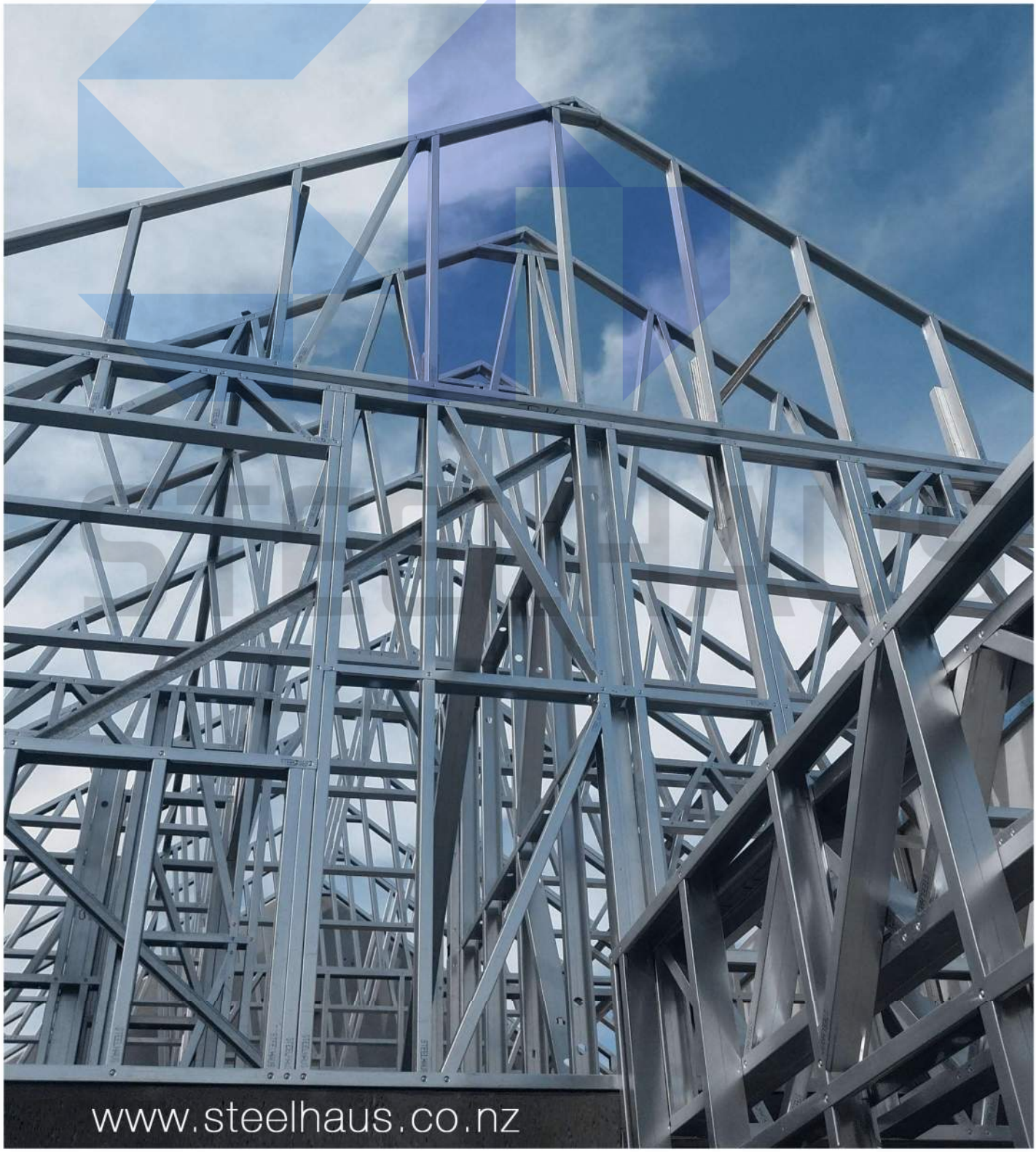
STEELHAUS

STEEL FRAMING CONSTRUCTION MANUAL



www.steelhaus.co.nz

DISCLAIMER

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

-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

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.

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

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/m2 (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.

 June 2016

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Auckland, New Zealand
Phone 09 277 2700
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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.

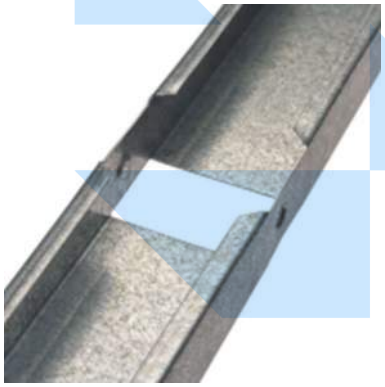
 June 2016

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.

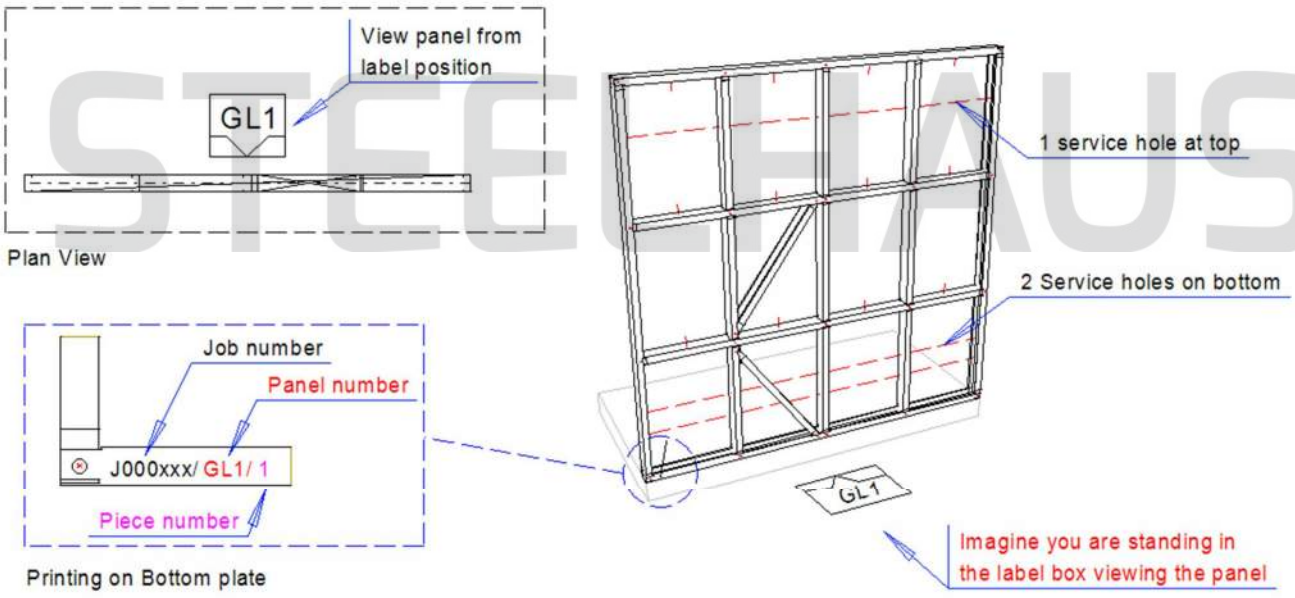
Inkjet Printer

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

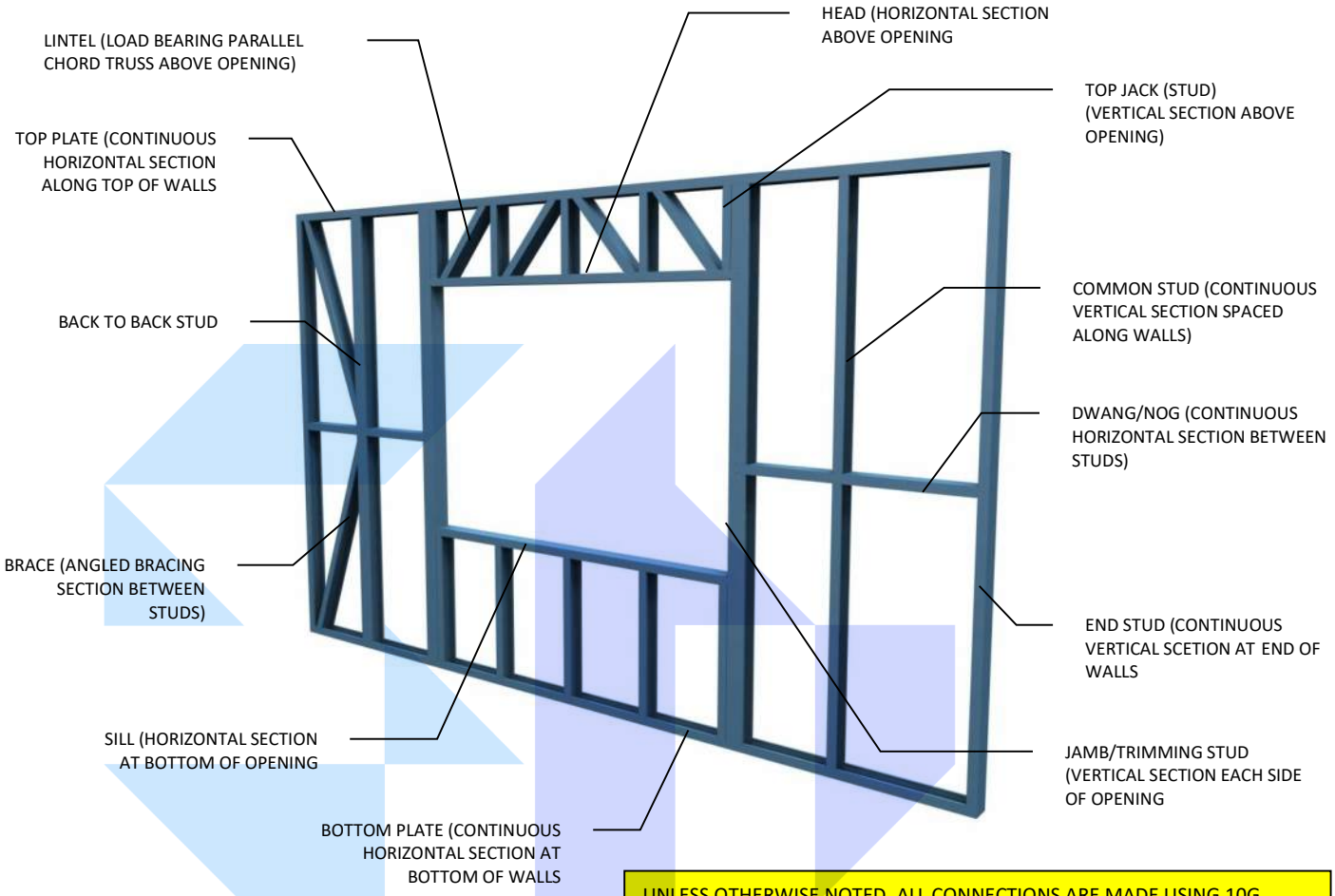
UPDATES FROM PREVIOUS VERION(S)

