

# STEEL FRAMING CONSTRUCTION MANUAL

V8.0 - 01.11.2023



**STEELHAUS**

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# DISCLAIMER

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With SteelHaus 2014 Limited's commitment to continuous improvement, information provided in this guide may be subject to modification. At the time of publication, we believe the information contained in this document is the best available. Nonetheless, we reserve the right to modify any product, technique, or statement to reflect improvements in the manufacture and application of steel framing. In the event of any conflict between this information and the building code of New Zealand and specific manufactures instruction, the building code and the manufactures documentation will prevail.

All information contained in this document is subject to change without notice. This document supersedes all previous documents.

## REFERENCES

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- AS/NZ4600:2005 – Cold Formed Steel Structures
- NZS3604:2011 – Timber Framed Buildings
- NASH 3405:2011
- NASH Handbook: Best Practice for Design and Construction of Residential and Low-Rise Steel Framing
- NASH Standard for Residential and Low-rise Steel Framing, Part 1: Design Criteria
- NASH Standard for Residential and Low-rise Steel Framing, Part 2: Light Steel Framed Buildings
- NASH Building Envelope Solutions
- New Zealand Building Code
- AS1170.0:2002 – Structural Design Actions – General Principals
- AS1397:2001 – Steel sheet and strip – Hot-dipped zinc-coated or aluminium/zinc-coated
- AS 3566.2–2002: Self-drilling screws for the building and construction industries – Corrosion resistance requirements
- Nash N11- House insulation guide



# DURABILITY

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Protective coatings of Zinc and Aluminium alloy defend the steel against corrosion.

Forming and fabrication does not impair the coatings. Because the protective coatings are tough, and their bending properties understood, the formed processes involved in shaping the building frame components do not impair the effectiveness of the protective coatings. The coatings are also tough and resist damage during fabrication and handling on site.

During the fabrication of the frame a variety of joining methods are used that usually penetrate the steel. At the slit edges of the plates and studs, at fixing points where the steel base is penetrated and where components have been punched or cut, the steel base is exposed, but will not rust. It is protected against corrosion by sacrificial protection.

Sacrificial protection refers to the process initiated when dissimilar metals are in contact in the presence of moisture. The more active metal, in this case the zinc or zinc/aluminium coating, will sacrifice itself in preference to the steel, thus protecting the steel base and its structural properties.

In certain conditions Galvanized coatings can be corroded by galvanic action through contact with dissimilar metals. In particular, contact with copper or brass in the presence of moisture will lead to the rapid removal of the coating from Galvanized, followed in due course by corrosion of the underlying steel. Plumbers must therefore take care to isolate copper piping from steel framing by inserting specialized plastic plumbing grommets into the pre-punched service holes in the studs.

For the same reasons CCA treated timbers (which contain soluble copper-based chemicals) must not come into contact with the steel frames. They must be isolated by an approved building membrane, such as DPC.

STEELHAUS



# KIWI FRAME Steel for Framing DURABILITY STATEMENT

Kiwi Steel NZ Ltd.  
12 Hautu Drive,  
Wiri PO Box 98 – 851 Manukau City,  
Auckland, New Zealand  
Phone 09 277 2700  
Fax 09 277 2701  
[www.kiwisteel.co.nz](http://www.kiwisteel.co.nz)

## Scope :

Residential and commercial buildings that are constructed and erected with a design life of no less than 50 years.

KiwiFrame is Kiwi Steel NZ Ltd's range of Galvanised Steel that has been specifically selected for use in residential house framing, roof framing, wall framing and mid floors that are within a closed building envelope.

This product is assured a 50 year durability period guarantee if all requirements are met from the New Zealand Building Code B2 Durability, located in a lined and dry internal environment according to NASH N11 and maintained in accordance with the guidelines as referred to in this document.

This statement excludes all other applications such as sub floor framing, purlins, battens and girts that are not lined within a dry envelope (e.g. : open fronted implemented sheds).

The above declarations are subject to the following:

### 1. Product Description

Supplied only from first grade mills, these KiwiFrame hot-dip galvanised coils are widely used in the production of steel house framing, building interiors & exteriors worldwide and have excellent paintability, workability and corrosion resistance.

#### Product Range and Specifications of KiwiFrame

Grade Standard	AS 1397-2011
Thickness (Base Metal)	0.55, 0.75 up to 2.90mm
Unit coil weight	5 ton max
Steel grade	G550
Zinc Coating weight	275 g/m <sup>2</sup> (Z275)
Surface (All Skin passed)	Zero or Regular Spangle (LEAD FREE)
Coil I.D.	508 / 610 mm



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### 2. Design, Fixing and Handling Requirements

Design, Fixing and Handling of Framing systems and components are to be in accordance with the NASH Best Practice Handbook and the NASH N11 House Insulation Guide.

All components including the Bottom Plate must remain dry and not be subject to any water exposure. A water proof membrane, such as Damp proof Course (DPC), must be provided under the base plate walls and must be at least 10mm wider than the steel.

Suitable separation to be provided when KiwiFrame is in contact with other materials that are not compatible. These materials include but are not limited to other metallic substances as well as concrete and copper based timber treatments.

KiwiFrame steel for framing should not be scratched or bent. Careful handling is required during transportation and erection so as not to damage the frames. Care must be taken not to drag the frames along concrete floors, etc and must be carried when being moved.

KiwiFrame steel for framing must be stored in an environment where it is kept dry at all times and protected from corrosive substances prior to installation.

Erected KiwiFrame steel for framing must be enclosed (wrapped) as soon as possible to minimise exposure to the elements. As a guide the building should be wrapped within 3 weeks in a marine or geothermal environment and 12 weeks within moderate environments.

KiwiFrame steel for framing must be kept dry and free of any dirt, debris, concrete dust and corrosion prior to installation of both external and internal linings.

KiwiFrame steel for framing should not be exposed to high temperature cutting methods such as angle grinders and high speed cutting disks or the sparks and hot metal particles generated by these tools. This also includes welding or welding spatter.

All building wraps should be fit for purpose and be used as per the manufacturers guidelines and recommendations in accordance with the requirements of the NZ Building Code.





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### 3. Maintenance & General Requirements

It is the installer's duty to ensure that all KiwiFrame steel for framing is free of corrosion, rust and debris prior to installation. If the coating shows any sign of breakdown, (e.g.: rust), regular maintenance is required for this durability statement to be kept valid.

Regular visual inspections of accessible steel framing must be undertaken, and if any indications of rust are spotted, this usually means a breakdown in the galvanised coating.

These surfaces should be treated with protective coatings and must be conducted under and comply with AS/NZS2312:2014 - Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings.

Kiwi Steel NZ Ltd must be advised immediately if any potential issues with KiwiFrame steel for framing are observed. Any further use of KiwiFrame steel should be suspended until Kiwi Steel NZ Ltd is notified of the situation

### 4. Additional Information

Unless Kiwi Steel NZ Ltd has agreed in writing to extend the durability for a particular installation, this statement does not cover the following conditions:

- a. Failure of the material if the Design, Fixing and Handling Requirements are not met.
- b. Failure of the material if used in severe environmental zones.
- c. Chemical pollutant corrosion or any corrosion caused as a result of high humidity.
- d. Condensation damage or pollutant damage generated within a building.
- e. Damage caused by forces beyond the control of Kiwi Steel NZ Ltd (Force Majeure).
- f. Intentional Damage.
- g. Defects caused by faulty design or frame manufacturing methods.

### 5. References

- a. New Zealand Building Code B2 Durability.
- b. Environment to be compliant with ISO 9223 Category C1.
- c. NASH Handbook - Best Practice for Design and Construction of Residential and Low-Rise Steel Framing.
- d. NASH N-11 – House Insulation Guide.
- e. AS/NZS2312:2014 - Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings.

### 6. Disclaimer

The information provided in this Durability Statement is subject to change and all information at the time of publication we believe is true and accurate.

Kiwi Steel NZ Ltd reserves the right to modify the Durability Statement at any time.

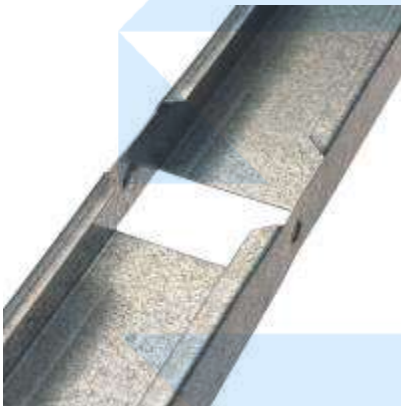
This version of Kiwi Steel NZ Ltd Durability statement for KiwiFrame supersedes all previous editions created.

# MANUFACTURING TOOLING OPERATIONS

The standard steel connection is a precision pre-punched, notched, swaged, and dimpled connection. All required punches are performed on the fabrication machines, so no further manual cutting is required. It punches automatically plumbing services, at any position specified at the time of detailing, performed are as follows.

## Services Hole

Provide routes through the framing for running of electrical and plumbing helps eliminate wasted time by tradesman punching or drilling holes onsite. The hole size is 34mm. A plastic grommet is then inserted to cap the edge of the hole.



## Web Notch & Lip Notch & Dimple

These tools are generally used together in some form. The dimple is a recess with a 3.8mm hole allowing for the screw to sit in the recess leaving a flat surface for the wall linings. The dimples also make assembly of the frames easy, by aligning and holding the joint prior to a fastening being placed. The web and lip notch allows a stud to pass through a nog, meaning the nogging can be continuous if required. This punch is also used for braces and automating cutting on areas where manual cutting would otherwise be needed.

## Chamfer Tool

This allows for a partly rounded end of a webs or braces to be installed at angles to



member. This allows for truss each other.

## Swage

Used to reduce the width of the section to allow sections to fit easily inside another and keeping the edge of the frame even. This swaging also allows the stud to sit flat in the track for full end bearing and load transfer.



## Inkjet Printer

The information printed by the Inkjet Printer details all the information required to identify and orientate every component.



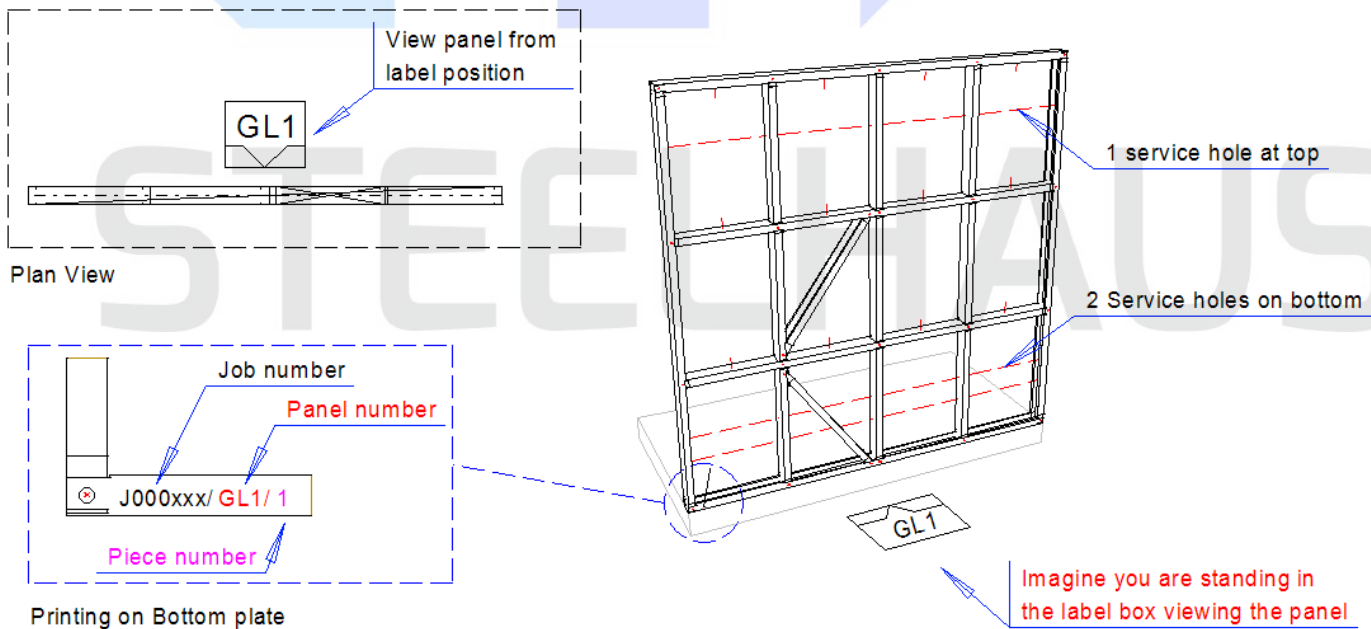
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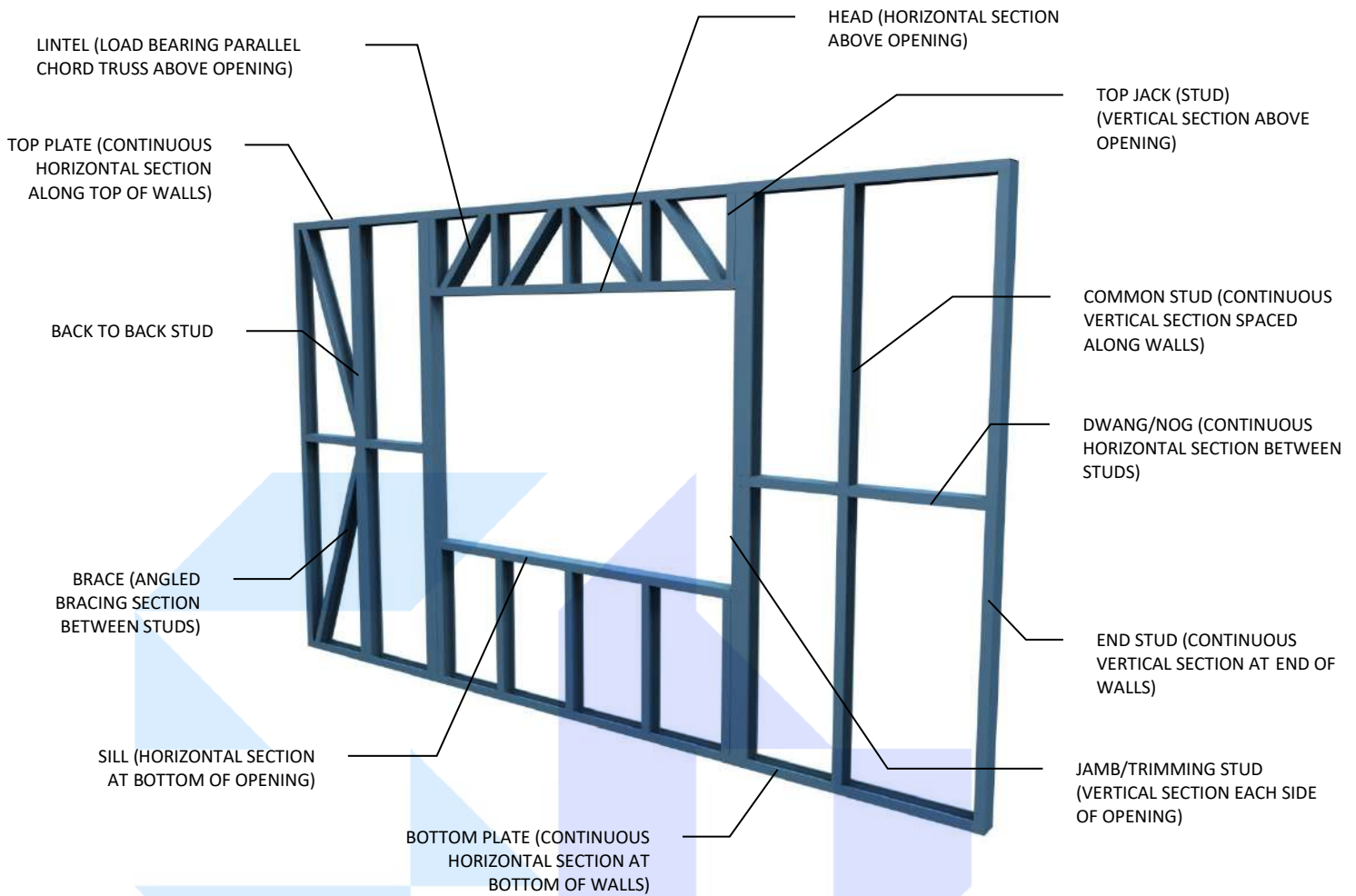


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# SECTION 1: WALL FRAMING



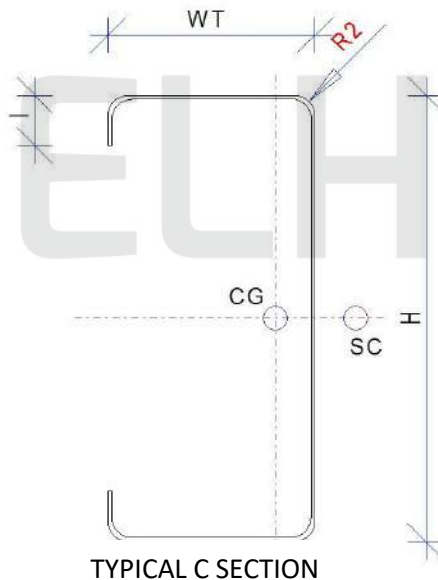
## Frame Orientation



UNLESS OTHERWISE NOTED, ALL CONNECTIONS ARE MADE USING 10G SCREWS – WAFER/FLAT HEAD SCREWS RECOMMENDED, ALL SCREWS ARE EQUIVALENT IN STRENGTH AND CAN BE SUBSTITUTED WITH EACH OTHER

## WALL FRAME TERMINOLOGY

LIPPED C SECTION PROPERTIES			
NAME	S8975		
GRADE		G	550
COATING		Z	275
YIELD STRESS	$f_y$	Mpa	550
TENSILE STRENGTH	$f_u$	Mpa	550
HEIGHT	$h$	mm	89
WIDTH TOP	$w_t$	mm	41
WIDTH BOTTOM	$w_b$	mm	39
THICKNESS	$t$	mm	0.75
LIP TOP	$l$	mm	10.1
FEED		mm	182
AREA		mm <sup>2</sup>	136.5
MASS		kg	1.072
2ND MOMENT OF AREA	$I_x$	mm <sup>4</sup>	174103
2ND MOMENT OF AREA	$I_y$	mm <sup>4</sup>	29996
RADIUS OF GYRATION	$r_x$	mm	35.7
RADIUS OF GYRATION	$r_y$	mm	14.8
CENTROID POSITION	$x$	mm	12.6
CENTROID POSITION	$y$	Cmm	44
SHEAR CENTRE	$x_o$	mm	33.2
SHEAR CENTRE	$y_o$	mm	0
POLAR RADIUS OF GYRATION	$r_{o1}$	mm	43.6
TORTION CONSTANT	$J$	mm <sup>4</sup>	25.6
WARPING CONSTANT	$I_w$	mm <sup>6</sup>	48912422
SECTIONAL MODULUS	$Z_{xt}$	mm <sup>3</sup>	3957
SECTIONAL MODULUS	$Z_{xb}$	mm <sup>3</sup>	3869
SECTIONAL MODULUS	$Z_{yt}$	mm <sup>3</sup>	2381
SECTIONAL MODULUS	$Z_{yb}$	mm <sup>3</sup>	1056



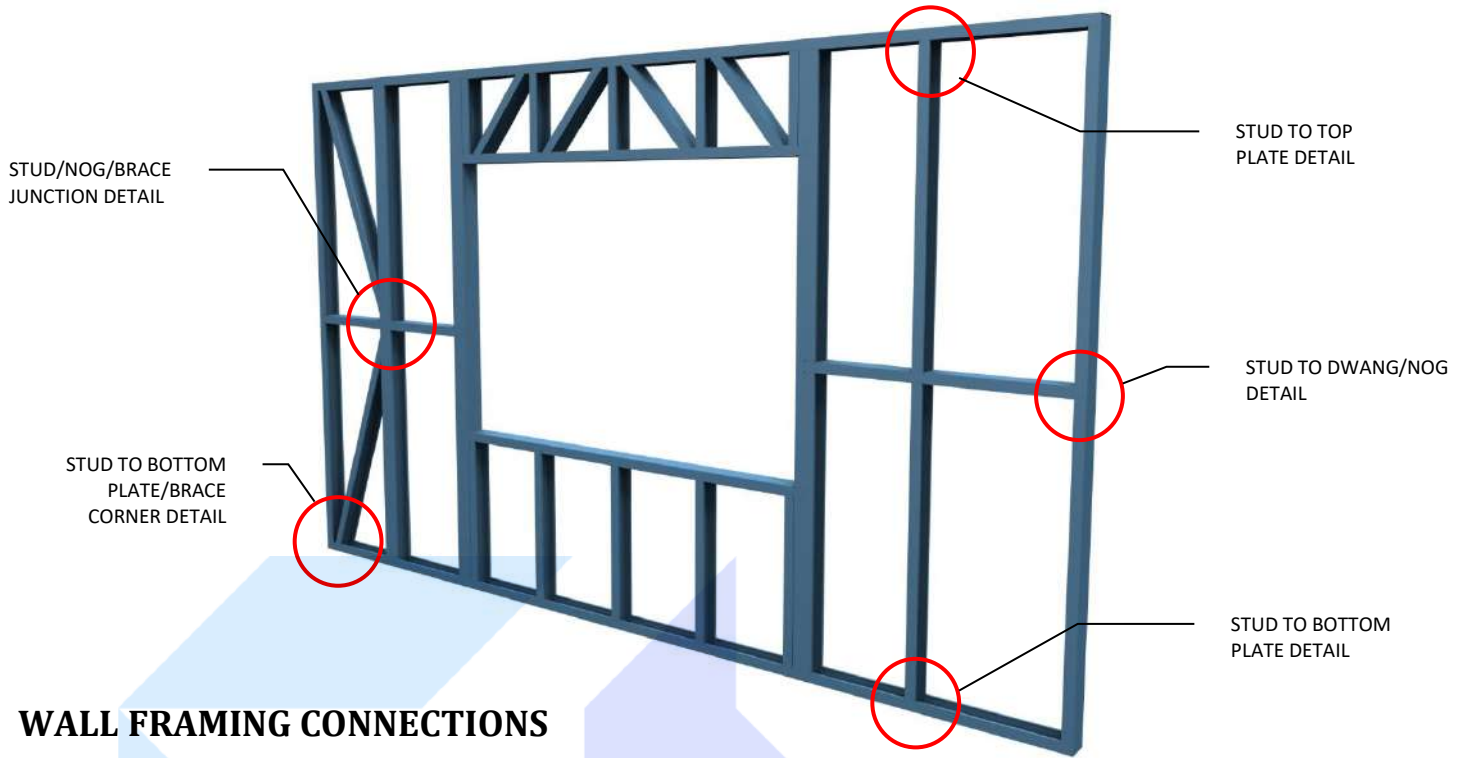
TYPICAL C SECTION

10g 16x16mm  
TYPICAL FRAME ASSEMBLY SCREW

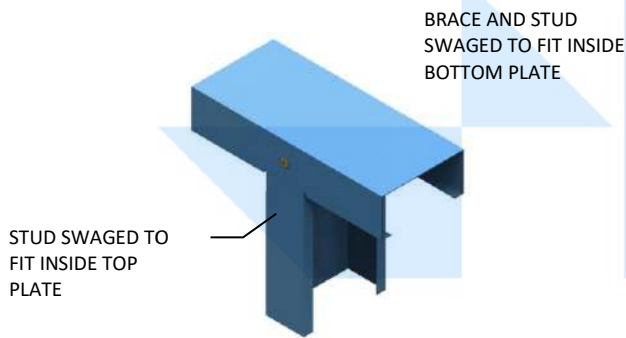
10g 16x16mm  
TYPICAL HEX HEAD SCREW

10g 16x16mm  
TYPICAL FLAT HEAD SCREW

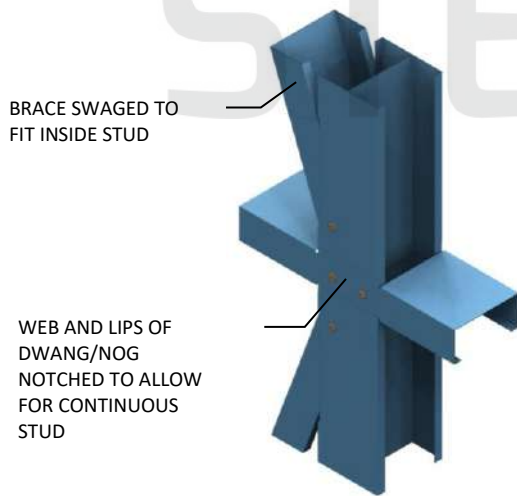




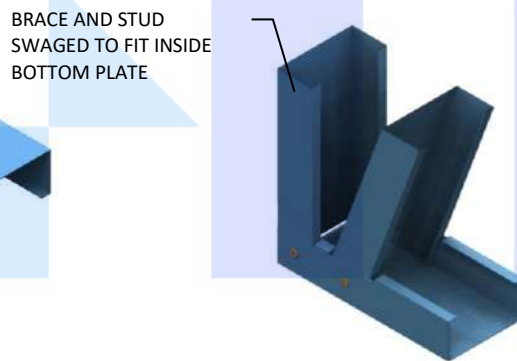
## WALL FRAMING CONNECTIONS



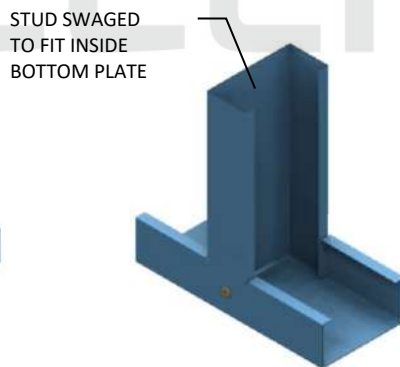
STUD TO TOP PLATE DETAIL



STUD /NOG/BRACE JUNCTION DETAIL



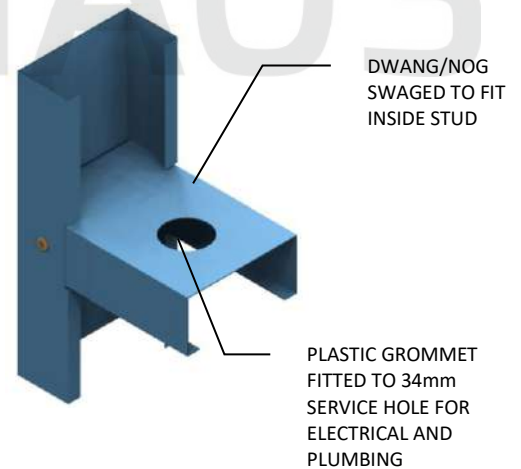
STUD TO BOTTOM PLATE/BRACE DETAIL



STUD TO BOTTOM PLATE DETAIL



PLASTIC GROMMETS



STUD TO NOG DETAIL

STUD FOR INTERNAL LINING FIXING

INTERNAL LINING

2/10g SCREWS AT TOP/  
MIDDLE AND BOTTOM.  
NO MORE THAN  
1350mm APART

STUD FOR INTERNAL LINING FIXING

INTERNAL LINING

TEMPORARY FIXING;  
1/10g SCREW TOP  
AND BOTTOM.

PERMINANT FIXING;  
2/10g SCREW TOP ,  
MIDDLE AND  
BOTTOM.

CORNER WALL FRAME CONNECTION

Uplift Capacity	Screw Quantity per connection
5.0 kN	2/10g
7.5 kN	3/10g
10.0 kN	4/10g
12.5 kN	5/10g

NOTE: IF SOFFIT RIBBON IS USED  
THE STRAP IS NOT REQUIRED

150mm LONG STRIP OF  
25x0.75 STRAP FIXED WITH  
10G SCREWS TO TOP PLATE  
(3 IN EACH WALL)

BRACED WALL  
TOP PLATE

STUD FOR INTERNAL  
LINING FIXING

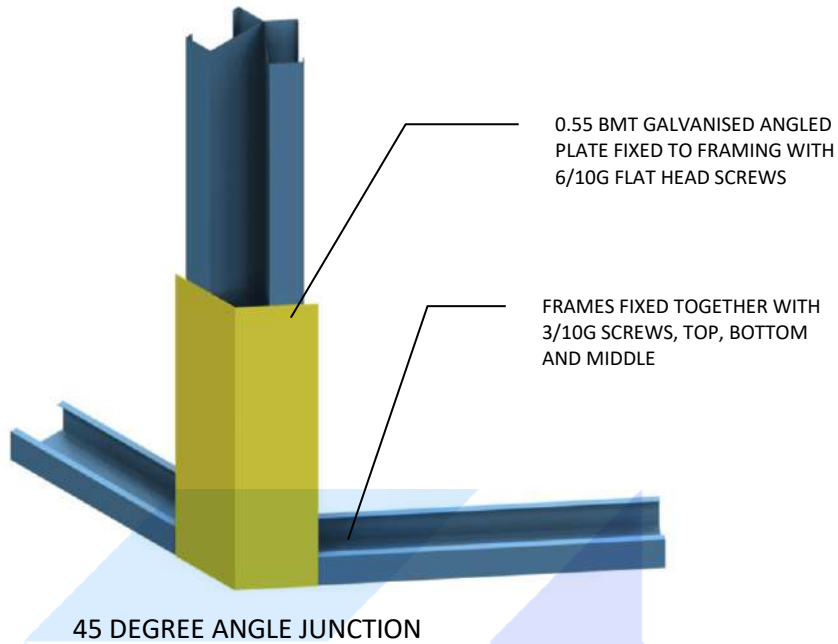
GENERAL WALL FRAME TO  
WALL FRAME CONNECTIONS

STUD

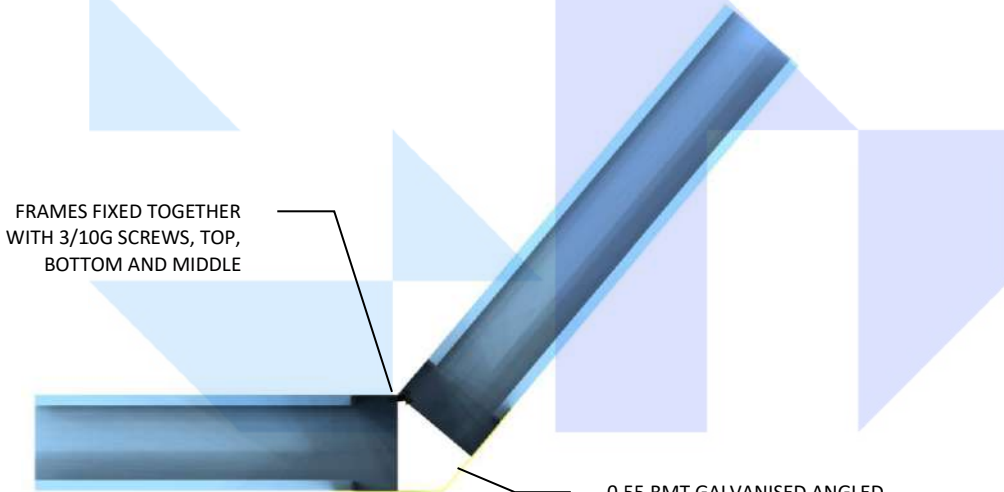
BRACED WALL FRAME(S) TO  
WALL FRAME CONNECTION

PERPENDICULAR WALL  
T-CONNECTION





45 DEGREE ANGLE JUNCTION

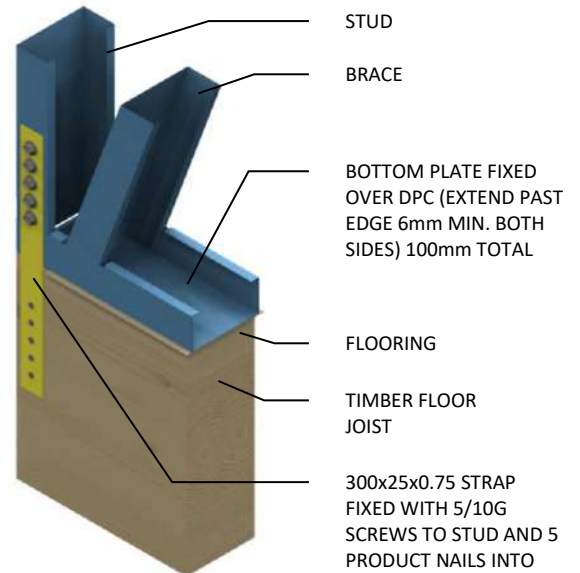
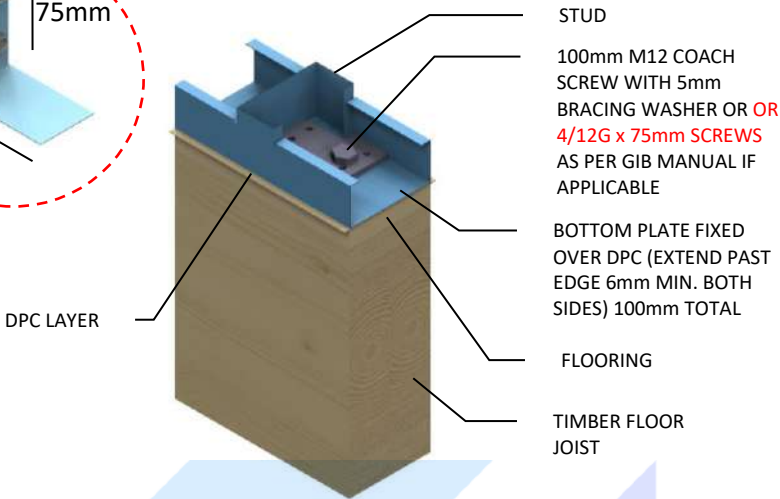
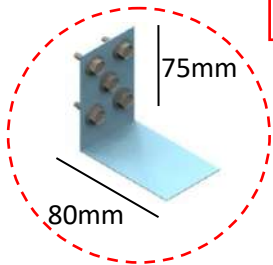


45 DEGREE ANGLE CONNECTION

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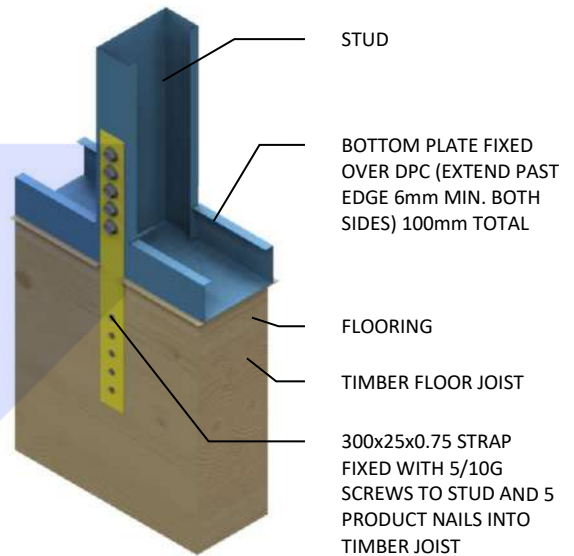
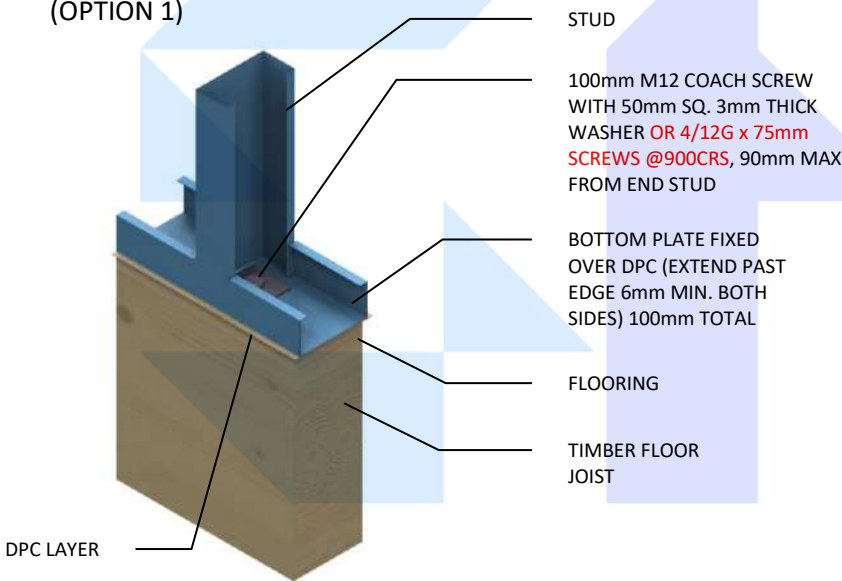


FOR THE USE OF GBPs BRACELINE AND PLY – ADDITIONAL 0.95BMT BRACKET IS REQUIRED AS PER GIB MANUAL



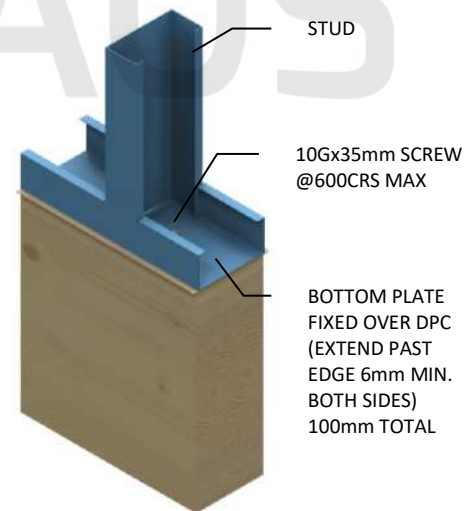
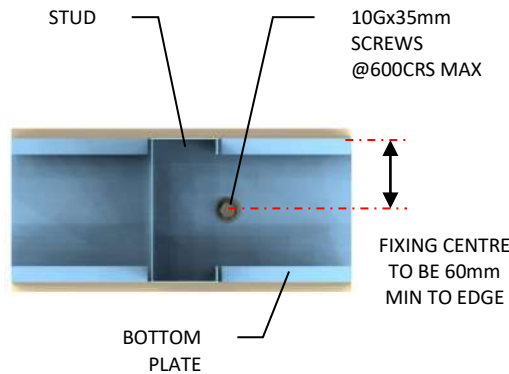
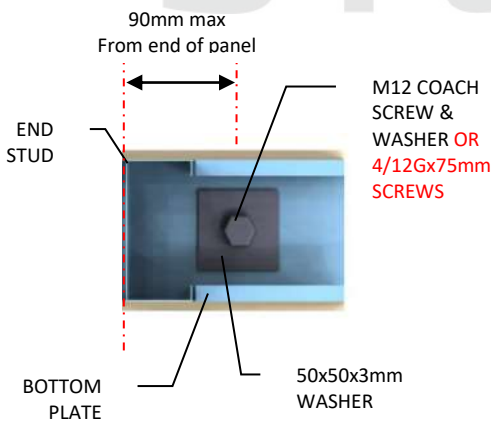
BRACED WALL HOLD DOWN (OPTION 1)

BRACED WALL HOLD DOWN (OPTION 2)



LOAD BEARING WALL HOLD DOWN (OPTION 1)

LOAD BEARING WALL HOLD DOWN (OPTION 2)



LOAD BEARING WALL HOLD DOWN OPTION 1 (PLAN VIEW)

NON-LOAD BEARING WALL HOLD DOWN (PLAN VIEW)

NON-LOAD BEARING WALL HOLD DOWN

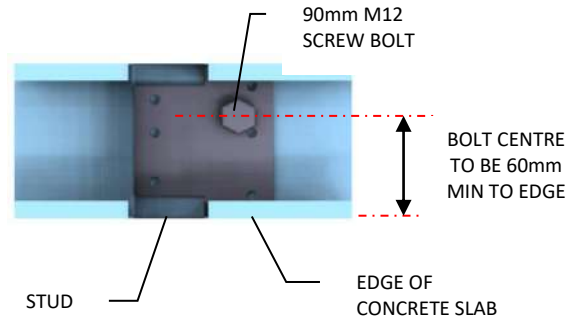
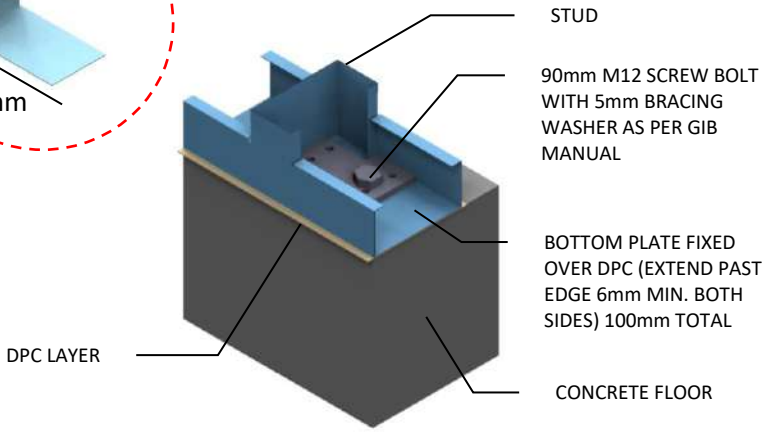
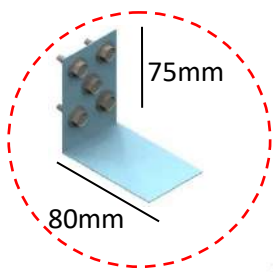


