	2.5	10.85	13.83
C35929	350	90	90	2.9	12.58	16.03

Section Properties

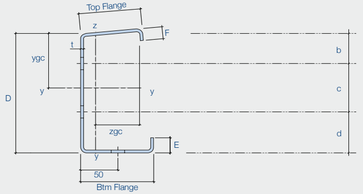
Section Ref.	Iy cm⁴	Iz cm³	Wy cm⁴	Wz cm³	iy cm	iz cm	ygc mm	zgc mm	Mcy kNm	Mcz kNm
C15613	141.04	22.89	18.97	5.09	6.04	2.43	75.00	45.65	6.108	2.021
C15614	151.80	24.59	20.43	5.47	6.04	2.43	75.00	45.65	6.935	2.188
C15615	162.50	26.27	21.89	5.85	6.03	2.42	75.00	45.65	7.760	2.353
C15616	173.14	27.93	23.33	6.23	6.03	2.42	75.00	45.64	8.614	2.517
C15618	194.22	31.19	26.21	6.97	6.02	2.41	75.00	45.64	10.401	2.841
C15620	215.06	34.39	29.06	7.71	6.01	2.40	75.00	45.63	12.277	3.158
C17613	188.02	23.81	22.29	5.15	6.76	2.40	85.00	46.86	6.989	2.040
C17614	202.41	25.57	24.01	5.54	6.75	2.40	85.00	46.85	7.934	2.209
C17615	216.72	27.32	25.72	5.93	6.75	2.40	85.00	46.85	8.879	2.376
C17616	230.95	29.05	27.43	6.31	6.74	2.39	85.00	46.85	9.856	2.543
C17618	259.18	32.44	30.82	7.06	6.73	2.38	85.00	46.84	11.894	2.871
C17620	287.10	35.77	34.18	7.81	6.72	2.37	85.00	46.83	14.044	3.193
C17624	342.03	42.22	40.82	9.26	6.70	2.36	85.00	46.81	17.394	3.814
C20613	290.36	25.17	28.51	5.24	7.98	2.35	102.50	48.65	8.547	2.069
C20614	312.66	27.04	30.71	5.64	7.98	2.35	102.50	48.64	9.703	2.240
C20615	334.85	28.88	32.91	6.03	7.97	2.34	102.50	48.63	10.860	2.411
C20616	356.94	30.71	35.10	6.42	7.97	2.34	102.50	48.63	12.056	2.580
C20618	400.79	34.30	39.45	7.19	7.96	2.33	102.50	48.61	14.557	2.915
C20620	444.21	37.82	43.76	7.95	7.95	2.32	102.50	48.60	17.179	3.243
C20624	529.76	44.63	52.30	9.42	7.93	2.30	102.50	48.57	22.431	3.879
C20629	634.32	52.74	62.77	11.20	7.90	2.28	102.50	48.54	26.876	4.631
C23815	500.68	50.78	43.82	8.85	9.04	2.88	115.00	58.13	12.961	3.481
C23816	533.88	54.03	46.75	9.43	9.03	2.87	115.00	58.12	14.524	3.731
C23818	599.87	60.46	52.57	10.57	9.02	2.86	115.00	58.11	17.623	4.228
C23820	665.30	66.78	58.36	11.70	9.01	2.86	115.00	58.10	20.880	4.719
C23824	794.50	79.10	69.82	13.91	8.99	2.84	115.00	58.08	27.840	5.679
C23830	984.21	96.77	86.71	17.11	8.96	2.81	115.00	58.04	37.097	7.056
C25816	679.18	55.67	53.61	9.51	9.90	2.83	127.50	59.31	16.226	3.760
C25818	763.30	62.29	60.29	10.67	9.89	2.82	127.50	59.29	19.690	4.261
C25820	846.75	68.80	66.94	11.81	9.88	2.81	127.50	59.28	23.331	4.757
C25824	1011.67	81.49	80.10	14.04	9.85	2.80	127.50	59.25	31.112	5.728
C25830	1254.12	99.69	99.53	17.28	9.82	2.77	127.50	59.21	42.733	7.122
C30920	1403.37	101.86	92.63	15.36	11.75	3.16	152.50	67.30	29.623	6.128
C30925	1746.84	125.55	115.49	19.02	11.72	3.14	152.50	67.26	42.279	7.720
C30929	2017.41	143.84	133.56	21.87	11.70	3.12	152.50	67.22	53.207	8.956
C35925	2421.16	130.26	139.35	19.23	13.23	3.07	175.00	68.98	49.044	7.803
C35929	2797.59	149.24	161.20	22.11	13.21	3.05	175.00	68.94	61.738	9.056



C Sleeve Gauge Line Details-<1.8mm

Section Series	Dim L mm	Dim X mm	Dim A mm	Dim B mm	Dim C mm	Dim Y mm
156	584	225	38	67	37	205
176	584	225	39	87	38	205
206	734	300	36	116	35	280
238	734	300	38	146	38	280
258	934	400	49	146	49	380

Lipped C-Channel Sleeves apply to channels up to and including 1.8mm gauge. Sleeves for thicker sections are shown on page 51.