Update	Date	Location
• Angled Frame Connection	28/06/16	page 13
• FJ 240 x 1.2 Span Table added	28/06/16	page 39
• PLY bracing spec added	28/06/16	page 28
• Valley Connection detail	29/06/16	page 58
• Service Hole Spacings (note)	01/08/16	page 25
• 3d added plus DPC note	01/08/16	pages 19,40,41
• DPC note	01/08/16	pages 42,43,44
• Top plate packer photo added	08/08/16	page 52
• Joist bracing (alt. option)	08/08/16	page 50
• Thermal break spec	08/08/16	page 34
• Joist Penetration spec	06/09/16	page 47,48
• Type 3 lintel	27/10/16	page 17
• On-site fixing section	27/10/16	pages 75,76,77
• Floor joist over LB wall detail note expanded	27/10/16	page 42
• 2016 GIB Steel bracing specs added	21/02/18	pages 29-33
• DriStud building wrap spec	21/02/18	page 35
• Top plate stiffener/header plate	21/02/18	page 13
• Lintel types and span tables	21/02/18	page 16,17,18,19
• Stud span tables	21/02/18	page 22,23
• Webbed rafter span tables	21/02/18	page 72
• Webbed Ridge beam	21/02/18	page 73
• EPS install tips	31/01/20	page 34
• Screw shear capacities added	31/01/20	page 12
• EzyJoist span tables added	31/01/20	pages38-41
• Frame and Truss orientation	31/01/20	pages 9,53
• Packer installation/bolted midfloor option	31/01/20	page 44

SECTION 1
WALL FRAMING



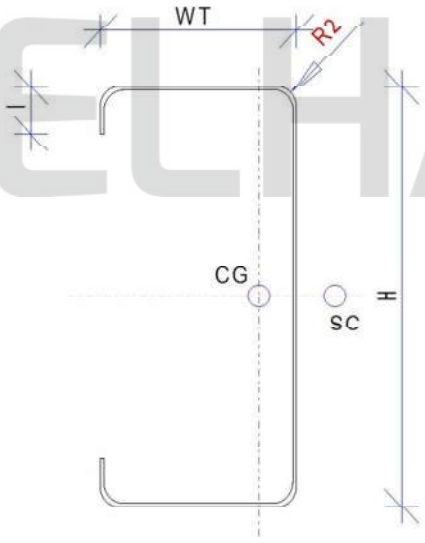
Frame Orientation



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

WALL FRAME TERMINOLOGY

LIPPED C SECTION PROPERTIES			
NAME S0975			
GRADE		G	550
COATING		Z	275
YIELD STRESS	fy	Mpa	550
TENSILE STRENGTH	fu	Mpa	550
HEIGHT	h	mm	89
WIDTH TOP	wt	mm	41
WIDTH BOTTOM	wb	mm	39
THICKNESS	t	mm	0.75
LIP TOP	l	mm	10.1
FEED		mm	182
AREA		mm2	136.5
MASS		kg	1.072
2ND MOMENT OF AREA	Ix	mm4	174103
2ND MOMENT OF AREA	Iy	mm	29996
RADIUS OF GYRATION	rx	mm	35.7
RADIUS OF GYRATION	ry	mm	14.8
CENTROID POSITION	x	mm	12.6
CENTROID POSITION	y	Cmm	44
SHEAR CENTRE	xo	mm	33.2
SHEAR CENTRE	yo	mm	0
POLAR RADIUS OF GYRATION	ro1	mm	43.6
TORTION CONSTANT	J	mm4	25.6
WARPING CONSTANT	Iw	mm6	48912422
SECTIONAL MODULUS	Zxt	mm3	3957
SECTIONAL MODULUS	Zxb	mm3	3869
SECTIONAL MODULUS	Zyt	mm3	2301
SECTIONAL MODULUS	Zyb	mm3	1056

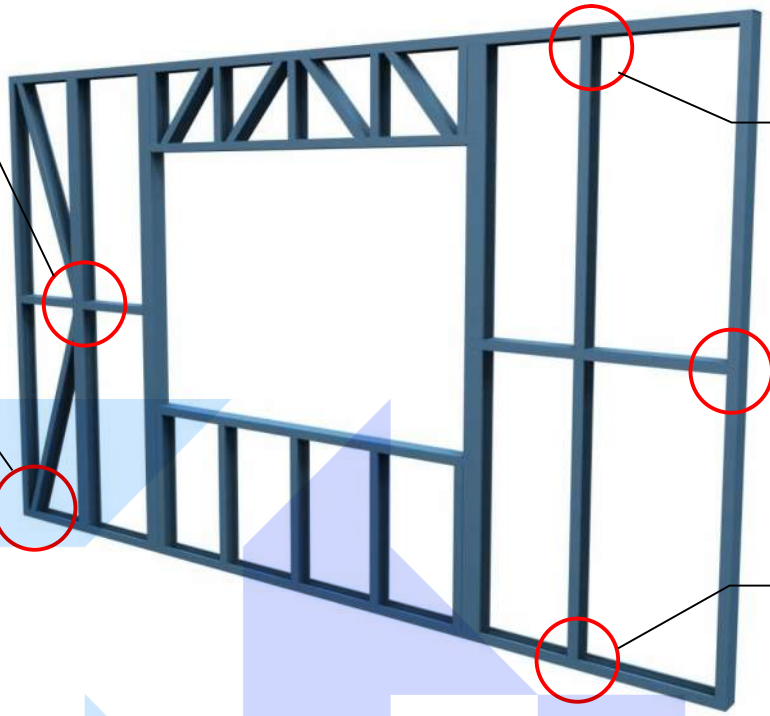


TYPICAL C SECTION

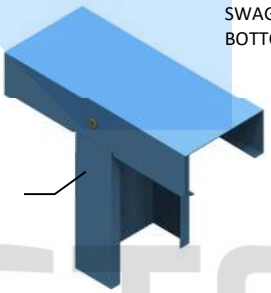
10g 16x16mm
TYPICAL FRAME ASSEMBLY SCREW