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WALL TO TIMBER FLOOR CONNECTIONS

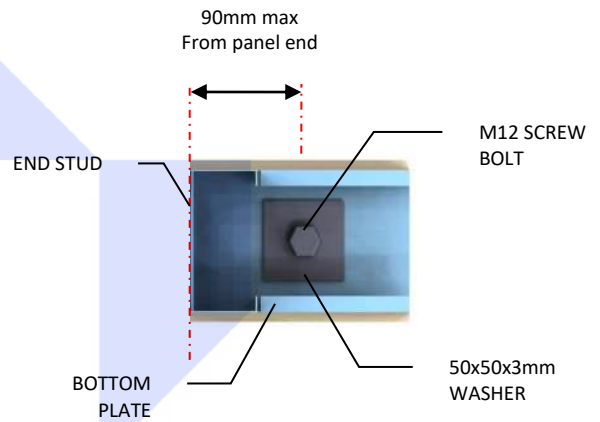
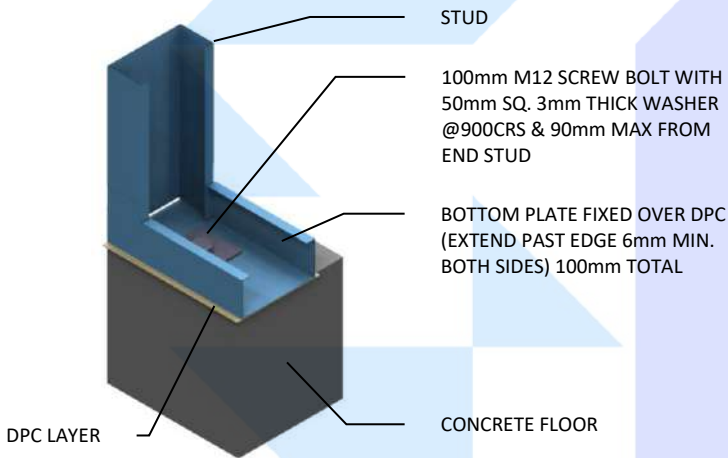
DATE: November 1, 2023  
PAGE #: 15

FOR THE USE OF GBPs BRACELINE AND PLY – ADDITIONAL 0.95BMT BRACKET IS REQUIRED AS PER GIB MANUAL



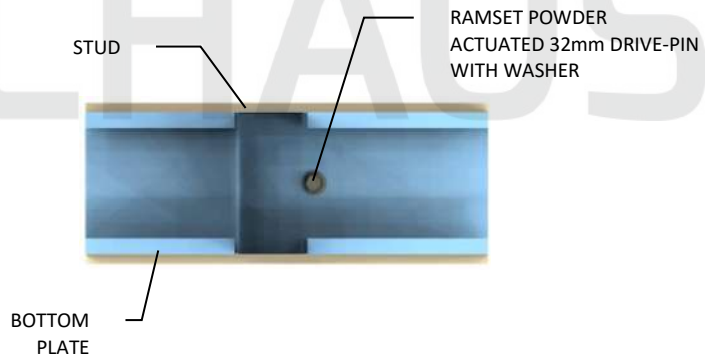
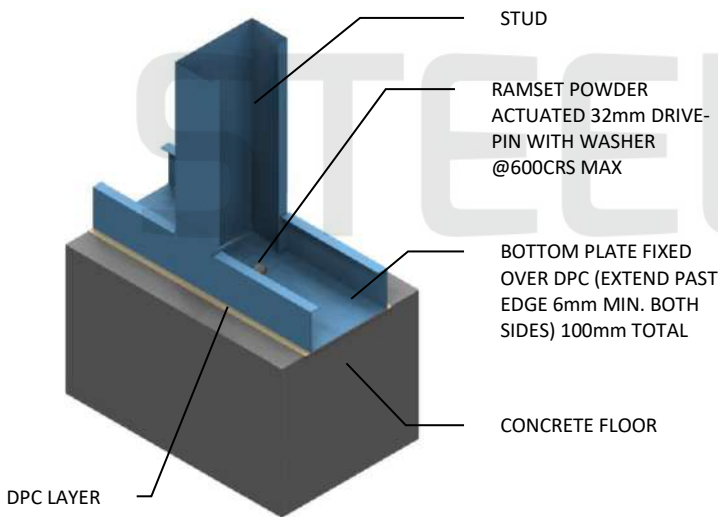
BRACED WALL HOLD DOWN (OPTION 1)

BRACED WALL HOLD DOWN (PLAN VIEW)



LOAD BEARING WALL HOLD DOWN

LOAD BEARING WALL HOLD DOWN PLAN VIEW



NON-LOAD BEARING WALL HOLD DOWN 3D VIEW

NON-LOAD BEARING WALL HOLD DOWN (PLAN VIEW)

NOTE: ALL EXTERNAL AND BRACED WALL FRAMES ON CONCRETE FLOORS MUST HAVE M12 BOLTS @CRS NO GREATER THAN 900mm WITH 50x50x3 WASHERS LOCATED WITHIN 90mm TO END OF PANEL AS PER NASH 3405:2011 8.9.1

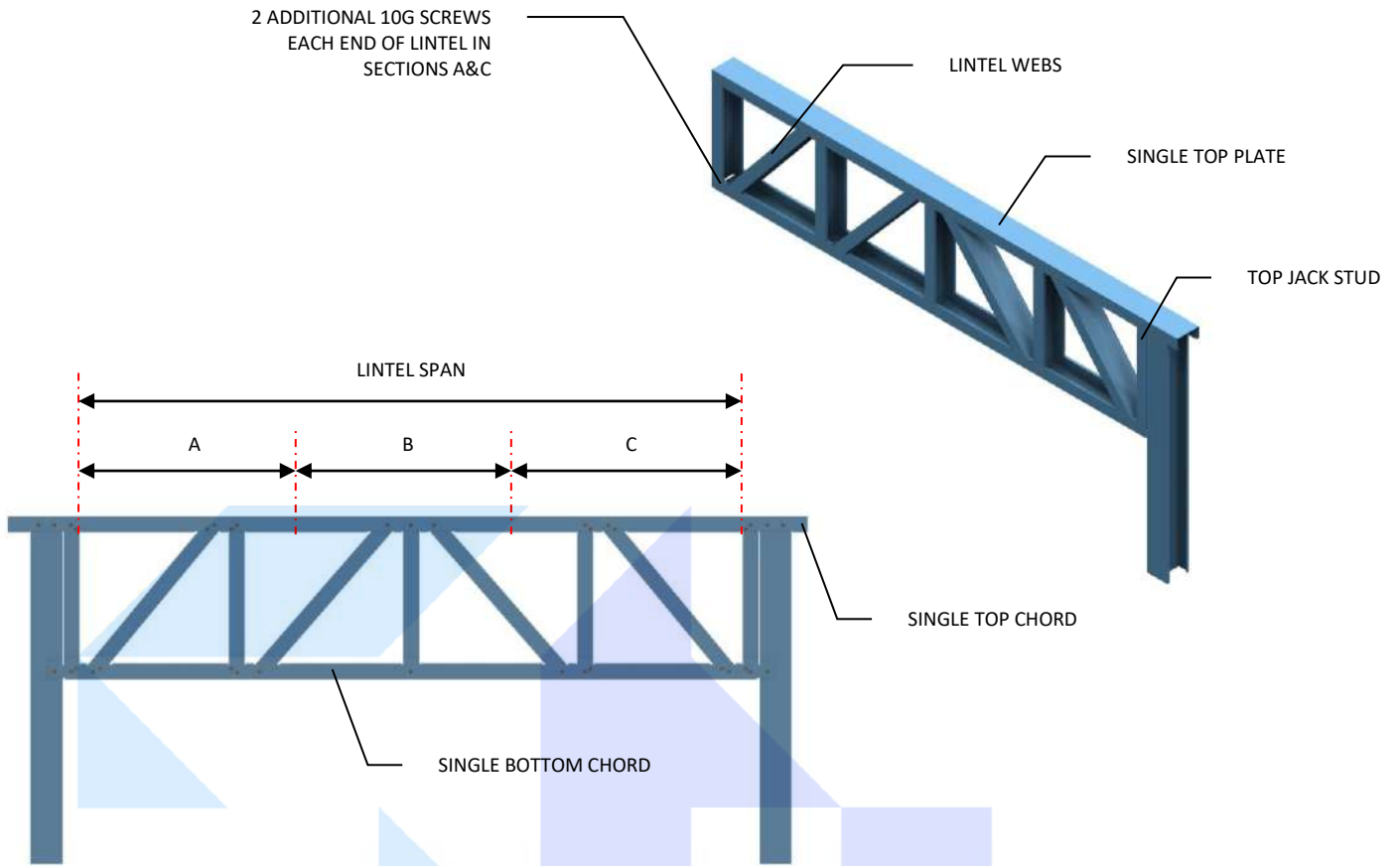
NOTE: ALL CONCRETE HOLD DOWNS REQUIRE A SCREW BOLT OR CONNECTION AT:  
 -EACH INTERSECTION OF EXTERNAL OR BRACED WALL.  
 -EACH SIDE OF OPENINGS.  
 -CENTRES NO GREATER THAN 900mm.



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WALL TO CONCRETE FLOOR CONNECTIONS

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LINTEL (NASH TYPE A2)

4x 150x20x0.95 L PLATES FIXED TO ALL FOUR CORNERS OF LINTEL. PLATES TO LAP OVER 2 TRIMMING STUDS MINIMUM.

PLATE FIXED TO TOP AND BOTOM CHORD WITH 10G SCREWS @150CRS

80mm max  
12mm min.

PLATE FIXED TO ALL WEBS WITH 10G SCREWS @80mm CRS

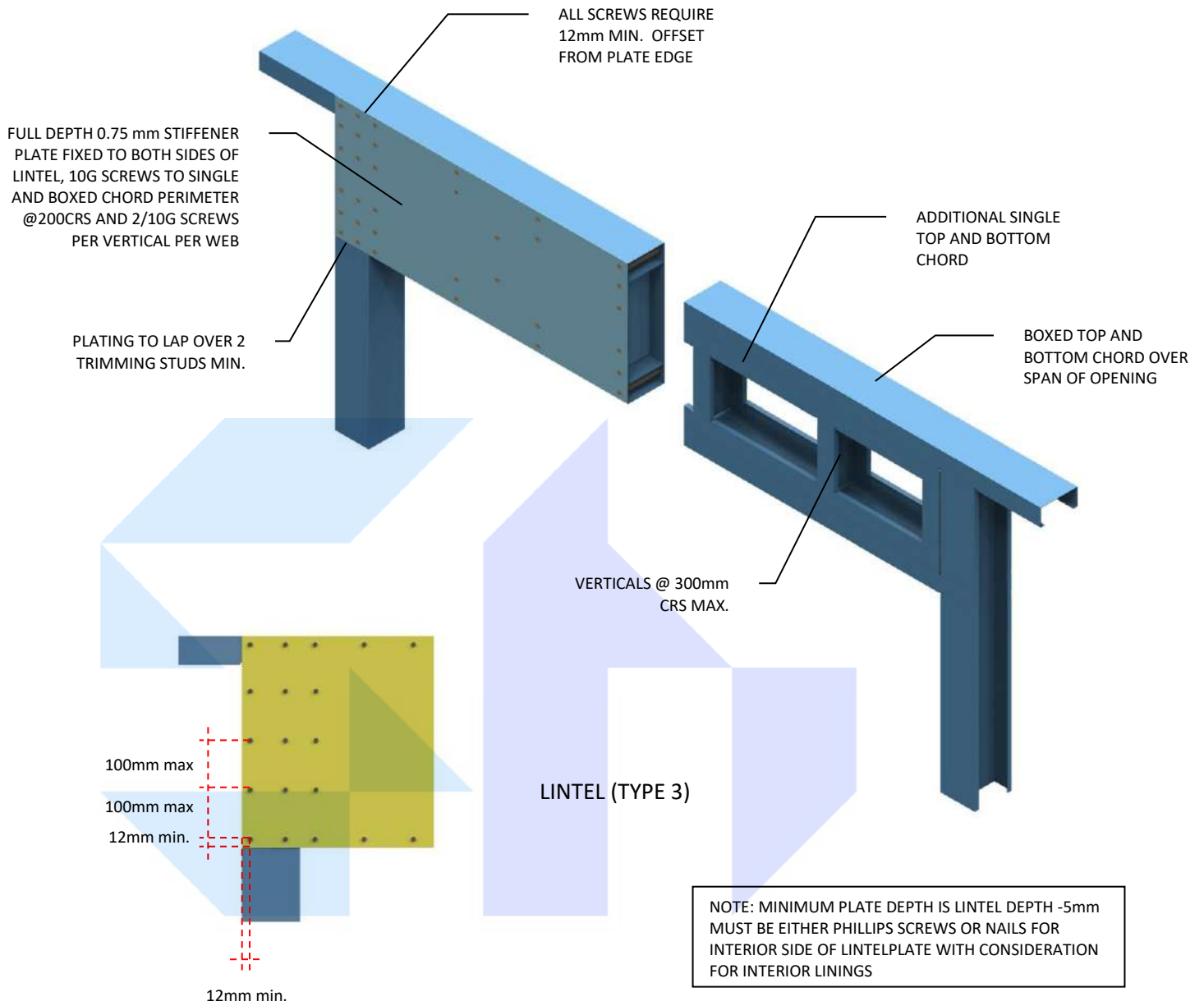
TYPE C LINTEL – 2/L ANGLES REQ. ONE TOP AND ONE BOTTOM  
TYPE C2LINTEL – 4/L ANGLES REQ. TWO TOP AND TWO BOTTOM.

12mm min. 150mm

LINTEL (NASH TYPE C/C2)

NOTE: L PLATE FIXED TO LINTEL WEB MEMBERS AND TOP AND BOTTOM CHORDS WITH 10G SCREWS @150mm CENTRES TO TOP PLATE AND EACH WEB WITH 10G SCREWS @80mm CENTRES.





# STEELHAUS

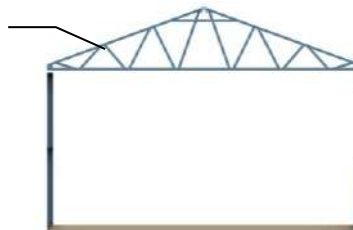
Table 7.23 (continued) Lintels for single storey or upper of two storey - Light roof

Member type	Wind zone	Lintel depth (mm)	Lintel type A				Lintel type A2			
			Span for LD of: (m)				Span for LD of: (m)			
			1.5	3.0	4.5	6.0	1.5	3.0	4.5	6.0
PC/SC	Low to Medium	180	2.40	1.90	1.20	0.70	2.40	2.40	2.00	1.40
		250	2.40	2.10	1.40	1.00	2.40	2.40	2.20	1.60
		300	2.40	2.20	1.50	1.20	2.40	2.40	2.30	1.70
		400	2.40	2.40	1.80	1.50	2.40	2.40	2.40	2.00
		600	2.40	2.40	2.30	1.90	2.40	2.40	2.40	2.40
	High	180	2.40	1.90	1.20	0.70	2.40	2.40	2.00	1.40
		250	2.40	2.10	1.40	1.00	2.40	2.40	2.20	1.60
		300	2.40	2.20	1.50	1.20	2.40	2.40	2.30	1.70
		400	2.40	2.40	1.80	1.50	2.40	2.40	2.40	2.00
		600	2.40	2.40	2.30	1.90	2.40	2.40	2.40	2.40
	Very High	180	2.40	1.90	1.20	0.70	2.40	2.40	2.00	1.40
		250	2.40	2.10	1.40	1.00	2.40	2.40	2.20	1.60
		300	2.40	2.20	1.50	1.20	2.40	2.40	2.30	1.70
		400	2.40	2.40	1.80	1.50	2.40	2.40	2.40	2.00
		600	2.40	2.40	2.30	1.90	2.40	2.40	2.40	2.40
	Extra High	180	2.40	1.50	0.90	SED	2.40	2.40	1.50	1.20
		250	2.40	1.70	1.20	0.80	2.40	2.40	1.80	1.40
		300	2.40	1.90	1.40	0.90	2.40	2.40	2.00	1.50
		400	2.40	2.20	1.60	1.30	2.40	2.40	2.30	1.80
		600	2.40	2.40	2.10	1.80	2.40	2.40	2.40	2.30

Table 7.24 (continued) Lintel for single storey or upper of two storey - Light roof

Member type	Wind zone	Lintel depth (mm)	Lintel type C or E				Lintel type C2 or E2			
			Span for LD of: (m)				Span for LD of: (m)			
			1.5	3.0	4.5	6.0	1.5	3.0	4.5	6.0
PC/SC	Low to Medium	180	2.00	0.80	SED	SED	3.50	1.60	1.10	0.60
		250	3.50	1.80	1.30	0.80	4.60	3.10	2.10	1.50
		300	4.30	2.50	1.60	1.30	4.80	3.60	2.80	2.20
		400	4.80	3.70	2.70	2.10	4.80	4.20	3.60	3.10
		600	4.80	4.70	3.80	3.30	4.80	4.80	4.40	3.80
	High	180	2.00	0.80	SED	SED	3.50	1.60	1.10	0.60
		250	3.50	1.80	1.30	0.80	4.60	3.10	2.10	1.50
		300	4.30	2.50	1.60	1.30	4.80	3.60	2.80	2.20
		400	4.80	3.70	2.70	2.10	4.80	4.20	3.60	3.10
		600	4.80	4.70	3.80	3.30	4.80	4.80	4.40	3.80
	Very High	180	2.00	0.80	SED	SED	3.50	1.60	1.10	0.60
		250	3.50	1.80	1.30	0.80	4.60	3.10	2.10	1.50
		300	4.30	2.50	1.60	1.30	4.80	3.60	2.80	2.20
		400	4.80	3.70	2.70	2.10	4.80	4.20	3.60	3.10
		600	4.80	4.70	3.80	3.30	4.80	4.80	4.40	3.80
	Extra High	180	1.80	0.80	SED	SED	3.20	1.60	1.10	0.60
		250	3.30	1.80	1.30	0.80	4.40	3.10	2.10	1.50
		300	4.20	2.50	1.60	1.30	4.80	3.60	2.80	2.20
		400	4.80	3.70	2.70	2.10	4.80	4.20	3.60	3.10
		600	4.80	4.70	3.80	3.30	4.80	4.80	4.40	3.80

STANDARD TRUSS



WEBBED LINTEL

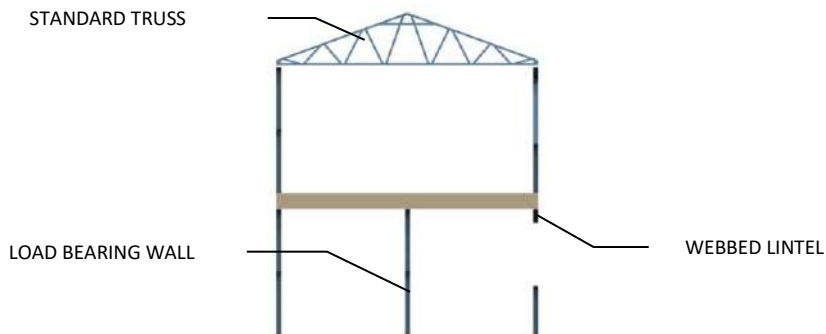
(LIGHT ROOF ONLY) LINTEL SPAN – SINGLE OR UPPER FLOOR

Table 7.27 (continued) Lintels for lower of two storey - Light roof

Member type	Wind zone	Lintel depth (mm)	Lintel type A				Lintel type A2			
			Span for LD of: (m)				Span for LD of: (m)			
			1.5	3.0	4.5	6.0	1.5	3.0	4.5	6.0
PC/SC	Low to Medium	180	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		300	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		400	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		600	1.30	0.70	SED	SED	2.00	1.10	0.80	0.60
	High	180	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		300	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		400	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		600	1.30	0.70	SED	SED	2.00	1.10	0.80	0.60
	Very High	180	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		300	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		400	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		600	1.30	0.70	SED	SED	2.00	1.10	0.80	0.60
	Extra High	180	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		300	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		400	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		600	1.30	0.70	SED	SED	2.00	1.10	0.80	0.60

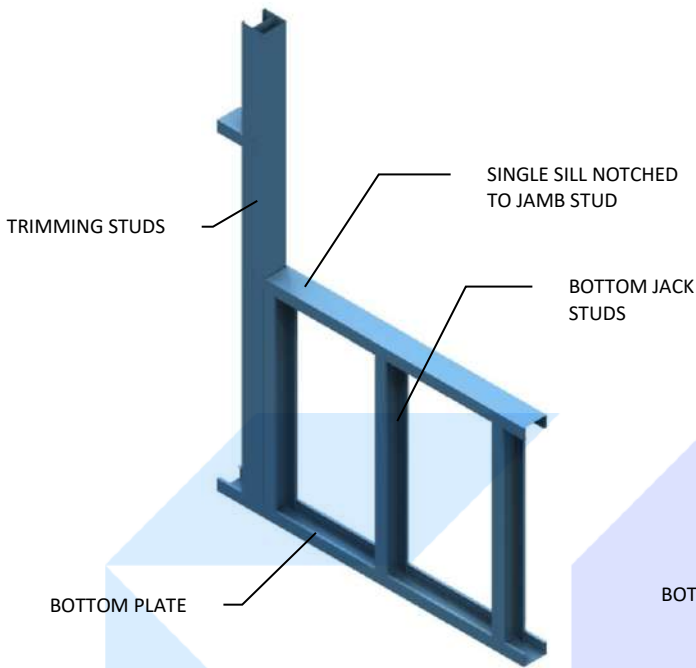
Table 7.28 (continued) Lintels for lower of two storey - Light roof

Member type	Wind zone	Lintel depth (mm)	Lintel type C or E				Lintel type C2 or E2			
			Span for LD of: (m)				Span for LD of: (m)			
			1.5	3.0	4.5	6.0	1.5	3.0	4.5	6.0
PC/SC	Low to Medium	180	1.20	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	2.00	1.10	0.80	0.60	2.70	1.90	1.40	1.00
		300	2.50	1.50	1.00	0.80	3.00	2.30	1.70	1.30
		400	3.00	1.80	1.20	0.90	3.60	2.70	2.20	1.70
		600	3.60	2.10	1.50	1.10	4.50	SED	SED	SED
	High	180	1.20	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	2.00	1.10	0.80	0.60	2.70	1.90	1.40	1.00
		300	2.50	1.50	1.00	0.80	3.00	2.30	1.70	1.30
		400	3.00	1.80	1.20	0.90	3.60	2.70	2.20	1.70
		600	3.60	2.10	1.50	1.10	4.50	SED	SED	SED
	Very High	180	1.20	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	2.00	1.10	0.80	0.60	2.70	1.90	1.40	1.00
		300	2.50	1.50	1.00	0.80	3.00	2.30	1.70	1.30
		400	3.00	1.80	1.20	0.90	3.60	2.70	SED	SED
		600	3.60	2.10	1.50	1.10	4.50	SED	SED	SED
	Extra High	180	1.20	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	2.00	1.10	0.80	0.60	2.70	1.90	1.40	1.00
		300	2.50	1.50	1.00	0.80	3.00	2.30	1.70	1.30
		400	3.00	1.80	1.20	0.90	3.60	2.70	SED	SED
		600	3.60	2.10	1.50	1.10	4.50	SED	SED	SED

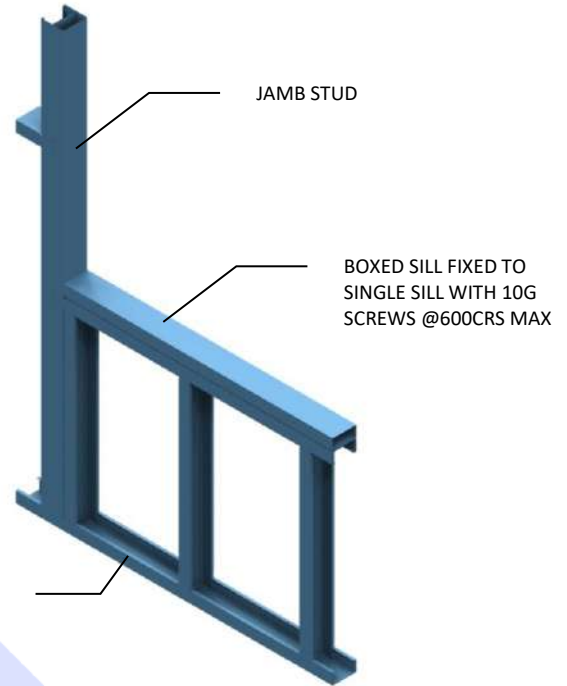


(LIGHT ROOF ONLY) LINTEL SPAN – LOWER OF TWO LEVELS (JOISTS PERPENDICULAR TO LINTEL)

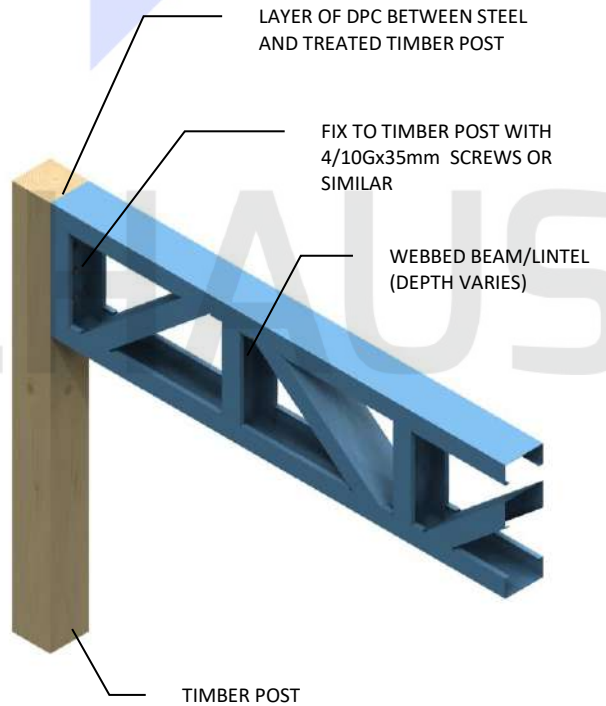
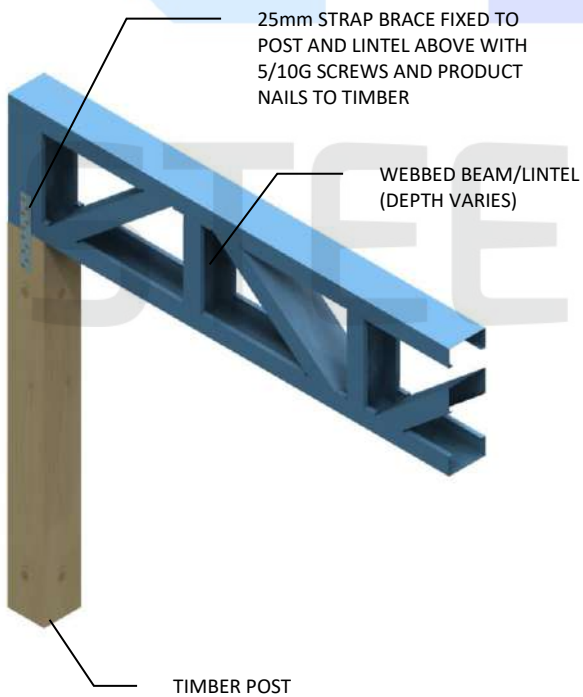




SINGLE SILL



BOXED SILL





NUMBER OF STUDS FOR MAX UNRESTRAINED HEIGHT (m)					NUMBER OF STUDS FOR MAX UNRESTRAINED HEIGHT (m)				
WIND ZONE	2.4				WIND ZONE	2.7			
	MAX STUD SPACING (mm)					MAX STUD SPACING (mm)			
	200	300	400	600		200	300	400	600
INTERNAL	1	1	1	1	INTERNAL	1	1	1	1
LOW	1	1	1	1	LOW	1	1	1	1
MEDIUM	1	1	1	1	MEDIUM	1	1	1	1
HIGH	1	1	1	1	HIGH	1	1	1	1
VERY HIGH	1	1	1	1	VERY HIGH	1	1	1	2
EXTRA HIGH	1	1	1	2	EXTRA HIGH	1	1	2	2

NUMBER OF STUDS FOR MAX UNRESTRAINED HEIGHT (m)					NUMBER OF STUDS FOR MAX UNRESTRAINED HEIGHT (m)				
WIND ZONE	3				WIND ZONE	3.6			
	MAX STUD SPACING (mm)					MAX STUD SPACING (mm)			
	200	300	400	600		200	300	400	600
INTERNAL	1	1	1	1	INTERNAL	1	1	1	1
LOW	1	1	1	1	LOW	1	1	1	2
MEDIUM	1	1	1	1	MEDIUM	1	1	1	2
HIGH	1	1	1	2	HIGH	1	1	2	2
VERY HIGH	1	1	2	2	VERY HIGH	1	2	2	
EXTRA HIGH	1	2	2	2	EXTRA HIGH	2	2	2	

NUMBER OF STUDS FOR MAX UNRESTRAINED HEIGHT (m)					NUMBER OF STUDS FOR MAX UNRESTRAINED HEIGHT (m)				
WIND ZONE	4.2				WIND ZONE	4.8			
	MAX STUD SPACING (mm)					MAX STUD SPACING (mm)			
	200	300	400	600		200	300	400	600
INTERNAL	1	1	2	2	INTERNAL	2	2	2	
LOW	1	1	2	2	LOW	2	2	2	
MEDIUM	1	2	2		MEDIUM	2	2		
HIGH	2	2			HIGH	2			
VERY HIGH	2				VERY HIGH				
EXTRA HIGH	2				EXTRA HIGH				

**THESE STUD TABLES ARE CALCULATED FOR THE FOLLOWING LOADS:**

ROOF PITCH -25 DEGREES  
 NOG SPACINGS -1.35m CENTRES  
 TRUSS SPACINGS -1.2m CENTRES  
 LOADED DIMENSION -6.0m MAX.

**ROOF LOADS:**

DEAD -0.27kPa (10mm PLASTERBOARD CEILING, STEEL ROOF)  
 LIVE -0.25kPa (RESTRICTED ACCESS ROOF)  
 SNOW -0.44kPa (0.9kPa GROUND SNOW LOAD)



### 7.4.3. Studs in internal load bearing wall - single storey or upper of two storey

#### 7.4.3.1. Light roof

Stud type for the maximum height (length) of internal load bearing studs in single or upper storey with light roofs shall be in accordance with Table 7.7.

**Table 7.7. Single or upper storey - Internal**

Wind zone	Loaded dimension (m)	Stud type for maximum height (length) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing of (mm)			At maximum stud spacing of (mm)			At maximum stud spacing of (mm)		
		300	400	600	300	400	600	300	400	600
Low - Medium	3.0	SA	SA	SA	SA	SA	SA	SA	SA	SA
	4.5	SA	SA	SA	SA	SA	SA	SA	SA	SA
	6.0	SA	SA	SA	SA	SA	SB	SA	SA	SB
High	3.0	SA	SA	SA	SA	SA	SB	SA	SA	SB
	4.5	SA	SA	SA	SA	SB	SC	SA	SA	SC
	6.0	SA	SA	SC	SC	SC	SC	SB	SC	SC
Very High	3.0	SA	SA	SA	SA	SB	SC	SA	SB	SC
	4.5	SA	SB	SC	SC	SC	SC	SB	SC	SC
	6.0	SC	SC	SC	SC	SC	SC	SC	SC	SC
Extra High	3.0	SA	SA	SC	SB	SC	SC	SB	SC	SC
	4.5	SB	SC	SC	SC	SC	SC	SC	SC	SC
	6.0	SC	SC	SC	SC	SC	SC	SC	SC	SC

#### 7.4.3.2. Heavy roof

Stud type for the maximum height (length) of internal load bearing studs in single or upper storey with heavy roofs shall be in accordance with Table 7.8.

**Table 7.8. Single or upper storey - Internal**

Wind zone	Loaded dimension (m)	Stud type for maximum height (length) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing of (mm)			At maximum stud spacing of (mm)			At maximum stud spacing of (mm)		
		300	400	600	300	400	600	300	400	600
Low - Medium	3.0	SA	SA	SA	SA	SA	SA	SA	SA	SA
	4.5	SA	SA	SA	SA	SA	SA	SA	SA	SA
	6.0	SA	SA	SA	SA	SB	SC	SA	SA	SB
High	3.0	SA	SA	SA	SA	SA	SB	SA	SA	SB
	4.5	SA	SA	SA	SA	SB	SC	SA	SA	SC
	6.0	SA	SA	SC	SC	SC	SC	SB	SC	SC
Very High	3.0	SA	SA	SA	SA	SB	SC	SA	SA	SC
	4.5	SA	SA	SC	SB	SC	SC	SB	SC	SC
	6.0	SC	SC	SC	SC	SC	SC	SC	SC	SC
Extra High	3.0	SA	SA	SB	SB	SC	SC	SA	SB	SC
	4.5	SB	SC	SC	SC	SC	SC	SC	SC	SC
	6.0	SC	SC	SC	SC	SC	SC	SC	SC	SC



## 7.4.4. Studs in external load bearing walls - lower of two storey

### 7.4.4.1. Light roof

Stud type for the maximum height (length) of external load bearing studs in the lower of two storeys with light roofs shall be in accordance with Table 7.9.

For Table 7.9 the maximum wall loaded dimension from joists shall be 3.0 metres.

**Table 7.9. Lower storey of two storey – External**

Wind zone	Loaded dimension from roof (m)	Stud type for maximum height (length) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing of (mm)			At maximum stud spacing of (mm)			At maximum stud spacing of (mm)		
		300	400	600	300	400	600	300	400	600
Low - Medium	3.0	SA	SA	SB	SA	SB	SC	SA	SA	SC
	4.5	SA	SA	SB	SA	SB	SC	SA	SA	SC
	6.0	SA	SA	SC	SA	SB	SC	SA	SA	SC
High	3.0	SA	SA	SC	SA	SB	SC	SA	SB	SC
	4.5	SA	SA	SC	SA	SC	SC	SA	SC	SC
	6.0	SA	SB	SC	SB	SC	SC	SA	SC	SC
Very High	3.0	SA	SB	SC	SB	SC	SC	SB	SC	SC
	4.5	SA	SB	SC	SB	SC	SC	SB	SC	SC
	6.0	SA	SC	SC	SC	SC	SC	SC	SC	SC
Extra High	3.0	SA	SC	SC	SC	SC	SC	SC	SC	SD
	4.5	SA	SC	SC	SC	SC	SC	SC	SC	SD
	6.0	SB	SC	SC	SC	SC	SC	SC	SC	SD

### 7.4.4.2. Heavy roof

Stud type for the maximum height (length) of external load bearing studs in the lower of two storeys with heavy roofs shall be in accordance with Table 7.10.

For Table 7.10 the maximum wall loaded dimension from joists shall be 3.0 metres.