Gauge Line Details

Section Depth	Dim b mm	Dim c mm	Dim d mm
170	42	84	44
200	45	100	55
240	69	116	55
280	79	146	55

Lip Dimensions

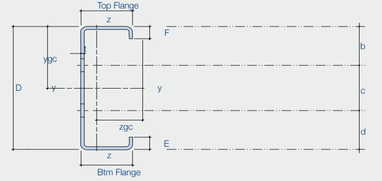
Section Depth	Dim F mm	Dim E mm
170	16	20
200	20	22
240	20	22
280	20	22

Section Dimensions

Section Ref.	Depth mm	Top Flange	Bottom Flange	t mm	Weight kg/m	Area cm²
E17020	170	75	100	2.0	5.74	7.31
E20020	200	83	100	2.0	6.42	8.17
E20024	200	83	100	2.4	7.70	9.80
E24020	240	83	100	2.0	7.03	8.96
E24025	240	83	100	2.5	8.79	11.19
E28020	280	100	100	2.0	7.91	10.07
E28025	280	100	100	2.5	9.89	12.60
E28029	280	100	100	2.9	11.46	14.60

Section Properties

Section Ref.	Iy cm⁴	Iz cm³	Wy cm⁴	Wz cm³	iy cm	iz cm	ygc mm	zgc mm	Mcy kNm	Mcz kNm
E17020	349.04	81.26	38.63	11.60	6.91	3.33	91.35	71.05	14.858	4.691
E20020	531.39	96.07	51.38	13.73	8.06	3.43	104.41	70.99	18.544	5.483
E20024	634.49	114.06	61.47	16.35	8.04	3.41	104.42	70.98	24.742	6.635
E24020	808.28	101.69	65.26	14.04	9.50	3.37	124.86	73.44	22.579	5.570
E24025	1004.92	125.41	81.29	17.38	9.48	3.35	124.87	73.42	32.105	7.036
E28020	1223.83	128.55	87.75	17.93	11.02	3.57	140.46	72.69	27.387	7.108
E28025	1523.21	158.69	109.41	22.22	11.00	3.55	140.46	72.66	39.334	8.977
E28029	1759.01	182.05	126.53	25.57	10.98	3.53	140.47	72.64	49.763	10.433



Gauge Line Details

Section Series	Dim b mm	Dim c mm	Dim d mm
127	30	67	30
220	52	116	52
270	62	146	62
290	47	196	47

Lip Dimensions

Section Series	Dim F mm	Dim E mm
127	15	15
220	15	15
270	15	15
290	15	15

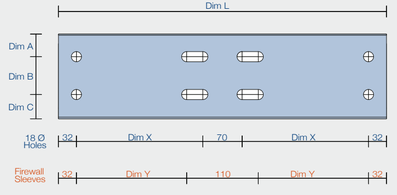
Additional complimentary C-sections for use as mezzanine floor beams

Section Dimensions

Section Ref.	Depth mm	Top Flange	Bottom Flange	t mm	Weight kg/m	Area cm²
C12715	127	66	66	1.5	3.24	4.13
C12716	127	66	66	1.6	3.46	4.41
C12718	127	66	66	1.8	3.89	4.96
C12720	127	66	66	2.0	4.32	5.51
C22016	220	66	66	1.6	4.60	5.86
C22018	220	66	66	1.8	5.18	6.60
C22020	220	66	66	2.0	5.75	7.33
C22024	220	66	66	2.4	6.90	8.79
C27020	270	66	66	2.0	6.52	8.31
C27024	270	66	66	2.4	7.83	9.97
C27030	270	66	66	3.0	9.76	12.43
C29030	290	75	75	3.0	10.64	13.56

Section Properties

Section Ref.	Iy cm⁴	Iz cm³	Wy cm⁴	Wz cm³	iy cm	iz cm	ygc mm	zgc mm	Mcy kNm	Mcz kNm
C12715	111.16	24.87	17.71	5.74	5.19	2.45	63.50	44.05	6.486	2.322
C12716	118.40	26.44	18.88	6.11	5.18	2.45	63.50	44.05	7.201	2.483
C12718	132.74	29.53	21.21	6.84	5.17	2.44	63.50	44.05	8.698	2.801
C12720	146.90	32.56	23.50	7.56	5.16	2.43	63.50	44.05	9.921	3.112
C22016	421.29	31.33	38.58	6.46	8.48	2.31	110.00	49.29	13.008	2.594
C22018	473.13	34.99	43.37	7.23	8.47	2.30	110.00	49.27	15.707	2.931
C22020	524.48	38.58	48.12	7.99	8.46	2.29	110.00	49.26	18.538	3.262
C22024	625.73	45.53	57.51	9.48	8.44	2.28	110.00	49.22	24.488	3.903
C27020	853.49	40.72	63.69	8.13	10.13	2.21	135.00	51.11	23.125	3.315
C27024	1019.29	48.06	76.18	9.64	10.11	2.20	135.00	51.07	30.562	3.970
C27030	1262.75	58.47	94.59	11.81	10.08	2.17	135.00	51.00	40.007	4.898
C29030	1610.45	82.32	112.23	14.59	10.90	2.46	145.00	57.94	48.040	6.032



C Sleeve Gauge Line Details >1.8mm

Section Series	Dim L mm	Dim X mm	Dim A mm	Dim B mm	Dim C mm	Dim Y mm
156	584	225	36	67	35	205
176	584	225	38	87	37	205
206	734	300	37	116	37	280
238	734	300	40	146	39	280
258	934	400	49	146	48	380
309	1334	600	51	196	51	580
359	1524	695	51	241	50	675

Non-Lipped C-Channel Sleeves apply to channels greater than 1.8mm gauge. Sleeves for thinner sections are shown on page 50.

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