10g 16x16mm
TYPICAL HEX HEAD SCREW

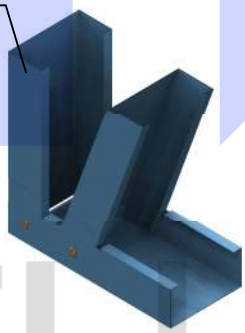
10g 16x16mm
TYPICAL FLAT HEAD SCREW



WALL FRAMING CONNECTIONS

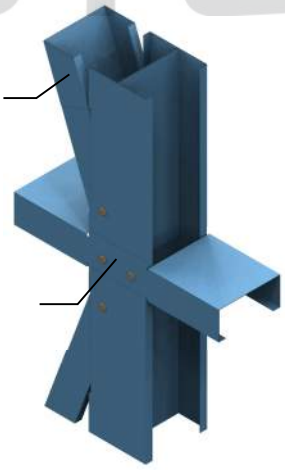


STUD TO TOP PLATE DETAIL

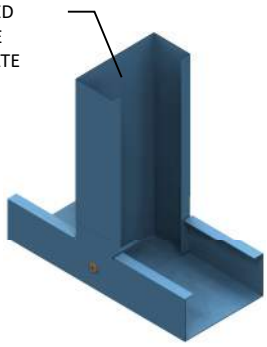


STUD TO BOTTOM PLATE/BRACE DETAIL

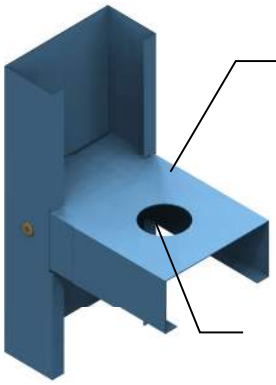
PLASTIC GROMMETS



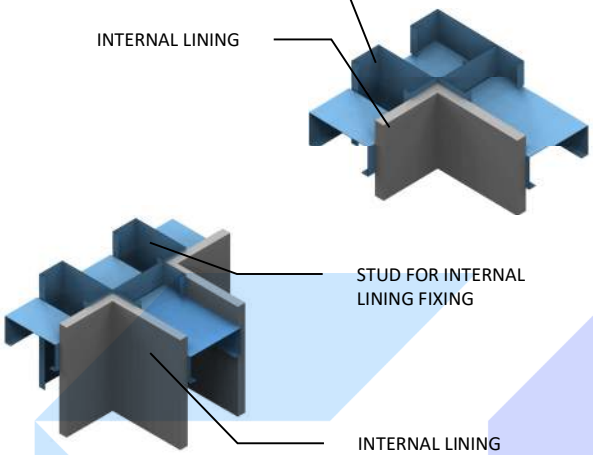
STUD /NOG/BRACE JUNCTION DETAIL

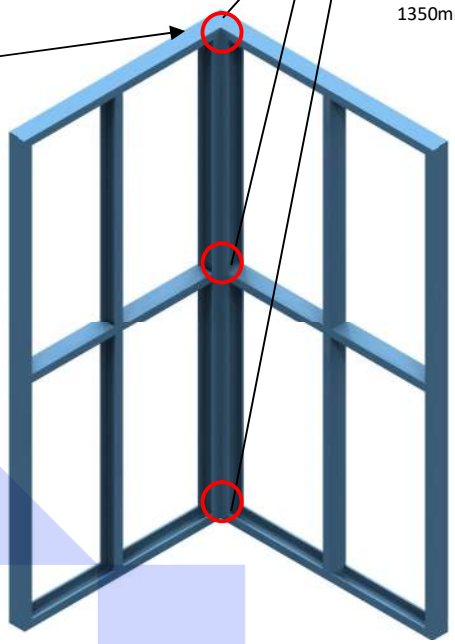


STUD TO BOTTOM PLATE DETAIL



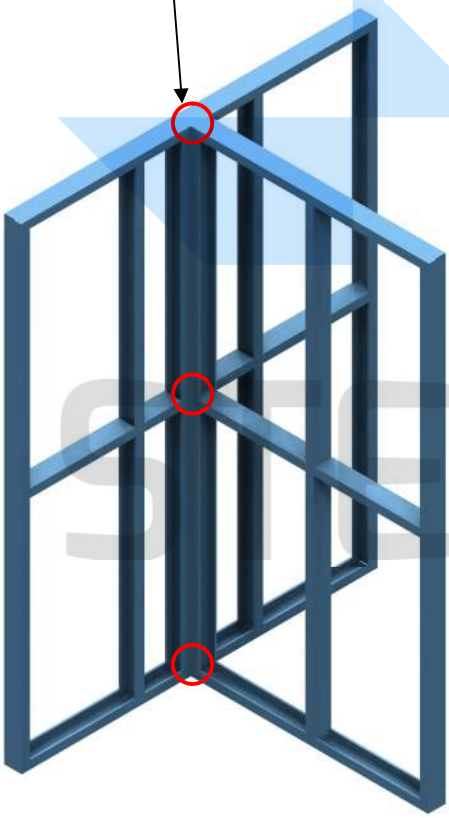
STUD TO NOG DETAIL





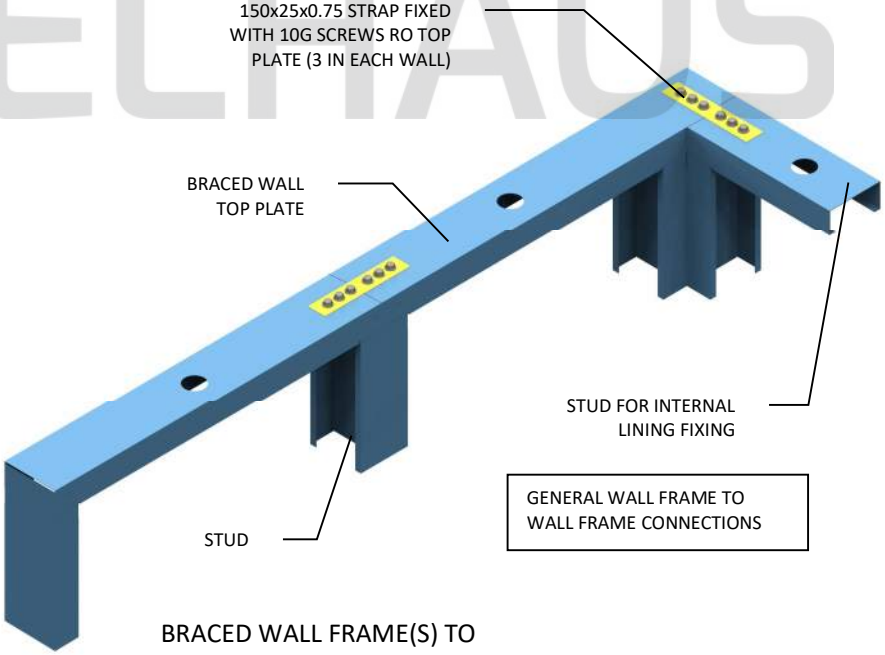
CORNER WALL FRAME CONNECTION

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



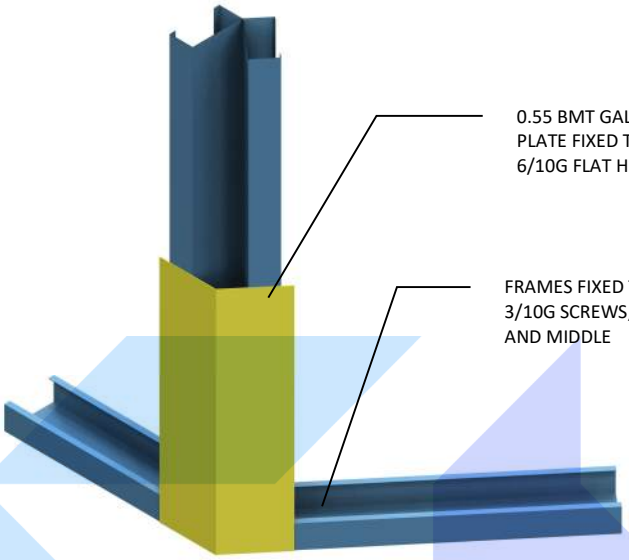
PERPENDICULAR WALL T-CONNECTION

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

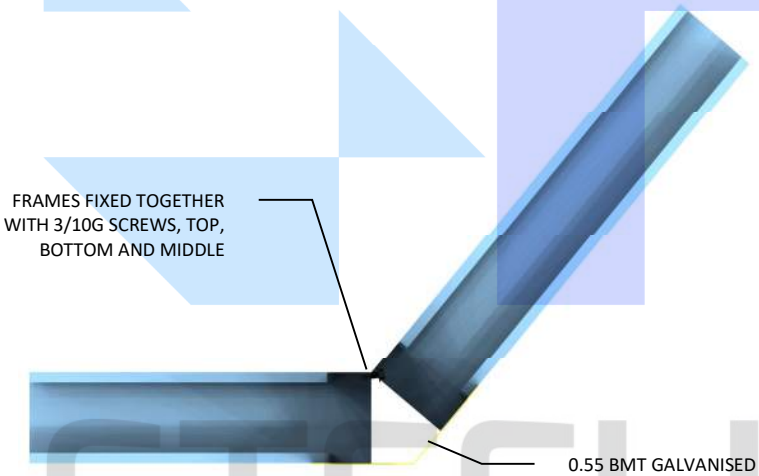


GENERAL WALL FRAME TO WALL FRAME CONNECTIONS

BRACED WALL FRAME(S) TO WALL FRAME CONNECTION

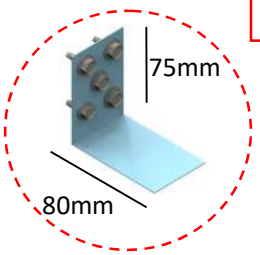


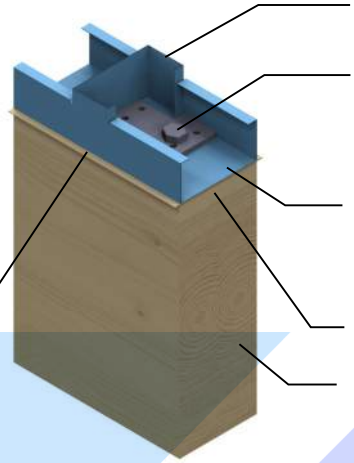
45 DEGREE ANGLE JUNCTION



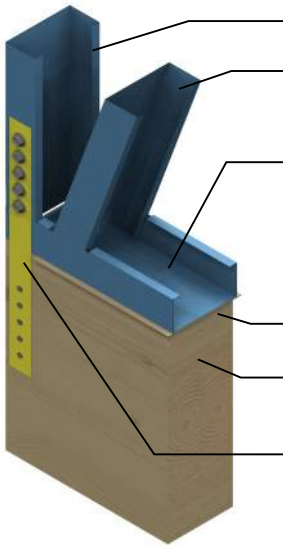
45 DEGREE ANGLE CONNECTION

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

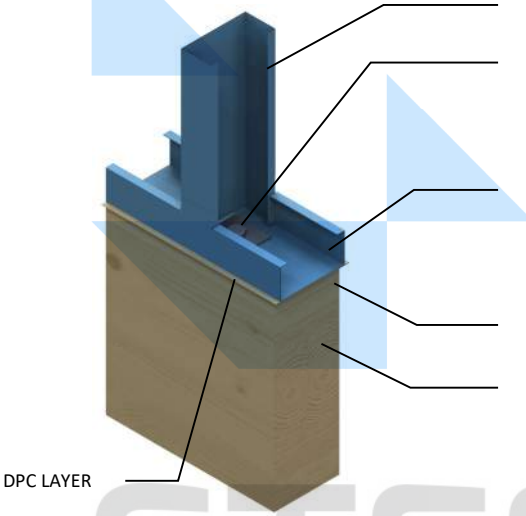




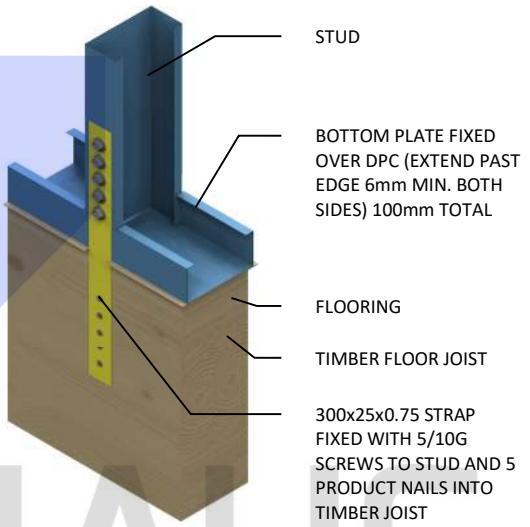
BRACED WALL HOLD DOWN (OPTION 1)



BRACED WALL HOLD DOWN (OPTION 2)



LOAD BEARING WALL HOLD DOWN (OPTION 1)



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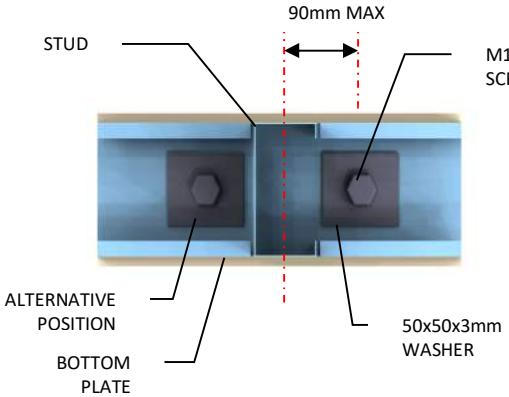
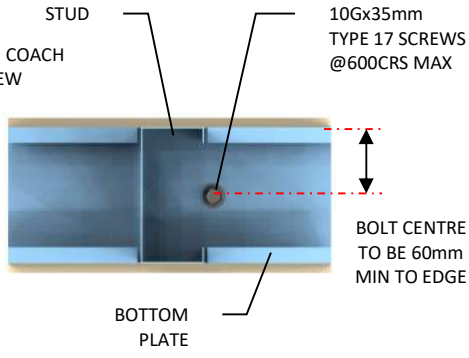
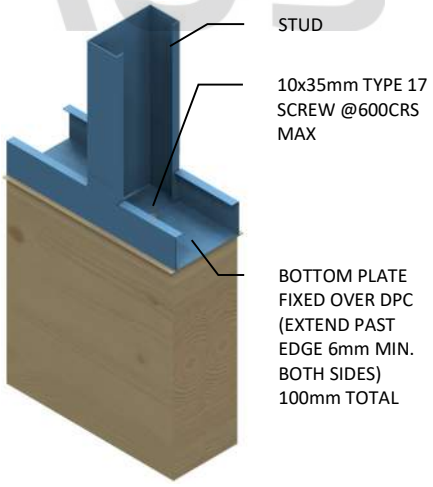


LOAD BEARING WALL HOLD DOWN (OPTION 1) PLAN VIEW

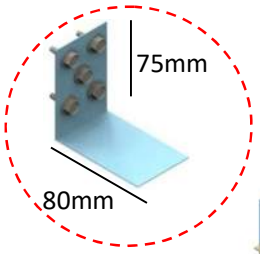


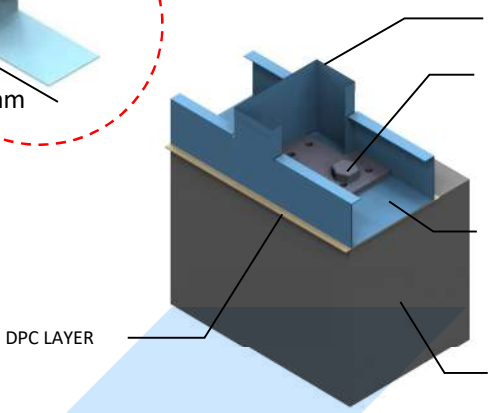
NON LOAD BEARING WALL HOLD DOWN PLAN VIEW

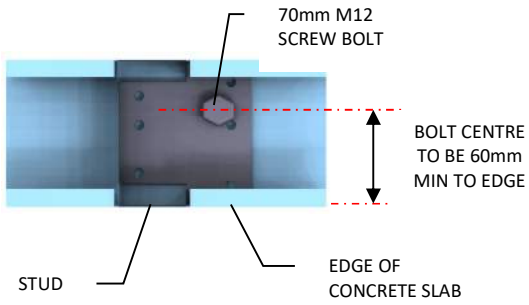


NON LOAD BEARING WALL HOLD DOWN

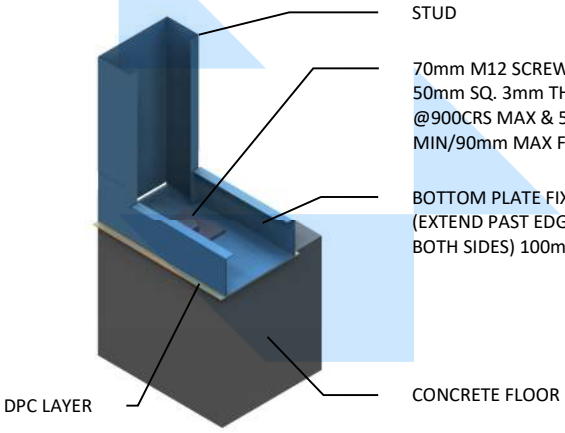
FOR THE USE OF GBPs BRACELINE AND PLY – ADDITIONAL 0.95BMT BRACKET IS REQUIRED AS PER GIB MANUAL