**Table 7.10. Lower storey of two storey - External**

Wind zone	Loaded dimension from roof (m)	Stud type for maximum height (length) of: (m)								
		2.4			2.7			3		
		At maximum stud spacing of (mm)			At maximum stud spacing of (mm)			At maximum stud spacing of (mm)		
		300	400	600	300	400	600	300	400	600
Low - Medium	3.0	SA	SA	SB	SA	SB	SC	SA	SA	SC
	4.5	SA	SB	SC	SA	SB	SC	SA	SB	SC
	6.0	SA	SB	SC	SA	SC	SC	SA	SC	SC
High	3.0	SA	SA	SC	SA	SC	SC	SA	SC	SC
	4.5	SA	SB	SC	SB	SC	SC	SB	SC	SC
	6.0	SA	SC	SC	SB	SC	SC	SB	SC	SC
Very High	3.0	SA	SB	SC	SB	SC	SC	SB	SC	SC
	4.5	SA	SC	SC	SC	SC	SC	SC	SC	SC
	6.0	SB	SC	SC	SC	SC	SC	SC	SC	SC
Extra High	3.0	SA	SC	SC	SC	SC	SC	SC	SC	SD
	4.5	SB	SC	SC	SC	SC	SC	SC	SC	SD
	6.0	SC	SC	SC	SC	SC	SC	SC	SC	SD

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CONTINUOUS DPC STRIP BETWEEN STEEL AND TREATED TIMBER

2/10G 38mm SCREWS, 2 TOP, 2 MIDDLE, 2 BOTTOM

TIMBER FRAME

TIMBER FRAMING –  
DESIGNED AND  
SUPPLIED BY OTHERS

STEEL FRAME

### STEEL TO TIMBER WALL FIXING

STEELHAUS

STEEL FRAMED ROOF PANEL

CPC40s EACH SIDE OF POST (2 IN TOTAL), 2/10G SCREWS PER BRACKET TO ROOF PANEL, 3/10G SCREWS PER BRACKET TO TIMBER POST

TIMBER POST

### ROOF PANEL TO TIMBER POST



SteelHaus (2014) Ltd  
Unit 1 31 Ha Crescent, Wiri, Auckland 2104  
0508 826 766  
[www.steelhaus.co.nz](http://www.steelhaus.co.nz)

### STEEL TO TIMBER FIXING

DATE November 1, 2023

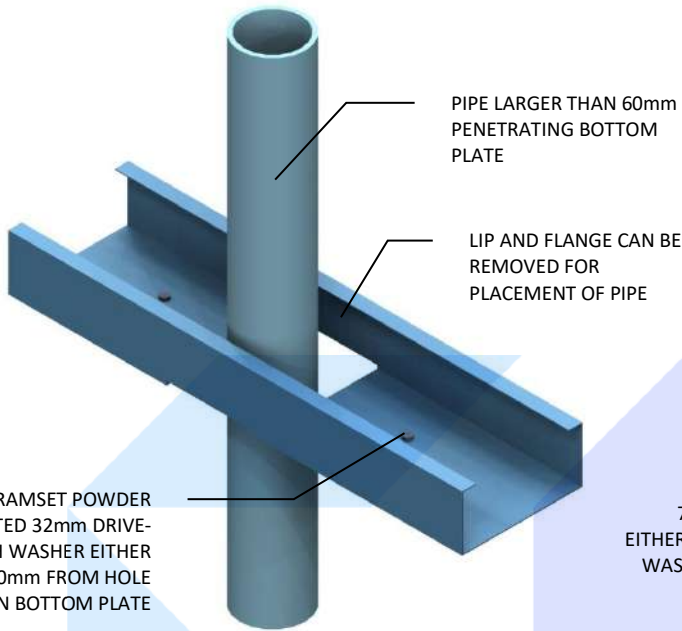
PAGE # 25



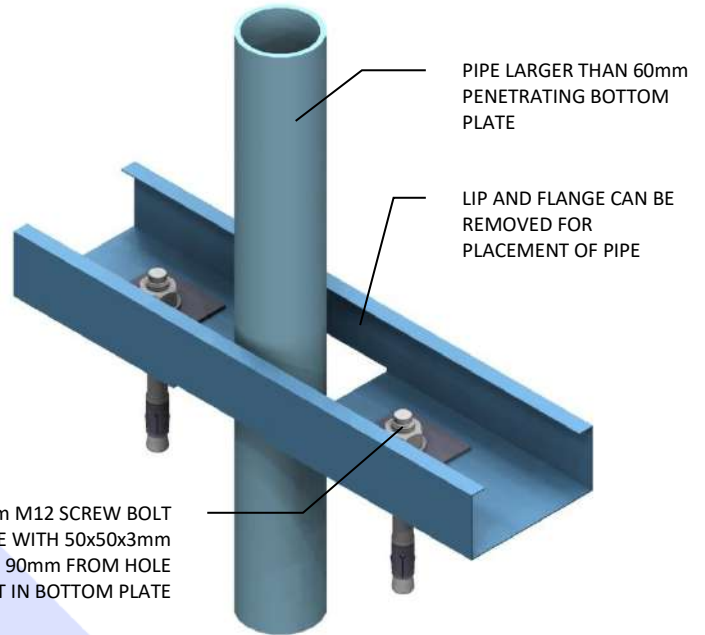
**STEELHAUS FACTORY SPACINGS  
(FROM BOTTOM PLATE)**

- 200mm
- 400mm
- 2100mm

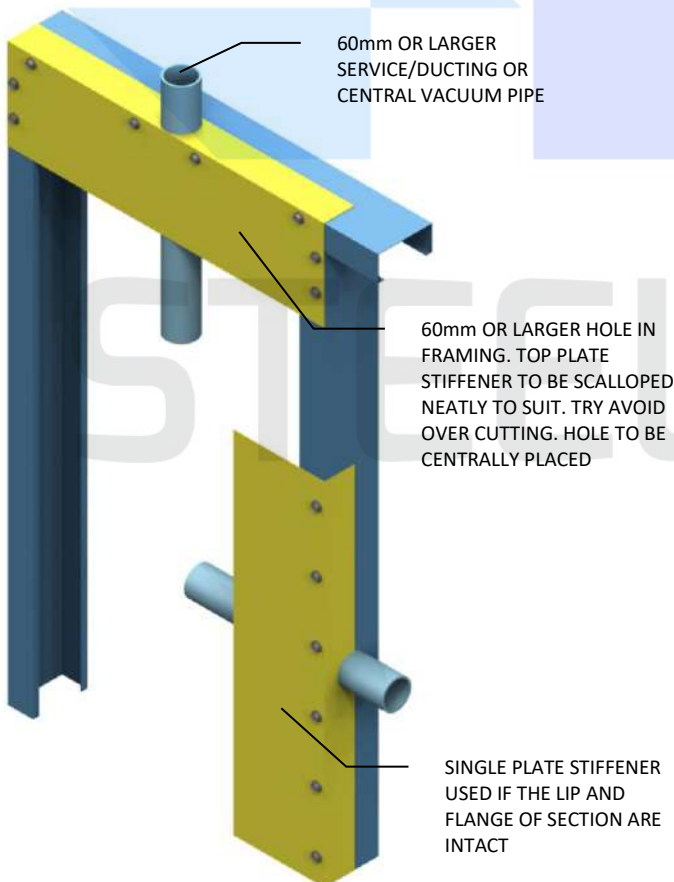
**NOTE: ANY PENETRATION WITH A DIAMETER LESS THAN 60mm IS ACCEPTABLE WITHOUT A STIFFENER. THE FLANGE AND LIPS OF THE SECTION MUST BE INTACT.**



**LARGE PIPE PENETRATIONS IN NON-LOAD BEARING BOTTOM PLATE**



**LARGE PIPE PENETRATIONS IN LOAD BEARING BOTTOM PLATE**



**PENETRATIONS LARGER THAN 60mm WITH LIP AND FLANGES IN-TACT – LOAD BEARING WALL**

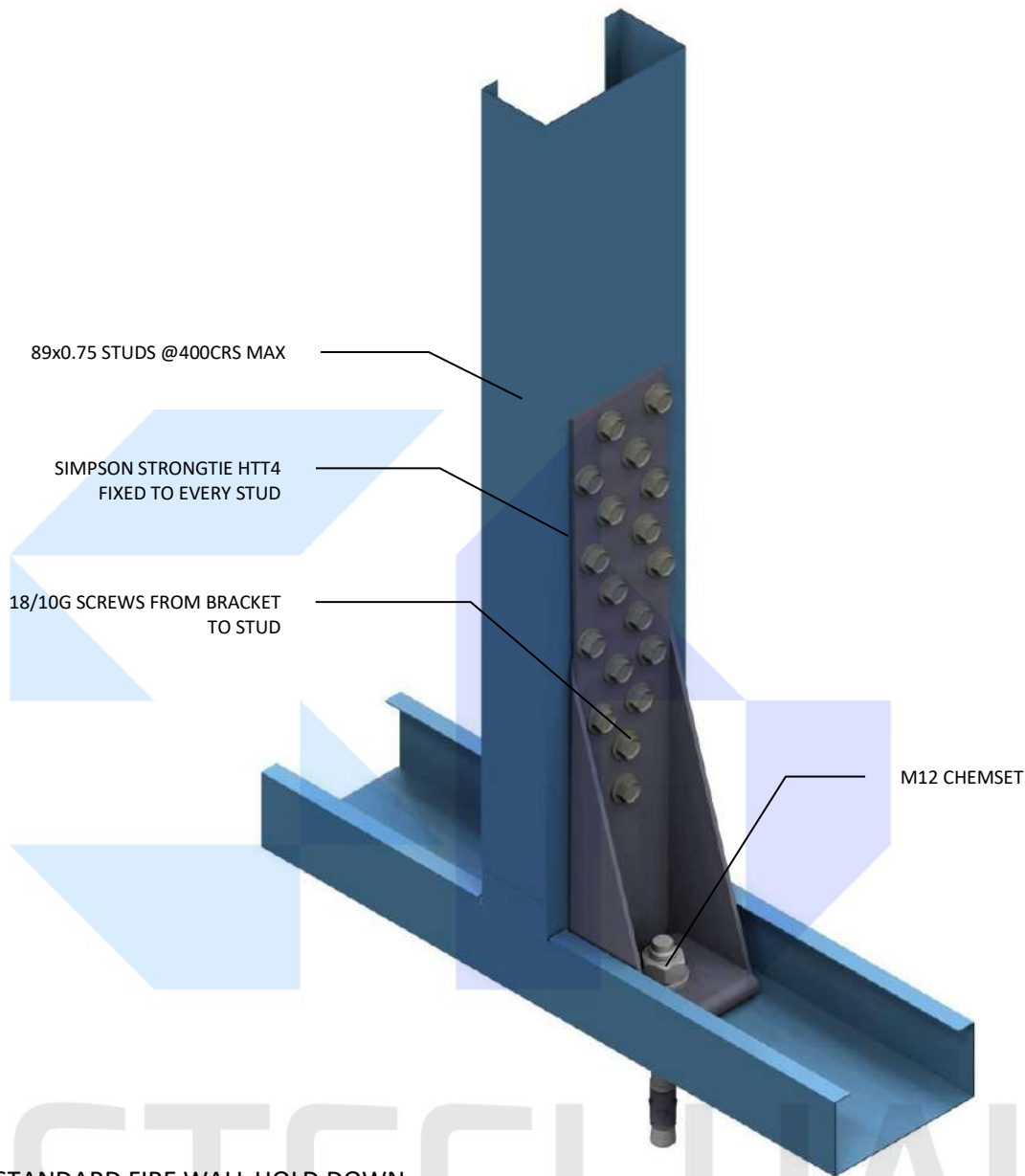


**PENETRATION WITH LIP AND FLANGE OF SECTION REMOVED – LOAD BEARING WALL**

NO. OF JAMB STUDS EACH SIDE OF OPENING- 2.4m WALL HEIGHT							
WIND ZONE	ROOF LOADED DIMENSION (LD)	MAXIMUM CLEAR WIDTH OF OPENING (m)					
		0.9	1.8	3	3.6	4.2	5.4
LOW OR MEDIUM	3	1	1	2	2	2	2
	4.5	1	1	2	2	2	3
	6	1	2	2	2	3	3
HIGH	3	1	2	2	2	3	3
	4.5	1	2	2	3	3	3
	6	1	2	2	3	3	4
VERY HIGH	3	1	2	2	3	3	4
	4.5	1	2	2	3	3	4
	6	1	2	3	3	3	4
EXTRA HIGH	3	1	2	3	3	3	4
	4.5	1	2	3	3	4	4
	6	2	2	3	3	4	5

NO. OF JAMB STUDS EACH SIDE OF OPENING- 2.7m WALL HEIGHT							
WIND ZONE	ROOF LOADED DIMENSION (LD)	MAXIMUM CLEAR WIDTH OF OPENING (m)					
		0.9	1.8	3	3.6	4.2	5.4
LOW OR MEDIUM	3	1	1	2	2	2	3
	4.5	1	2	2	2	3	3
	6	1	2	2	3	3	4
HIGH	3	1	2	2	3	3	4
	4.5	1	2	3	3	3	4
	6	1	2	3	3	3	4
VERY HIGH	3	1	2	3	3	3	4
	4.5	2	2	3	3	4	5
	6	2	2	3	4	4	5
EXTRA HIGH	3	2	2	3	4	4	5
	4.5	2	2	3	4	4	5
	6	2	3	4	4	5	6

NO. OF JAMB STUDS EACH SIDE OF OPENING- 3.0m WALL HEIGHT							
WIND ZONE	ROOF LOADED DIMENSION (LD)	MAXIMUM CLEAR WIDTH OF OPENING (m)					
		0.9	1.8	3	3.6	4.2	5.4
LOW OR MEDIUM	3	1	2	2	2	3	3
	4.5	1	2	2	3	3	3
	6	1	2	2	3	3	4
HIGH	3	1	2	2	3	3	4
	4.5	1	2	3	3	4	4
	6	2	2	3	3	4	5
VERY HIGH	3	2	2	3	4	4	5
	4.5	2	2	3	4	4	5
	6	2	2	3	4	4	5
EXTRA HIGH	3	2	3	4	4	5	6
	4.5	2	3	4	4	5	6
	6	2	3	4	5	5	6



STANDARD FIRE WALL HOLD DOWN

STEELHAUS

**OPTION 1**

M12 CHEMSET 101 WITH 220mm MIN. EMBEDMENT

$f'c = 20\text{Mpa}$   
 MIN. EDGE DISTANCE = 40mm  
 BOLT SPACING = 400mm SCRS (ONE PER STUD)

**OPTION 2**

M12 STRUCTASET 401 M12 WITH 140mm MIN. EFFECTIVE DEPTH

$f'c = 20\text{Mpa}$   
 MIN. EDGE DISTANCE = 40mm  
 BOLT SPACING = 400mm SCRS (ONE PER STUD)

**OPTION 3**

M12 EPCON C6 WITH 100mm MIN. EMBEDMENT

$f'c = 20\text{Mpa}$   
 MIN. EDGE DISTANCE = 40mm  
 BOLT SPACING = 400mm SCRS (ONE PER STUD)

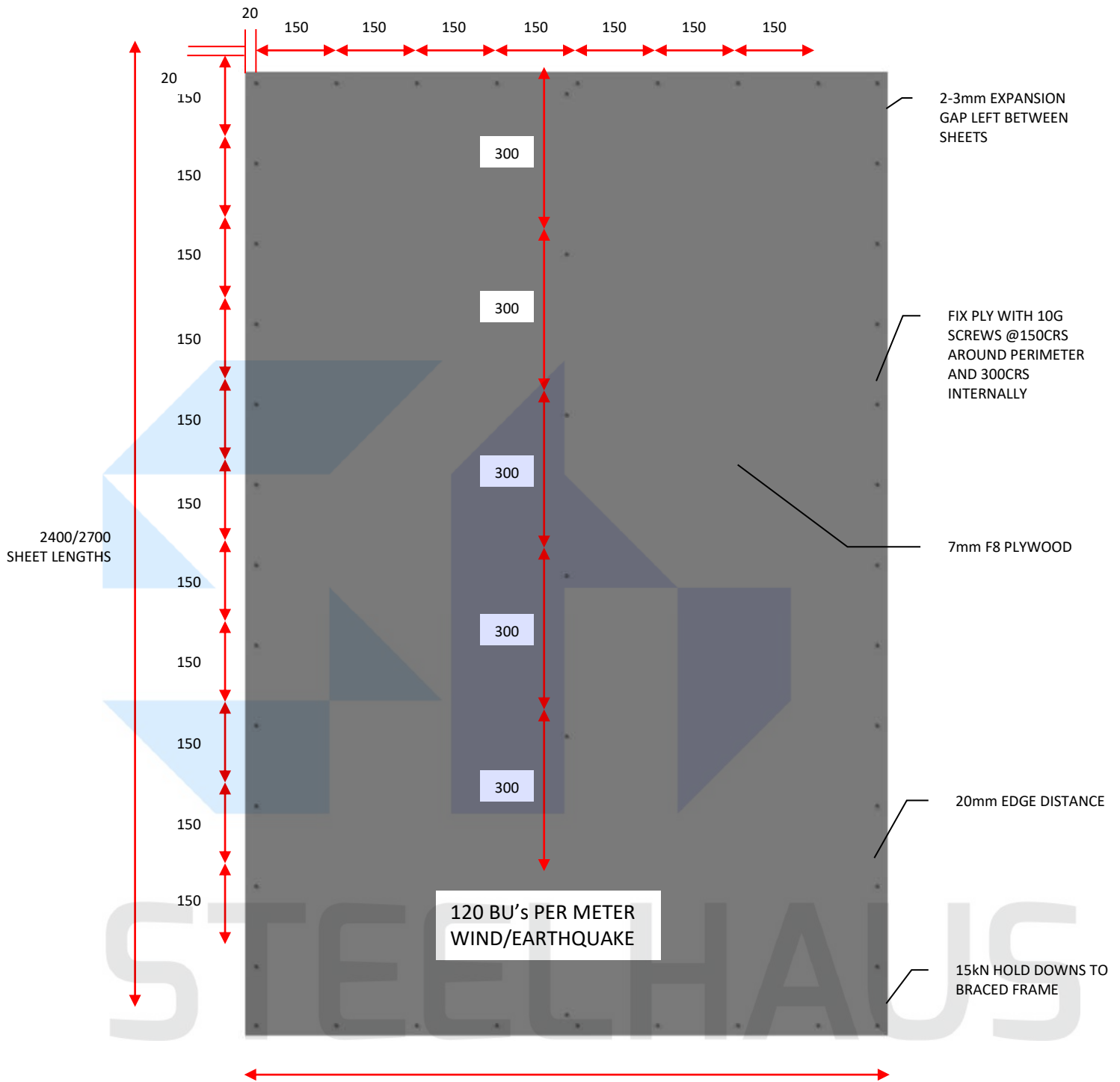
**NOTE:**  
 MAX WALL HEIGHT OF WALL = 2.8m



**SteelHaus (2014) Ltd**  
 Unit 1 31 Ha Crescent, Wiri, Auckland 2104  
 0508 826 766  
[www.steelhaus.co.nz](http://www.steelhaus.co.nz)

**CANTILEVERED FIRE WALL  
 HOLD DOWN**

DATE	November 1, 2023
PAGE #	28



1200 SHEET LENGTHS

PLY BRACING

NOTE: DPC TO BE USED TO SEPARATE STEEL FROM TREATED TIMBER

FOR WALL HEIGHTS GREATER THAN 2420mm, BU= BU TABLE x2420/WALL HEIGHT.

PLYWOOD SHEAR WALLS FROM NASH PART 1 ARE CAPABLE OF ACHIEVING  $\mu=4$ . NZSS604 BRACING DEMAND IS BASED ON  $\mu=3.5$  THEREFOR OKAY.

FOR HOLD DOWN DETAILS REFER TO GIB BRACING PAGES. AS FOLLOWS.



## GIB EzyBrace® Systems specification GS1s

Specification code	Minimum length (m)	Lining requirement	Other requirements	BU rating per metre	
				Wind	Earthquake
GS1s	0.4	10 mm GIB® Standard plasterboard one side	Hold-down	60	70
	1.2			95	80

### WALL FRAMING

Wall framing to comply with,

- NZBC B1 – Structure
- NZBC B2 – Durability

Steel framing dimensions and height as determined by Specific Engineering Design. C section studs shall have a minimum thickness of 0.75 mm and minimum nominal depth of 90 mm with 35 mm wide flanges.

### BOTTOM PLATE FIXING

#### Timber floor

5mm washer as illustrated, fixed to timber floor framing using a 12 mm x 100 mm galvanized coach screw or 4 x 75mm Type 17 class 3 screws.

#### Concrete floor

5mm washer as illustrated, fixed to the concrete slab using a proprietary concrete anchor with a minimum uplift capacity of 10kN taking into consideration concrete slab thickness (internal walls) and edge distance (external walls).

### WALL LINING

- One layer of 10 mm GIB® Standard plasterboard.
- Vertical or horizontal fixing permitted.
- Sheet joints shall be touch fitted.
- Use full height sheets where possible.

### PERMITTED ALTERNATIVES

The Bracing Unit ratings for system GS1s apply to 10mm GIB® Standard plasterboard and any other 10 or 13mm GIB® plasterboard.

### FASTENING THE LINING

#### Fasteners

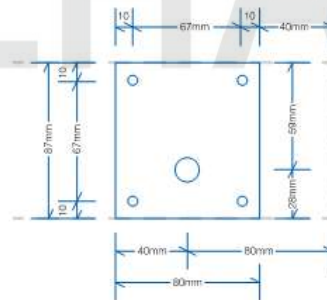
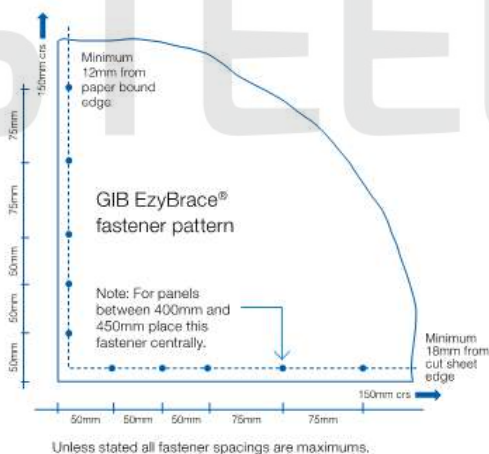
32mm x 6g GIB® Grabber® Drywall Screws.

#### Fastener Centres

50,100,150,225,300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets, place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets, place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

### JOINTING

All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



GIB EzyBrace® end brace hold down washer (available from frame supplier)

*In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems*

## GIB EzyBrace® Systems specification GS2s

Specification code	Minimum length (m)	Lining requirement	Other requirements	BU rating per metre	
				Wind	Earthquake
GS2s	0.4	10 mm GIB® Standard plasterboard both sides	Hold-down	75	95
	1.2			130	110

### WALL FRAMING

Wall framing to comply with,

- NZBC B1 – Structure
- NZBC B2 – Durability

Steel framing dimensions and height as determined by Specific Engineering Design. C section studs shall have a minimum thickness of 0.75 mm and minimum nominal depth of 90 mm with 35 mm wide flanges.

### BOTTOM PLATE FIXING

#### Timber floor

5mm washer as illustrated, fixed to timber floor framing using a 12 mm x 100 mm galvanized coach screw or 4 x 75mm Type 17 class 3 screws.

#### Concrete floor

5mm washer as illustrated, fixed to the concrete slab using a proprietary concrete anchor with a minimum uplift capacity of 12kN taking into consideration concrete slab thickness (internal walls) and edge distance (external walls).

### WALL LINING

- One layer of 10 mm GIB® Standard plasterboard each side of the frame.
- Vertical or horizontal fixing permitted.
- Sheet joints shall be touch fitted.
- Use full height sheets where possible.

### PERMITTED ALTERNATIVES

The Bracing Unit ratings for system GS2s apply to 10mm GIB® Standard plasterboard and any other 10 or 13mm GIB® plasterboard.

### FASTENING THE LINING

#### Fasteners

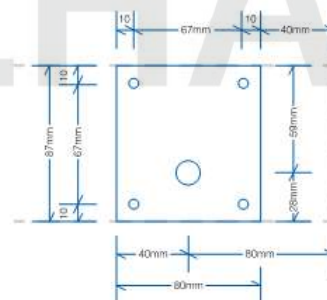
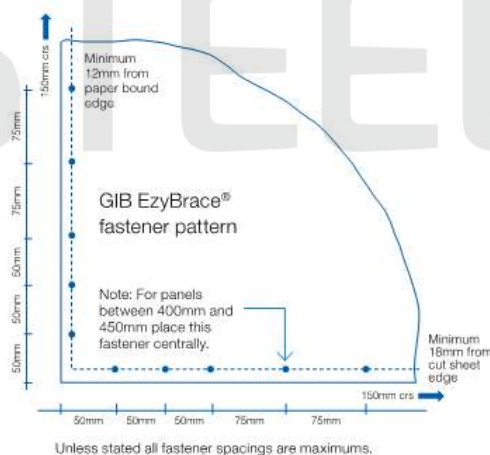
32mm x 6g GIB® Grabber® Drywall Screws.

#### Fastener Centres

50,100,150,225,300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets, place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets, place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

### JOINTING

All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



GIB EzyBrace® end brace hold down washer (available from frame supplier)

*In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems*



## GIB EzyBrace® Systems specification GS2s-NOM

Specification code	Minimum length (m)	Lining requirement	Other requirements	BU rating per metre	
				Wind	Earthquake
GS2s-NOM	0.4	10 mm GIB® Standard plasterboard both sides	Hold-down	65	60
	1.2			80	65

### WALL FRAMING

Wall framing to comply with,

- NZBC B1 – Structure
- NZBC B2 – Durability

Steel framing dimensions and height as determined by Specific Engineering Design. C section studs shall have a minimum thickness of 0.75 mm and minimum nominal depth of 90 mm with 35 mm wide flanges.

### BOTTOM PLATE FIXING

#### Timber floor

3mm washer as illustrated, fixed to timber floor framing using a 12 mm x 100 mm galvanized coach screw or 4 x 75mm Type 17 class 3 screws.

#### Concrete floor

3mm washer as illustrated, fixed to the concrete slab using a proprietary concrete anchor with a minimum uplift capacity of 8kN taking into consideration concrete slab thickness.

### WALL LINING

- One layer of 10 mm GIB® Standard plasterboard each side of the frame.
- Vertical or horizontal fixing permitted.
- Sheet joints shall be touch fitted.
- Use full height sheets where possible

### PERMITTED ALTERNATIVES

The Bracing Unit ratings for system GS2s-NOM apply to 10mm GIB® Standard plasterboard and any other 10 or 13mm GIB® plasterboard.

### FASTENING THE LINING

#### Fasteners

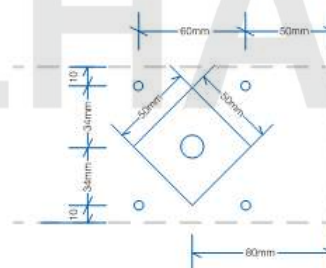
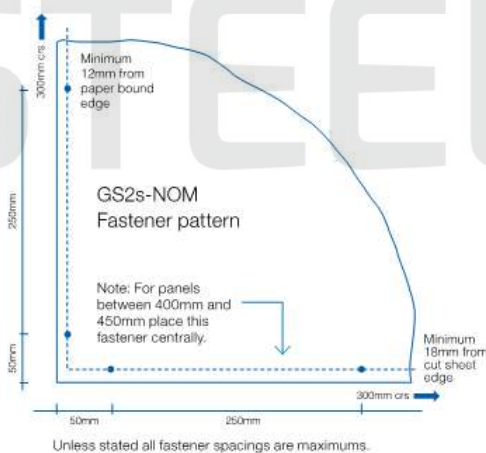
32mm x 6g GIB® Grabber® Drywall Screws.

#### Fastener Centres

50, 300mm from each corner and 300mm maximum thereafter around the perimeter of the bracing element. For horizontally fixed sheets, place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

### JOINTING

All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



GIB EzyBrace® end brace hold down washer (available from frame supplier)

*In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems*

## GIB EzyBrace® Systems specification GBPs

Specification code	Minimum length (m)	Lining requirement	Other requirements	BU rating per metre	
				Wind	Earthquake
GBPs	0.4	10 mm GIB Braceline® plasterboard one side and minimum 7mm structural plywood to AS/NZS 2269.0:2012 to the other side	Hold-down	100	95
	0.6			130	120

### WALL FRAMING

Wall framing to comply with,

- NZBC B1 – Structure
- NZBC B2 – Durability

Steel framing dimensions and height as determined by Specific Engineering Design. C section studs shall have a minimum thickness of 0.55 mm and minimum nominal depth of 75mm with 35 mm wide flanges.

### BOTTOM PLATE FIXING

#### Timber floor

0.95 BMT bracket and 5 mm washer as illustrated, fixed to timber floor framing using a 12 mm x 100 mm galvanised coach screw.

#### Concrete floor

0.95 BMT bracket and 5 mm washer as illustrated, fixed to the concrete slab using a proprietary concrete anchor with a minimum uplift capacity of 12 kN taking consideration concrete slab thickness (internal walls) and edge distance (external walls).

### WALL LINING

- 10 mm GIB Braceline® plasterboard one side of the frame.
- Vertical or horizontal fixing permitted.
- Sheet joints shall be touch fitted.
- Use full height sheets where possible.
- The other side of the frame is lined with minimum 7 mm structural plywood AS/NZS 2269.0:2012.

### PERMITTED ALTERNATIVES

The Bracing Unit ratings for system GBPs apply to 10mm GIB Braceline® plasterboard.

### FASTENING THE LINING

#### Fasteners

32mm x 6g GIB® Grabber® Drywall Screws (use in both plasterboard and plywood fixing).

#### Fastener Centres

150 mm around the perimeter of the bracing element starting at 50 - 50 mm from the bracing element corners.

#### GIB Braceline®

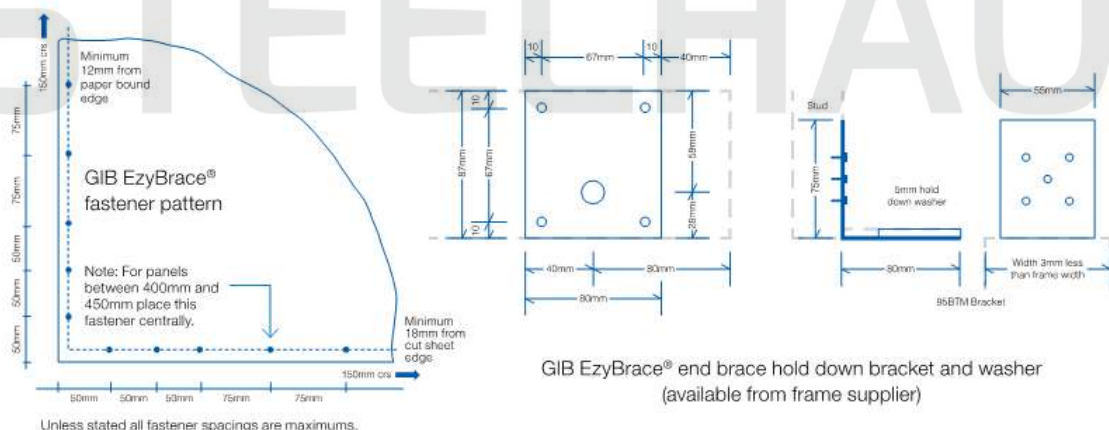
For vertical fixing, place fasteners at 300 mm centres at sheet joints in the tapered sheet edges in the field of the bracing element. For horizontal fixing, place single fasteners in the tapered edge where sheets cross studs. Use daubs of GIBFix® All-Bond adhesive at 300mm centres to intermediate studs in the body of the sheets. Place fasteners a minimum of 12mm from vertical sheet edges and 18mm from horizontal sheet edge.

#### Plywood

Vertical sheet fixing only. Within the bracing element place fasteners at 150 mm centres along the sheet joints at 300 mm centres to intermediate framing.

### JOINTING

All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



GIB EzyBrace® end brace hold down bracket and washer (available from frame supplier)

*In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems*



## GIB EzyBrace® Systems specification GB1s

Specification code	Minimum length (m)	Lining requirement	Other requirements	BU rating per metre	
				Wind	Earthquake
GB1s	0.4	10 mm GIB Braceline® plasterboard one side	Hold-down	70	85
	1.2			125	105

### WALL FRAMING

Wall framing to comply with,

- NZBC B1 – Structure
- NZBC B2 – Durability

Steel framing dimensions and height as determined by Specific Engineering Design. C section studs shall have a minimum thickness of 0.75 mm and minimum nominal depth of 90 mm with 35 mm wide flanges.

### BOTTOM PLATE FIXING

#### Timber floor

5mm washer as illustrated, fixed to timber floor framing using a 12 mm x 100 mm galvanized coach screw or 4 x 75mm Type 17 class 3 screws.

#### Concrete floor

5mm washer as illustrated, fixed to the concrete slab using a proprietary concrete anchor with a minimum uplift capacity of 12kN taking into consideration concrete slab thickness (internal walls) and edge distance (external walls).

### WALL LINING

- One layer of 10 mm GIB Braceline® plasterboard.
- Vertical or horizontal fixing permitted.
- Sheet joints shall be touch fitted.
- Use full height sheets where possible.

### PERMITTED ALTERNATIVES

The Bracing Unit ratings for system GB1s apply to 10 mm GIB Braceline®.

### FASTENING THE LINING

#### Fasteners

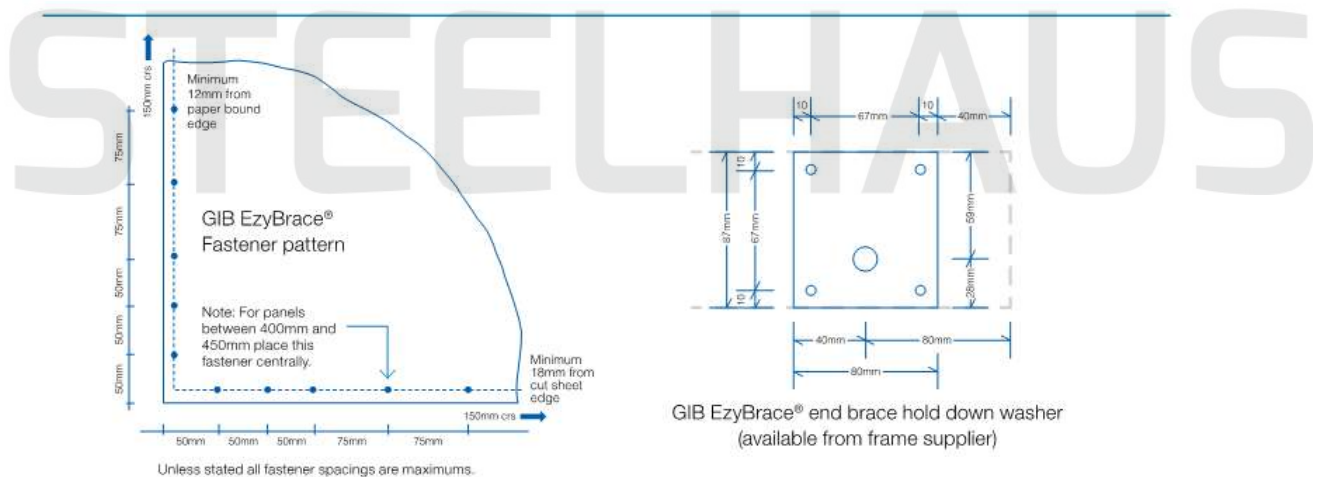
32mm x 6g GIB® Grabber® Drywall Screws.

#### Fastener Centres

50,100,150,225,300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets, place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets, place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm centres to intermediate studs. Place fasteners no closer than 12mm from paper bound sheet edges and 18mm from any sheet end or cut edge.

### JOINTING

All fastener heads stopped and all sheet joints GIB® Joint Tape reinforced and stopped in accordance with the GIB® Site Guide.



*In order for GIB® systems to perform as tested, all components must be installed exactly as prescribed. Substituting components produces an entirely different system and may seriously compromise performance. Follow the specifications. This specification sheet is issued in conjunction with the publication GIB EzyBrace® Systems*

## EXPANDED POLYSTYRENE (EPS) THERMAL BREAK

Expanded polystyrene (EPS) is the only insulation material that in practical, economic and efficiency terms can be applied to all areas of building constructions – ceilings, roofs, walls, floors and under slab – to provide superior standards of thermal insulation. That's why EPS is the ultimate insulation

Up to 30% of a buildings heat is lost through the walls. Expanded polystyrene (EPS) provides a thermal break to the exterior side of the steel framing (thermal bridge) to help reduce heat loss.

Issues to consider when installing electrical wiring is the reaction between the EPS and some types of PVC cable sheathing. This can be avoided by either using migration-resistant plasticizer or prevent the cable coming in contact with the EPS. Failing to prevent this can cause the eating away of the EPS.

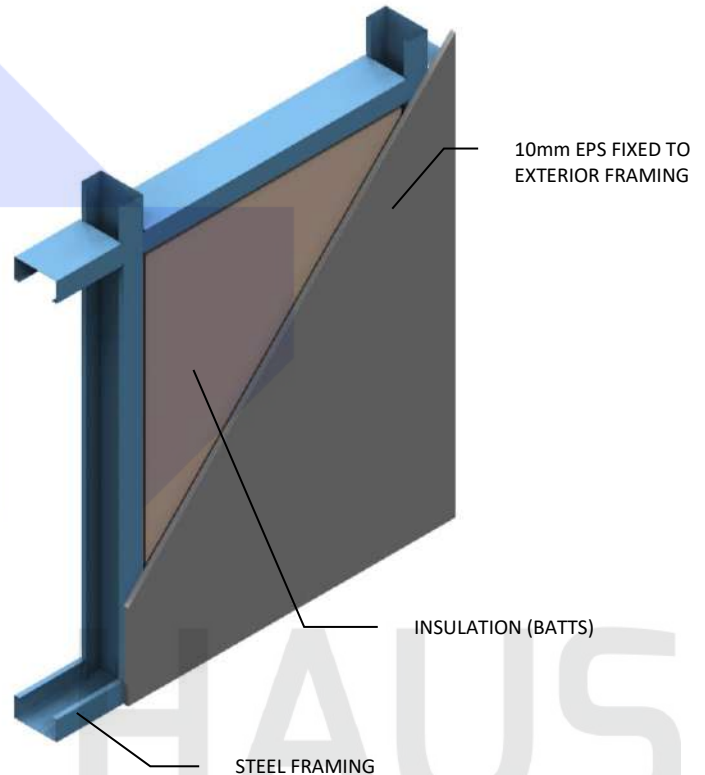
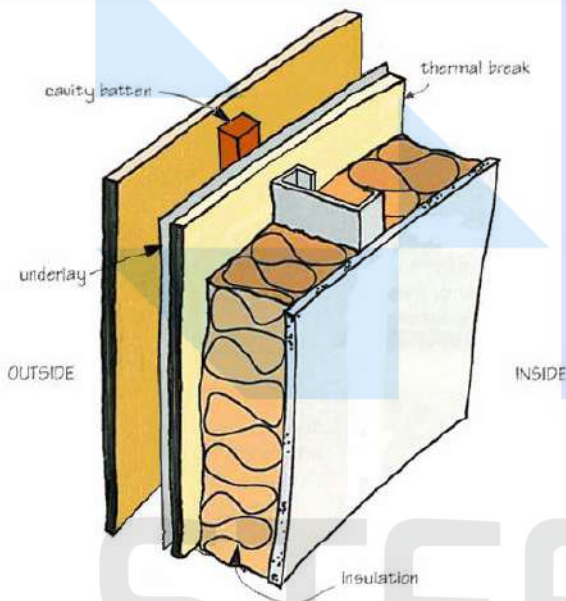
EPS can be installed as strips to each steel member; the strips should be 15mm wider than the framing for an R value of 0.25 and 30mm wider for a higher R value.

Sheets of thermal break can be used, covering the outside of the framing and provides a better thermal performance than strips.

EPS sheets can come with self-adhesive backing which is easily adhered to steel framing. Separate adhesive can be used as well as flat head gib screws to secure sheet while cladding is fixed over.

### Installation Tips;

- Avoid windy weather if possible.
- Tack on thermal break with an 8g plasterboard screw to each corner. Follow closely with wrap install.
- Screw through both products @600c/s



Material		10mm EPS	Test Method
Density	kg/m <sup>3</sup>	16	AS 2464.5 or AS 2464.6
R Value	m <sup>2</sup> K/W	0.265	
Compressive Strength at 10% deformation (min)	KPA	85	AS 2498.3
Cross Breaking Strength	KPA	165	AS 2498.4
Determination of flame propagation surface ignition			
Medium Flame duration (max)	sec	2	AS2122.1-1993
Eighth Value	sec	3	
Fire Behaviour			
	FDI	0	AS/NZS
	SDI	5	1530.3.1999
Diminisional Stability of Length, Width and Thickness (max) at 70 deg C for 7 days	%	1	AS 2498.6
Recycled Content	%	0	
Rate of Water Vapour Transmission (max) measured Parallel to rise at 23 deg C	mg/m <sup>2</sup> s	520	AS 2498.5
Long Term Water Absorbtion by immersion	% w/v	-	

## Electrical cable in polystyrene insulation



A sample of EPS insulation and PVC cabling, showing how the migrating plasticiser has 'eaten' into the polystyrene.

## PRODUCT TECHNICAL STATEMENT

DriStud Wall Wrap must be installed in accordance with Dristud Wall Wrap Instruction Manual.

DriStud Wall Wrap is intended to be used in conjunction with DriStud Bozz Window Flashing Tape or DriStud Cool Window Flashing Tape.

### MAINTENANCE

DriStud Wall Wrap does not require any maintenance but when exposed through removal of cladding, the wrap must be inspected and any damaged areas repaired or replaced.

### STORAGE & TRANSPORTATION

DriStud Wall Wrap rolls must be stored in a clean, dry place and must be protected from damage and weather. Dristud Wall Wrap must not be exposed to UV light for more than 60 days.

### QUALITY ASSURANCE

The manufacture of DriStud Wall Wrap is ISO9001:2008 certified by Q.A. International Certification Limited (No. QAIC/KR/6001-A) on 20 January 2015.

TCL Hunt is ISO9001:2008 certified by International Certifications (No. C32413) on 5 December 2013.

### NZBC CLAUSES

If designed, installed and maintained in accordance with all TCL Hunt requirements, DriStud Wall Wrap will comply with the following performance criteria of the NZ Building Code

- B1.3.1 B1.3.2 B1.3.3 a), c), q) B1.3.4 a), b), c), d), e) B2.3.1 a) B2.3.2 a)
- C3.4 c)
- E2.3.2 E2.3.7 a), b), c)
- F2.3.1

Table 1: NZBC E2/AS1 Table 23 Requirements

	Property	Test Method	Requirements	Results
1	Water Vapour Resistance	ASTM E96 Procedure B	≤ 7 MN s/g	0.33 MN s/g
2	Absorbency	AS/NZS 4201: Part 6	≥ 100 g/ m <sup>2</sup>	157 g/m <sup>2</sup>
3	Air Resistance	BS ISO 5636-5:2003	≥ 0.1 MN s/m <sup>3</sup>	0.426 MN s/m <sup>3</sup>
4	Water Resistance	AS/NZS 4201.4:1994	≥ 20mm water head	Pass
5	Flammability	AS 1530.2:1993	≤ Index 5	Index 1
6	Tensile Strength	ASTM D882		MD: 4.90 KN/m
				CD: 2.40 KN/m
7	Edge Tear Resistance	TAPPI T470		MD: 241 N
				CD: 120 N
8	UV exposure	ASTM G154		60 days



Distributed by TCL Hunt  
7 Fisher Crescent, Mt. Wellington  
Auckland, New Zealand

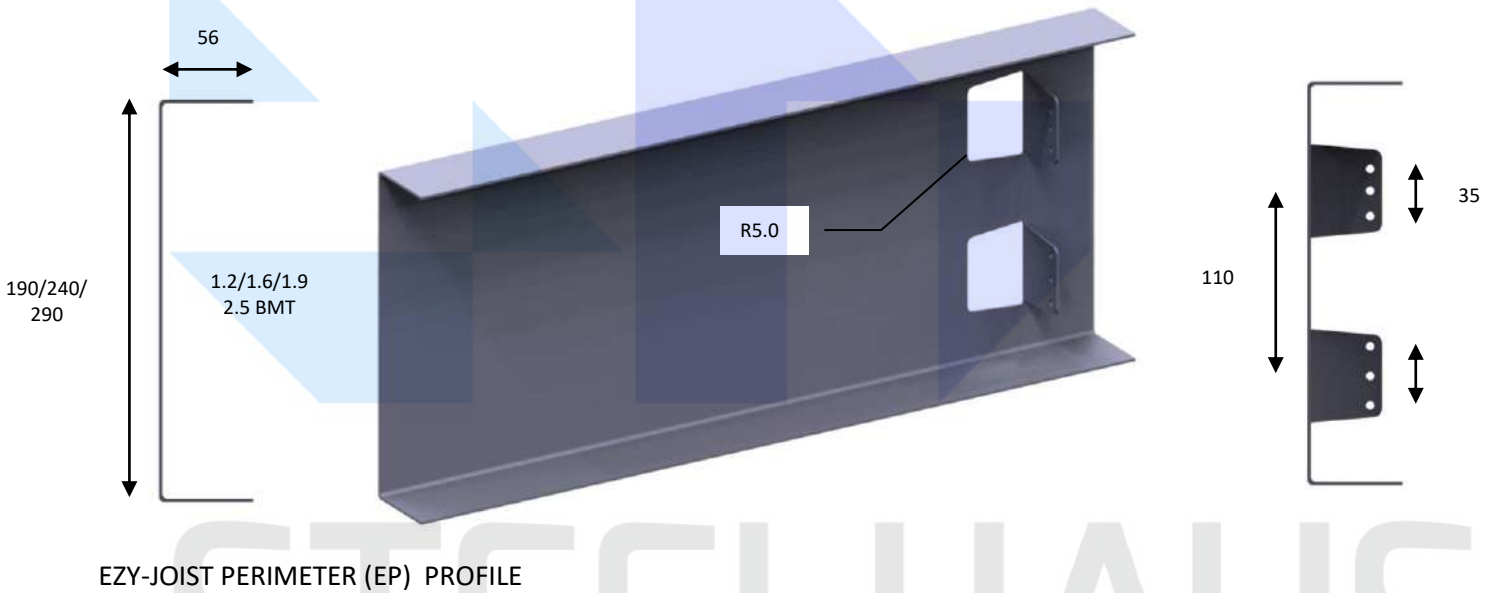
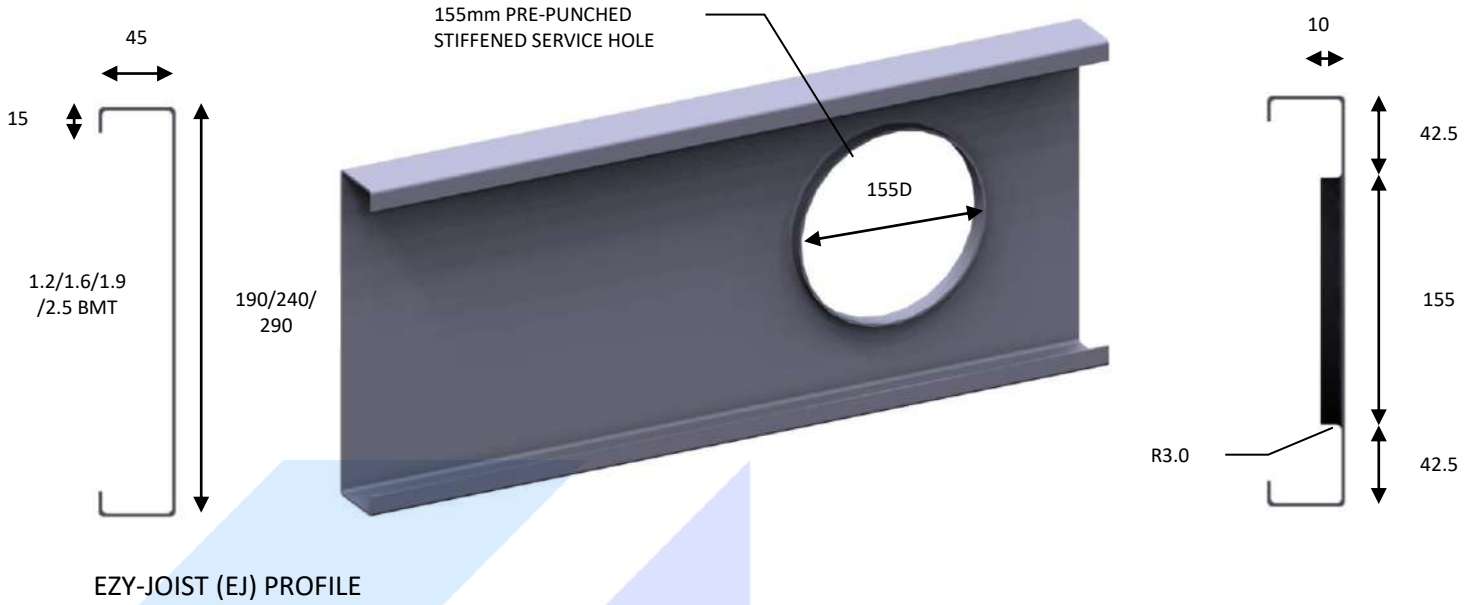
Revision B  
September 27 2016

For further information please visit [www.dristud.co.nz](http://www.dristud.co.nz) or call 0800 DRISTUD (374 7883).



# SECTION 2: FLOOR FRAMING

**EZYJOIST**<sup>TM</sup>  
STEEL FLOOR JOIST SYSTEM



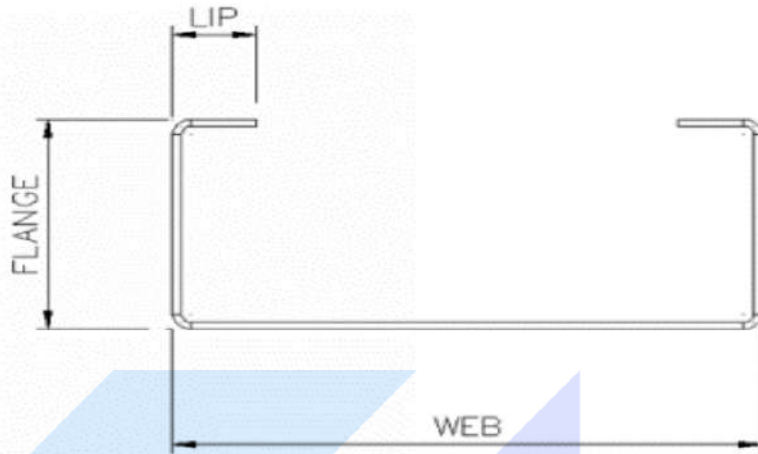
JOIST (EJ) SWAGED TO FIT INTO PERIMETER CHANNEL (EP)

6/10G SCREWS PER JOIST TABBED CONNECTION

PERIMETER U-SECTION TABBED AT EVERY JOIST CONNECTION

TYPICAL INTERMEDIATE EJ TO EP TABBED CONNECTION

# JOIST SPAN TABLES



The tables below are suitable based on the following:

1. Joist spans have been limited for dynamic vibration based on a 1kN point load causing 2mm of deflection. Where more stringent requirements need to be achieved joists to be specifically engineered.
2. Joists are designed for single span, if Joists are used in continuous span arrangements they are to be specifically engineered (allow for 15% reduction in span for estimation purposes).
3. Where service holes are allowed they are to be a minimum of 300mm from support locations.
4. Flooring to be a minimum of 20mm thick particle board.
5. Joist spans over 3.5m are to have a minimum of 1 row of full depth blocking at mid span installed
6. Where joists are subject to increased point loads they are to be specifically engineered
7. Grade 250MPa steel with minimum yield stress of 250MPa.

Max joist span for 1.5kPa (residential) live load & 0.5kPa dead load (typically timber flooring with carpet & gib ceiling on battens)									
Profile	Web (mm)	Flange (mm)	Lip (mm)	Material Thickness (mm)	Max Hole Diameter (mm)	Minimum Hole Spacing (mm)	Max Span (mm)		
							400cts	450cts	600cts
EJ150x1.55	150	45	16	1.55	32	1000	3650	3650	3300
EJ190x1.55	190	45	16	1.55	90	1000	4400	4400	4050
EJ240x1.15	240	45	16	1.15	155	1000	4850	4850	4200
EJ240x1.55	240	45	16	1.55	155	1000	5350	5350	5000
EJ240x1.95	240	45	16	1.95	155	1000	5750	5750	5450
EJ240x2.50	240	45	16	2.5	155	1000	6200	6200	6200
EJ290x1.55	290	45	16	1.55	155	1000	6250	6250	6250
EJ290x1.95	290	45	16	1.95	155	1000	6700	6700	6700
EJ290x2.50	290	45	16	2.5	155	1000	7250	7250	7050

Max joist span for 1.5kPa (residential) live load & 1.0kPa dead load (typically timber flooring with tiling & gib ceiling on battens)									
Profile	Web (mm)	Flange (mm)	Lip (mm)	Material Thickness (mm)	Max Hole Diameter (mm)	Minimum Hole Spacing (mm)	Max Span (mm)		
							400cts	450cts	600cts
EJ150x1.55	150	45	16	1.55	32	1000	3650	3650	3300
EJ190x1.55	190	45	16	1.55	90	1000	4400	4400	4050
EJ240x1.15	240	45	16	1.15	155	1000	4650	4400	3800
EJ240x1.55	240	45	16	1.55	155	1000	5350	5350	4950
EJ240x1.95	240	45	16	1.95	155	1000	5750	5750	5450
EJ240x2.50	240	45	16	2.5	155	1000	6200	6200	6200
EJ290x1.55	290	45	16	1.55	155	1000	6250	6250	5750
EJ290x1.95	290	45	16	1.95	155	1000	6700	6700	6600
EJ290x2.50	290	45	16	2.5	155	1000	7250	7250	7050



**Max joist span for 3.0kPa (offices) live load & 0.5kPa dead load (typically timber flooring with carpet & gib ceiling on battens)**

Profile	Web (mm)	Flange (mm)	Lip (mm)	Material Thickness (mm)	Max Hole Diameter (mm)	Minimum Hole Spacing (mm)	Max Span (mm)		
							400cts	450cts	600cts
EJ150x1.55	150	45	16	1.55	32	1000	3650	3600	3150
EJ190x1.55	190	45	16	1.55	90	1000	4400	4150	3600
EJ240x1.15	240	45	16	1.15	155	1000	3850	3600	3100
EJ240x1.55	240	45	16	1.55	155	1000	5000	4700	4100
EJ240x1.95	240	45	16	1.95	155	1000	5750	5500	4800
EJ240X2.50	240	45	16	2.5	155	1000	6200	6050	5250
EJ290X1.55	290	45	16	1.55	155	1000	5800	5450	4700
EJ290x1.95	290	45	16	1.95	155	1000	6650	6300	5450
EJ290x2.50	290	45	16	2.5	155	1000	7200	7000	6250

**Max joist span for 3.0kPa (offices) live load & 1.0kPa dead load (typically timber flooring with tiling & gib ceiling on battens)**

Profile	Web (mm)	Flange (mm)	Lip (mm)	Material Thickness (mm)	Max Hole Diameter (mm)	Minimum Hole Spacing (mm)	Max Span (mm)		
							400cts	450cts	600cts
EJ150x1.55	150	45	16	1.55	32	1000	3500	3350	3000
EJ190x1.55	190	45	16	1.55	90	1000	4200	3950	3400
EJ240x1.15	240	45	16	1.15	155	1000	3600	3400	2950
EJ240x1.55	240	45	16	1.55	155	1000	4750	4450	3850
EJ240x1.95	240	45	16	1.95	155	1000	5500	5200	4500
EJ240X2.50	240	45	16	2.5	155	1000	5950	5700	4950
EJ290X1.55	290	45	16	1.55	155	1000	5450	5150	4450
EJ290x1.95	290	45	16	1.95	155	1000	6300	5950	5150
EJ290x2.50	290	45	16	2.5	155	1000	6900	6700	5900

**Max joist span for 5.0kPa (storage) live load & 0.5kPa dead load (typically timber flooring with carpet & gib ceiling on battens)**

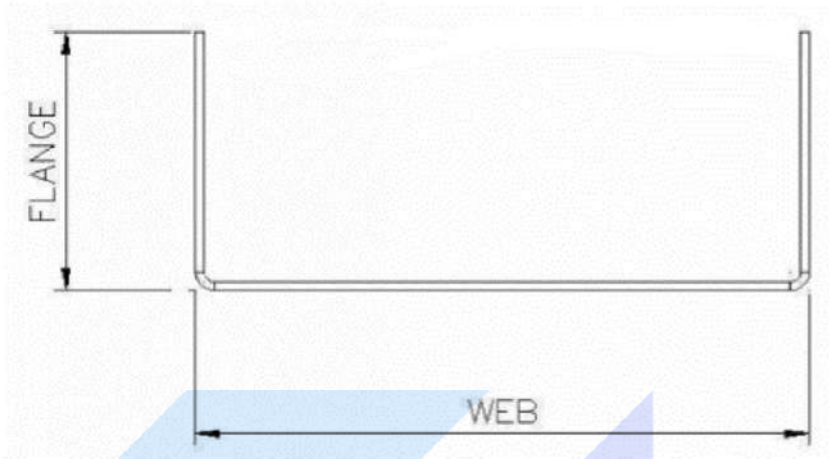
Profile	Web (mm)	Flange (mm)	Lip (mm)	Material Thickness (mm)	Max Hole Diameter (mm)	Minimum Hole Spacing (mm)	Max Span (mm)		
							400cts	450cts	600cts
EJ150x1.55	150	45	16	1.55	32	1000	3050	3900	2500
EJ190x1.55	190	45	16	1.55	90	1000	3500	3300	2850
EJ240x1.15	240	45	16	1.15	155	1000	3050	2850	2450
EJ240x1.55	240	45	16	1.55	155	1000	3950	3750	3250
EJ240x1.95	240	45	16	1.95	155	1000	4650	4400	3800
EJ240X2.50	240	45	16	2.5	155	1000	5100	4800	4150
EJ290X1.55	290	45	16	1.55	155	1000	4600	4300	3750
EJ290x1.95	290	45	16	1.95	155	1000	5300	5000	4300
EJ290x2.50	290	45	16	2.5	155	1000	6100	5750	4950

**Max joist span for 5.0kPa (storage) live load & 1.0kPa dead load (typically timber flooring with tiling & gib ceiling on battens)**

Profile	Web (mm)	Flange (mm)	Lip (mm)	Material Thickness (mm)	Max Hole Diameter (mm)	Minimum Hole Spacing (mm)	Max Span (mm)		
							400cts	450cts	600cts
EJ150x1.55	150	45	16	1.55	32	1000	2950	2800	2400
EJ190x1.55	190	45	16	1.55	90	1000	3400	3200	2750
EJ240x1.15	240	45	16	1.15	155	1000	2950	2750	2300
EJ240x1.55	240	45	16	1.55	155	1000	3850	3600	3100
EJ240x1.95	240	45	16	1.95	155	1000	4500	4200	3650
EJ240X2.50	240	45	16	2.5	155	1000	4900	4600	4000
EJ290X1.55	290	45	16	1.55	155	1000	4400	4150	3600
EJ290x1.95	290	45	16	1.95	155	1000	5100	4800	4150
EJ290x2.50	290	45	16	2.5	155	1000	5850	5550	4800



# PERIMETER CHANNEL SPAN TABLES

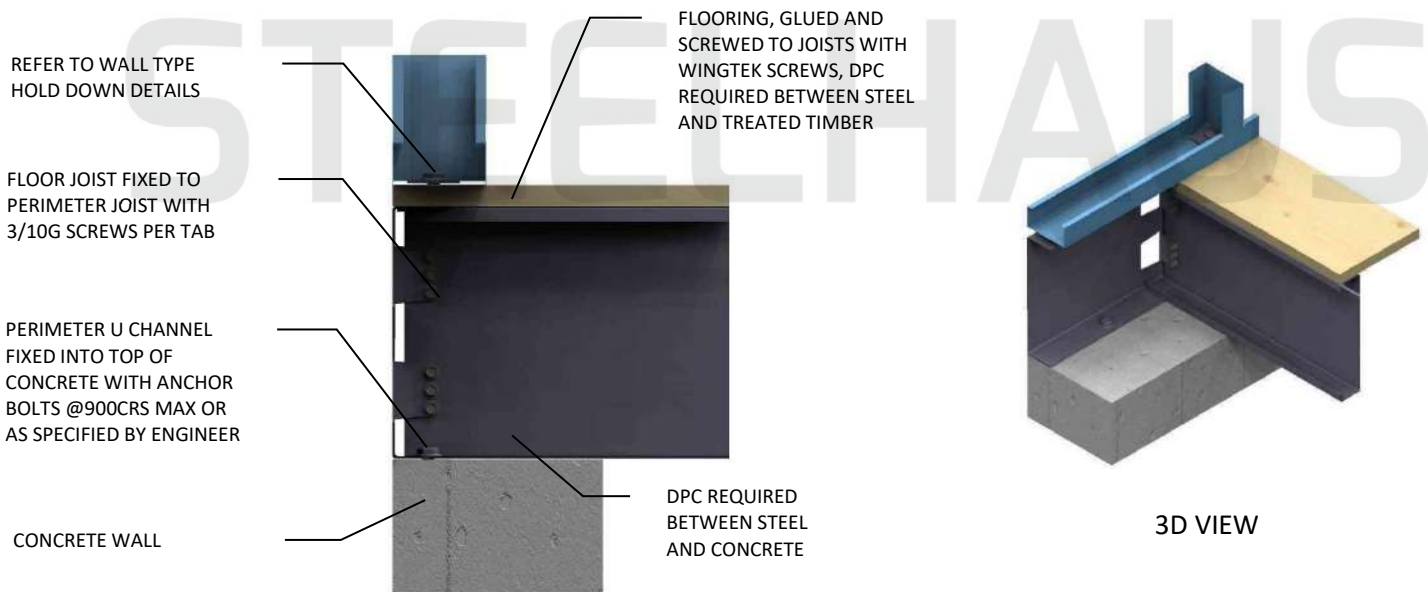


The tables below are suitable based on the following:

1. Perimeter channel spans are not applicable for support of load bearing walls or roof loads.
2. No service holes are permitted within the span.
3. Balustrade connections need to be independently assessed for suitability.
4. Effective load width supported by the perimeter channel is half the joist span.
5. Grade 250MPa steel with minimum yield stress of 250MPa.
6. Flooring to be a minimum of 20mm particle board installed as per manufacturers details & to be consistent with NASH Standard Part 2: 2016 Light Steel Framed Buildings Alternative Solution Clause 5.5.2.

Max perimeter channel span for 0.5kPa dead load (typically timber flooring with carpet & gib ceiling on battens)					
Max Joist Span (m)	Perimeter Channel Size	Max Perimeter Channel Span (mm)			
		1.5kPa (residential)	2.0kPa (balconies)	3.0kPa (offices)	5.0kPa (storage)
3000	PC150x1.55	1800	1600	1400	1100
	PC190x1.55	2100	1900	1600	1200
	PC240x1.15	1600	1400	1200	900
	PC240x1.55	2300	2000	1700	1300
	PC240x1.95	2800	2500	2100	1700
	PC290x2.50	4100	3600	3000	2400
4000	PC150x1.55	1600	1400	1200	900
	PC190x1.55	1800	1600	1400	1050
	PC240x1.15	1400	1200	1000	700
	PC240x1.55	2000	1700	1500	1100
	PC240x1.95	2400	2200	1800	1400
	PC290x2.50	3500	3100	2600	2100
5000	PC150x1.55	1400	1200	1000	850
	PC190x1.55	1600	1400	1200	900
	PC240x1.15	1300	1100	900	550
	PC240x1.55	1700	1500	1300	1050
	PC240x1.95	2200	1900	1600	1300
	PC290x2.50	3100	2800	2300	1850
6000	PC150x1.55	1300	1100	900	750
	PC190x1.55	1500	1300	1100	800
	PC240x1.15	1100	1000	700	450
	PC240x1.55	1600	1400	1200	950
	PC240x1.95	2000	1800	1500	1200
	PC290x2.50	2900	2500	2100	1650

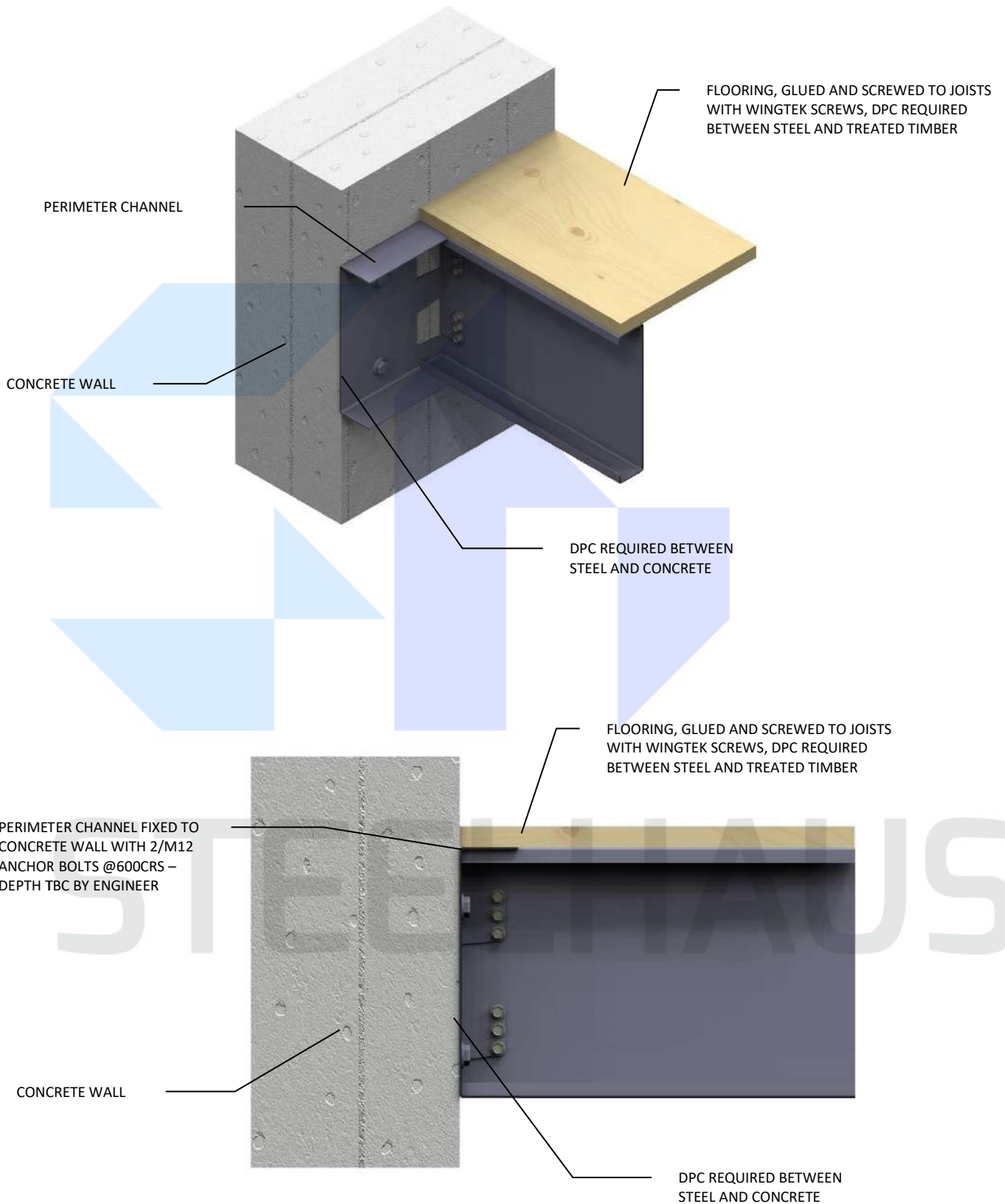
Max perimeter channel span for 1.0kPa dead load (typically timber flooring with tiling & gib ceiling on battens)					
Max Joist Span (m)	Perimeter Channel Size	Max Perimeter Channel Span (mm)			
		1.5kPa (residential)	2.0kPa (balconies)	3.0kPa (offices)	5.0kPa (storage)
3000	PC150x1.55	1700	1500	1300	1050
	PC190x1.55	1900	1700	1500	1200
	PC240x1.15	1500	1300	1100	900
	PC240x1.55	2100	1900	1600	1300
	PC240x1.95	2600	2300	2000	1600
	PC290x2.50	3700	3300	2900	2350
4000	PC150x1.55	1400	1300	1100	900
	PC190x1.55	1700	1500	1300	1050
	PC240x1.15	1300	1100	1000	650
	PC240x1.55	1800	1600	1400	1100
	PC240x1.95	2200	2000	1700	1400
	PC290x2.50	3200	2900	2500	2000
5000	PC150x1.55	1300	1200	1000	800
	PC190x1.55	1500	1300	1100	900
	PC240x1.15	1100	1000	800	500
	PC240x1.55	1600	1400	1200	1000
	PC240x1.95	2000	1800	1500	1200
	PC290x2.50	2800	2600	2200	1800
6000	PC150x1.55	1200	1000	900	700
	PC190x1.55	1300	1200	1000	800
	PC240x1.15	1000	900	700	400
	PC240x1.55	1400	1300	1100	900
	PC240x1.95	1800	1600	1400	1100
	PC290x2.50	2600	2300	2000	1500



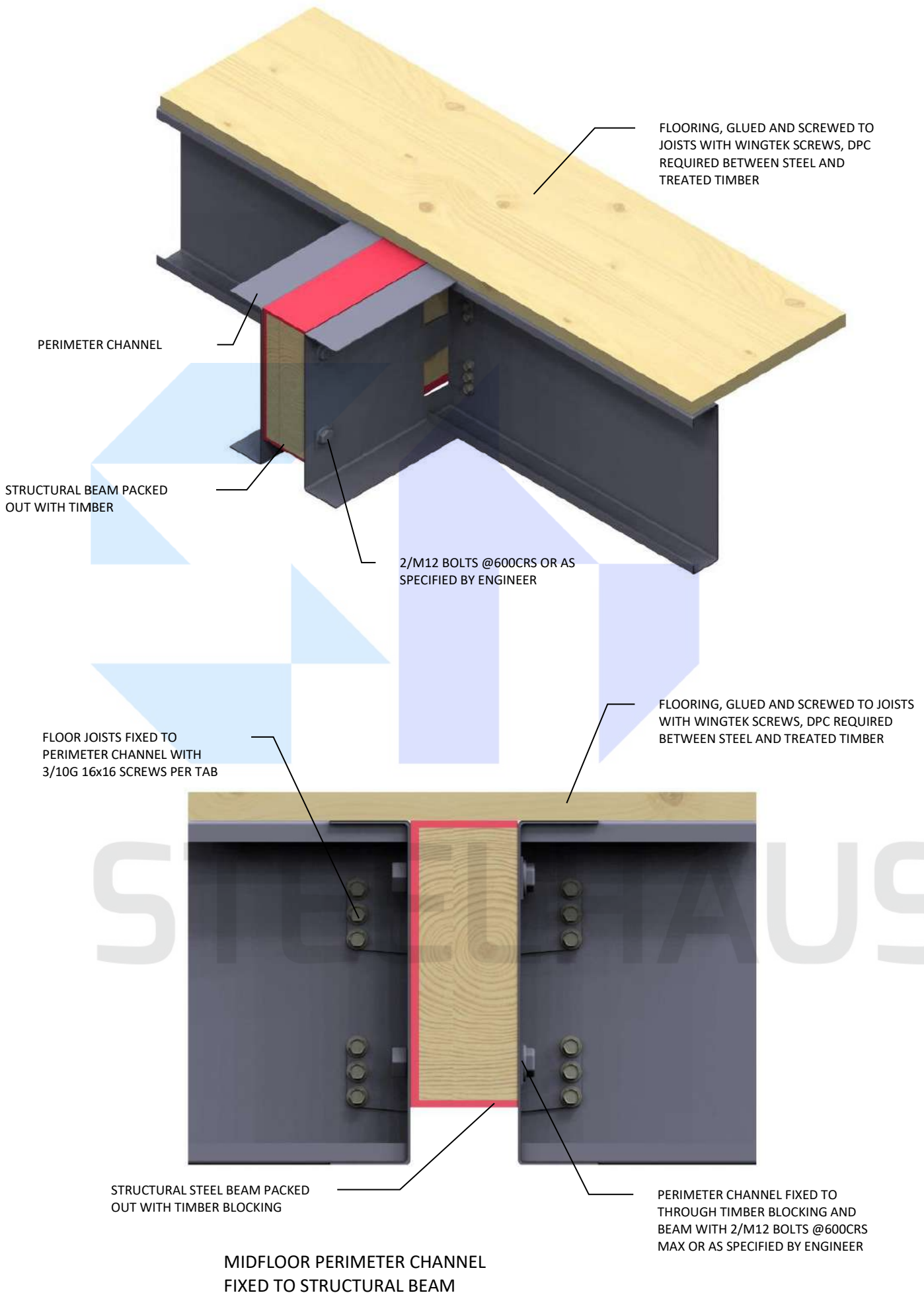
MIDFLOOR PERIMETER CHANNEL  
FIXED OVER CONCRETE WALL

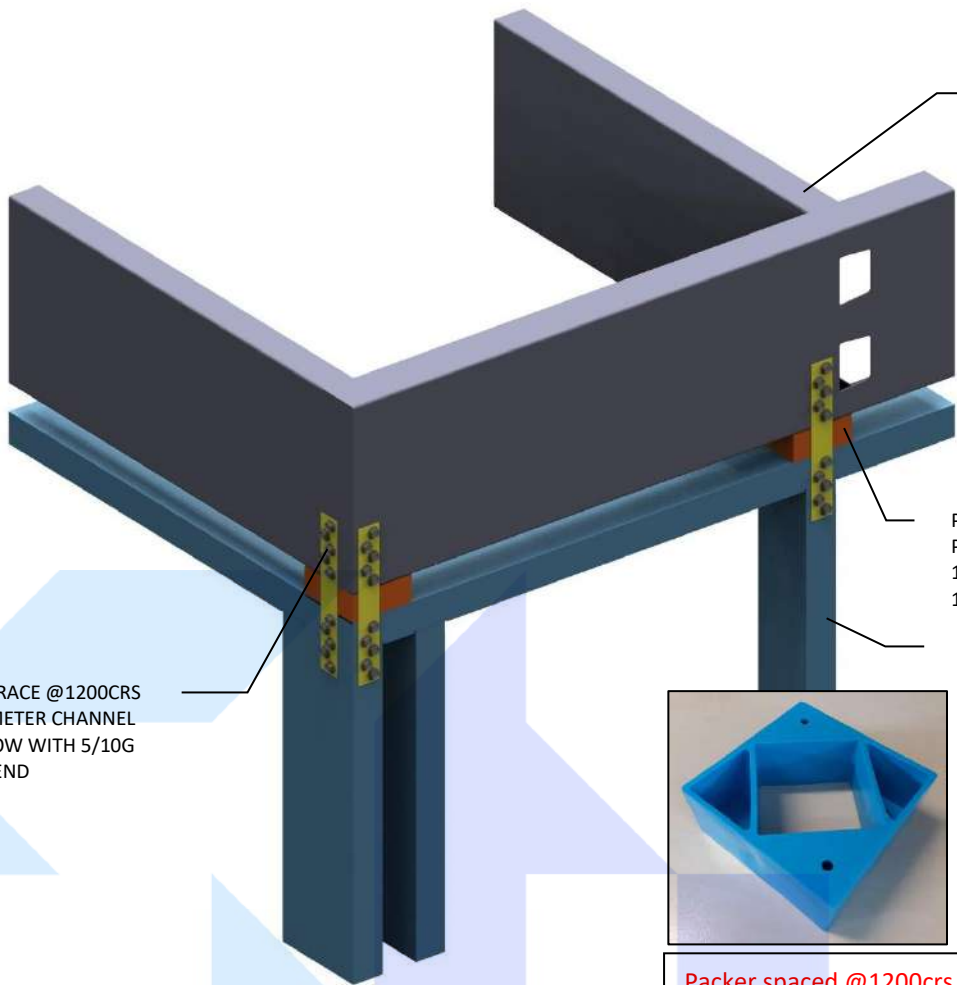






MIDFLOOR PERIMETER CHANNEL  
FIXED AGAINST CONCRETE WALL



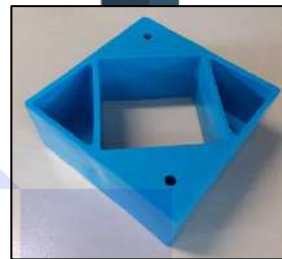


FLOOR JOIST FIXED TO PERIMETER CHANNEL WITH 3/10G SCREWS PER TAB

PERIMETER CHANNEL ON 35mm PACKERS @600CRS TYPICALLY, 1200mm MAX. PLACE WITHIN 100mm OF STUD

STEEL FRAMING BELOW

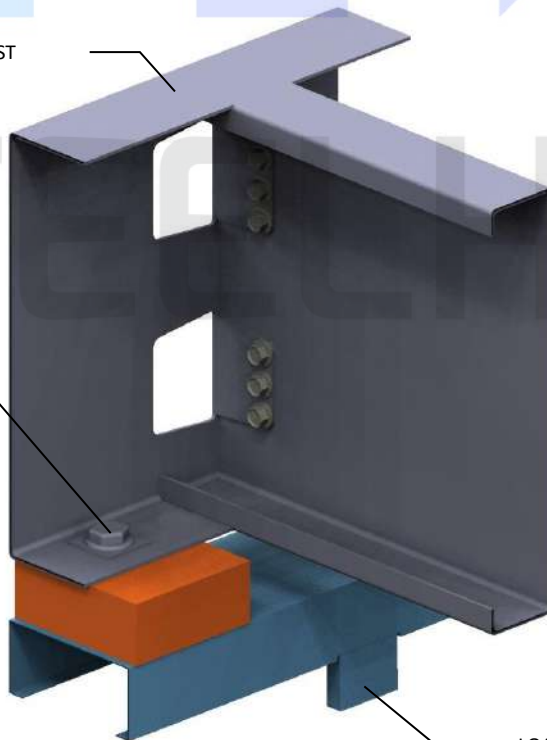
25mm STRAP BRACE @1200CRS FIXED TO PERIMETER CHANNEL AND STUD BELOW WITH 5/10G SCREWS EACH END



Packer spaced @1200crs MAX, Place within 100mm of stud below

MIDFLOOR JOIST OVER LOAD-BEARING WALLS – STRAP OPTION

PERIMETER CHANNEL/END JOIST



M12 BOLT WITH 50x3 sq WASHER. BOLT THROUGH CENTRE OF JOIST/ PERIMETER CHANNEL FLANGE THROUGH PACKER AND INTO WALL TOP PLATE – USE 40x3mm sq WASHER OR 30mm DIA FLANGE NUT BELOW

LOAD BEARING WALL BELOW

MIDFLOOR JOIST OVER LOAD-BEARING WALLS – BOLT OPTION



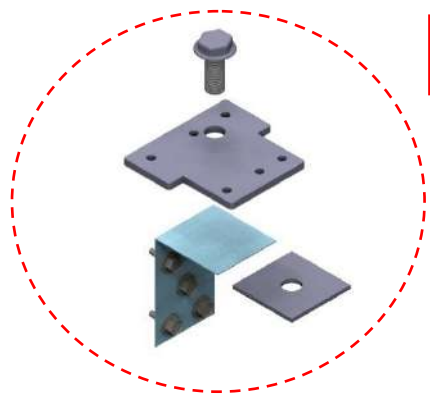
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 0508 826 766  
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MIDFLOOR FIXINGS

DATE November 1, 2023

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**TO ACHIEVE A 12kN CONNECTION – ADDITIONAL 0.95BMT BRACKET IS REQUIRED AS PER GIB MANUAL**

BRACING HOLD-DOWN AS PER GIB MANUAL

BLOCKING FIXED BETWEEN JOISTS WITH 150x100x40 x1.55mm BRACKET TO EACH SIDE OF BLOCKING WITH 3/10G SCREWS PER CONNECTION

BLOCKING UNDER BRACED WALL TO MATCH JOIST SIZE

FLOORING

0.95bmt ANGLE WITH 40x40x3 WASHER FIXED BLOCKING WITH 5/10G SCREWS

**DPC LAYER REQUIRED BETWEEN STEEL AND TREATED TIMBER.**

BRACED WALL HOLD DOWN (WALL BETWEEN JOISTS)

**TO ACHIEVE A 12kN CONNECTION – ADDITIONAL 0.95BMT BRACKET IS REQUIRED AS PER GIB MANUAL**

5mm BRACING WASHER

5mm BRACING WASHER

BOTTOM PLATE

M12 BOLT THROUGH BOTH HOLD DOWN WASHER AND ANGLE BRACKET BELOW

FLOORING

0.95bmt ANGLE WITH 40x40x3 WASHER FIXED TO JOIST WITH 5/10G SCREWS

0.95bmt ANGLE WITH 40x40x3 WASHER FIXED TO JOIST WITH 5/10G SCREWS

BRACED WALL HOLD DOWN (WALL ALONG BOUNDARY JOIST)

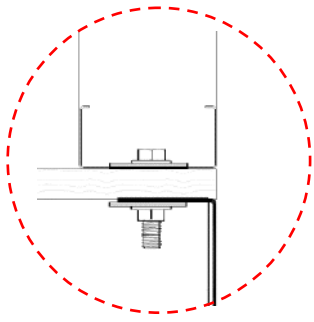
BRACED WALL HOLD DOWN (WALL ALONG JOIST)



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**MIDFLOOR FIXINGS BRACED WALL**

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FLOORING

BOTTOM PLATE FIXED TO  
BLOCKING WITH M12 BOLT AND  
WASHER AND 50x50x3mm  
WASHER @900CRS MAX  
– USE 40x3mm sq WASHER OR  
30mm DIA FLANGE NUT BELOW

BLOCKING FIXED BETWEEN  
JOISTS WITH 150x100x40  
x1.55mm BRACKET TO  
EACH SIDE OF BLOCKING  
WITH 3/10G SCREWS PER  
CONNECTION

BLOCKING TO BE INSTALLED @900CRS  
FOR LOAD BEARING WALL FIXING,  
BLOCKING TO MATCH JOIST SIZE

LOAD-BEARING WALL HOLD DOWN  
(WALL BETWEEN JOISTS)

DPC LAYER REQUIRED BETWEEN  
STEEL AND TREATED TIMBER.

OPTION 1: M12 BOLT WITH  
50x50x3mm WASHER FIXED  
@900CRS MAX  
– USE 40x3mm sq WASHER OR  
30mm DIA FLANGE NUT BELOW

M12 BOLT WITH  
50x50x3mm WASHER FIXED  
@900CRS MAX.  
– USE 40x3mm sq WASHER  
OR 30mm DIA FLANGE NUT  
BELOW

BOTTOM PLATE

OPTION 2: 25mm STRAP BRACE  
FIXED TO PERIMETER CHANNEL  
AND STUD ABOVE WITH 5/10G  
SCREWS STAGGERED EACH END

PERIMETER CHANNEL

LOAD-BEARING WALL HOLD DOWN  
(WALL ALONG BOUNDARY JOIST)

LOAD-BEARING WALL HOLD DOWN  
(WALL ALONG JOIST)

BLOCKING NOT REQUIRED IF WALL IS WITHIN 150mm OF JOIST AND NOT A BRACING WALL

C-CHANNEL OR 50x50x0.75 ANGLE WITH 4/10G SCREWS TO JOIST AND BLOCKING

BOTTOM PLATE FIXED TO FLOORING WITH 35mm 10G UNIVERSAL TEK SCREWS @600CRS MAX

FLOOR JOIST

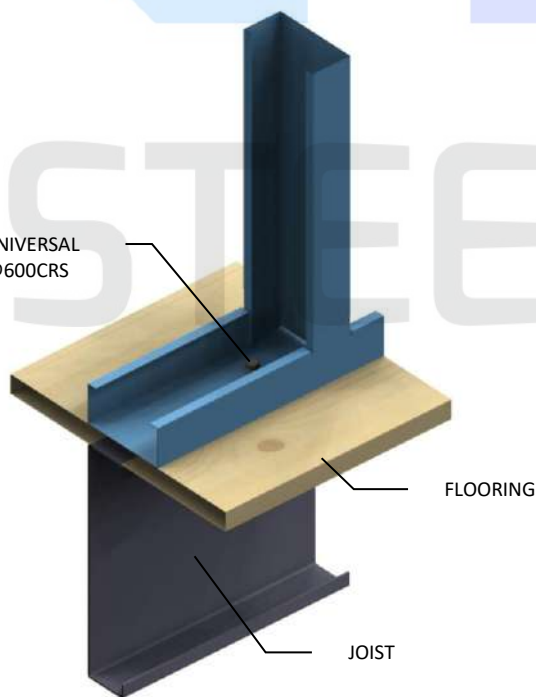
BLOCKING BETWEEN JOISTS @1200CRS MAX AND AT EACH SIDE OF OPENING IN WALL ABOVE

BLOCKING CAN BE C89 CHANNEL IN THIS

NON LOAD-BEARING WALL HOLD DOWN (WALL BETWEEN JOISTS)

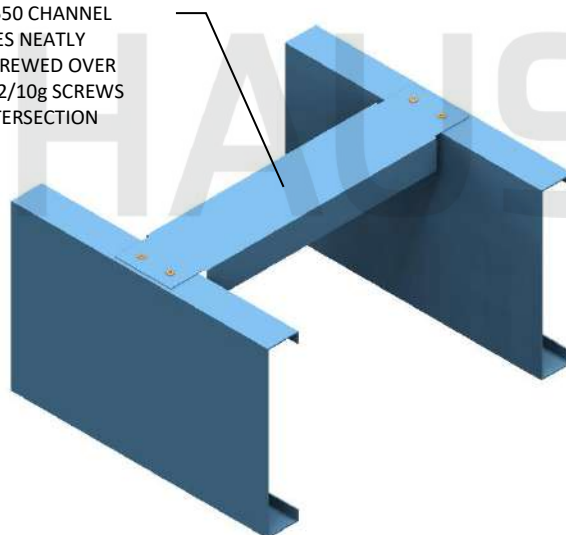
DPC LAYER REQUIRED BETWEEN STEEL AND TREATED TIMBER.