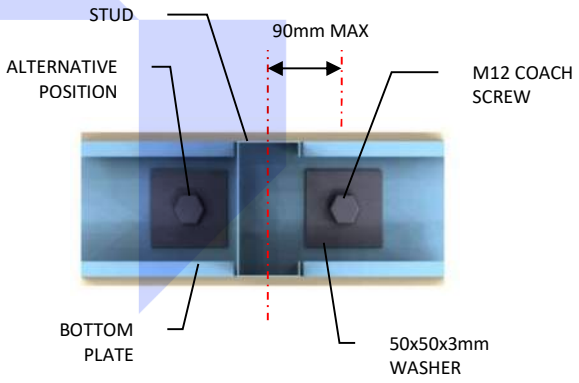




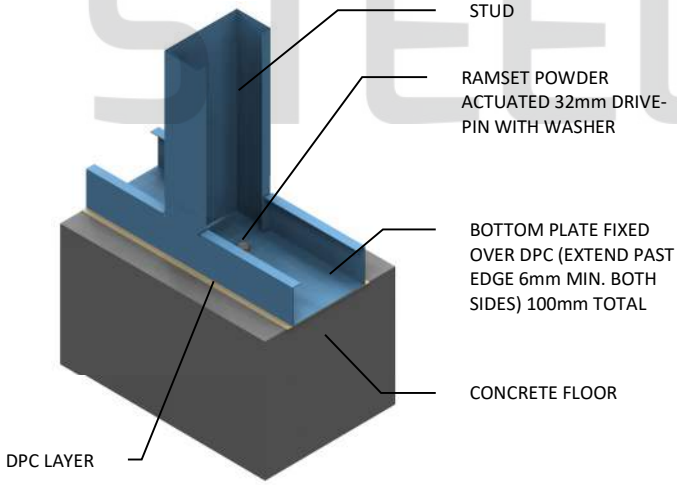
BRACED WALL HOLD DOWN (OPTION 1)



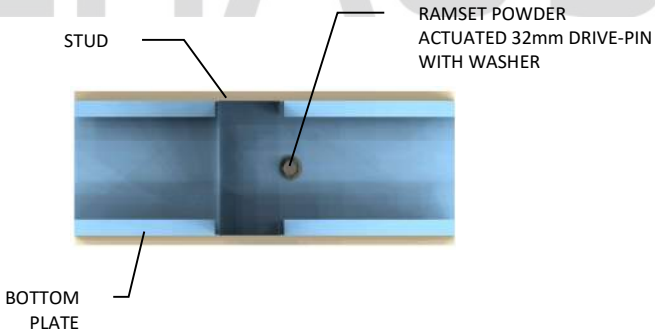
BRACED WALL HOLD DOWN (PLAN)



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

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 THE STUD 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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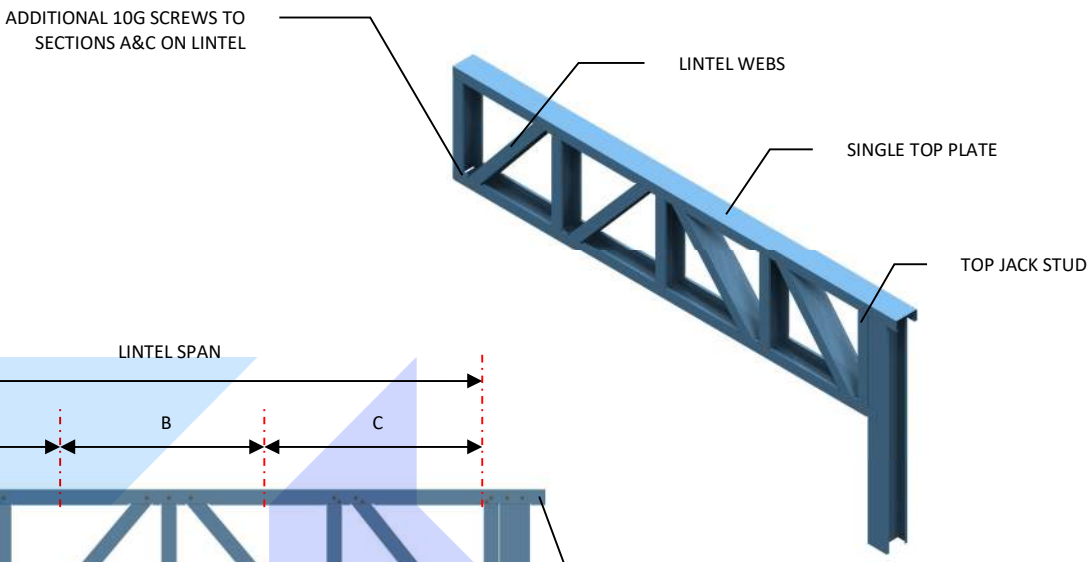
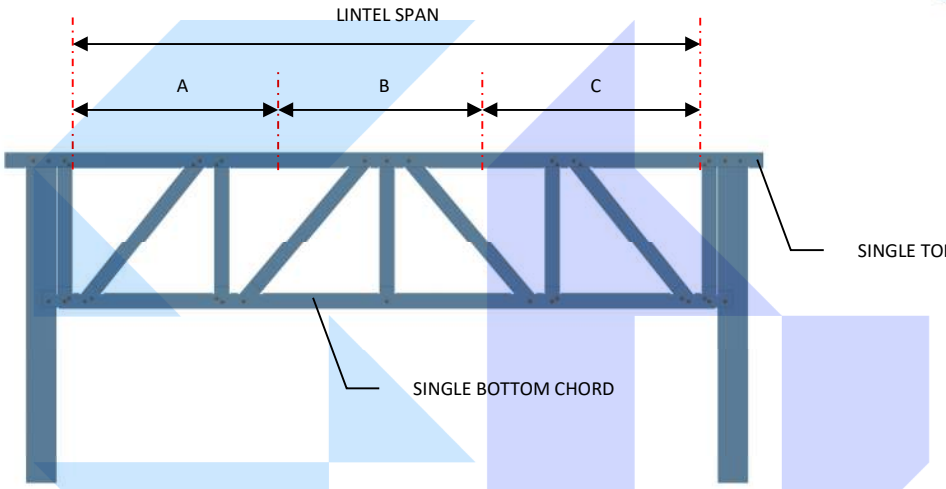
Unit 1 31 Ha Crescent, Wiri, Auckland 2104
0508 826 766
www.steelhaus.co.nz

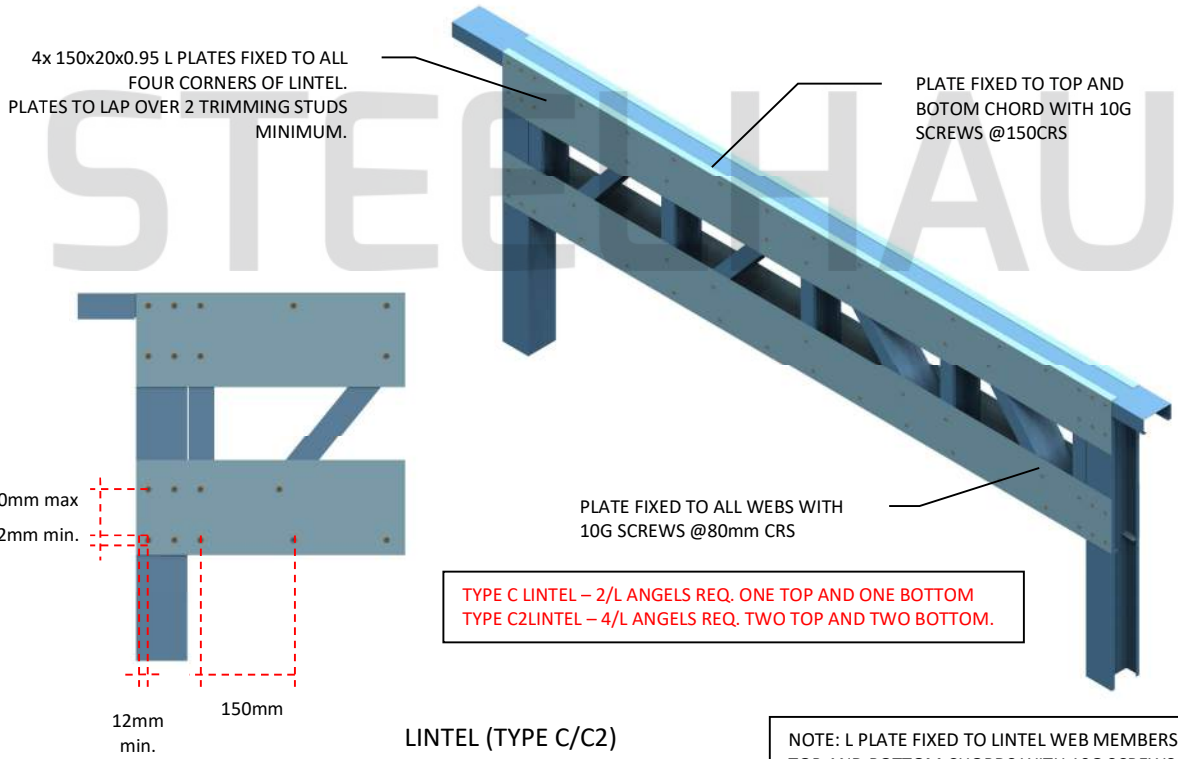
WALL TO CONCRETE FLOOR CONNECTIONS

DATE March 19, 2020





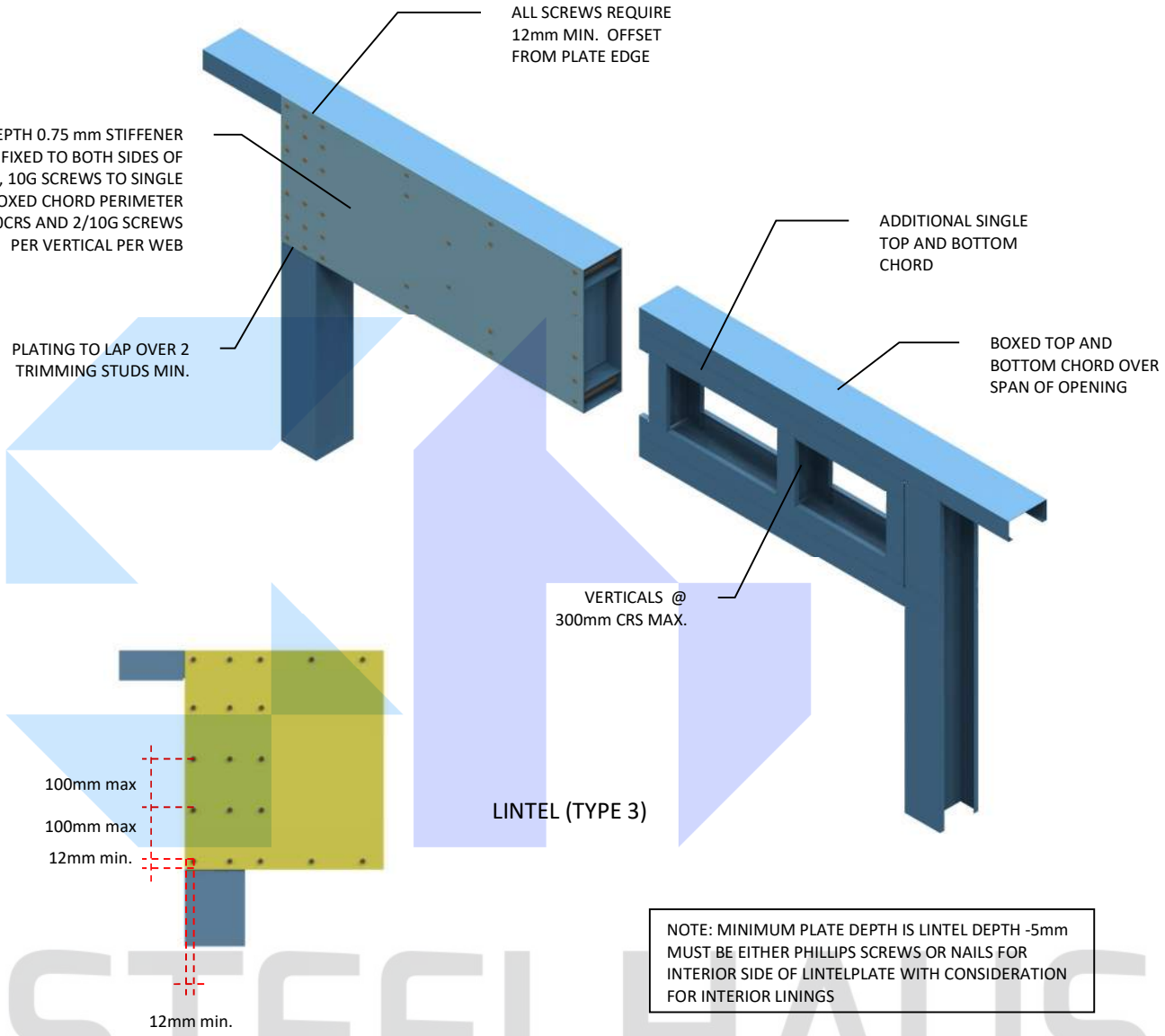
LINTEL (TYPE 1)



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

LINTEL (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.