35mm 10G UNIVERSAL TEK SCREW @600CRS MAX



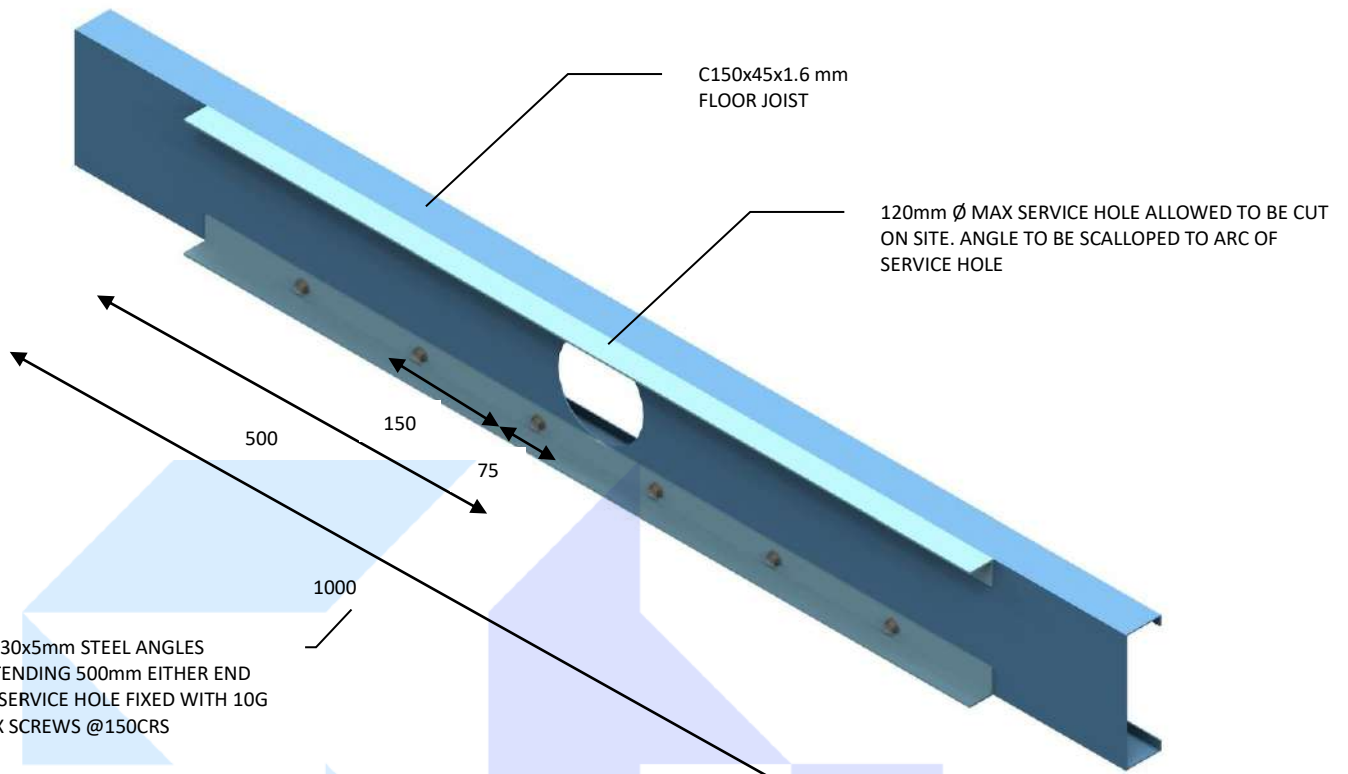
NON LOAD-BEARING WALL HOLD DOWN (WALL ALONG JOISTS)

C89 x 0.75 G550 CHANNEL WITH FLANGES NEATLY REMOVED SCREWED OVER JOISTS WITH 2/10g SCREWS PER JOIST INTERSECTION

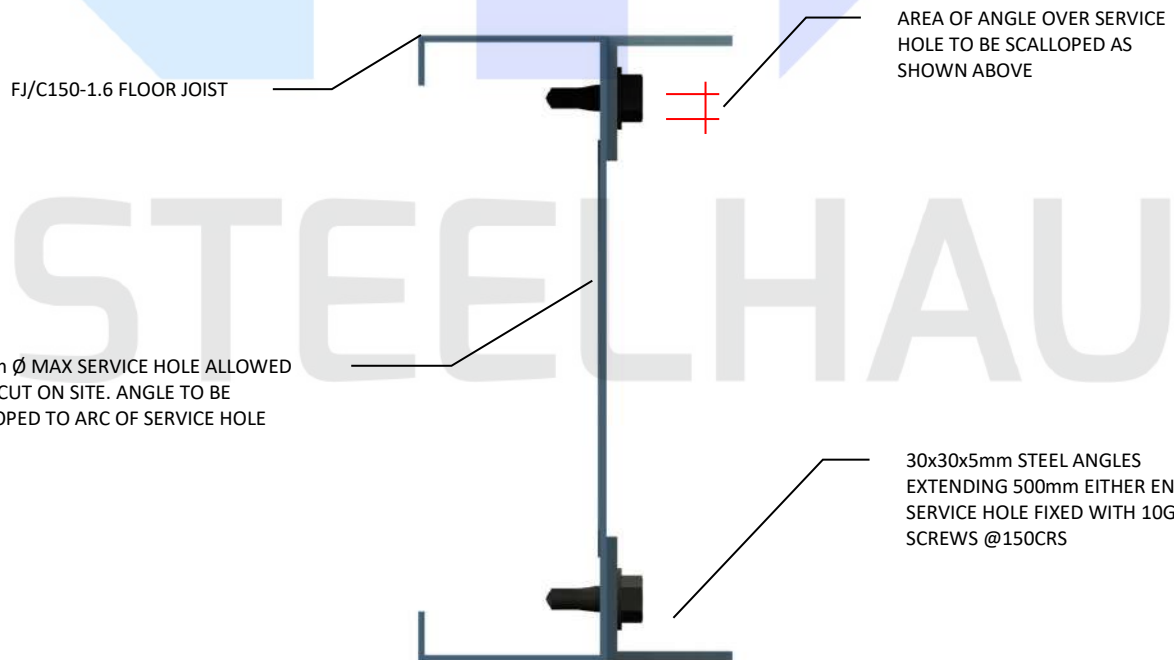


TYPICAL JOIST NOGGING FOR NLB WALLS & FLOOR DIAPHRAGM SHEET EDGE NOGGING

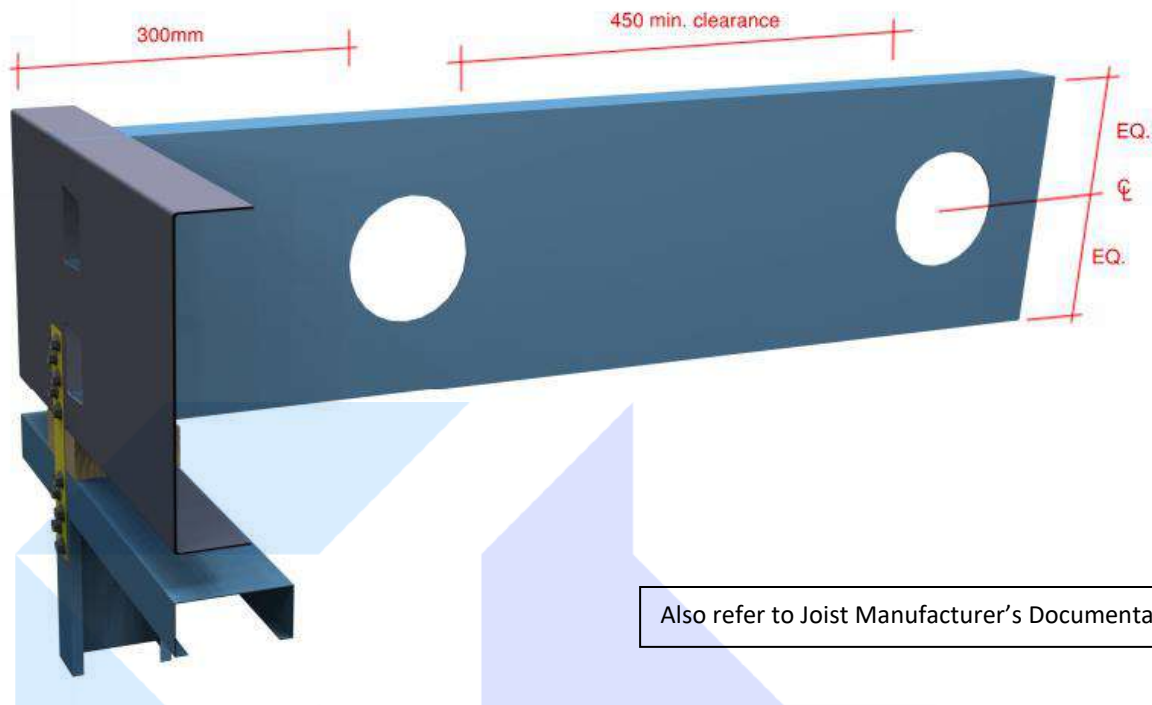




**C150 NON-STRUCTURAL PENETRATION (ON SITE)**



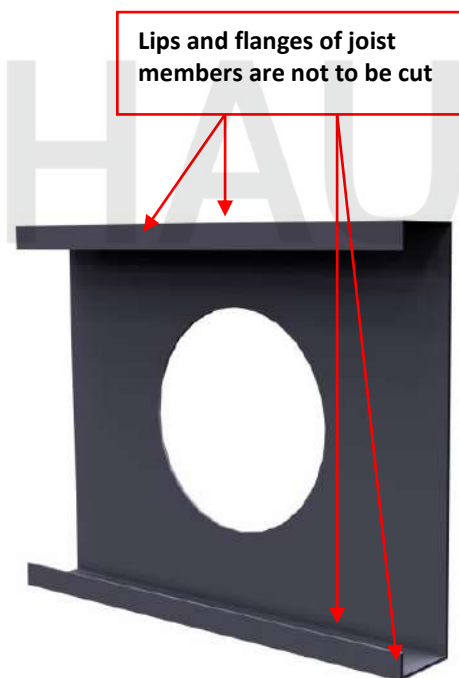
**C150 NON STRUCTURAL PENETRATION ELEVATION**

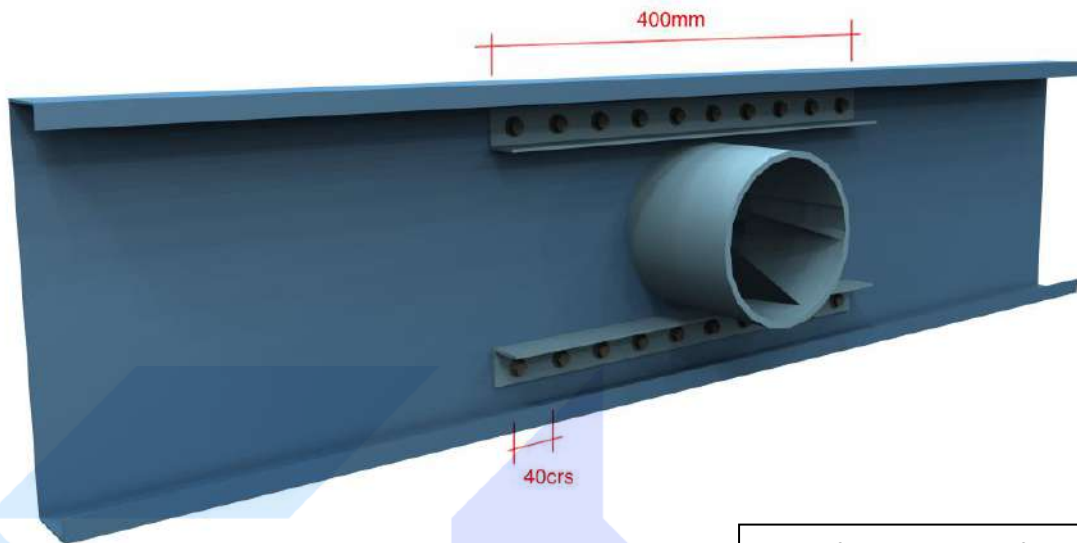


Also refer to Joist Manufacturer's Documentation

- Penetration to be a minimum of **300mm** clear from support and no less than **450mm crs** clearance between holes
- All Penetrations are to be centered to joist height.
- For remedial work, the steel should not be exposed to high temperature cutting methods such as angle grinders and high speed cutting disks or the sparks and hot metal particles generated by these tools. This also includes welding or welding spatter.

Joist Penetration - (without strengthening)	
Joist Size	Max Hole diameter
FJ140	50mm
FJ150	50mm
FJ190	70mm
FJ240	90mm
FJ290	110mm
MSS 150/12	50mm
MSS 150/15	50mm
MSS 150/18	50mm
MSS 150/23	50mm
MSS 200/12	70mm
MSS 200/15	70mm
MSS 200/18	70mm
MSS 200/23	70mm
MSS 250/13	90mm
MSS 250/15	90mm
MSS 250/18	90mm
MSS 250/23	90mm
MSS 300/15	110mm
MSS 300/18	110mm
MSS 300/23	110mm





Also refer to Joist Manufacturer's Documentation

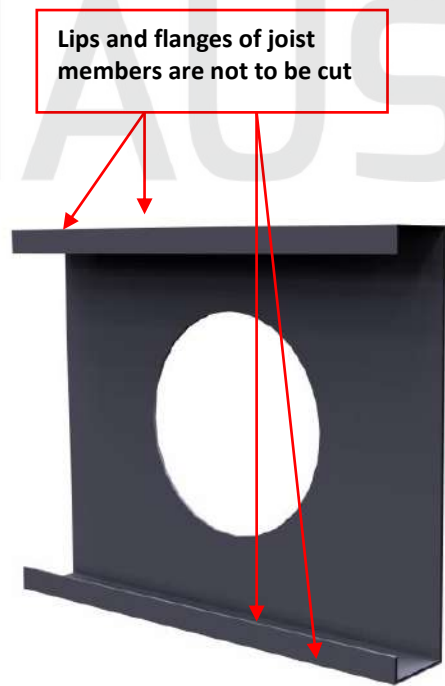
Where penetrations are required in joists as per the below table, strengthening will be required as per the above details. 400mm long 30x30x5mm steel angles are used at the top and bottom of penetration on one side. These are positioned to the center of the service hole, fixed with 10/12G hex screws evenly spaced (40mm crs).

-Penetration to be a minimum of 300mm clear from support and no less than 450mm crs clearance between holes

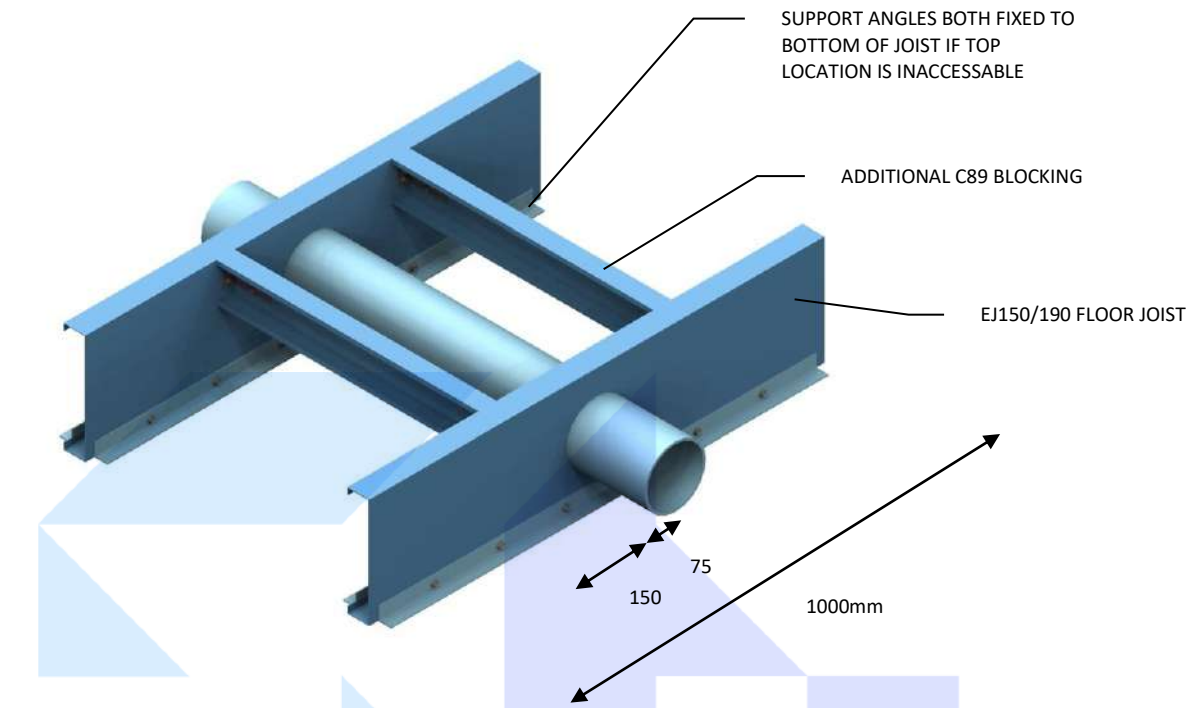
- All Penetrations are to be centered to joist

-For remedial work, the steel should not be exposed to high temperature cutting methods such as angle grinders and high speed cutting disks or the sparks and hot metal particles generated by these tools. This also includes welding or welding spatter.

Joist Penetration - (with strengthening)	
Joist Size	Max Hole diameter
FJ140	80mm
FJ150	80mm
FJ190	130mm
FJ240	150mm
FJ290	150mm
MSS 150/12	90mm
MSS 150/15	90mm
MSS 150/18	90mm
MSS 150/23	90mm
MSS 200/12	130mm
MSS 200/15	130mm
MSS 200/18	130mm
MSS 200/23	130mm
MSS 250/13	150mm
MSS 250/15	150mm
MSS 250/18	150mm
MSS 250/23	150mm
MSS 300/15	150mm
MSS 300/18	150mm
MSS 300/23	150mm







EJ150/190 FLOOR JOIST PENETRATION ALTERNATIVE SUPPORT OPTION

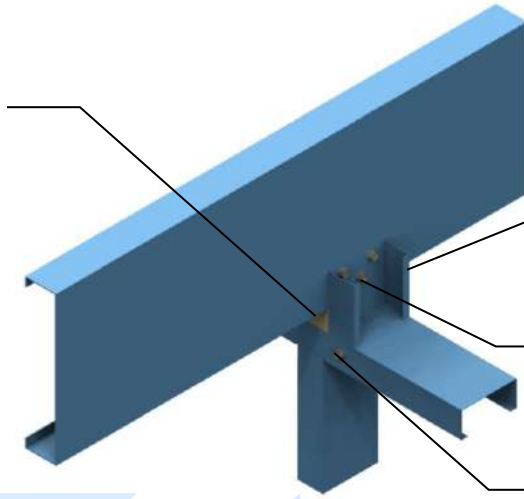
STEELHAUS

30x30x5mm ANGLE TO BOTTOM OF JOIST PLUS ADDITIONAL C89 BLOCKING EITHER SIDE OF PIPE



EJ150/190 FLOOR JOIST PENETRATION ALTERNATIVE SUPPORT OPTION (SECTION)

FLOOR JOIST ON 35mm TOP  
PLATE PACKER FIXED TO TOP  
PLATE WITH 2/10G SCREWS

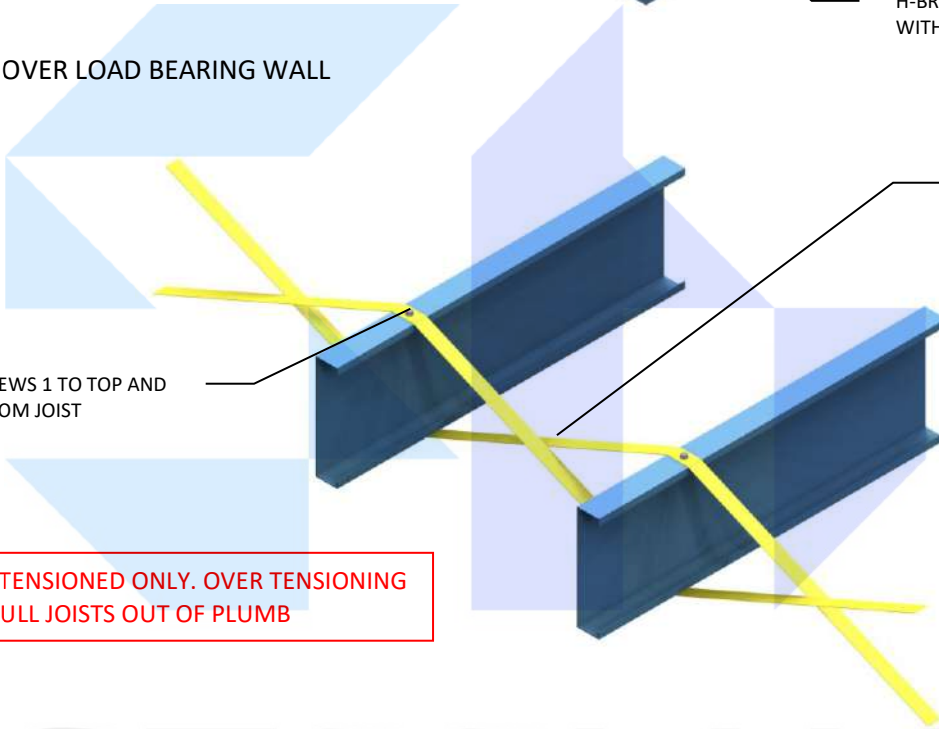


SINGLE H-BRACKET

3/10G SCREWS FROM  
BRACKET TO FLOOR JOIST

H-BRACKET FIXED TO TOP PLATE  
WITH 2/10G SCREWS, ONE EACH SIDE

JOIST OVER LOAD BEARING WALL



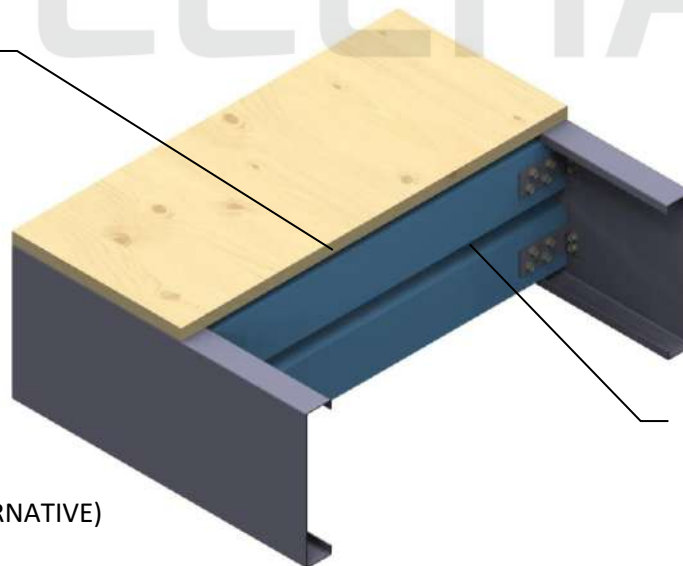
2/10G SCREWS 1 TO TOP AND  
1 TO BOTTOM JOIST

STRAP BRACE TO BE CONTINUOUS  
ALONG LINE OF BLOCKING TO  
BOTH SIDES OF JOISTS. BRACES TO  
BE A MINIMUM OF 5mm APART  
TO AVOID RUBBING

HAND TENSIONED ONLY. OVER TENSIONING  
WILL PULL JOISTS OUT OF PLUMB

MID-SPAN STRAP BRACING

BRACING MEMBERS TO SPAN  
FROM WEB TO WEB OF JOIST



2x C89 MEMBERS FIXED BETWEEN  
JOISTS WITH 0.75 FOLDED ANGLE  
USING 10G SCREWS.

MID-SPAN BRACING (ALTERNATIVE)



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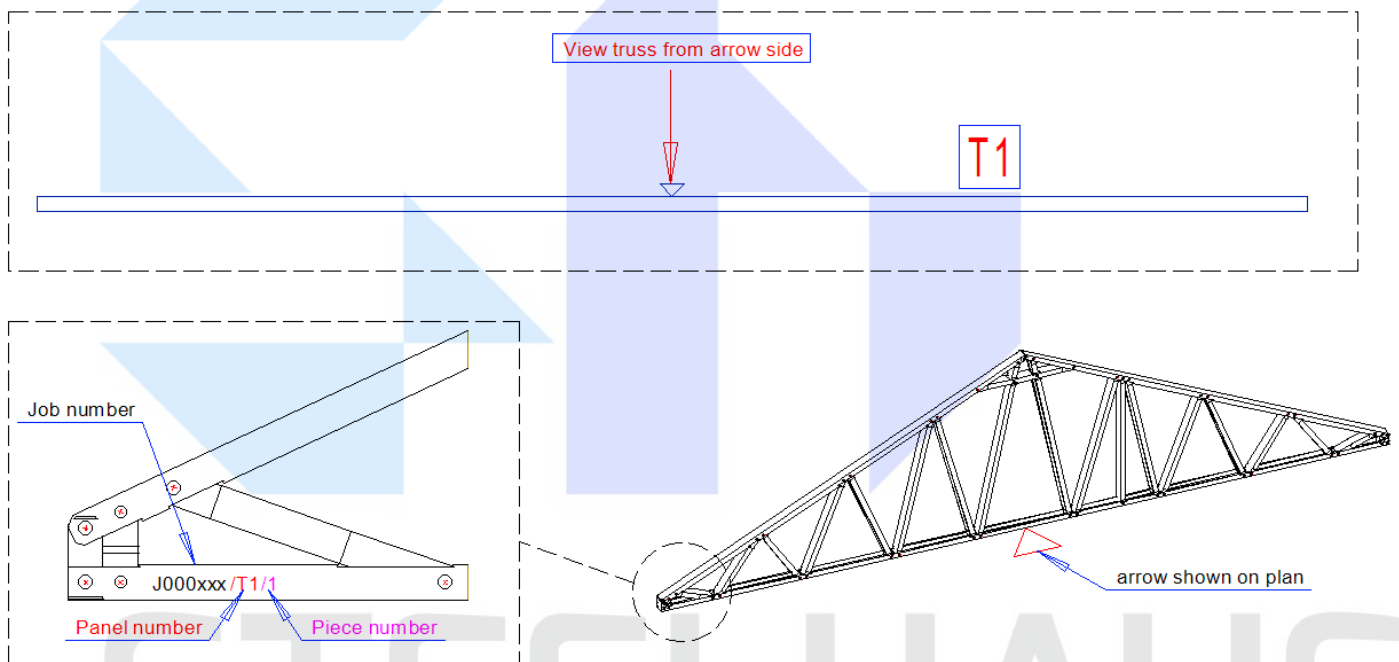
MID-FLOOR MID SPAN BRACING

DATE November 1, 2023

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# SECTION 3

# ROOF FRAMING



## Truss Orientation

### 11.5 Roof Construction

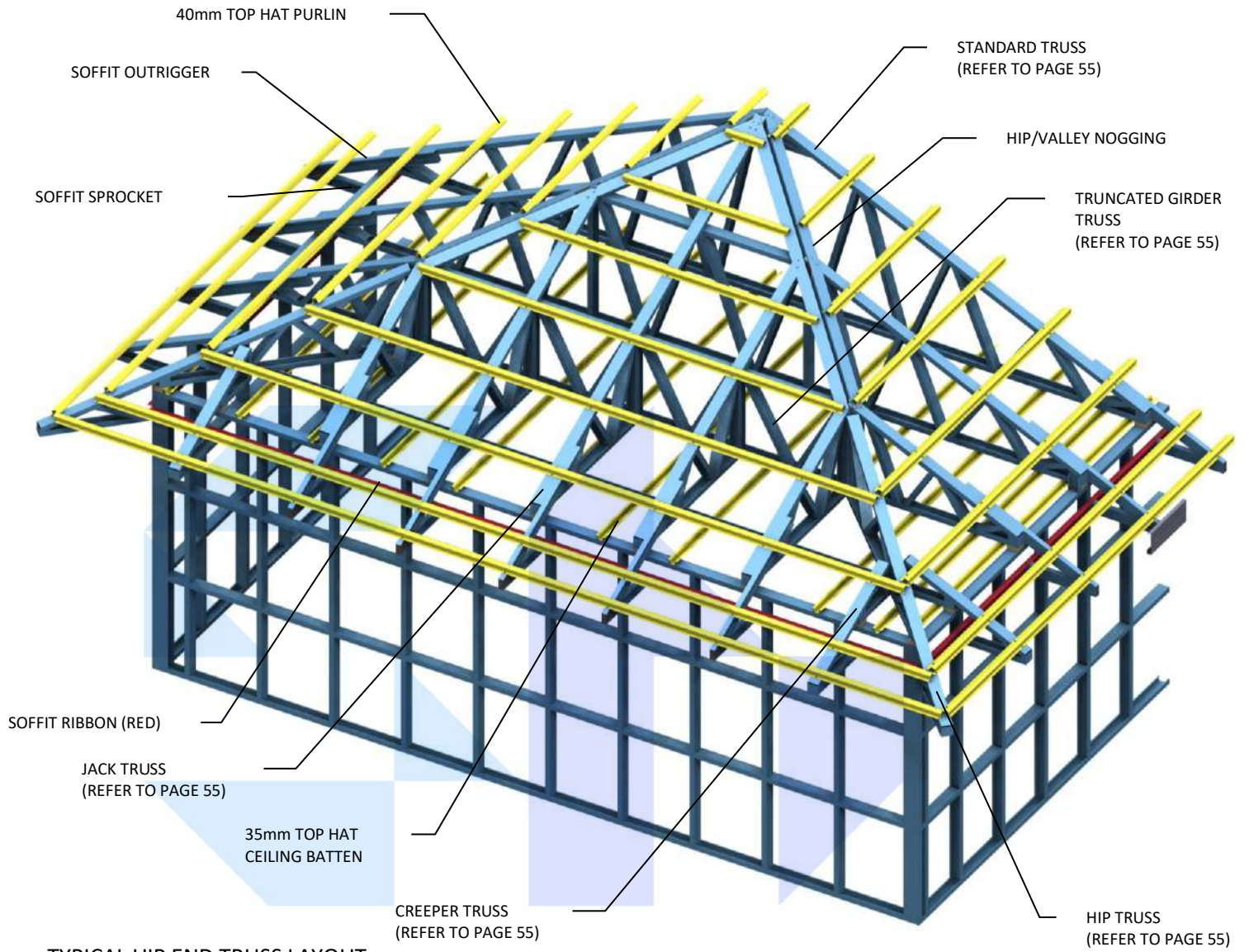
#### 11.5.1 Insulation to ceiling trussed roof

With trussed roof construction, the insulation shall run over and cover the bottom chord of the roof trusses.

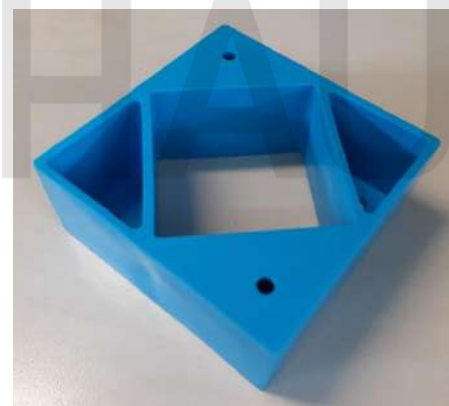
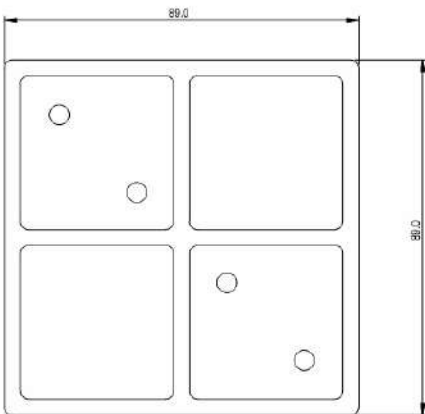
#### COMMENT :

This is achieved by cutting insulation and fitting over the truss chord. The insulation shall be fitted closely around the truss web members and be packed into the channel section of these members. The insulation is to extend out to the edges of the roof space and cover the wall top plate.





TYPICAL HIP END TRUSS LAYOUT



Polyethylene high density, PEHD  
 Thermal Conductivity  
 - k -  
 W/(m K)  
 0.42 - 0.51

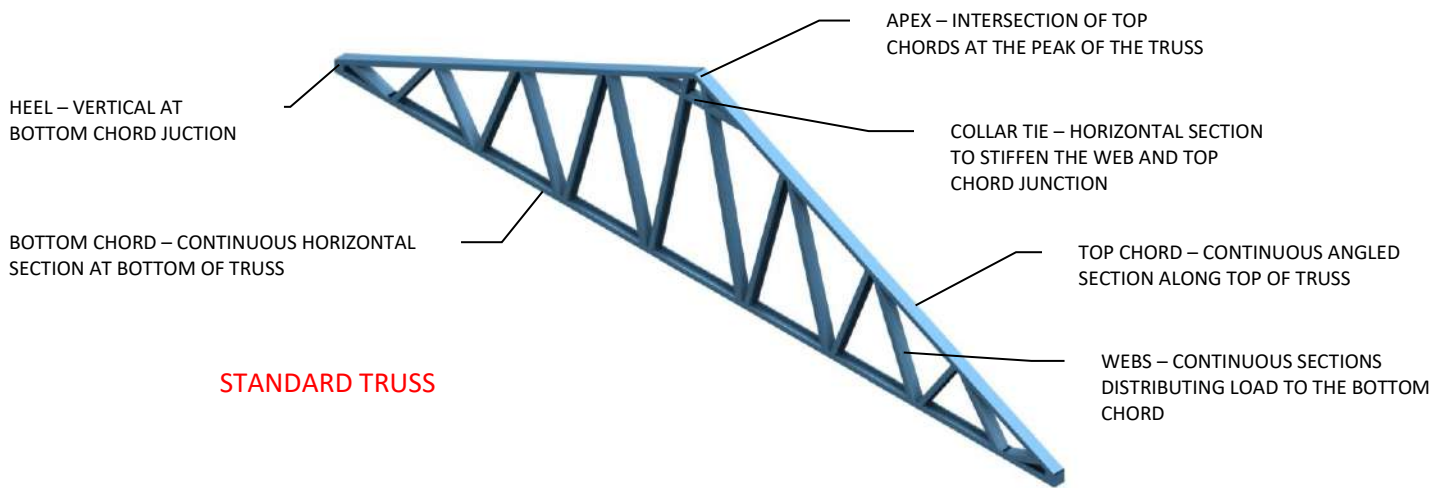
TOP PLATE PACKER/THERMAL BLOCK



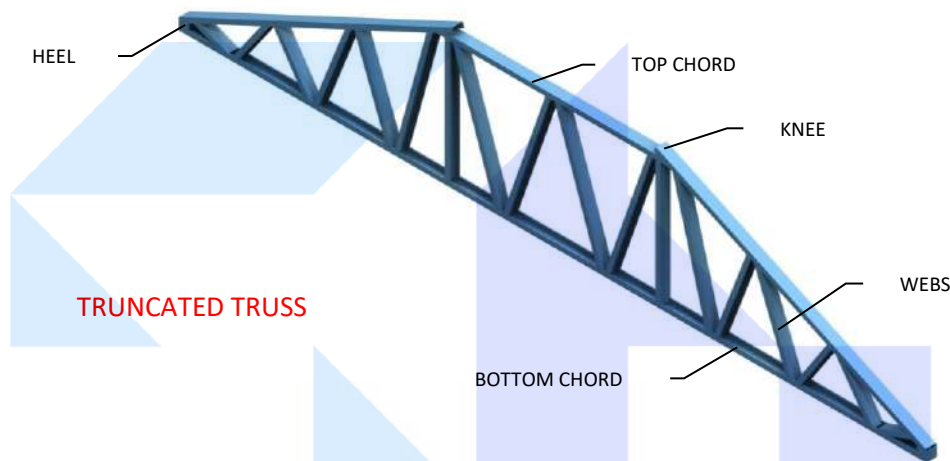
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TYPICAL HIP END TRUSS LAYOUT

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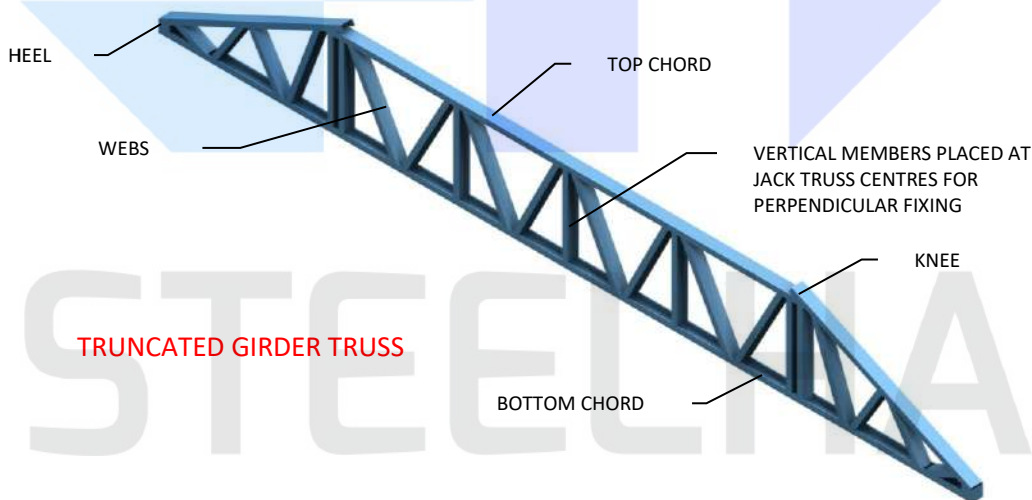


**STANDARD TRUSS**



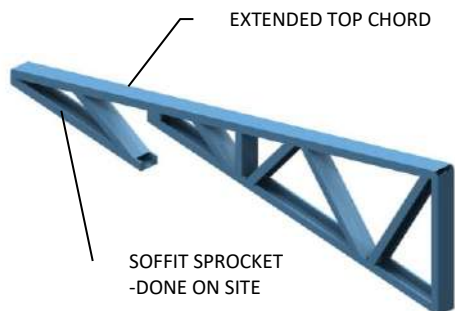
**TRUNCATED TRUSS**

**NOTE;**  
**OUTRIGGERS, SOFFIT**  
**SPROCKETS AND WEBS TO BE**  
**INSTALLED ON SITE.**

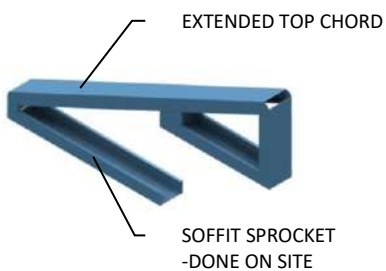


**TRUNCATED GIRDER TRUSS**

STEELHAUS



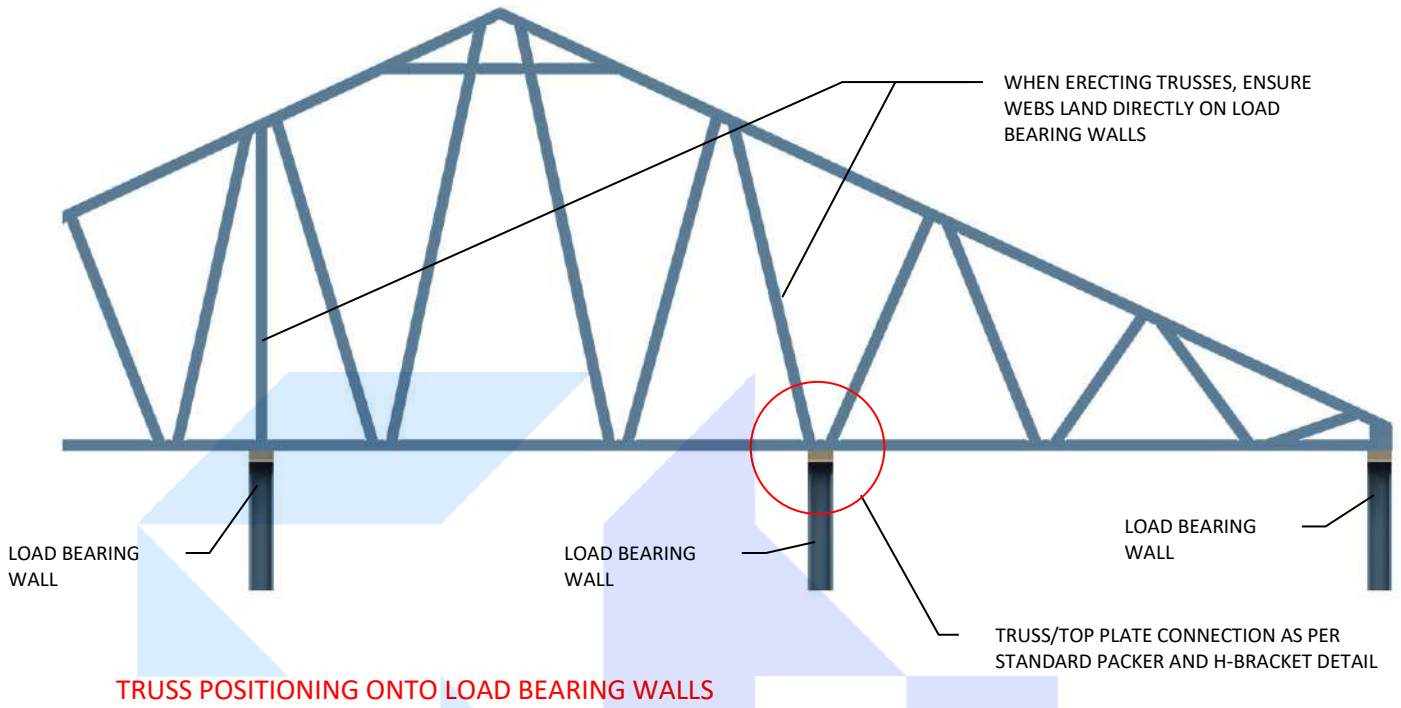
**HIP TRUSS**



**CREEPER TRUSS**



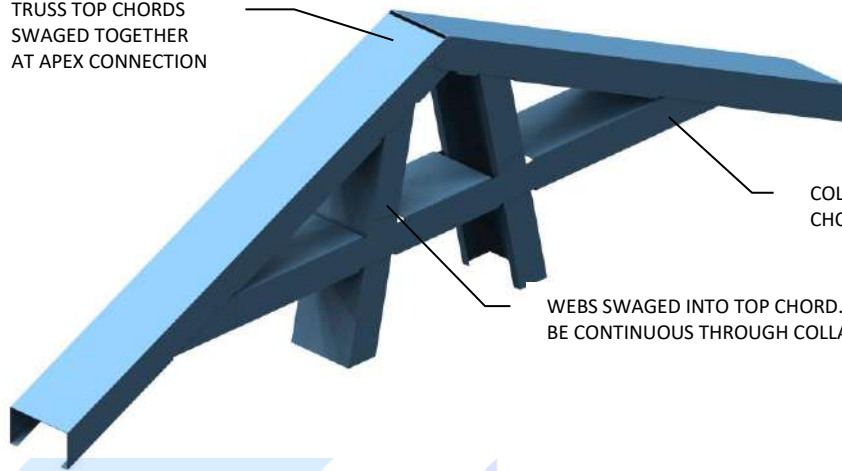
**JACK TRUSS**



**TRUSS POSITIONING ONTO LOAD BEARING WALLS- REMEDIAL**



TRUSS TOP CHORDS  
SWAGED TOGETHER  
AT APEX CONNECTION

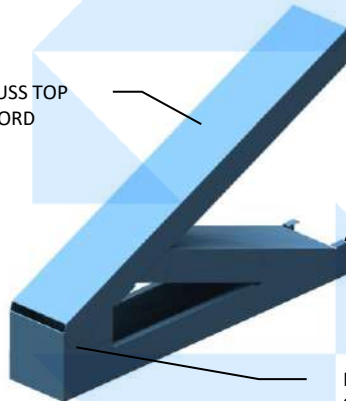


COLLAR TIE SWAGED INTO TOP  
CHORD

WEBS SWAGED INTO TOP CHORD. WEBS TO  
BE CONTINUOUS THROUGH COLLAR TIE

**TRUSS APEX CONNECTION**

TRUSS TOP  
CHORD



BOTTOM CHORD

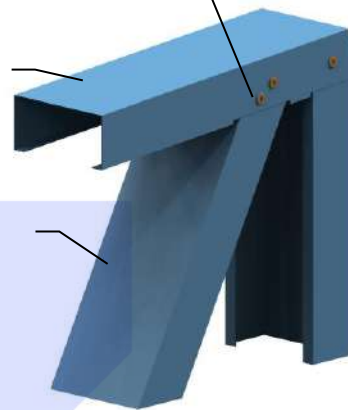
HEEL VERTICAL MEMBERS  
SWAGED INTO TOP AND  
BOTTOM CHORD

**TRUSS HEEL CONNECTION**

EXTRA SCREW PLACED  
HERE – ENSURE 15MM  
EDGE DISTANCE

TRUSS TOP  
CHORD

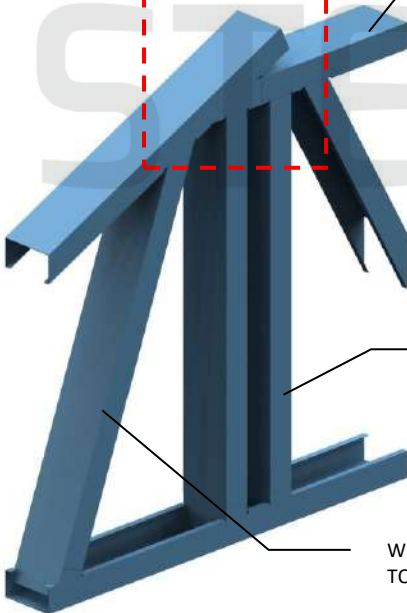
TRUSS WEBS



**DOUBLE SCREW CONNECTION**

**DETAIL 1**

HORIZONTAL TOP  
CHORD SWAGED INTO  
ANGLED TOP CHORD

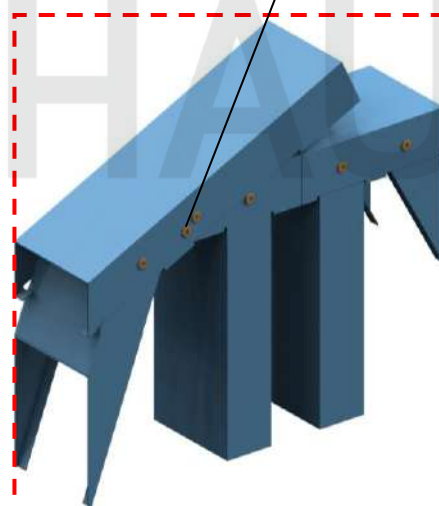


VERTICALS SWAGED  
INTO TOP CHORD

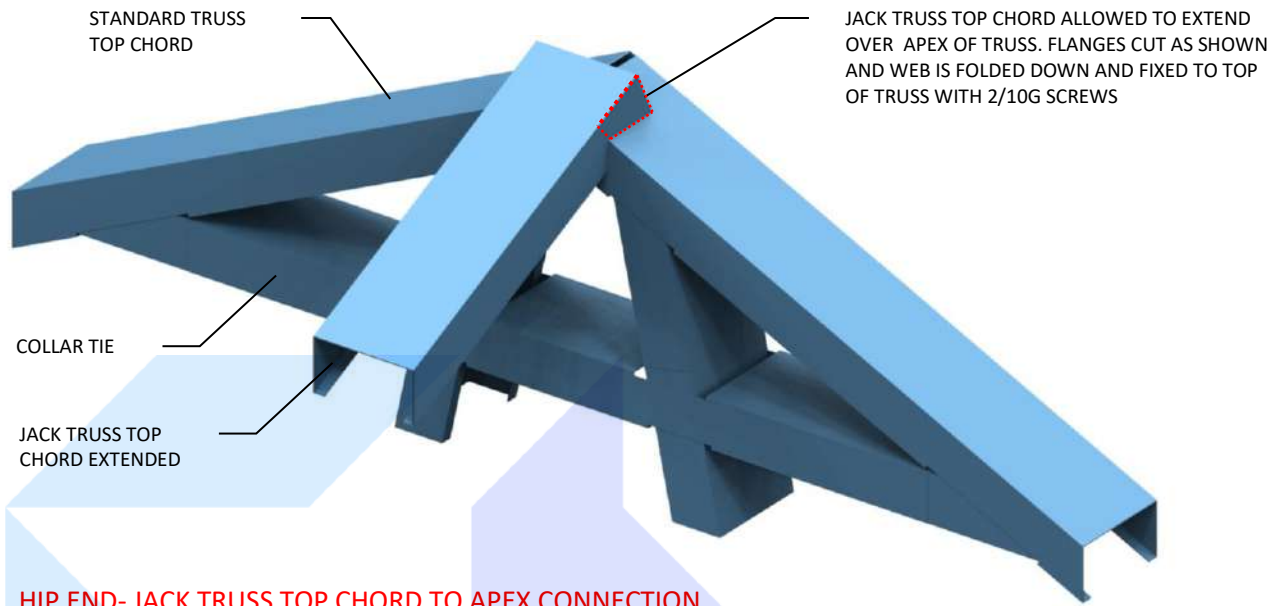
WEBS SWAGED INTO  
TOP CHORD

**TRUNCATED TRUSS KNEE CONNECTION**

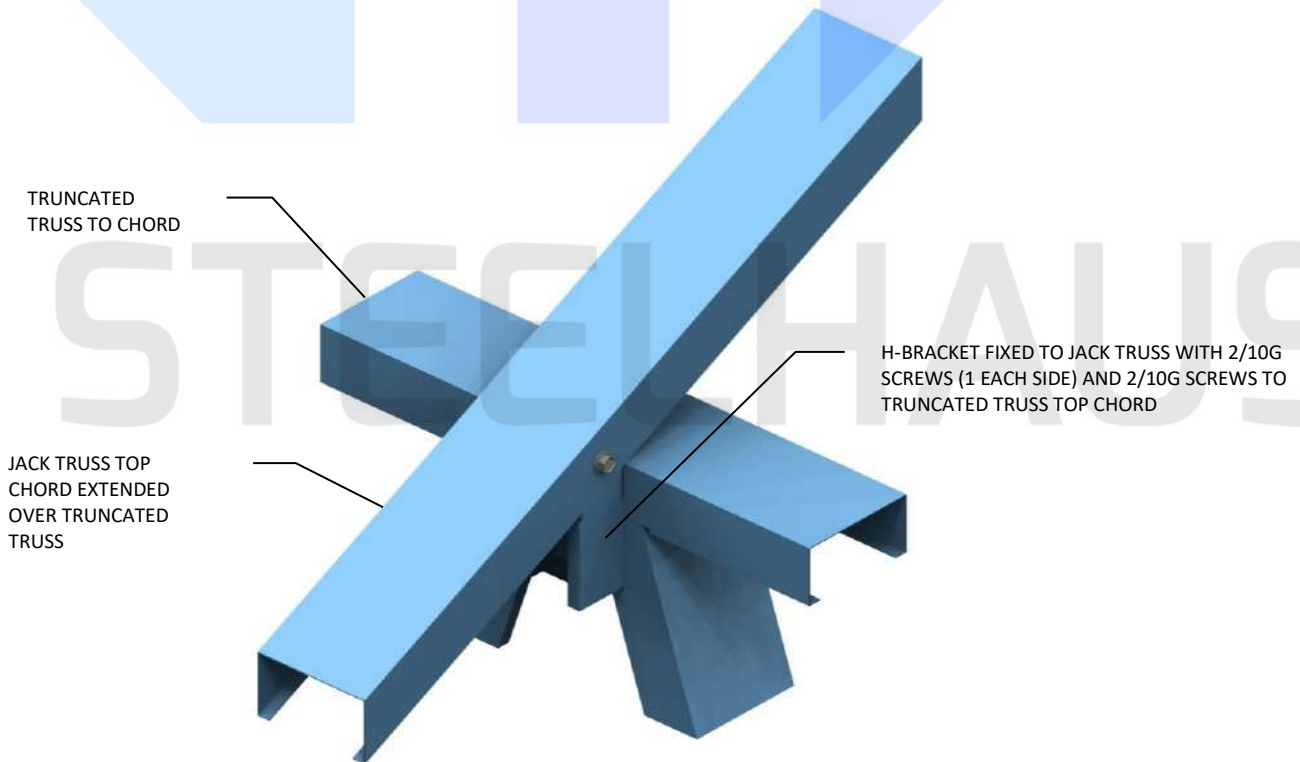
EXTRA 2/10G SCREWS  
(1 EACH SIDE) AS SHOWN



**DETAIL 1**



**HIP END- JACK TRUSS TOP CHORD TO APEX CONNECTION**



**HIP END- JACK TRUSS TOP CHORD TO TRUNCATED TRUSS CONNECTION**

EXTENDED JACK TRUSS  
TOP CHORD TABBED TO  
APEX CONNECTION REFER  
TO PREVIOUS PAGE

STANDARD TRUSS TOP CHORD

C-SECTIONS CUT ON SITE TO SUIT.  
FIXED OVER TOP CHORDS WITH  
2/10G SCREWS AT EACH TRUSS  
INTERSECTION

HIP /VALLEY NOGGING TO APEX CONNECTION

C-SECTIONS CUT ON SITE TO SUIT.  
FIXED OVER TOP CHORDS WITH  
2/10G SCREWS AT EACH TRUSS  
INTERSECTION

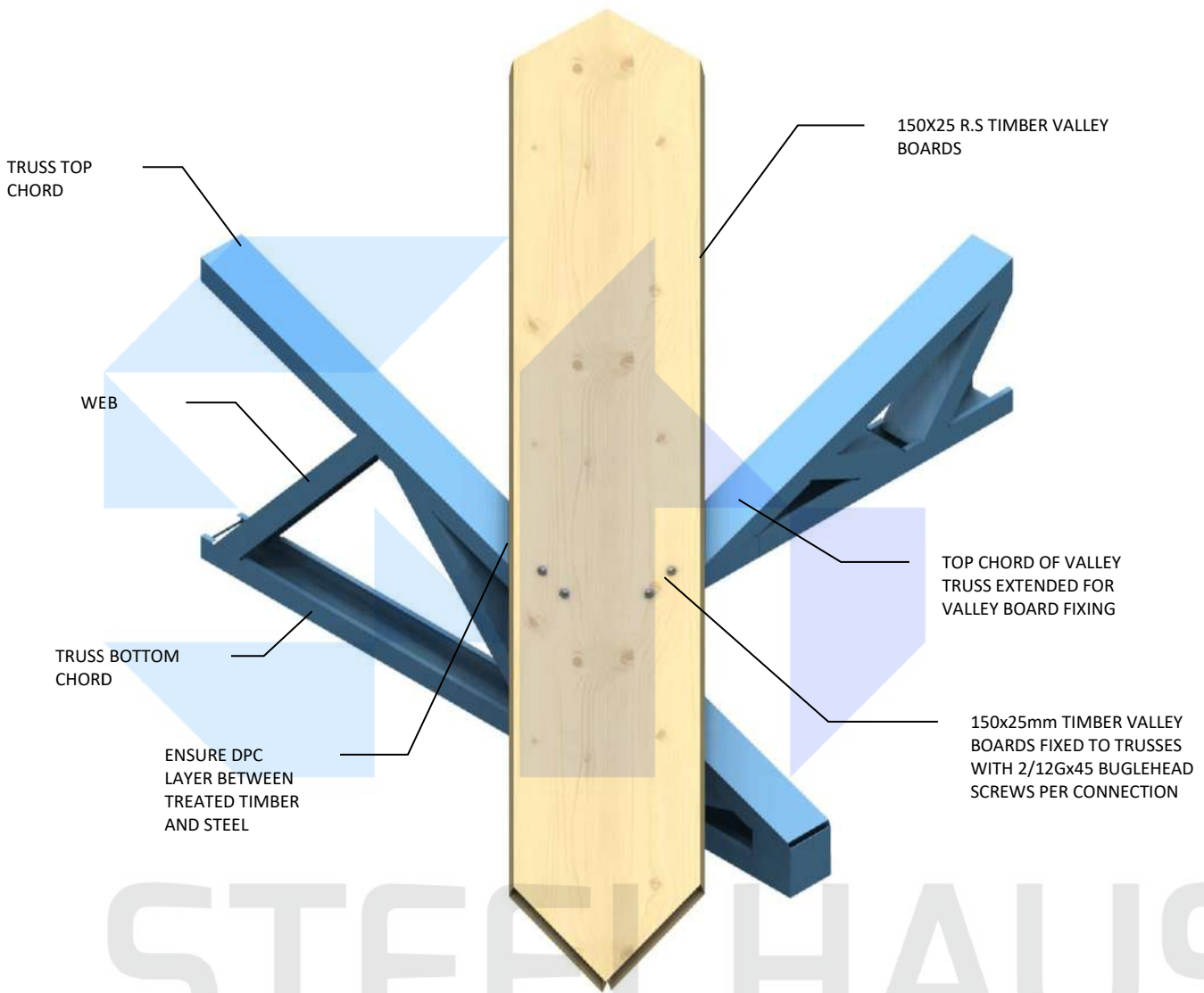
JACK TRUSS TOP  
CHORD

JACK TRUSS TOP  
CHORD

HIP TRUSS

HIP /VALLEY NOGGING OVER TRUNCATED  
TRUSS CONNECTION

HIP /VALLEY NOGGING AT HIP TRUSS  
CONNECTION



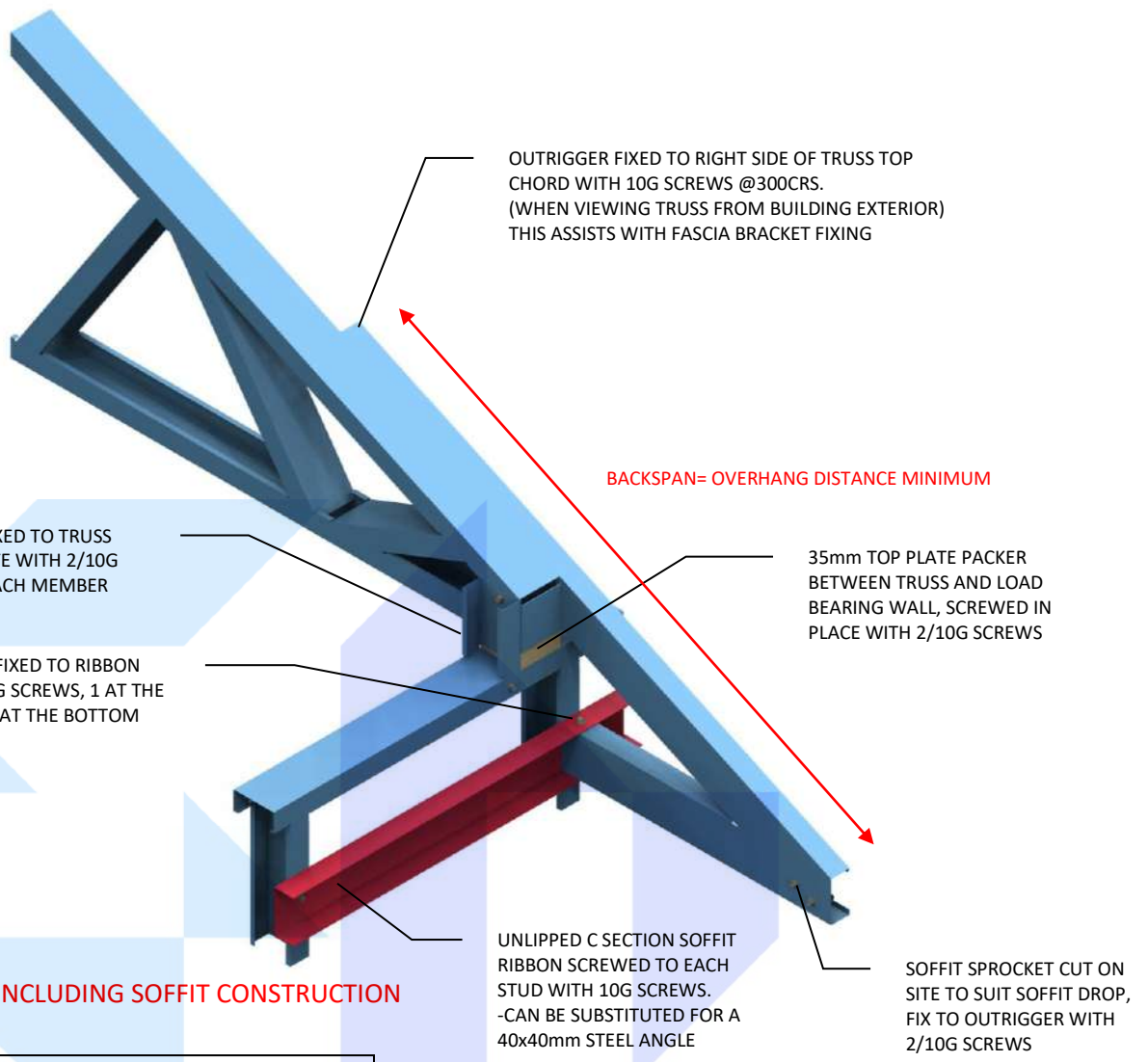
# STEELHAUS

## VALLEY BOARDS TO TRUSS CONNECTION



VALLEY BOARD FIXING – 12Gx45mm BUGLE HEAD SCREW

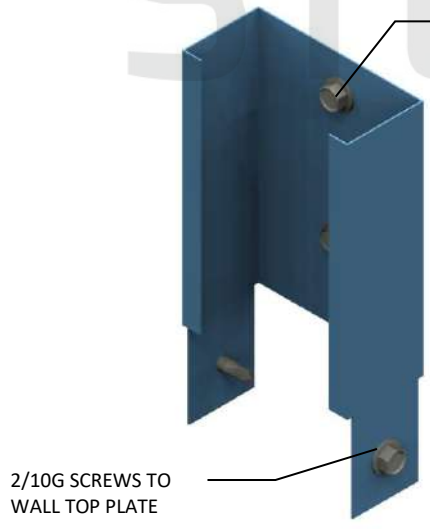




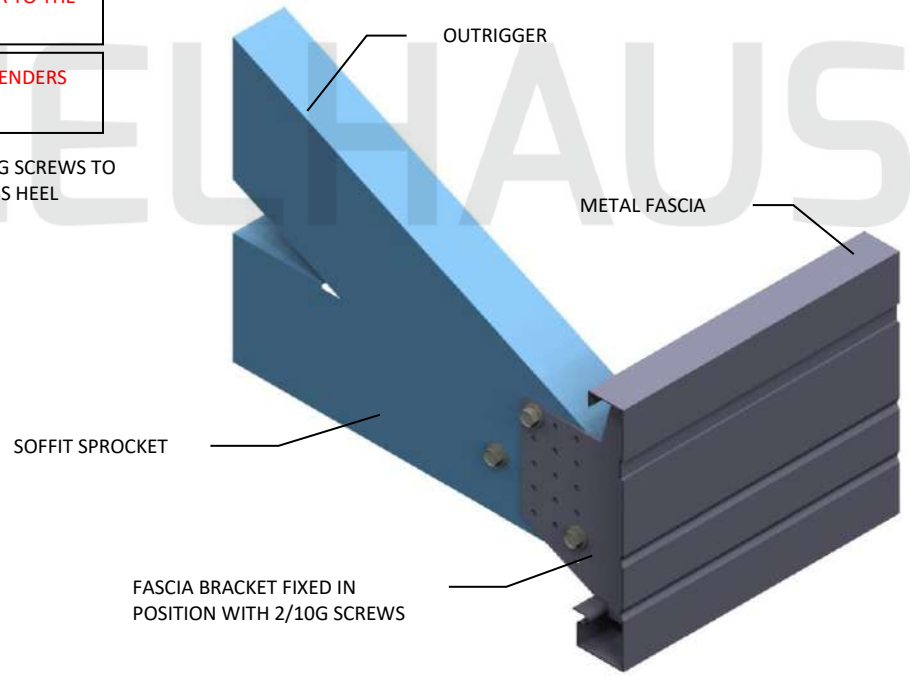
**TRUSS HOLD-DOWN INCLUDING SOFFIT CONSTRUCTION**

NOTE: THE SOFFIT RIBBON CAN BE EITHER LENGTHS OF UNLIPPED FRAMING SECTION OR LENGTHS OF 40x40mm STEEL ANGLE.  
 -THE SOFFIT RIBBON IS TO BE INSTALLED OVER THERMAL BREAK AND BUILDING PAPER. SOFFIT FRAMING MUST BE IN PLACE PRIOR TO THE FASCIA BEING FIXED TO ALLOW FOR BRACKET FIXING.

THERMAL BREAK AND BUILDING PAPER IS NOT SHOWN IN RENDERS FOR VISUAL CLARITY



**H-BRACKET CLOSE-UP**



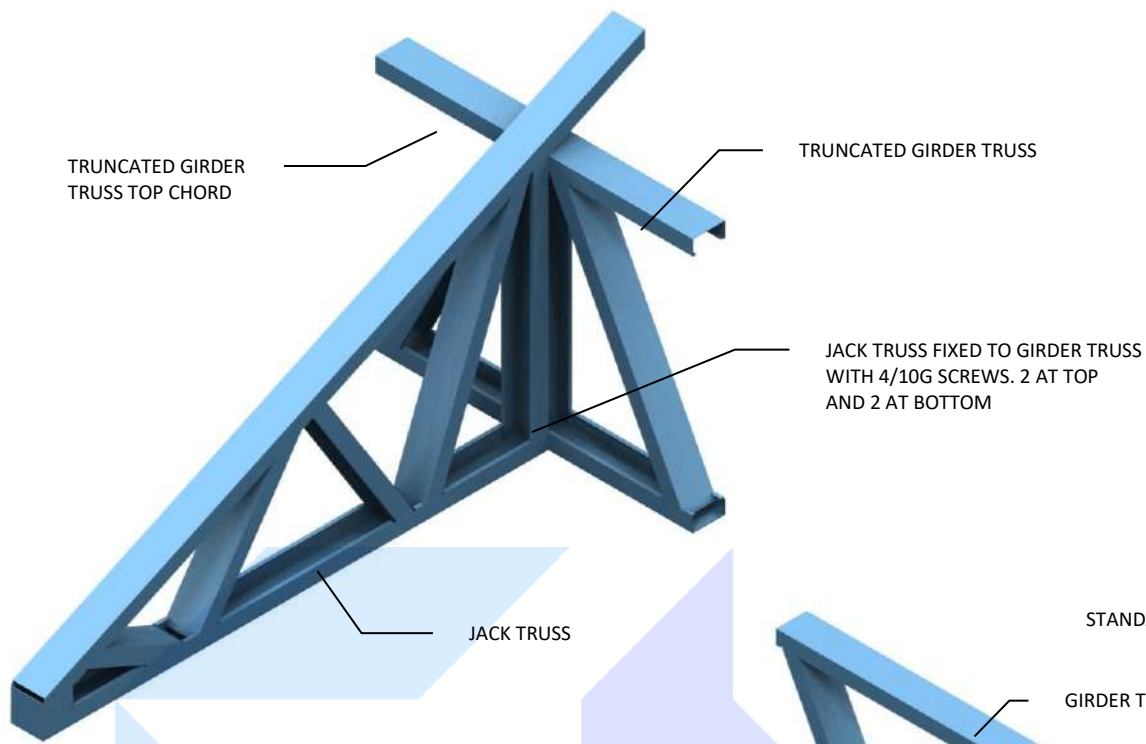
**FASCIA BRACKET FIXING DETAIL**



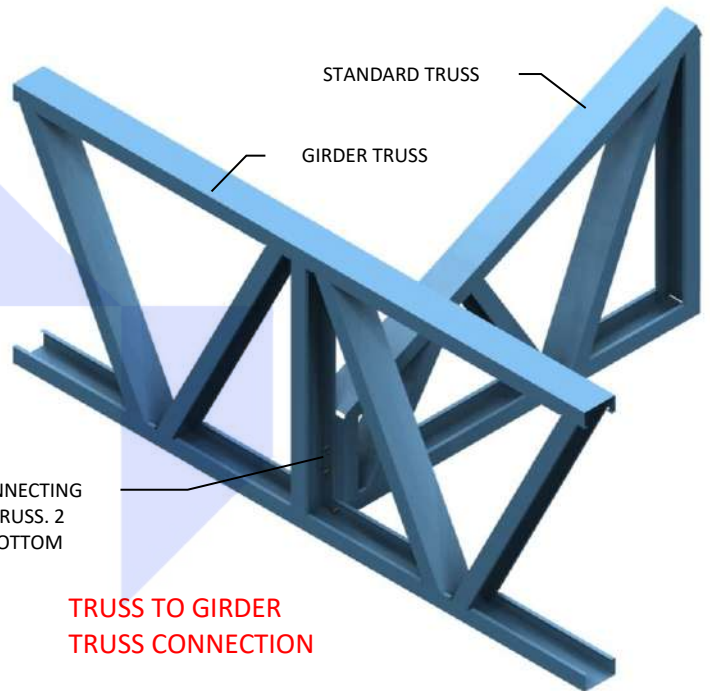
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**TYPICAL SOFFIT CONSTRUCTION**

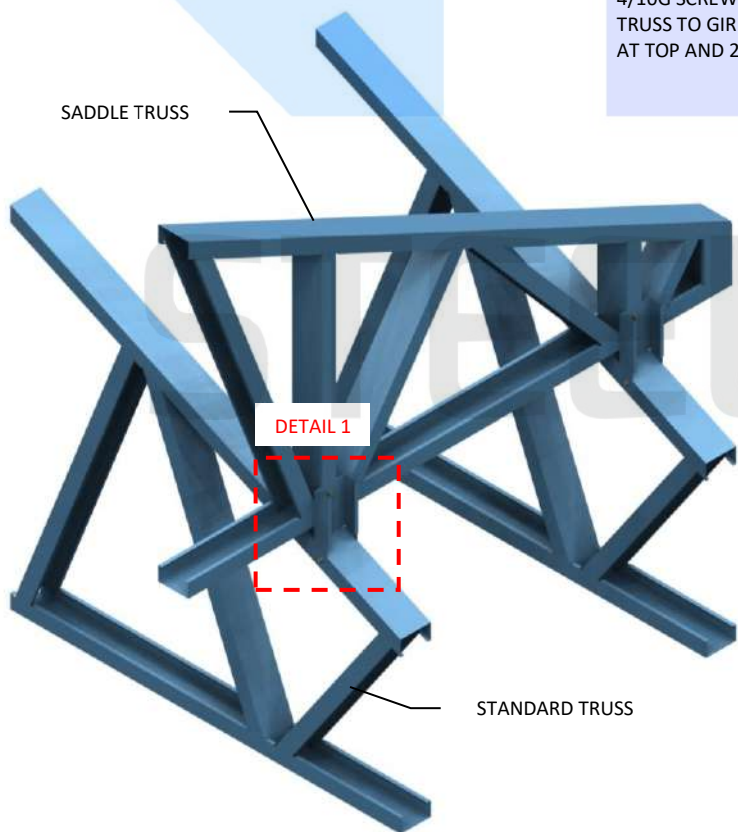
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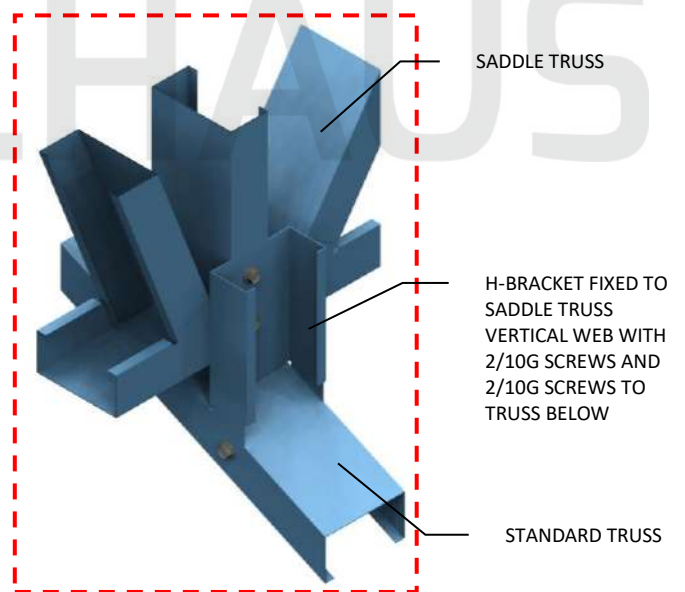
**JACK TRUSS TO TRUNCATED GIRDER TRUSS CONNECTION**



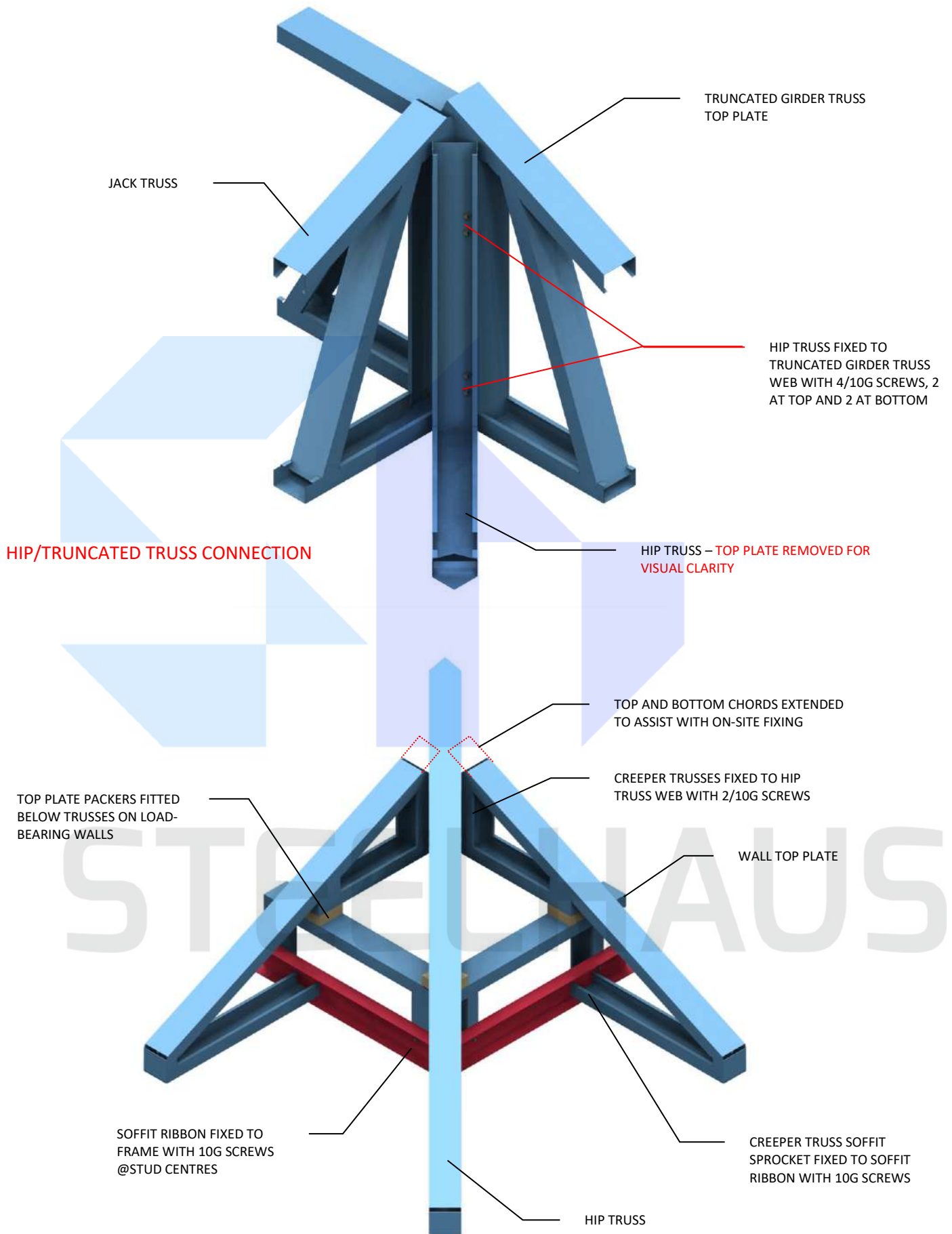
**TRUSS TO GIRDER TRUSS CONNECTION**



**SADDLE TRUSS TO STANDARD TRUSS CONNECTION**

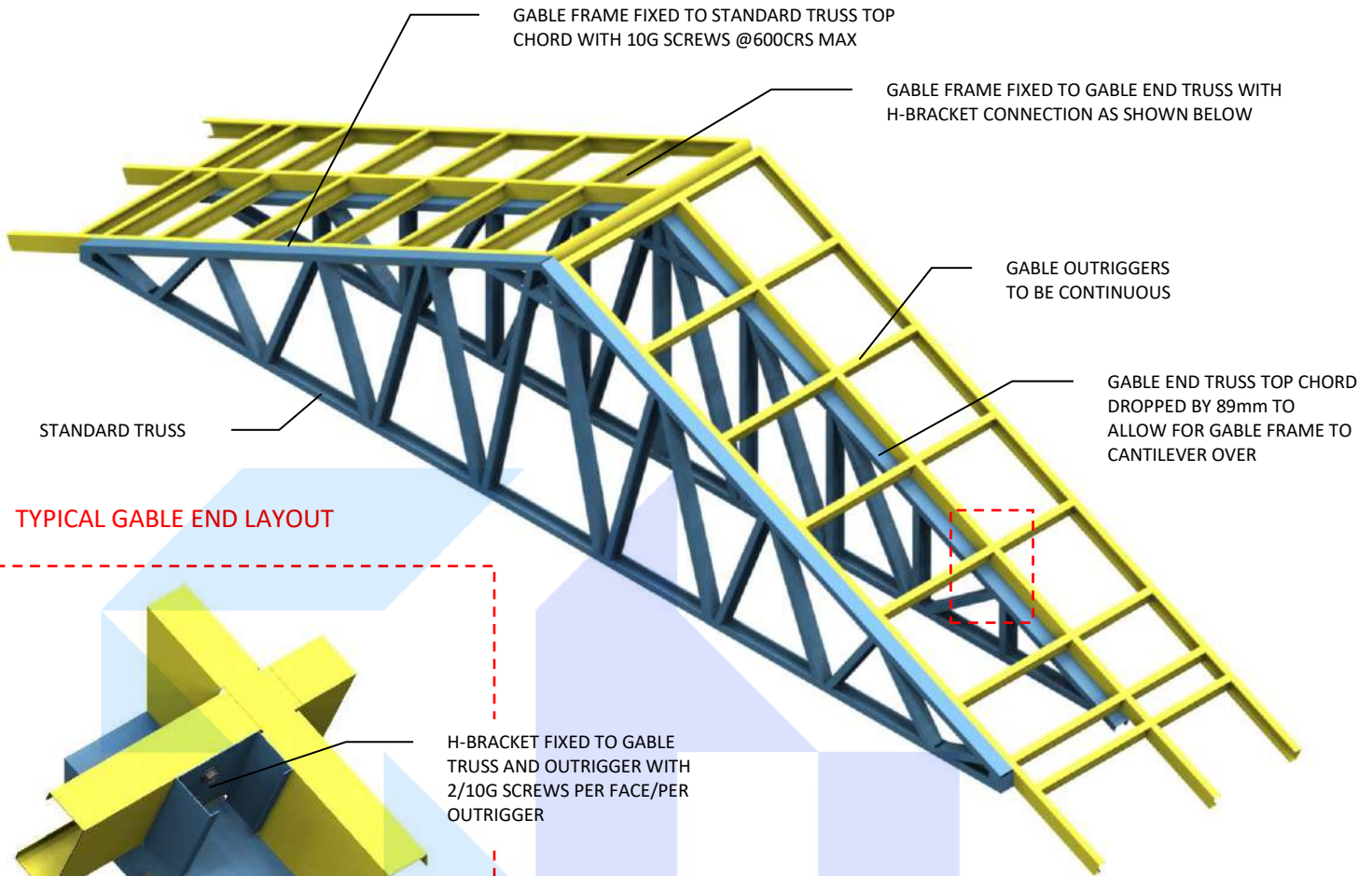


**DETAIL 1**

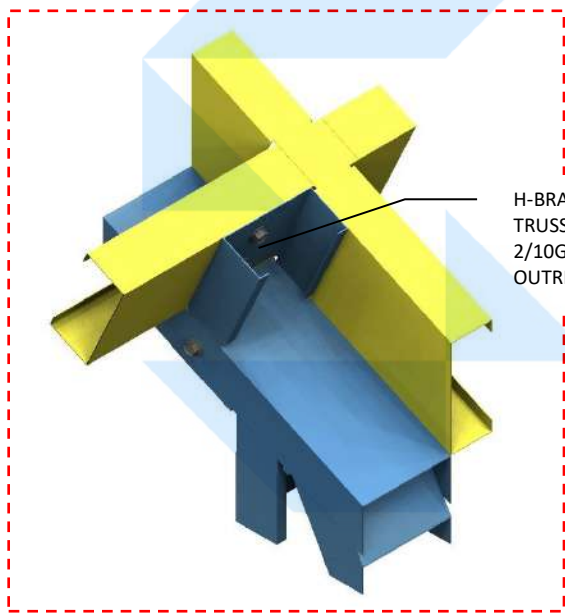


**CREEPER TRUSS/HIP TRUSS CONNECTION**



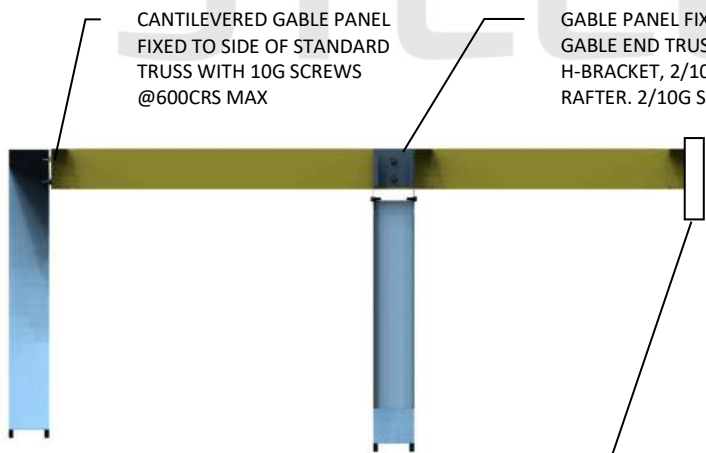


**TYPICAL GABLE END LAYOUT**



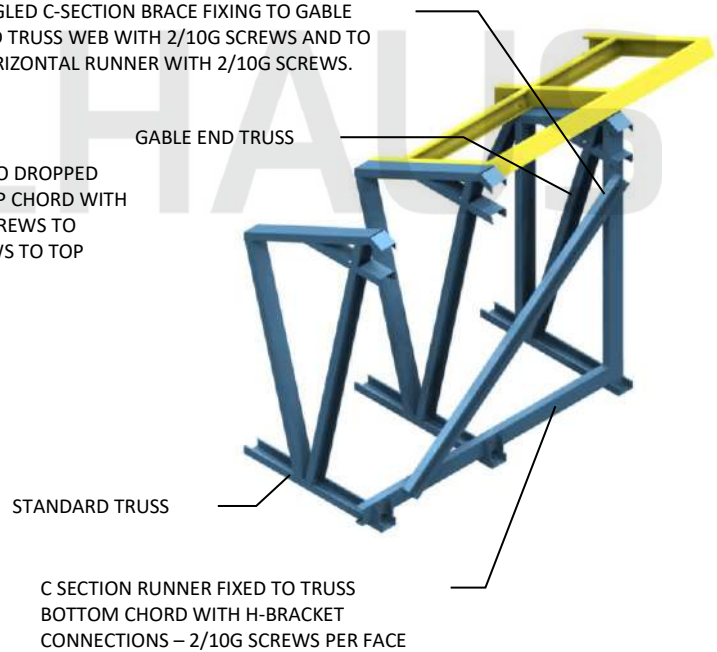
**NOTE;**  
 If full height gable wall framing is used -  
 Ensure 10mm thermal break strip between  
 gable panel and full height wall framing