LINTEL (TYPE 3)

NOTE: MINIMUM PLATE DEPTH IS LINTEL DEPTH -5mm
MUST BE EITHER PHILLIPS SCREWS OR NAILS FOR
INTERIOR SIDE OF LINTELPLATE WITH CONSIDERATION
FOR INTERIOR LININGS

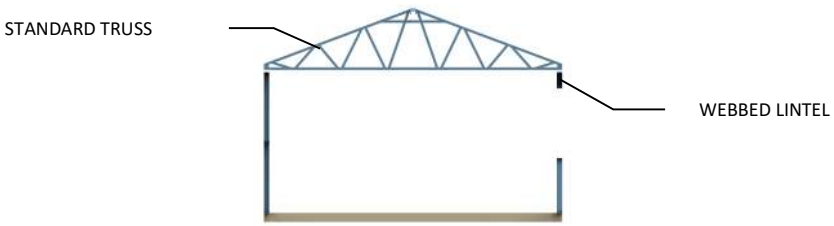
FOR HEAVY ROOF : REFER TO NASH TABLES 7.25.7.26.7.29 AND 7.30

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 Span for LD of: (m)				Lintel type A2 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 Span for LD of: (m)				Lintel type C2 or E2 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



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

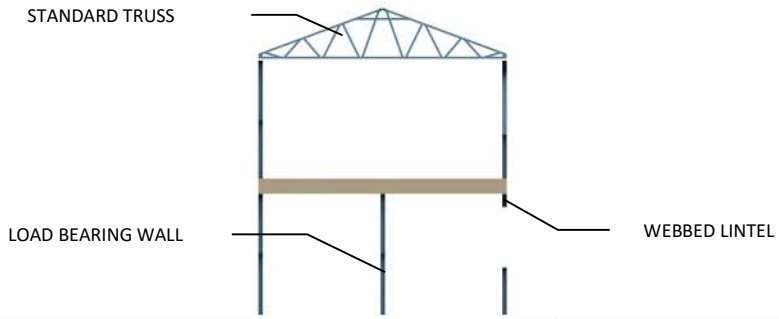
FOR HEAVY ROOF ; REFER TO NASH TABLES 7.25,7.26,7.29 AND 7.30

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

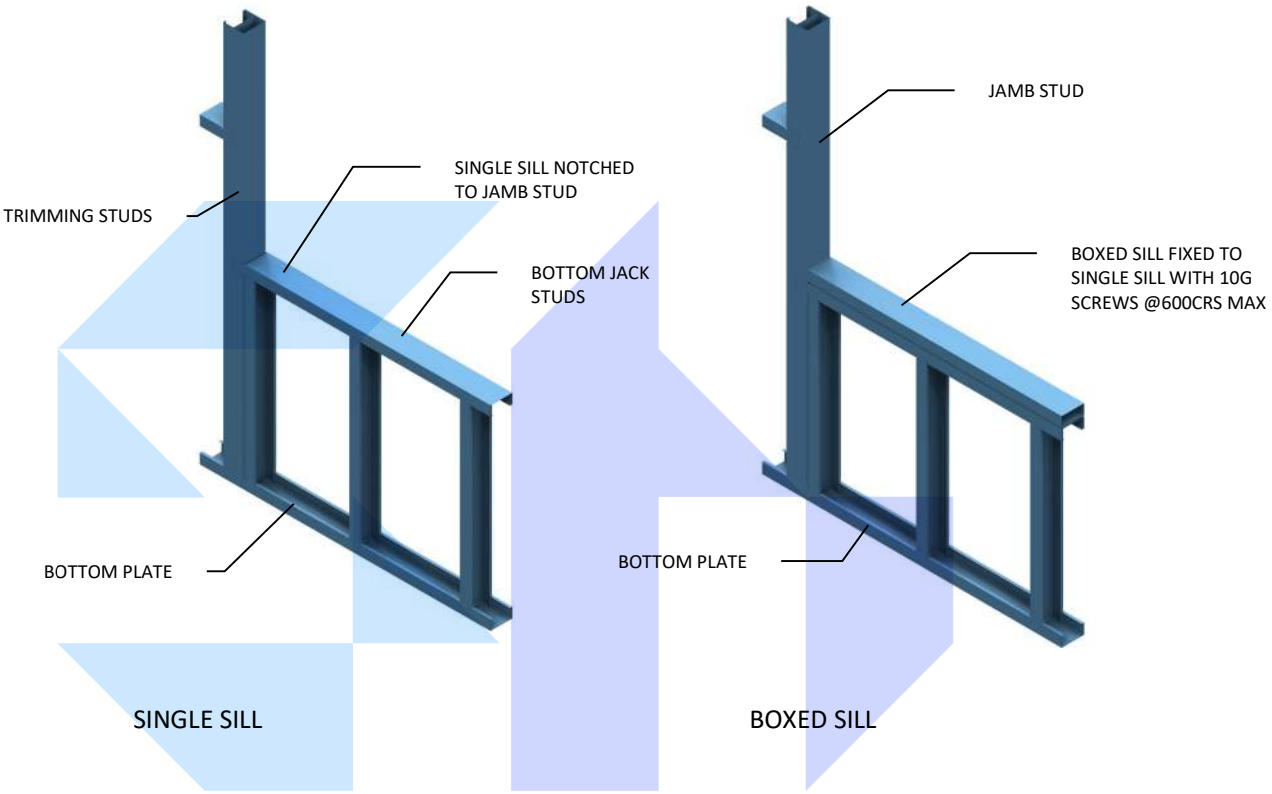
Member type	Wind zone	Lintel depth (mm)	Lintel type A				Lintel type A2			
			Span for LD of: (m)				Span for LD of: (m)			
			1.5	3.0	4.5	6.0	1.5	3.0	4.5	6.0
PC/SC	Low to Medium	180	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	1.30	0.70	SED	SED	2.00	1.20	0.80	0.60
		300	1.30	0.70	SED	SED	2.00	1.20	0.80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

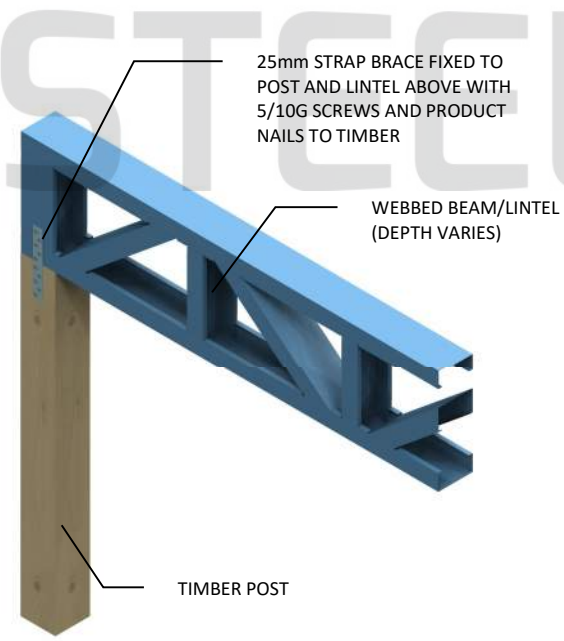
Table 7.28 (continued) Lintels for lower of two storey - Light roof

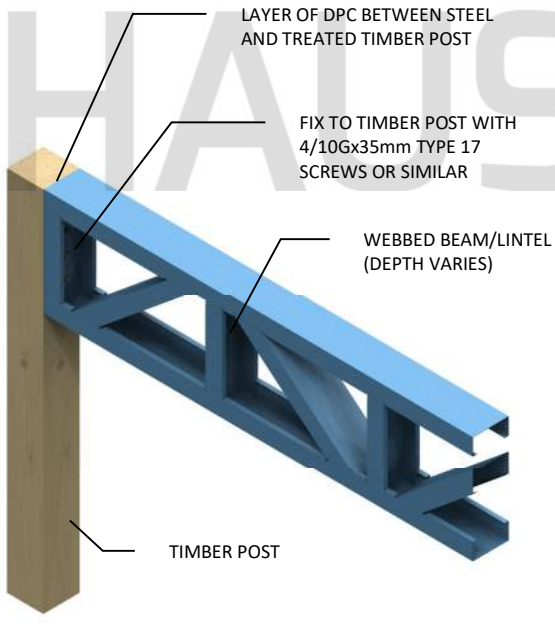
Member type	Wind zone	Lintel depth (mm)	Lintel type C or E				Lintel type C2 or E2			
			Span for LD of: (m)				Span for LD of: (m)			
			1.5	3.0	4.5	6.0	1.5	3.0	4.5	6.0
PC/SC	Low to Medium	180	1.20	0.70	SED	SED	2.00	1.20	0.80	0.60
		250	2.00	1.10	0.80	0.60	2.70	1.90	1.40	1.00
		300	2.50	1.50	1.00	0.80	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)