**GABLE FRAME/GABLE END TRUSS CONNECTION**



**SADDLE TRUSS TO STANDARD TRUSS CONNECTION**

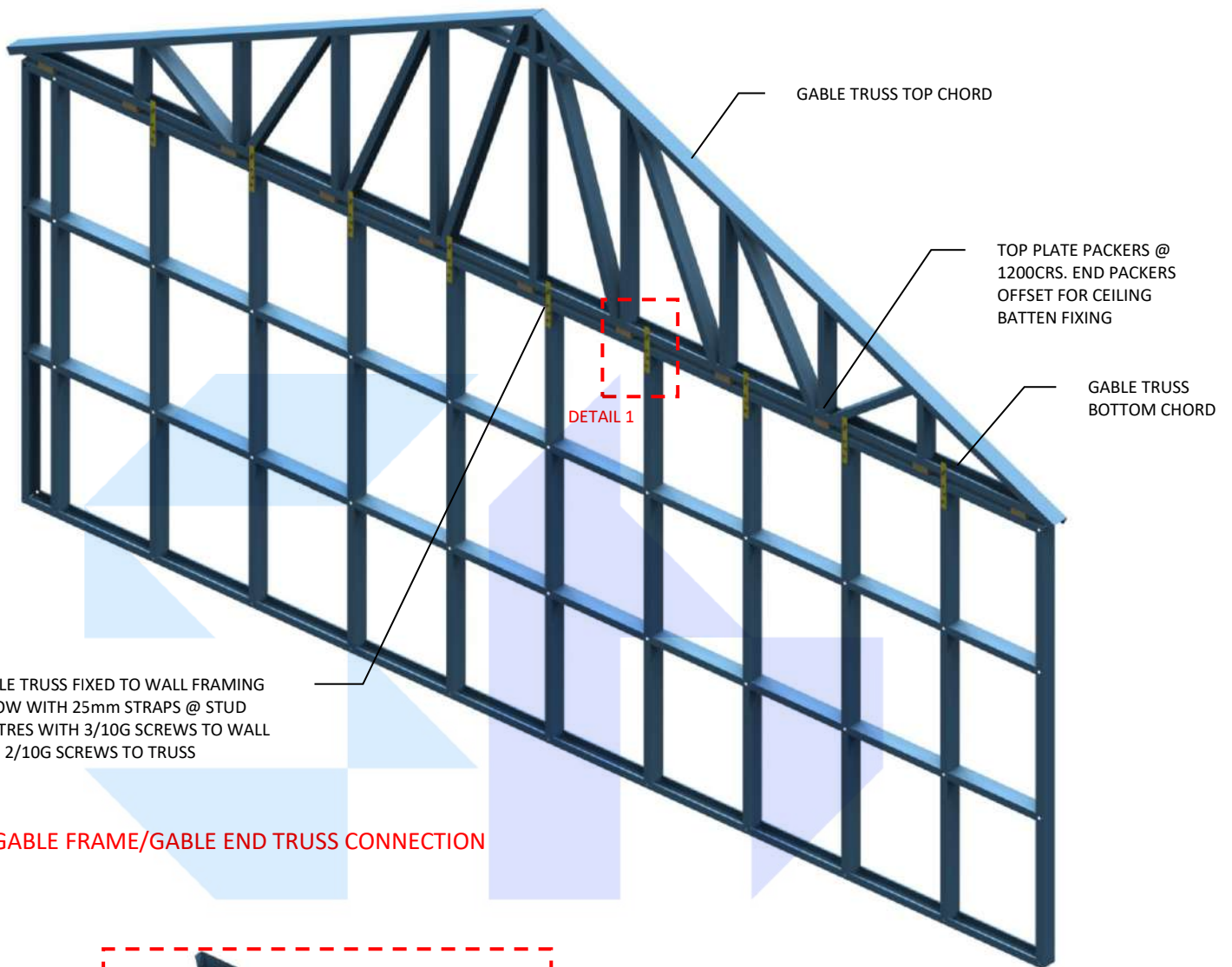
ANGLED C-SECTION BRACE FIXING TO GABLE END TRUSS WEB WITH 2/10G SCREWS AND TO HORIZONTAL RUNNER WITH 2/10G SCREWS.



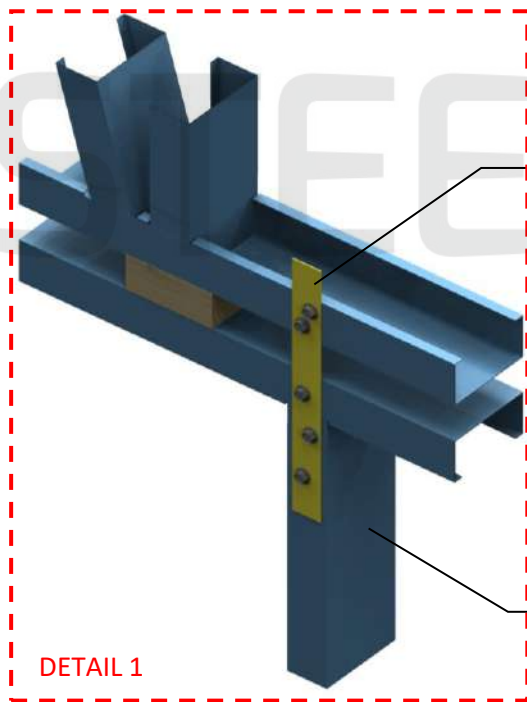
**GABLE END TRUSS BRACING**







**GABLE FRAME/GABLE END TRUSS CONNECTION**



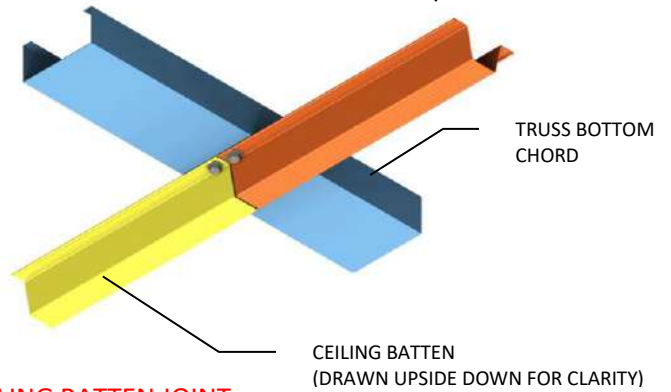
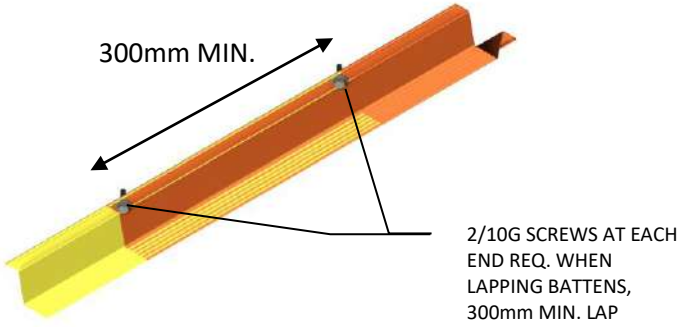
GABLE TRUSS FIXED TO WALL FRAMING BELOW WITH 25mm STRAPS @ STUD CENTRES WITH 3/10G SCREWS TO WALL AND 2/10G SCREWS TO TRUSS

WALL FRAME

DETAIL 1

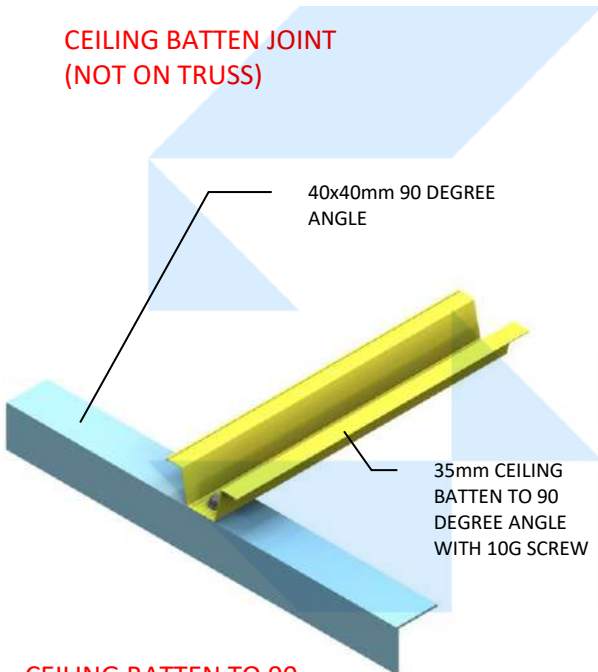
**GABLE FRAME/GABLE END TRUSS CONNECTION**

35mm CEILING BATTENS FIXED TO UNDERSIDE OF TRUSS BOTTOM CHORDS WITH 2/10G SCREWS EACH CONNECTION



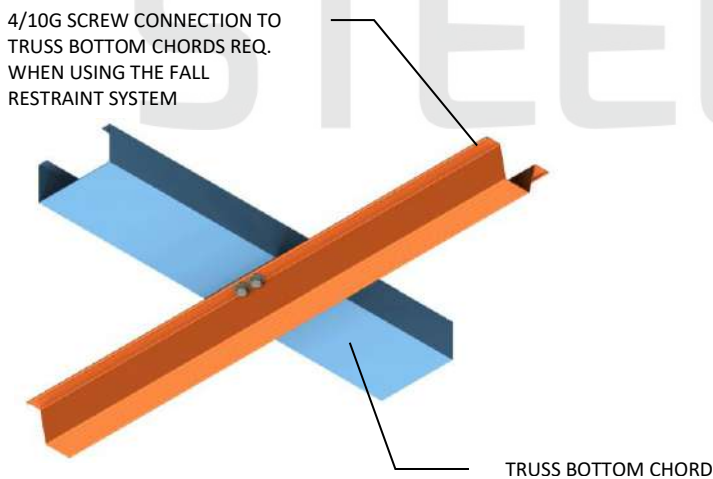
**CEILING BATTEN JOINT (NOT ON TRUSS)**

**CEILING BATTEN JOINT (ON TRUSS)**

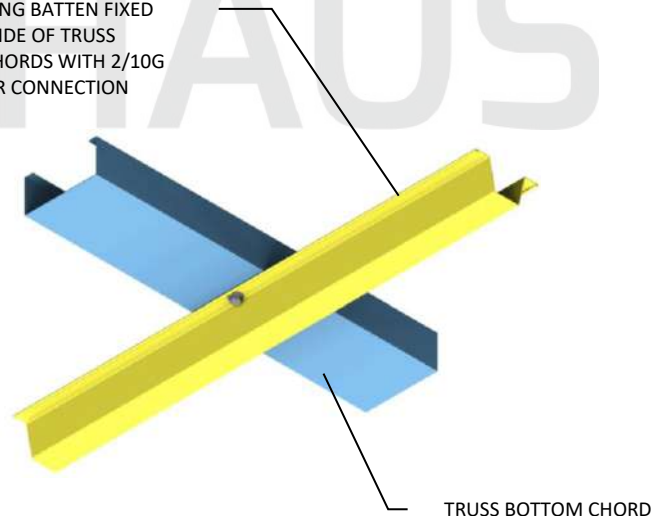


Ceiling Battens				
35mm Top Hat Section				
Proprietary ceilings with 0.5kPa Live load				
Table of max span vs. Spacings	Section Spacings (mm)			Figs based on Deflection L/500
	400	450	600	
Span (m)	Span (m)	Span (m)		
Using 10mm gib ceilings	1.7	1.5	1.4	
Using 13mm gib ceilings	1.5	1.4	1.3	
Using 16mm gib Ceilings	1.4	1.4	1.2	
Using 20mm gib Ceilings	1.3	1.3	1.2	

**CEILING BATTEN TO 90 DEGREE BEND ANGLE**

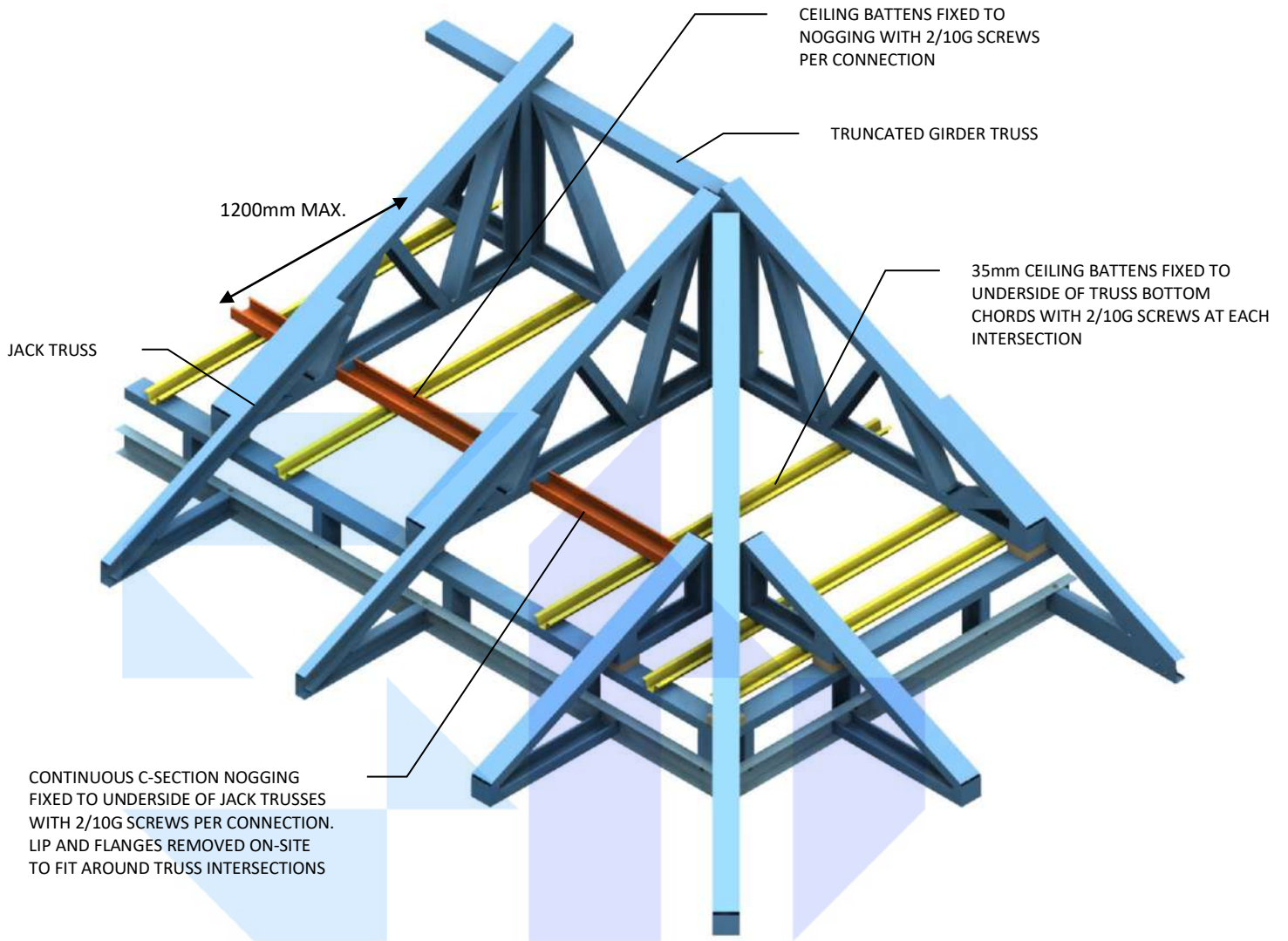


35mm CEILING BATTEN FIXED TO UNDERSIDE OF TRUSS BOTTOM CHORDS WITH 2/10G SCREWS PER CONNECTION



**CEILING BATTEN TO TRUSS CONNECTION (IF USED WITH FALL RESTRAINT SYSTEM)**

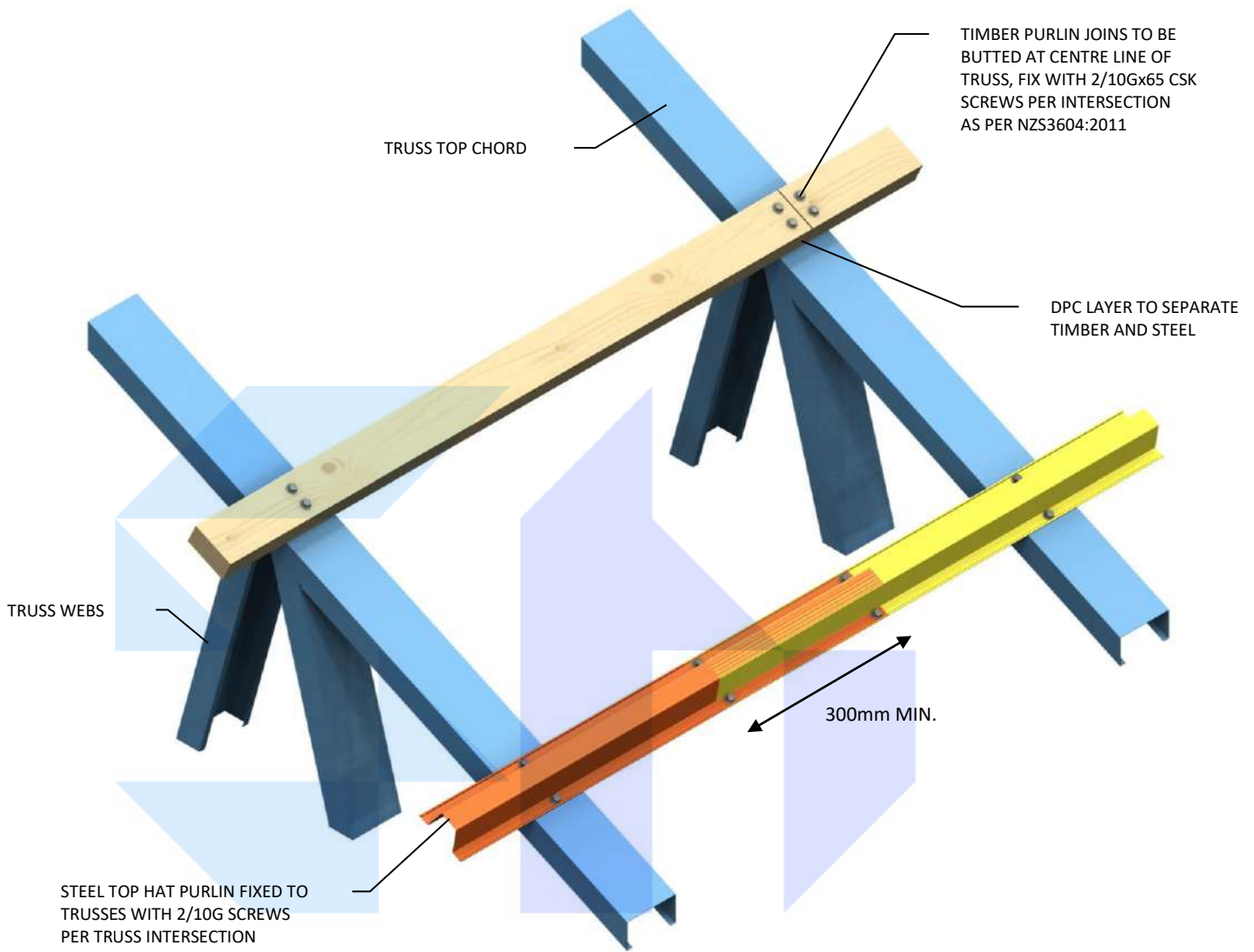
**CEILING BATTEN TO TRUSS CONNECTION (STANDARD)**



**CEILING BATTEN NOGGING ON HIP-END ROOF**

STEELHAUS





**STEEL/TIMBER PURLINS TO TRUSS CONNECTIONS**

STEELHAUS

		40 x 74 x 0.75BMT Tophat Purlins									
Purlin Spacing	Purlin Span	Low kN	32 Type	Med kN	37 Type	High kN	44 Type	V High kN	50 Type	E High kN	55 Type
0.9	0.9	0.77	A	1.05	A	1.50	A	1.96	A	2.38	B
0.9	1.2	1.03	A	1.40	A	2.01	B	2.61	B	N/A	N/A

<b>Type</b>	<b>Fastener</b>
<b>A</b>	2 x 10G 16x16 Hex Head screws
<b>B</b>	3 x 10G 16x16 Hex Head screws

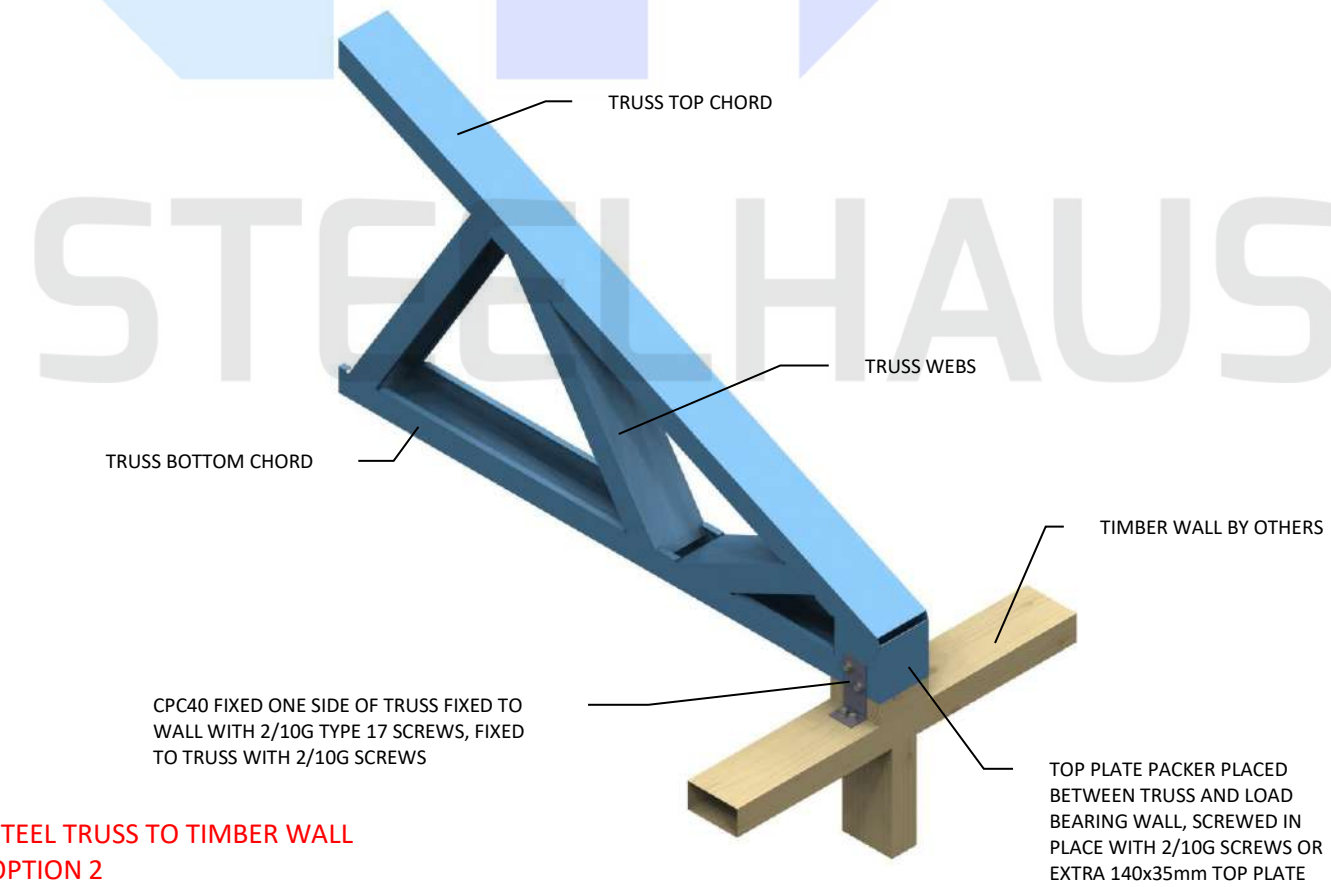
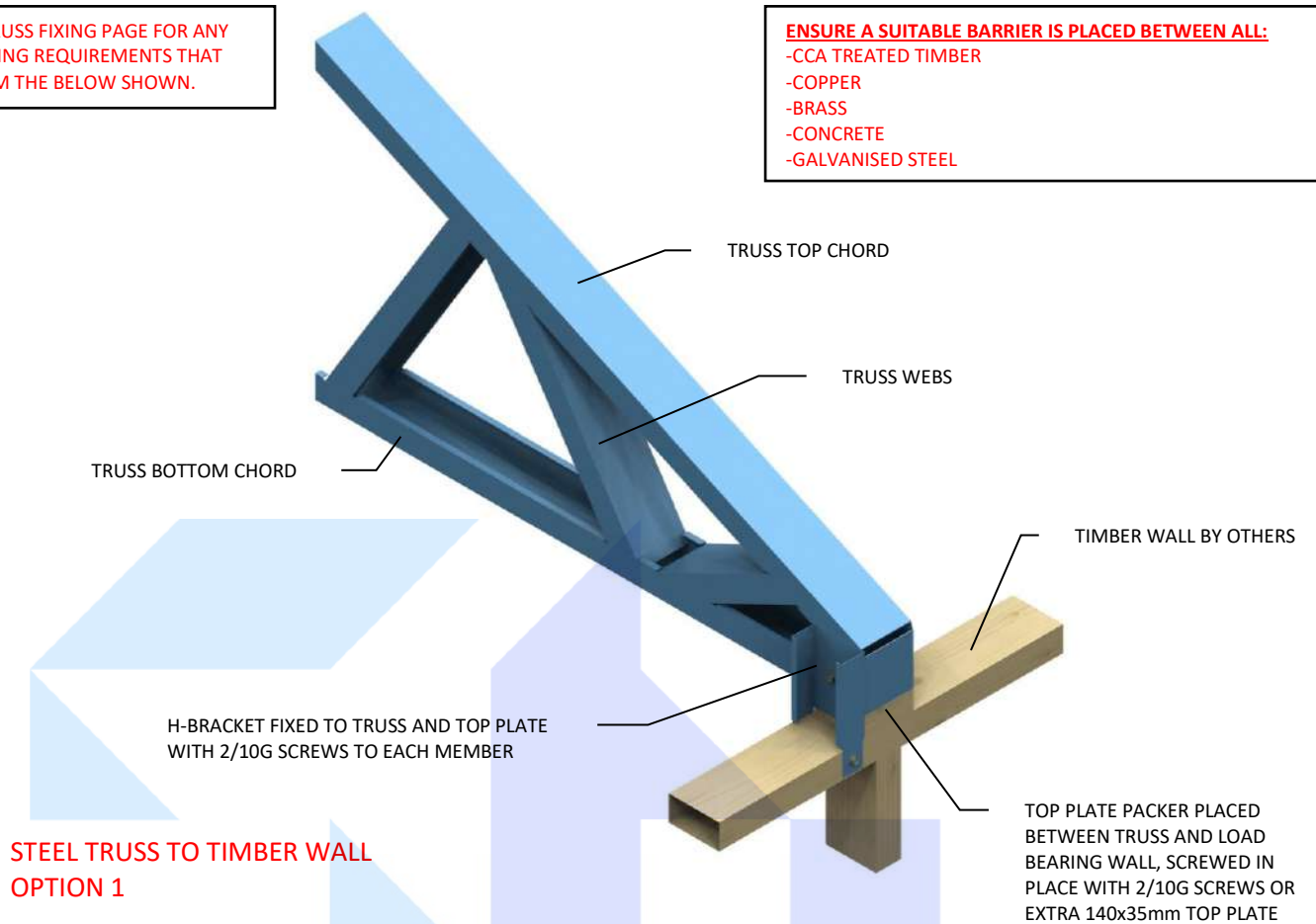
Suitable for elevations < 200 metres (All snow regions), otherwise refer to structural engineer.



REFER TO TRUSS FIXING PAGE FOR ANY SPECIFIC FIXING REQUIREMENTS THAT DIFFER FROM THE BELOW SHOWN.

**ENSURE A SUITABLE BARRIER IS PLACED BETWEEN ALL:**

- CCA TREATED TIMBER
- COPPER
- BRASS
- CONCRETE
- GALVANISED STEEL

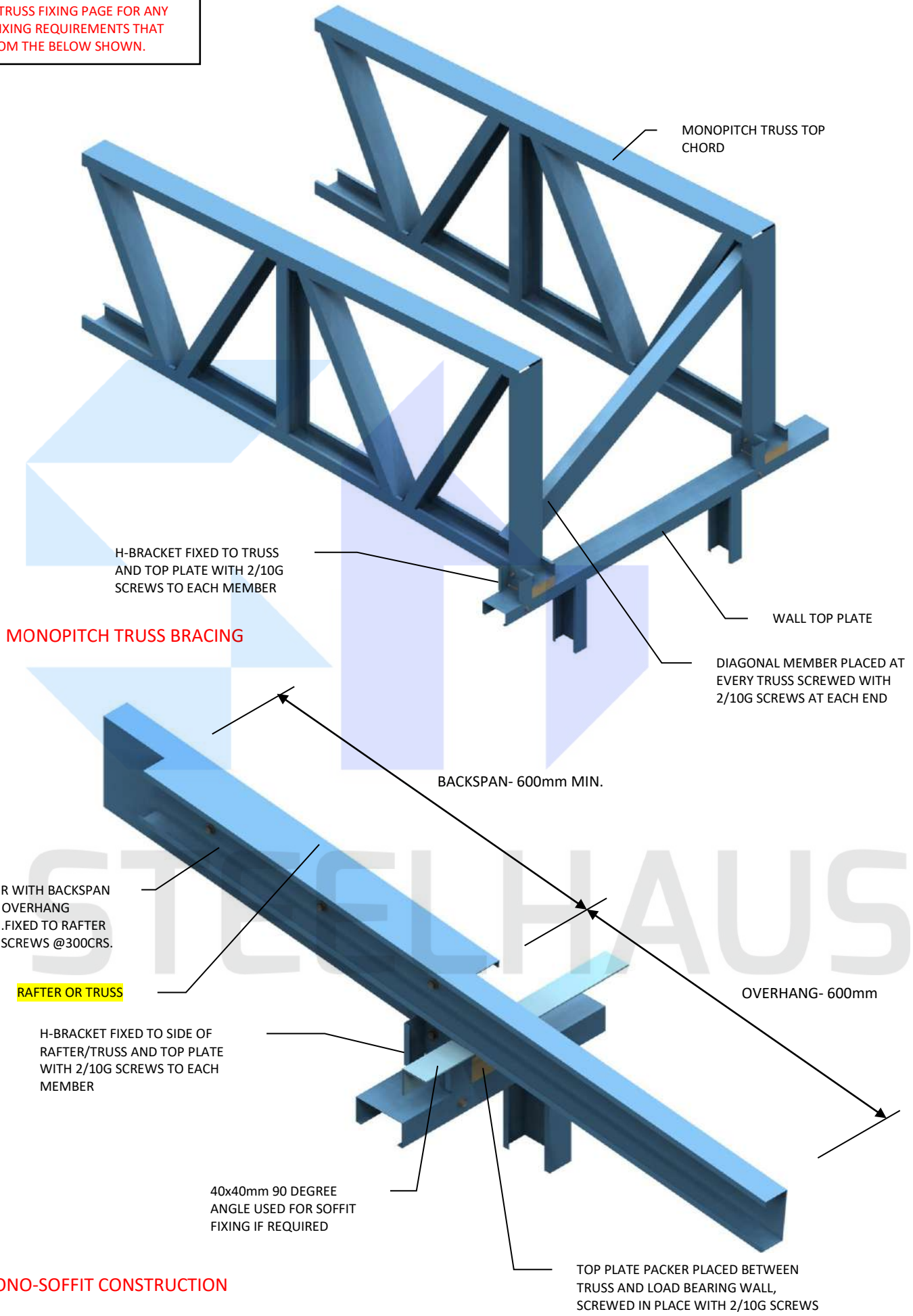


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**STEEL TRUSS TO TIMBER WALL CONNECTIONS**

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REFER TO TRUSS FIXING PAGE FOR ANY SPECIFIC FIXING REQUIREMENTS THAT DIFFER FROM THE BELOW SHOWN.



**MONOPITCH TRUSS BRACING**

**MONO-SOFFIT CONSTRUCTION**

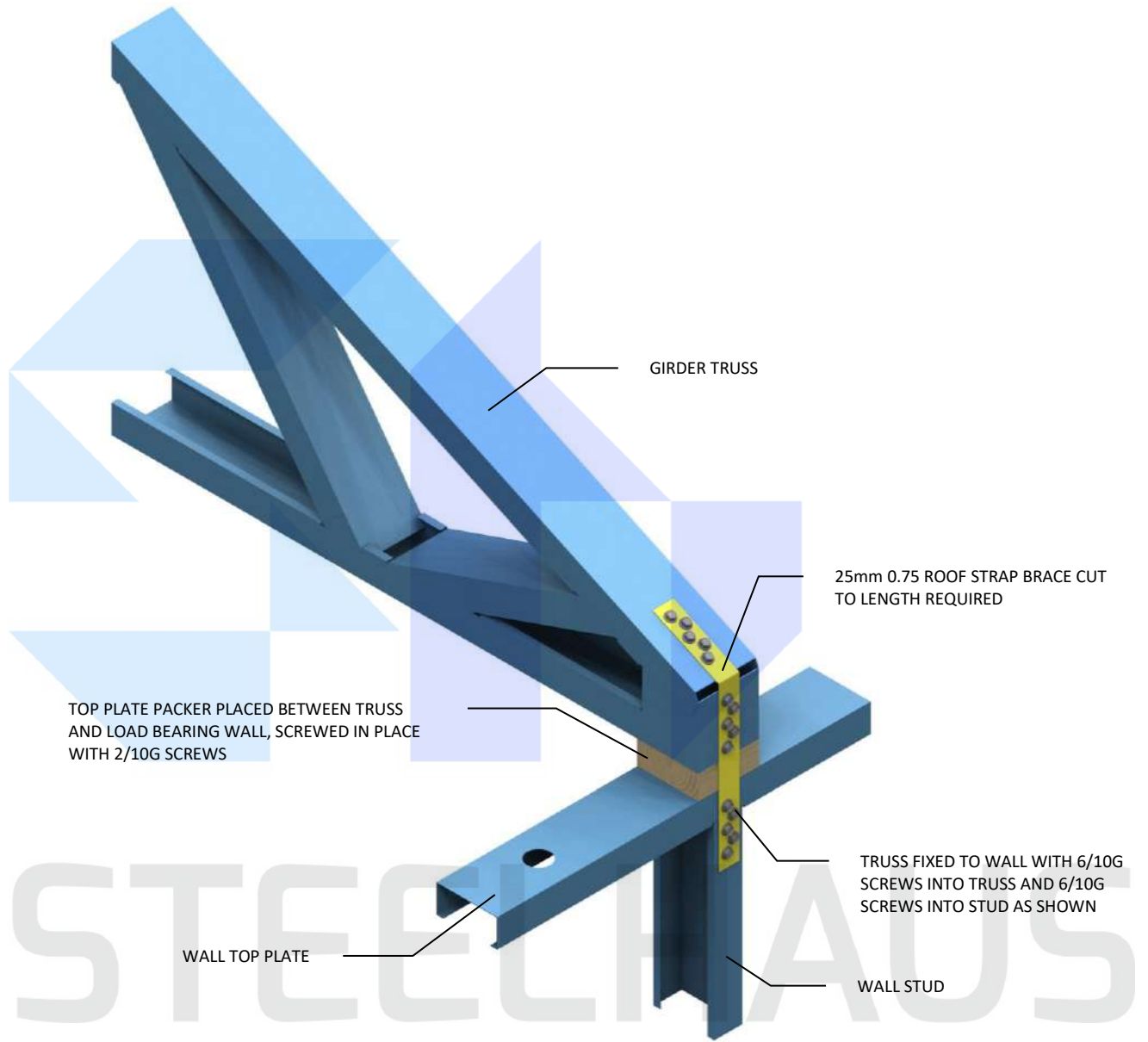


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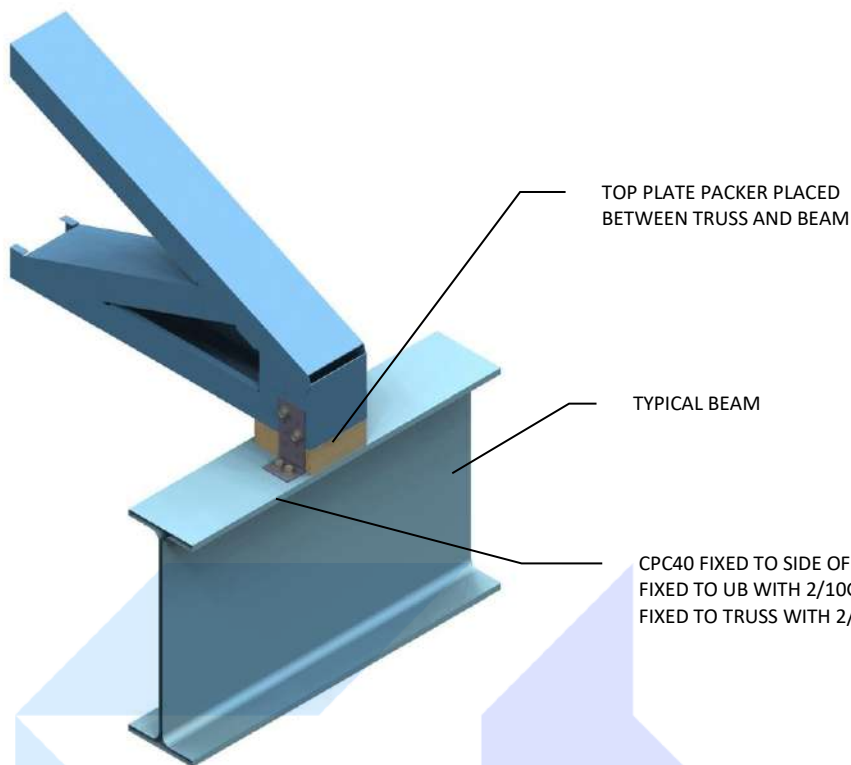
**MONOPITCH BRACING/  
 SOFFIT CONSTRUCTION**

DATE November 1, 2023  
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REFER TO TRUSS FIXING PAGE FOR ANY SPECIFIC FIXING REQUIREMENTS THAT DIFFER FROM THE BELOW SHOWN.