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

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

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

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

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

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

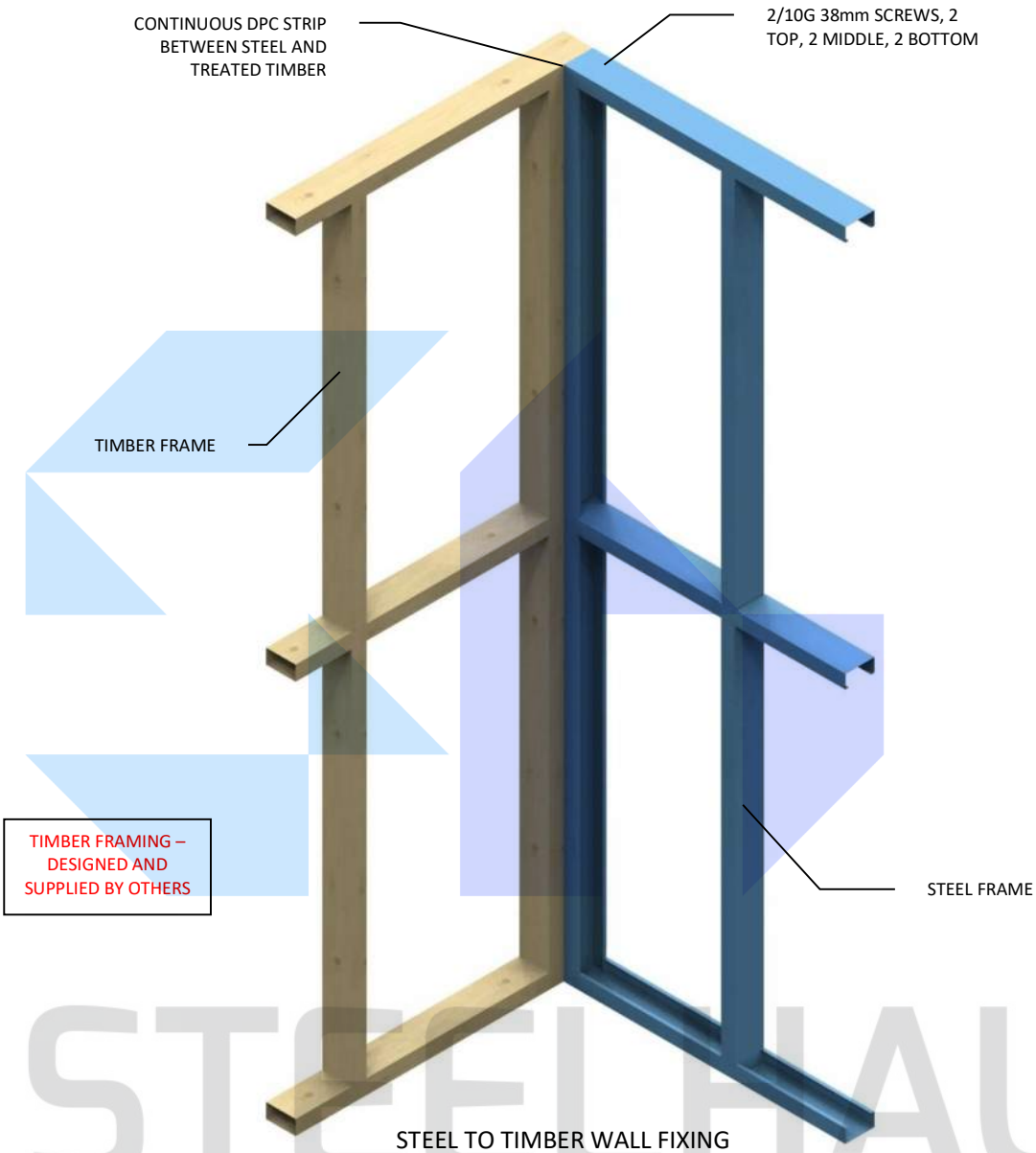
7.4.4.2. Heavy roof

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.

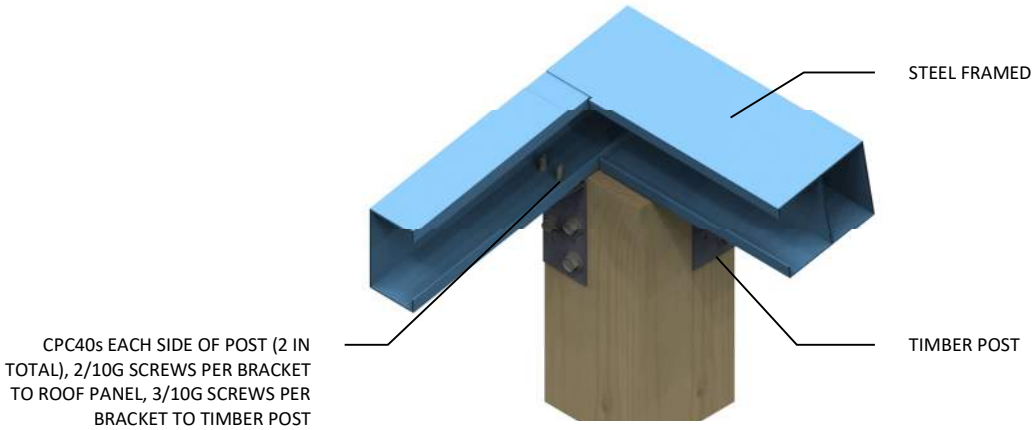
For Table 7.10 the maximum wall loaded dimension from joists shall be 3.0 metres.

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



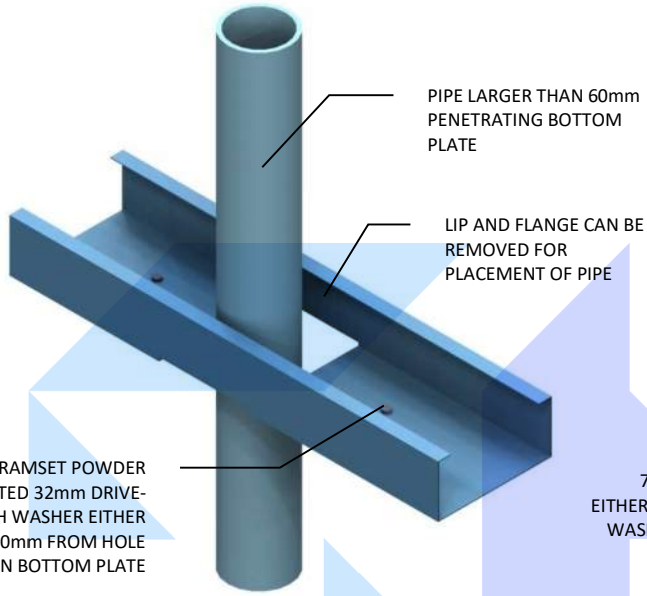
STEEL TO TIMBER WALL FIXING



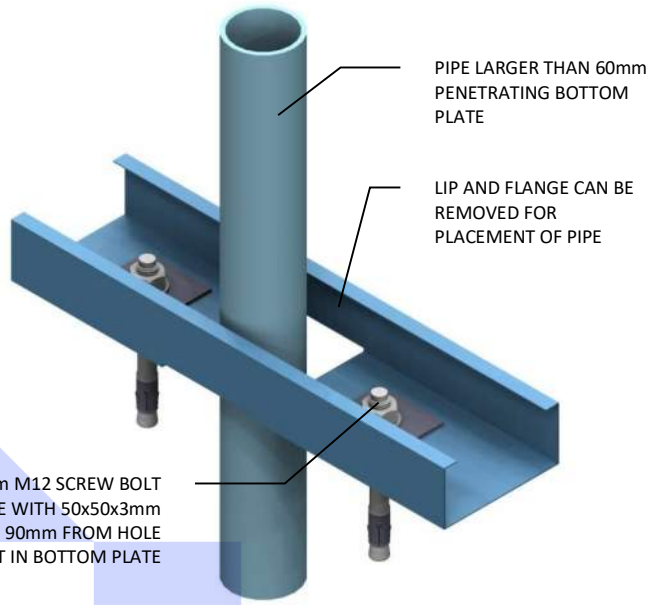
ROOF PANEL TO TIMBER POST

STEELHAUS FACTORY SPACINGS (FROM BOTTOM PLATE)
- 200mm
- 400mm
- 2100mm

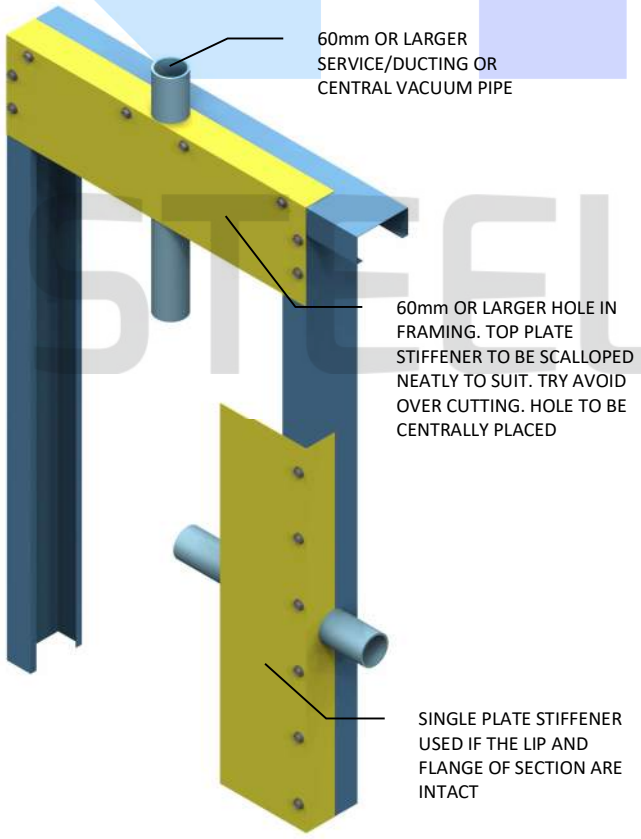
NOTE: ANY PENETRATION WITH A DIAMETER LESS THAN 60mm IS ACCEPTABLE WITHOUT A STIFFENER. THE FLANGE AND LIPS OF THE SCETION MUST BE INTACT.



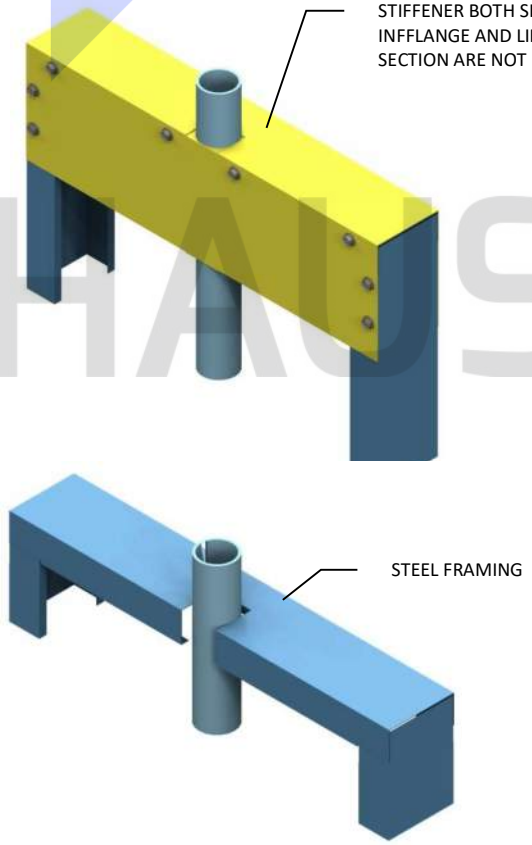
LARGE PIPE PENETRATIONS IN NON-LOAD BEARING BOTTOM PLATE