### ALTERNATIVE TRUSS TO WALL HOLD-DOWN

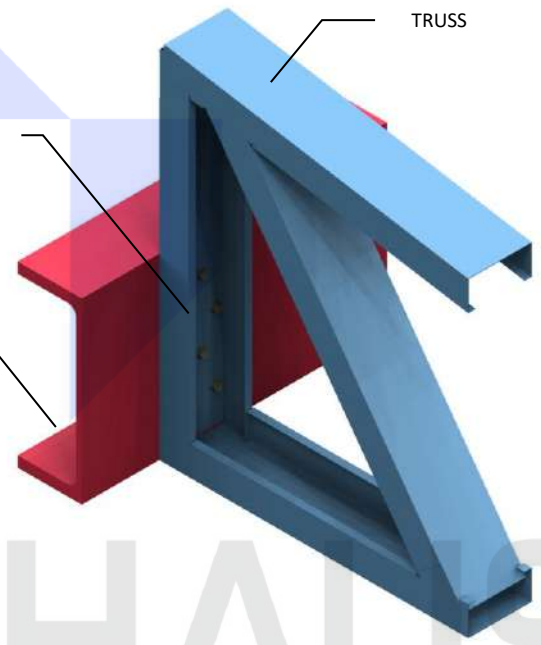


TOP PLATE PACKER PLACED BETWEEN TRUSS AND BEAM

TYPICAL BEAM

CPC40 FIXED TO SIDE OF TRUSS .  
FIXED TO UB WITH 2/10G SCREWS ,  
FIXED TO TRUSS WITH 2/10G SCREWS

**TRUSS END FIXING OVER ROOF BEAM**

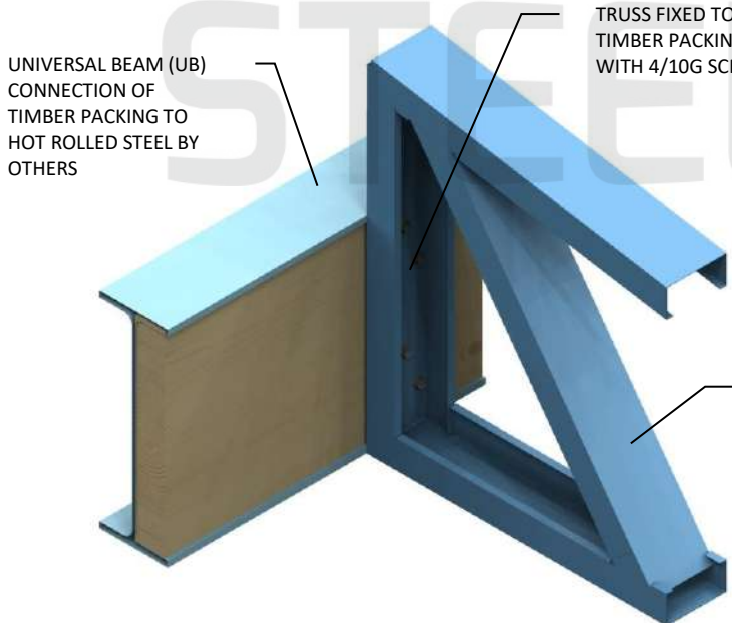


TRUSS

TRUSS DIRECT FIXED TO PFC WITH 4/10G SCREWS

PARALLEL FLANGE CHANNEL (PFC)

**TRUSS TO PFC CONNECTION**



UNIVERSAL BEAM (UB)  
CONNECTION OF  
TIMBER PACKING TO  
HOT ROLLED STEEL BY  
OTHERS

TRUSS FIXED TO  
TIMBER PACKING  
WITH 4/10G SCREWS

TRUSS

**TRUSS TO UB CONNECTION**



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**TRUSS TO STRUCTURAL STEEL CONNECTIONS**

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ANGLED MEMBERS TO BE BETWEEN 40 AND 60 DEGREES TO THE HORIZONTAL



FLAT WEBBED RAFTER

**NOTE:**

IN ACCORDANCE WITH NASH ENVELOPE SOLUTIONS 2019 FIGURE 127 – WEBBED RAFTERS WITH A DEPTH GREATER THAN 300mm MAY BE CLASSIFIED AS A TRUSS FOR THERMAL BREAK PROVISIONS



ANGLED WEBBED RAFTER  
CONSIDERED A TRUSS – S.E.D

ANGLED MEMBERS TO BE BETWEEN 40 AND 60 DEGREES TO THE HORIZONTAL

SPAN TABLES FOLLOWING ARE FOR C89,0.75 BMT PROFILE STEEL WITH VARYING SNOW LOADS.

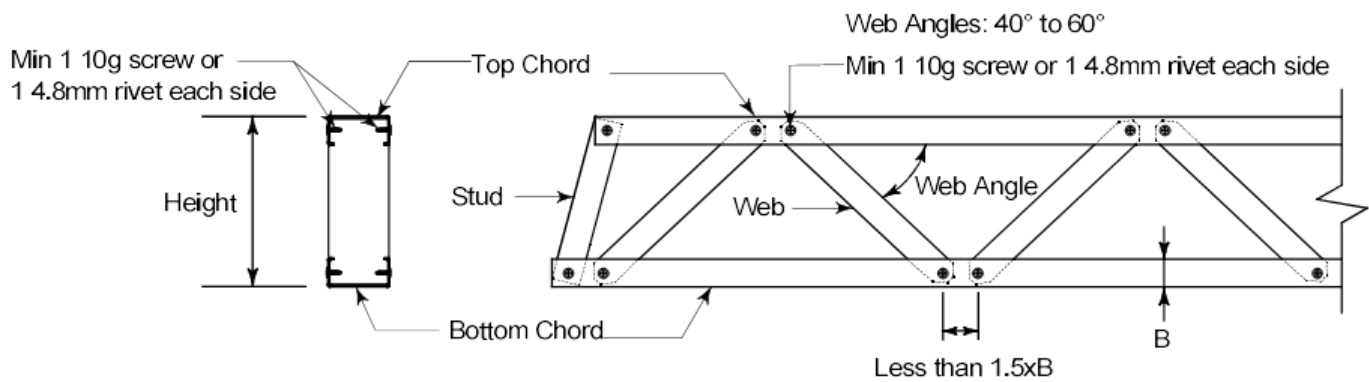


Figure 6.1. Web rafter assembly

Table 6.2. Support span Tables for 250 mm high web rafters

Chords PB or PC & stud and web SB or SC maximum spans in metres								
Wind zone	Light roof				Heavy roof			
	Rafter spacings (mm)							
	400	600	900	1200	400	600	900	1200
L	8.50	8.50	7.29	6.32	7.73	6.69	5.47	4.73
M	8.50	7.77	6.34	5.49	7.73	6.69	5.47	4.73
H	7.42	6.43	5.25	4.54	7.73	6.69	5.47	4.73
VH	6.48	5.61	4.58	3.97	7.48	6.48	5.29	4.58
EH	5.86	5.07	4.14	3.59	6.70	5.80	4.74	4.10

Table 6.3. Support span Table for 300 mm high web rafters

Chords PB or PC & stud and web SB or SC maximum spans in metres								
Wind zone	Light roof				Heavy roof			
	Rafter spacings (mm)							
	400	600	900	1200	400	600	900	1200
L	8.50	8.50	8.05	6.97	8.50	7.39	6.03	5.22
M	8.50	8.50	7.00	6.06	8.50	7.39	6.03	5.22
H	8.19	7.09	5.79	5.01	8.50	7.39	6.03	5.22
VH	7.15	6.19	5.05	4.38	8.25	7.15	5.83	5.05
EH	6.46	5.60	4.57	3.63	7.39	6.40	5.23	4.52

Table 6.4. Support span Table for 350 mm high web rafters

Chords PC & stud and web SC maximum spans in metres								
Wind zone	Light roof				Heavy roof			
	Rafter spacings (mm)							
	400	600	900	1200	400	600	900	1200
L	8.50	8.50	8.50	7.57	8.50	8.02	6.55	5.67
M	8.50	8.50	7.60	6.58	8.50	8.02	6.55	5.67
H	8.50	7.70	6.29	5.44	8.50	8.02	6.55	5.67
VH	7.76	6.72	5.49	4.75	8.50	7.76	6.33	5.49
EH	7.02	6.08	4.96	4.30	8.03	6.95	5.68	4.91

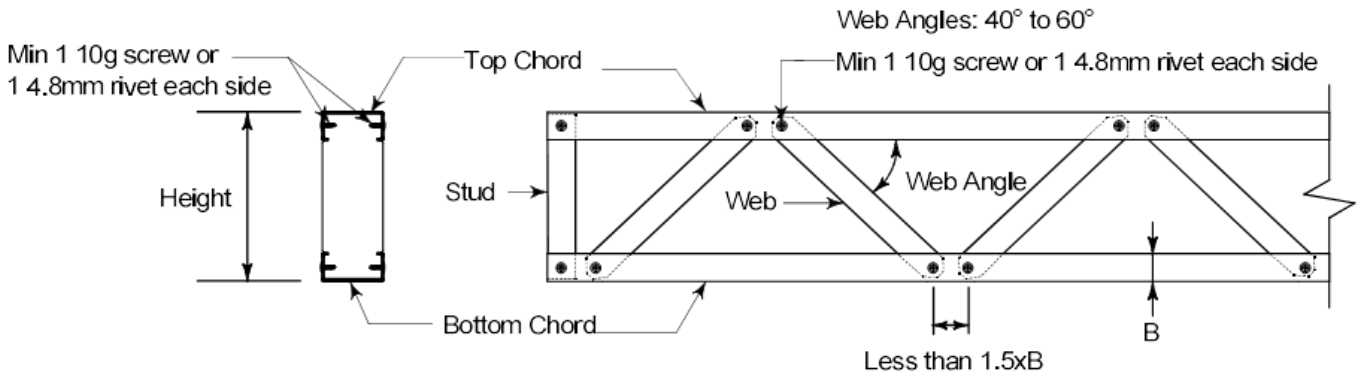


Figure 6.2. Web ridge and web intermediate beam assembly

Table 6.5. Support span Table for 250 mm high web ridge or web intermediate beams

Chords PB or PC & stud and web SB or SC maximum spans in metres								
Wind zone	Light roof				Heavy roof			
	Ridge or beam loaded dimension (m)							
	2.00	2.70	3.60	4.20	2.00	2.70	3.60	4.20
L	4.89	4.21	3.65	3.38	3.67	3.16	2.73	2.53
M	4.25	3.66	3.17	2.94	3.67	3.16	2.73	2.53
H	3.52	3.03	2.62	2.43	3.67	3.16	2.73	2.53
VH	3.07	2.64	2.29	2.12	3.55	3.05	2.64	2.45
EH	2.78	2.39	2.07	1.92	3.18	2.74	2.37	2.19

Table 6.6. Support span Table for 300mm high web ridge or web intermediate beams

Chords PB or PC & stud and web SB or SC maximum spans in metres								
Wind zone	Light roof				Heavy roof			
	Ridge or beam loaded dimension (m)							
	2.00	2.70	3.60	4.20	2.00	2.70	3.60	4.20
L	5.40	4.65	4.02	3.72	4.05	3.48	3.02	2.79
M	4.69	4.04	3.50	3.24	4.05	3.48	3.02	2.79
H	3.88	3.34	2.90	2.68	4.05	3.48	3.02	2.79
VH	3.39	2.92	2.53	2.34	3.91	3.37	2.92	2.70
EH	3.07	2.64	2.29	2.08	3.51	3.02	2.61	2.42

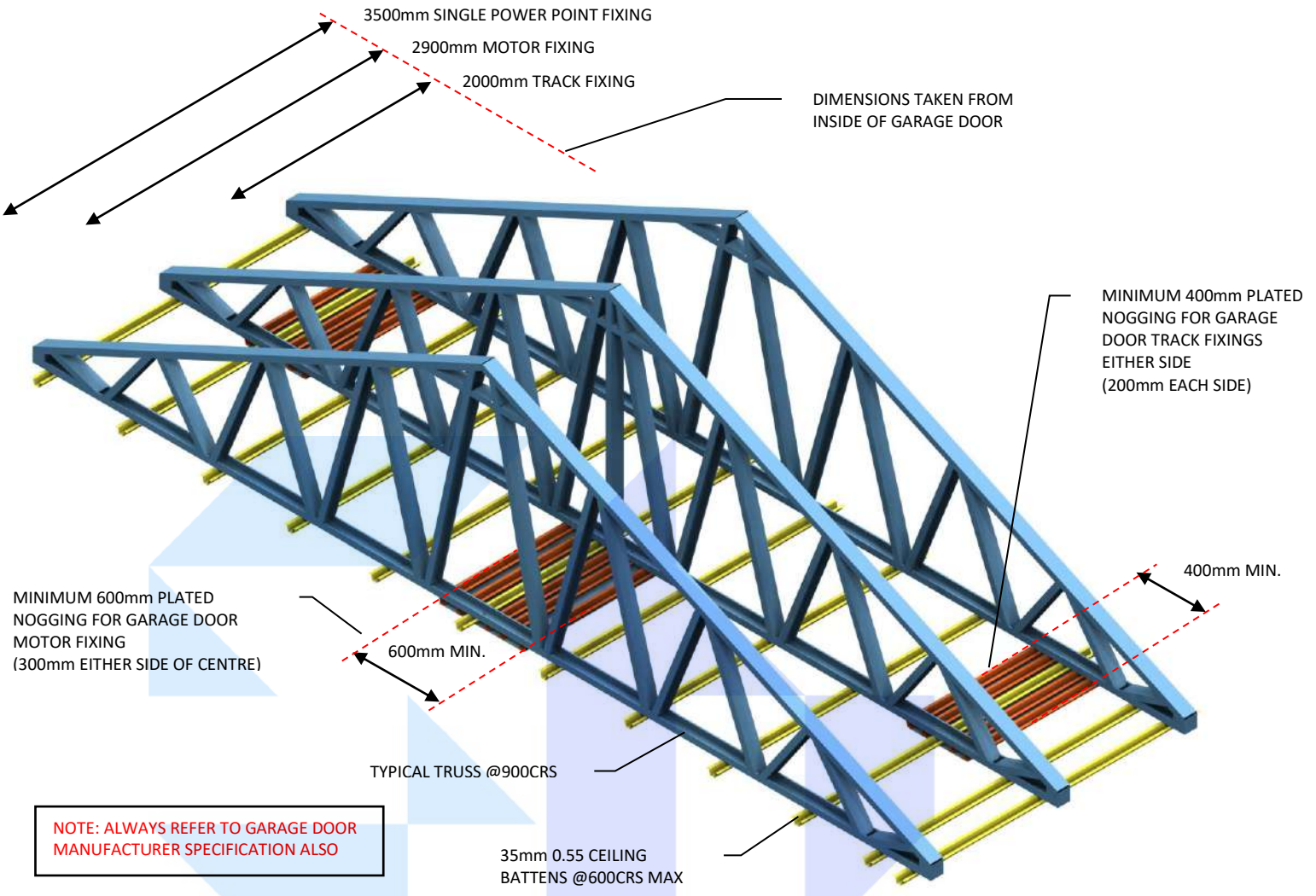
Table 6.7. Support span Table for 350mm high web ridge or web intermediate beams

Chords PB or PC & stud and web SB or SC maximum spans in metres								
Wind zone	Light roof				Heavy roof			
	Ridge or beam loaded dimension (m)							
	2.00	2.70	3.60	4.20	2.00	2.70	3.60	4.20
L	5.86	5.04	4.37	4.04	4.39	3.78	3.27	3.03
M	5.10	4.39	3.80	3.52	4.39	3.78	3.27	3.03
H	4.22	3.63	3.14	2.91	4.39	3.78	3.27	3.03
VH	3.68	3.17	2.74	2.54	4.25	3.66	3.17	2.93
EH	3.33	2.86	2.42	2.08	3.81	3.28	2.84	2.62

# SECTION 4: ON-SITE FIXINGS

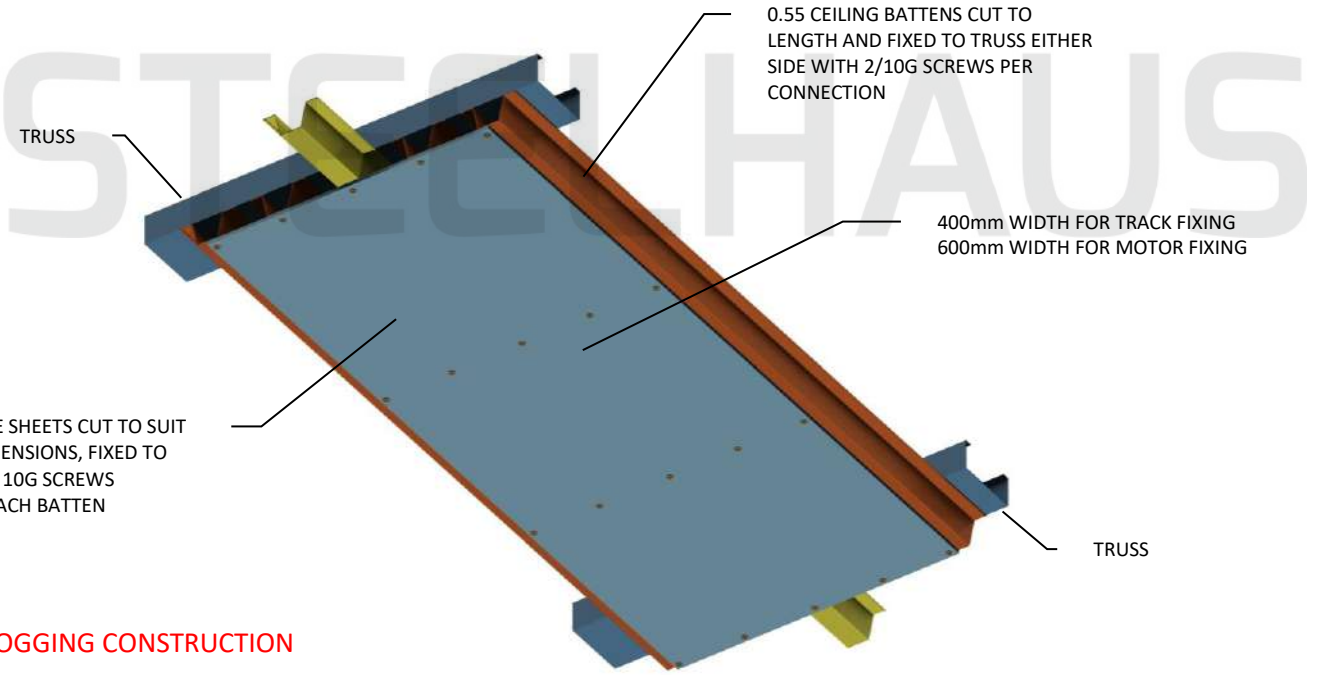
# STEELHAUS





**NOTE: ALWAYS REFER TO GARAGE DOOR MANUFACTURER SPECIFICATION ALSO**

**STEEL BATTEN NOGGING FOR GARAGE DOOR FIXING**



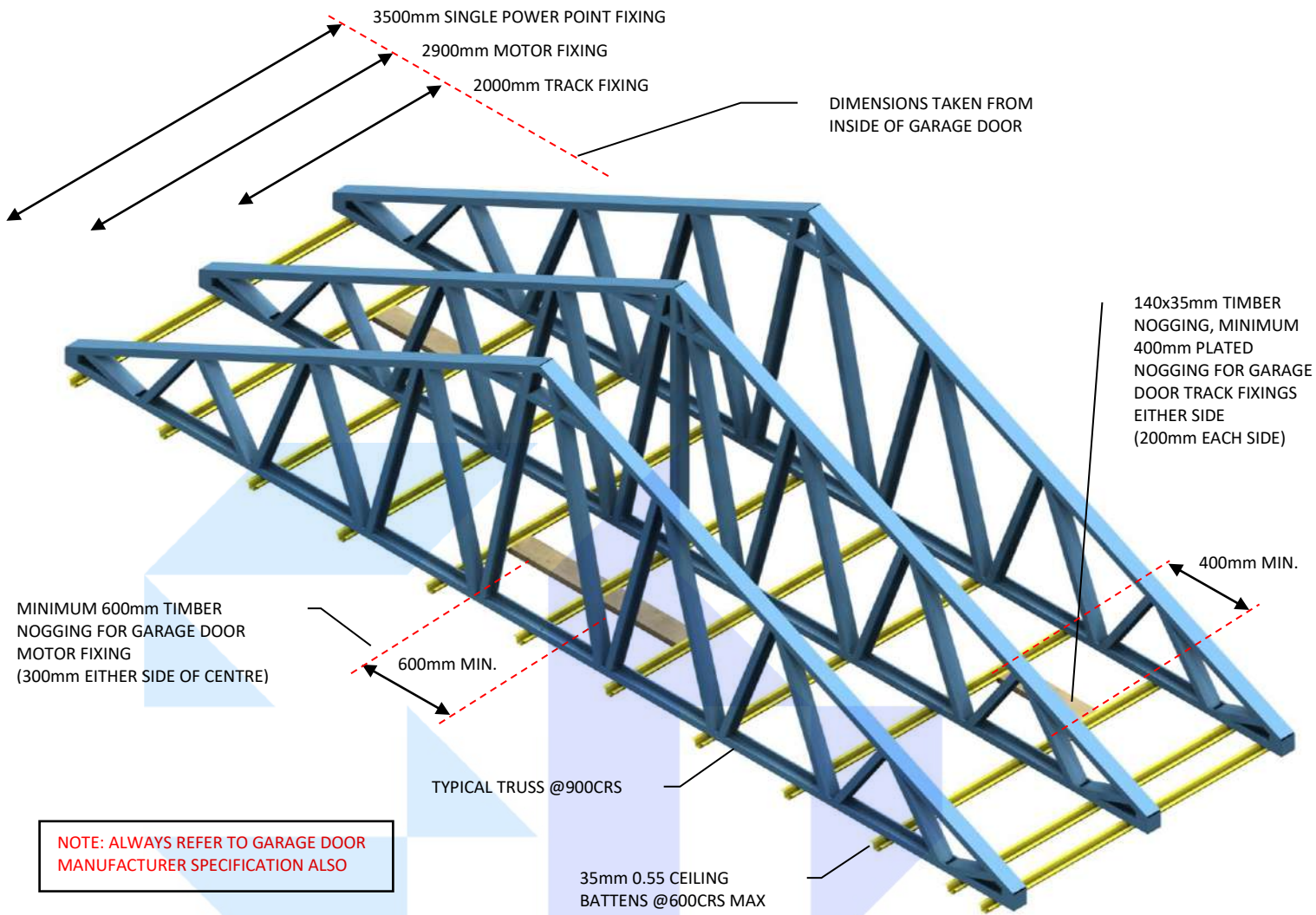
**STEEL NOGGING CONSTRUCTION**



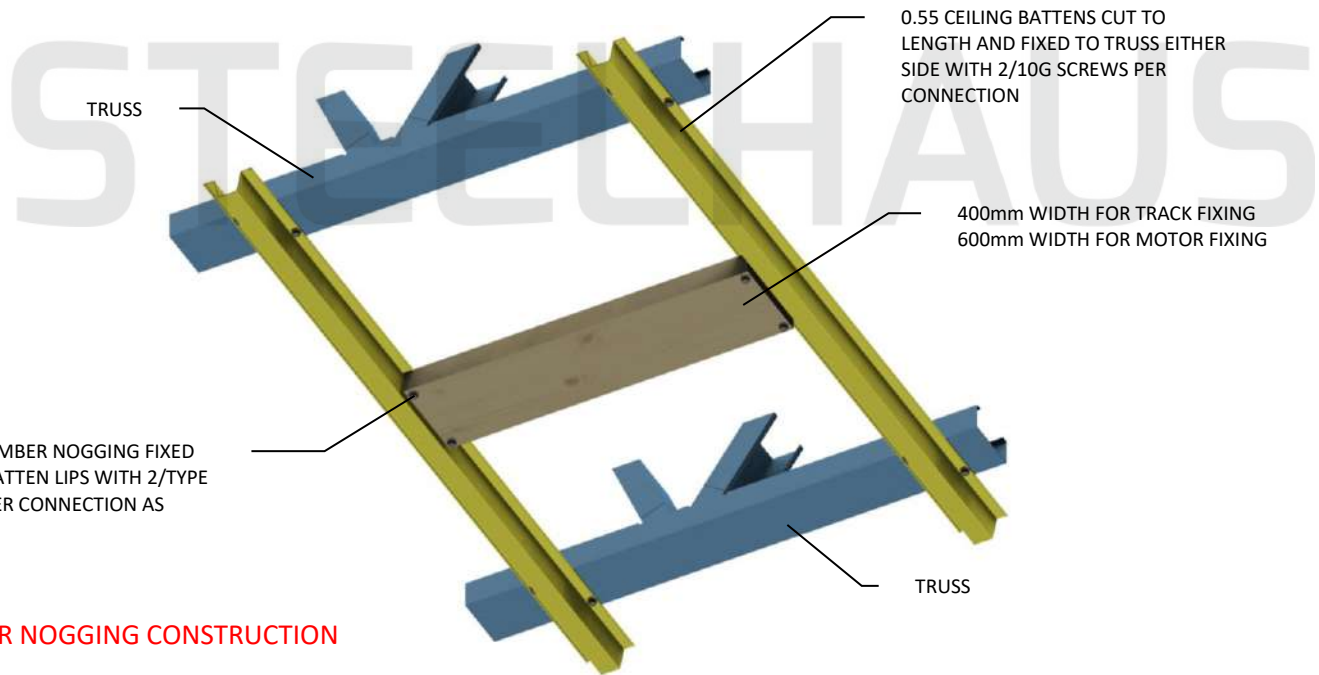
**SteelHaus (2014) Ltd**  
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 0508 826 766  
[www.steelhaus.co.nz](http://www.steelhaus.co.nz)

**BATTEN NOGGING FOR GARAGE DOOR FIXING**

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**TIMBER NOGGING FOR GARAGE DOOR FIXING**



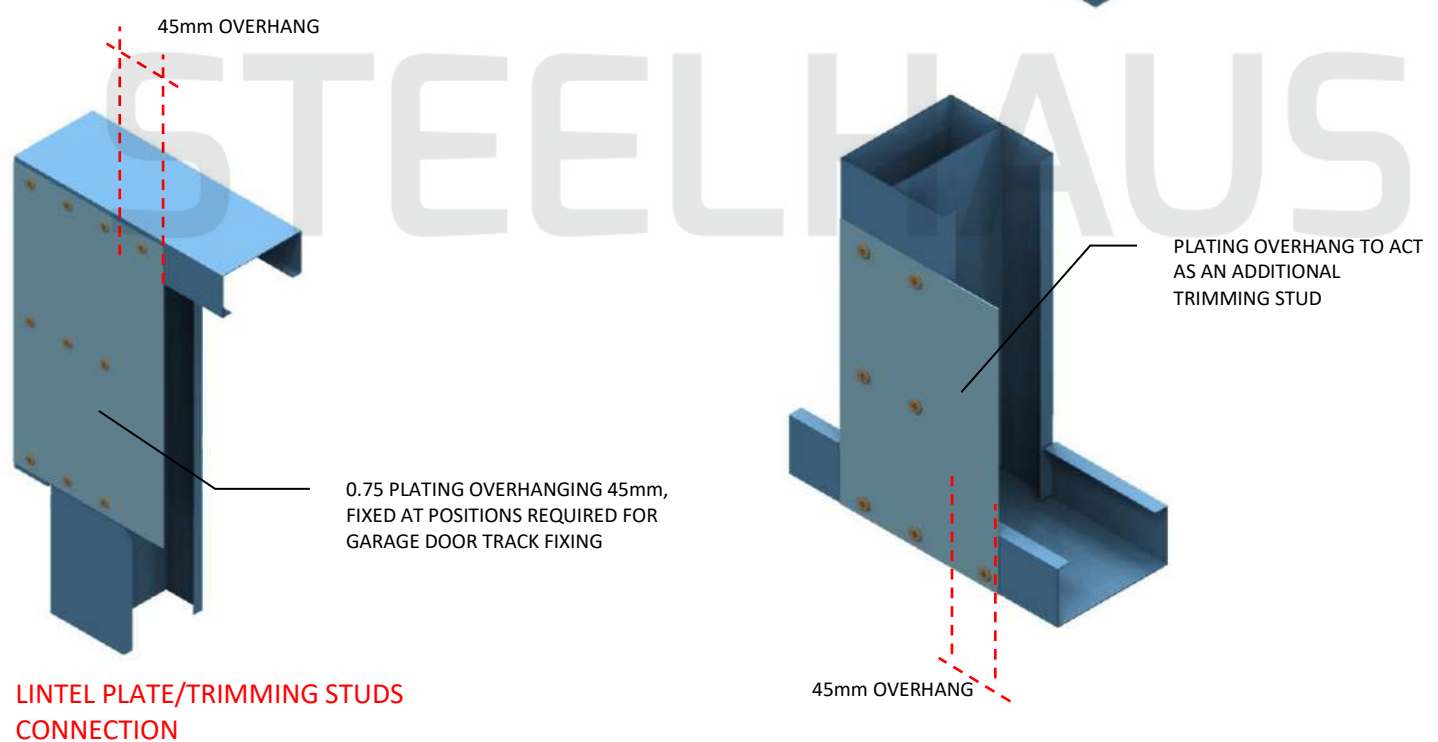
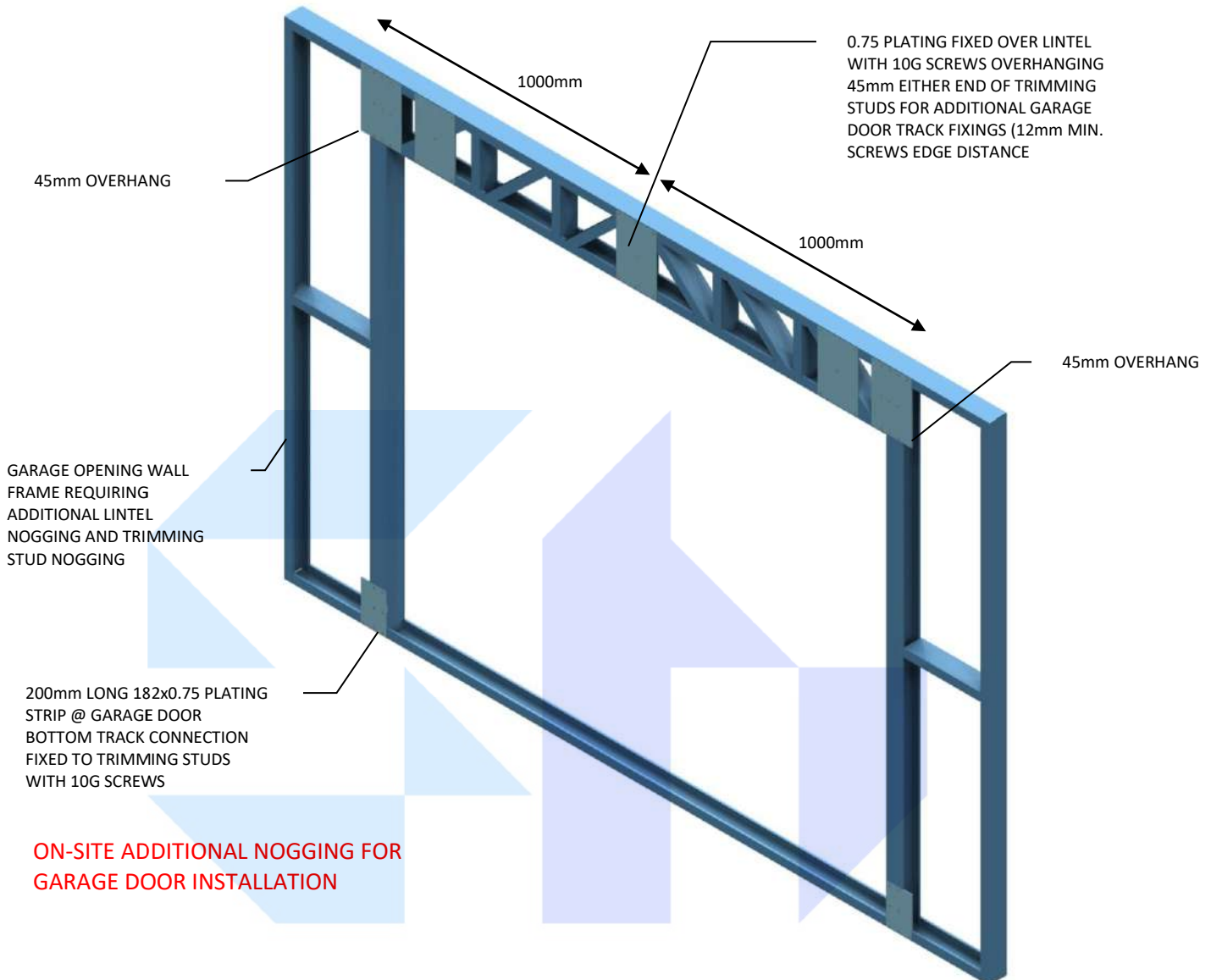
**TIMBER NOGGING CONSTRUCTION**



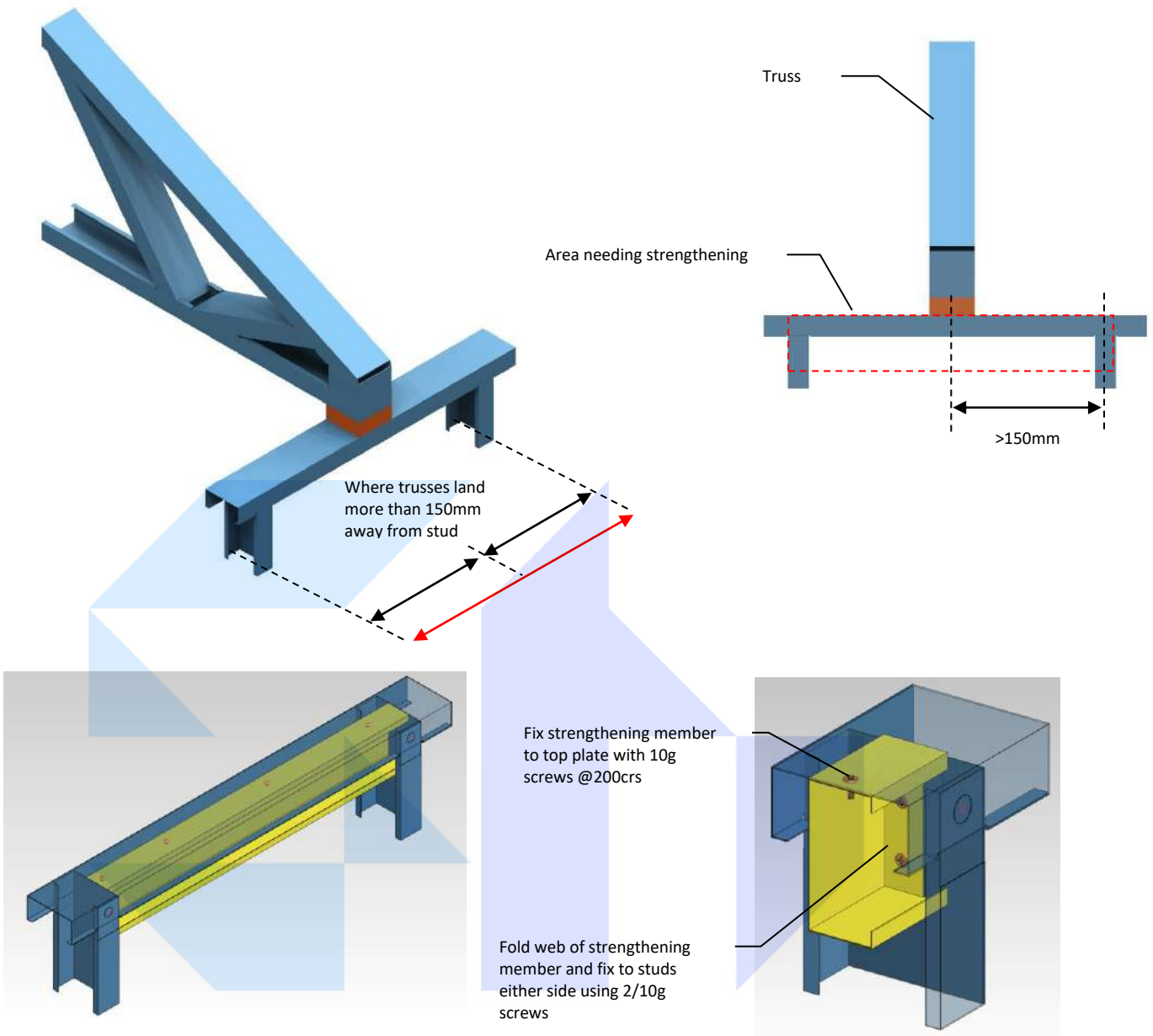
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**TIMBER NOGGING FOR GARAGE DOOR FIXING**

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C89 0.75 MEMBER SLOTTED BETWEEN STUDS WHERE TOP CHORD REQUIRES STRENGTHENING.  
 -10g SCREWS @200mm CRS ALONG TOP CHORD AS SHOWN ABOVE  
 -2/10g SCREWS INTO STUDS EACH SIDE

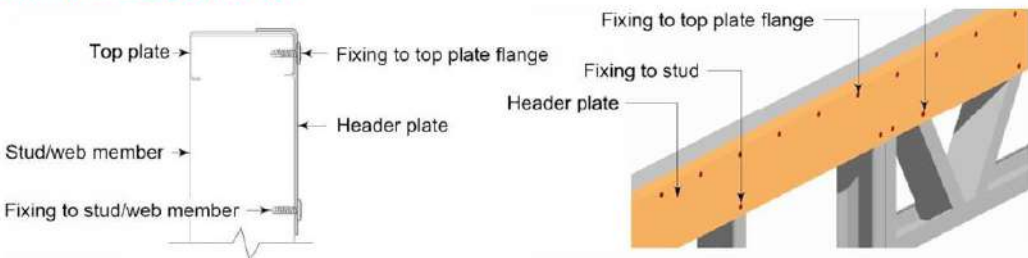
**OPTION A**

HEADER PLATES/ TOP PLATE STIFFENING WHERE SPECIFIED SHALL BE FIXED AS PER BELOW;

- 1/10G FLAT HEAD SCREW TO TOP PLATE FLANGE @150CRS AND AT EACH END.
- 1/10G FLAT HEAD SCREW INTO EACH INTERSECTING VERTICAL/WEB MEMBER AND AT EACH END.

NO HOLES ALLOWED IN L-ANGLEW APART FROM FIXINGS  
 JOINS OF L-ANGLE TO BE DIRECTLY ON VERTICAL MEMBER

HEADER PLATE = 150x30 0.95 G550



HEADER PLATE/ TOP PLATE STIFFENER

**OPTION B**



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**TOP PLATE STIFFENING**

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# RECOMMENDED FIXINGS FOR STEELHAUS FRAME

## **FRAME TO FRAME FIXING**

- USE 16x16 10G HEX HEAD SCREWS

## **PLATING/STRAP OR FLASHING TO FRAME**

- USE 16x16 10G FLAT HEAD SCREWS

## **PURLINS OR CEILING BATTENS TO FRAME**

- USE 16x16 10G SCREWS (2 SCREWS PER CONNECTION)

## **FRAMES TO STRUCTURAL STEEL (UP TO 20mm THICK)**

- USE 500 SERIES DEEP DRILLER SCREWS

## **FRAME TO TIMBER FRAME**

- USE 10G SELF DRILLING OR TYPE 17 SCREWS (LENGTH TO SUIT)

## **THERMAL BREAK /BUILDING WRAP TO FRAME**

- USE 8G SELF DRILLING PLASTERBOARD SCREWS (OR SIMILAR)

## **TIMBER WINDOW TRIM TO FRAME**

- USE 10G 24TPI FLAT HEAD SCREWS @450 CRS (LENGTH TO SUIT)

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### **FIXING TYPE/USE**

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