LARGE PIPE PENETRATIONS IN LOAD BEARING BOTTOM PLATE



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

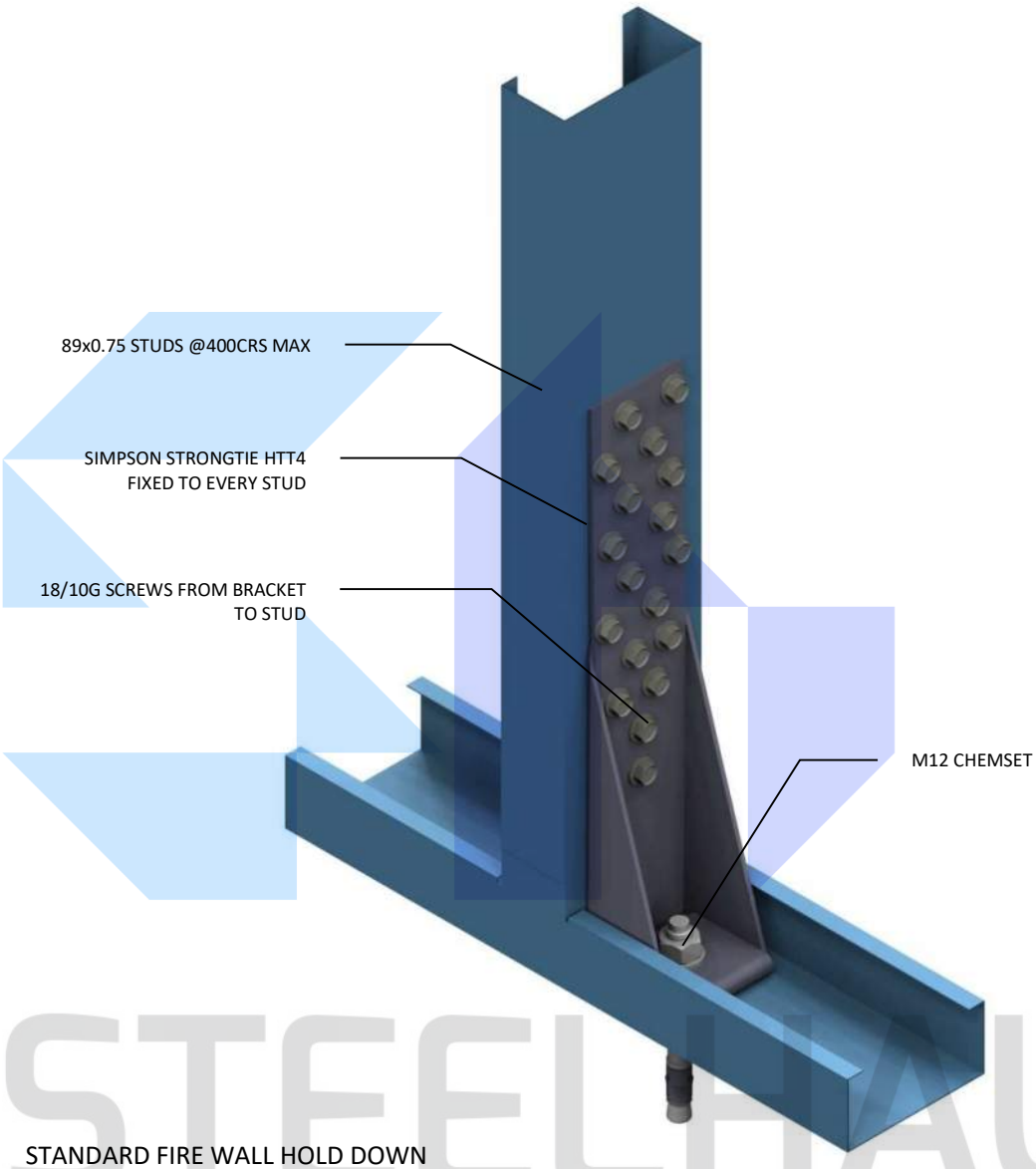


PENETRATION WITH LIP AND FLANGE OF SECTION REMOVED – LOAD BEARING WALL

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

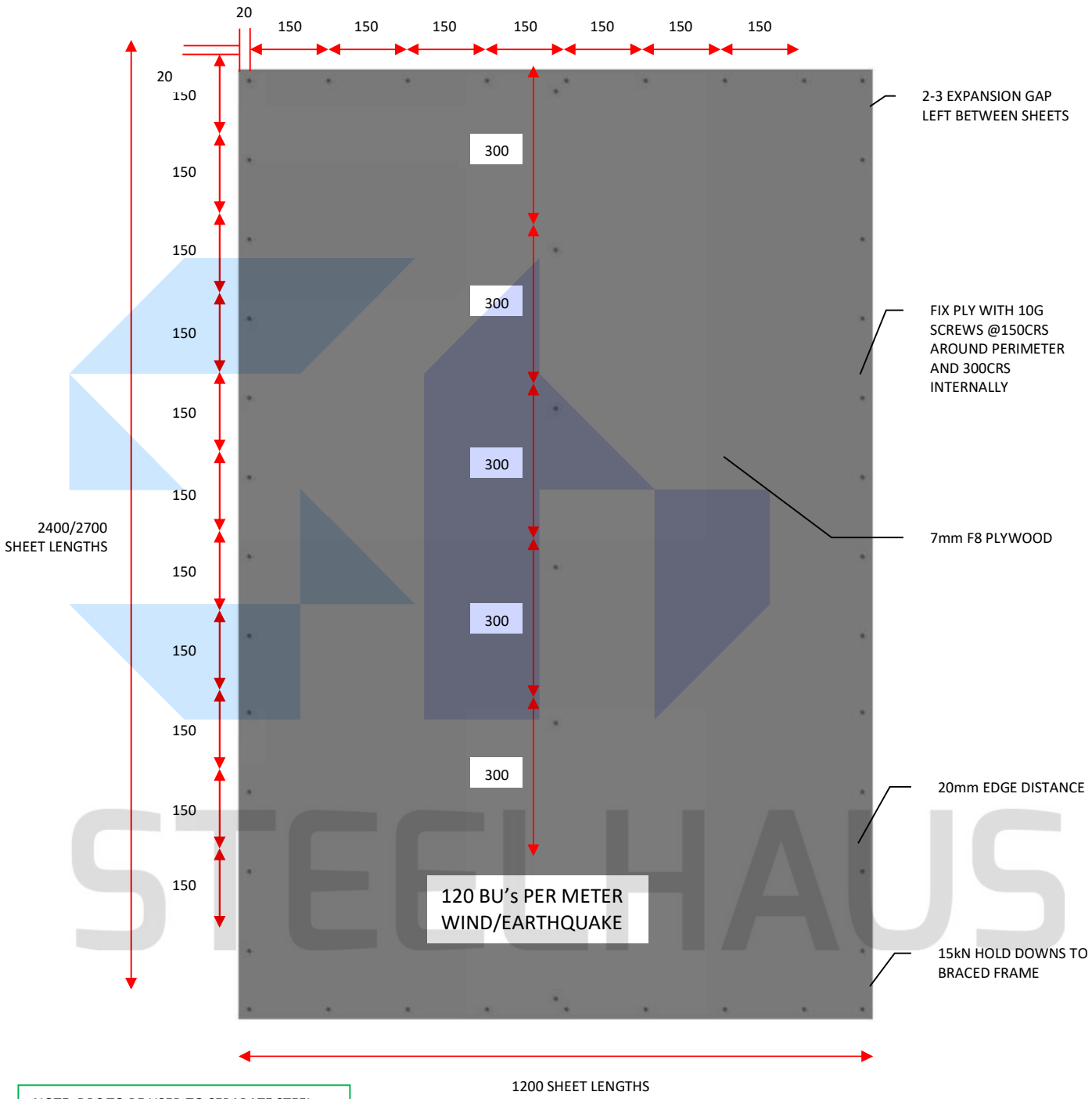
NO. OF JAMB STUDS EACH SIDE OF OPENING- 3.0m WALL HEIGHT							
WIND ZONE	ROOF LOADED DIMENSION (LD)	MAXIMUM CLEAR WIDTH OF OPENING (m)					
		0.9	1.8	3	3.6	4.2	5.4
LOW OR MEDIUM	3	1	2	2	2	3	3
	4.5	1	2	2	3	3	3
	6	1	2	2	3	3	4
HIGH	3	1	2	2	3	3	4
	4.5	1	2	3	3	4	4
	6	2	2	3	3	4	5
VERY HIGH	3	2	2	3	4	4	5
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

OPTION 1	OPTION 2	OPTION 3
M12 CHEMSET 101 WITH 220mm MIN. EMBEDMENT f'c = 20Mpa MIN. EDGE DISTANCE = 40mm BOLT SPACING = 400mm SCRS (ONE PER STUD)	M12 STRUCTASET 401 M12 WITH 140mm MIN. EFFECTIVE DEPTH f'c = 20Mpa MIN. EDGE DISTANCE = 40mm BOLT SPACING = 400mm SCRS (ONE PER STUD)	M12 EPCON C6 WITH 100mm MIN. EMBEDMENT f'c = 20Mpa MIN. EDGE DISTANCE = 40mm BOLT SPACING = 400mm SCRS (ONE PER STUD)

NOTE:
MAX WALL HEIGHT OF WALL = 2.8m



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 μ=4. NZSS604 BRACING DEMAND IS BASED ON μ=3.5 THEREFOR OKAY.

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

PLY BRACING

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

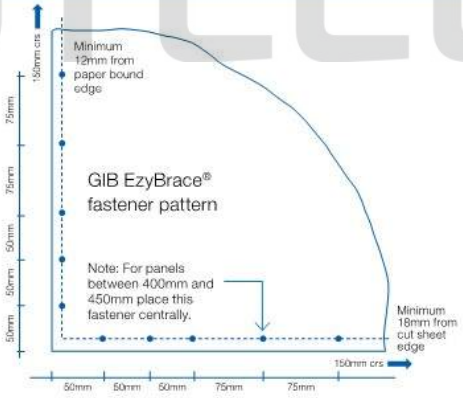
32mm x 6g GIB® Grabber® Drywall Screws.

Fastener Centres

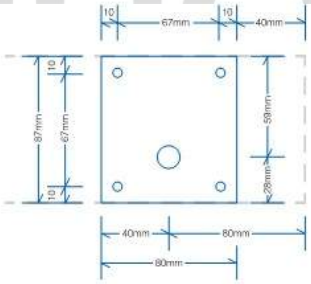
50,100,150,225,300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets, place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets, place single fasteners to the sheet edge where it crosses the stud. 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.



Unless stated all fastener spacings are maximums.



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

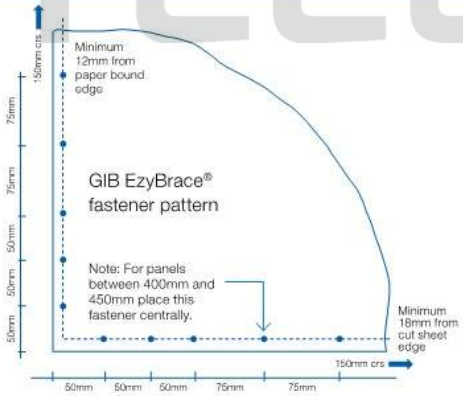
32mm x 6g GIB® Grabber® Drywall Screws.

Fastener Centres

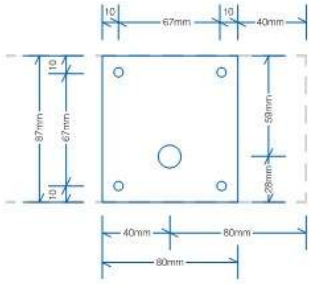
50,100,150,225,300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets, place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets, place single fasteners to the sheet edge where it crosses the stud. 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.



Unless stated all fastener spacings are maximums.



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

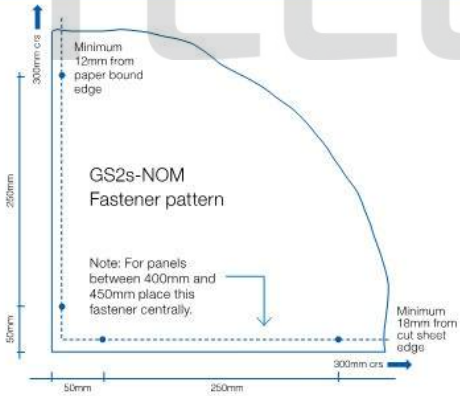
32mm x 6g GIB® Grabber® Drywall Screws.

Fastener Centres

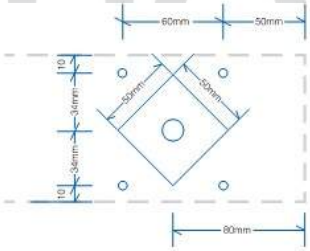
50, 300mm from each corner and 300mm maximum thereafter around the perimeter of the bracing element. For horizontally fixed sheets, place single fasteners to the sheet edge where it crosses the stud. Use daubs of GIBFix® adhesive at 300mm maximum centres to intermediate studs. Place fasteners no closer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



Unless stated all fastener spacings are maximums.



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 (internall 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®

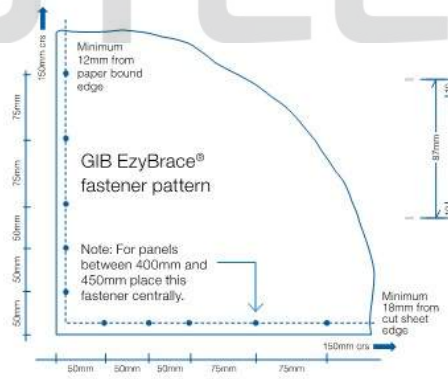
For vertical fixing, place fasteners at 300 mm centres at sheet joints in the tapered sheet edges in the field of the bracing element.For horizontal fixing, place single fasteners in the tapered edge where sheets cross studs.Use daubs of GIBFix® All-Bond adhesive at 300mm centres to intermediate studs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

Plywood

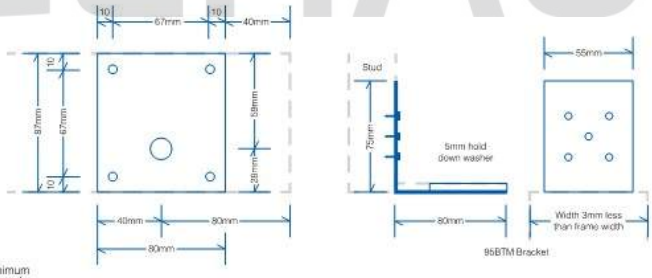
Vertical sheet fixing only. Within the bracing element place fasteners at 150 mm centres along the sheet joints at 300 mm centres to intermediate framing.

JOINTING

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



Unless stated all fastener spacings are maximums.



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

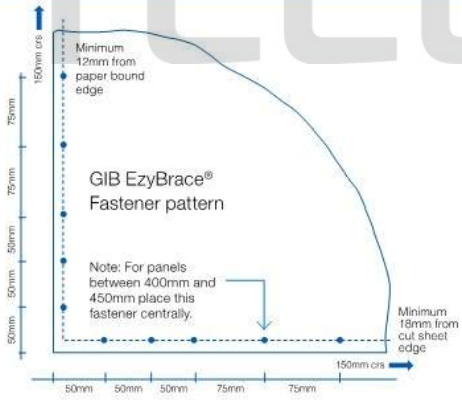
32mm x 6g GIB® Grabber® Drywall Screws.

Fastener Centres

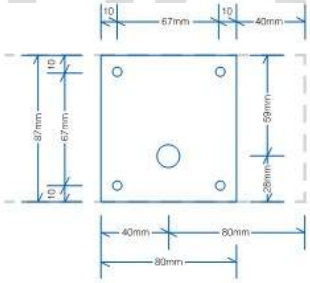
50,100,150,225,300mm from each corner and then 150mm thereafter around the perimeter of the bracing element. For vertically fixed sheets, place fasteners at 300mm centres to the intermediate sheet joints. For horizontally fixed sheets, place single fasteners to the sheet edge where it crosses the stud. 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.



Unless stated all fastener spacings are maximums.



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

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.

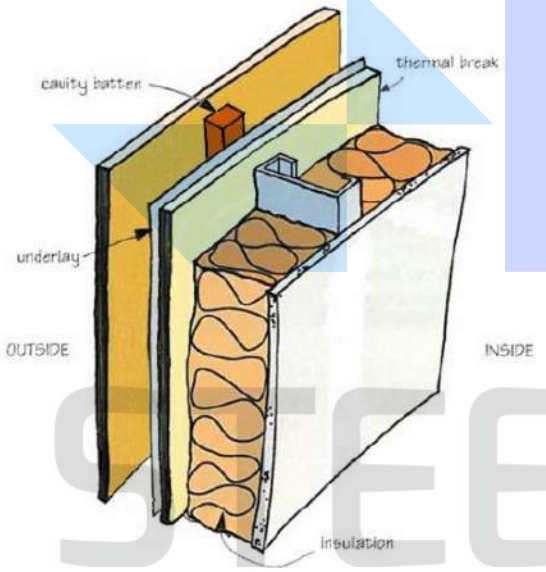
Sheets of thermal break can be used, covering the outside of the framing and provides a better thermal performance than strips.

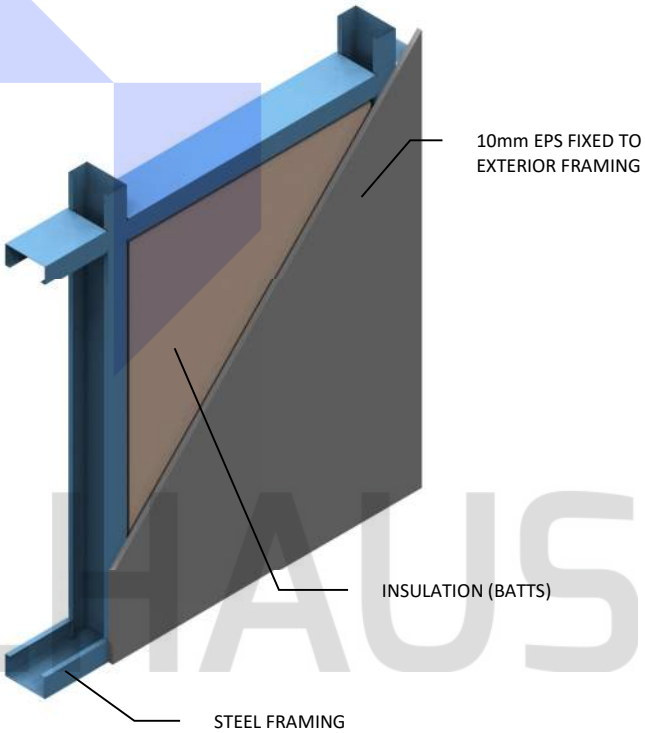
EPS sheets can come with self-adhesive backing which is easily adhered to steel framing. Separate adhesive can be used as well as flat head gib screws to secure sheet while cladding is fixed over.

Installation Tips;

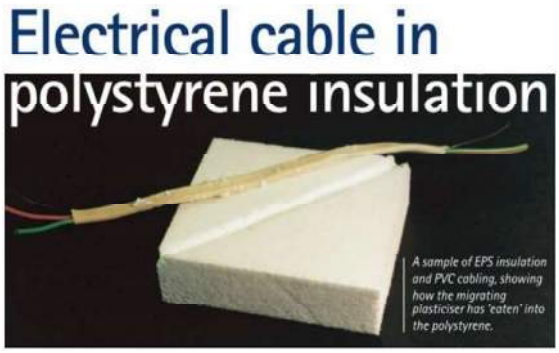
-Avoid windy weather if possible.

-Tack on thermal break with an 8g plasterboard screw to each corner.
Follow closely with wrap install.
Screw through both products @600crs





Material		10mm EPS	Test Method
Density	kg/m³	16	AS 2464.5 or
R Value	m²K/W	**0.265**	AS 2464.6
Compressive Strength at 10% deformation (min)	KPA	85	AS 2498.3
Cross Breaking Strength	KPA	165	AS 2498.4
Determination of flame propogation 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
Diminsional 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/m²s	520	AS 2498.5
Long Term Water Absorbtion by immersion	% v/v	-	



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

THERMAL BREAK SPECS

DATE March 19, 2020

DriStud™ A division of TCLHunt

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^2	**157 g/m^2**
3	Air Resistance	BS ISO 5636-5:2003	≥ 0.1 MN s/m3	**0.426 MN s/m3**
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**

DriStud

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

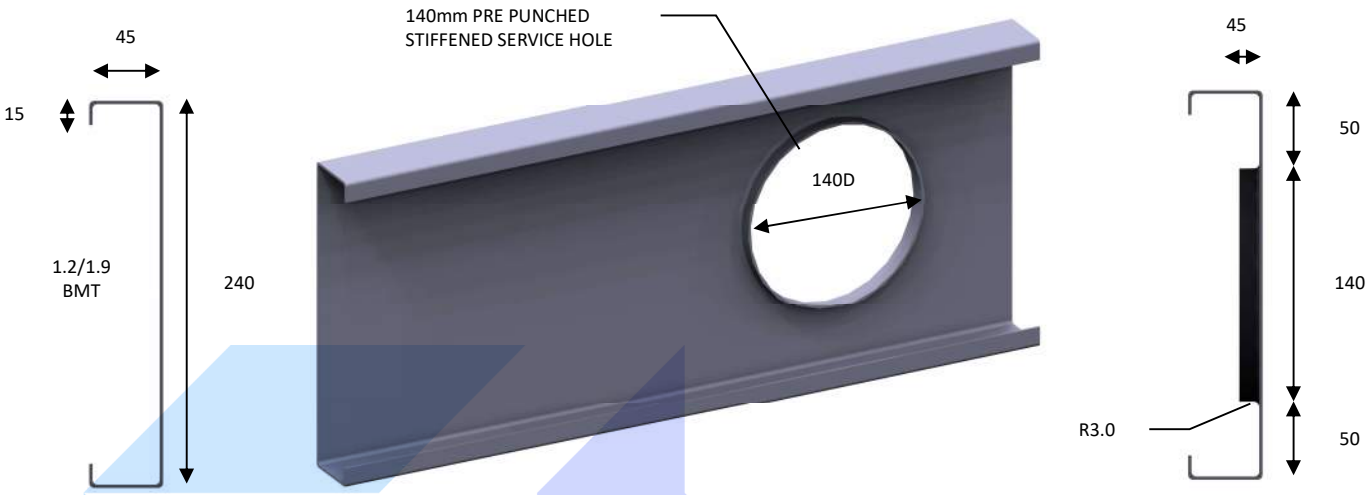
Revision B
September 27 2016

For further information please visit www.dristud.co.nz or call 0800 DRISTUD (374 7883).

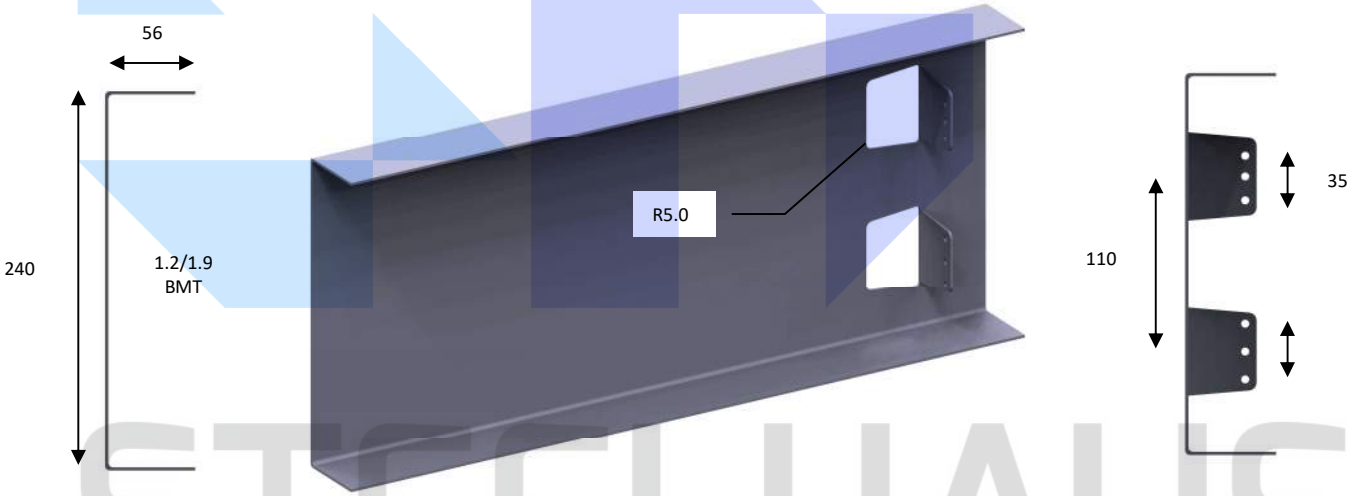
SECTION 2
FLOOR FRAMING

EZYJOIST™

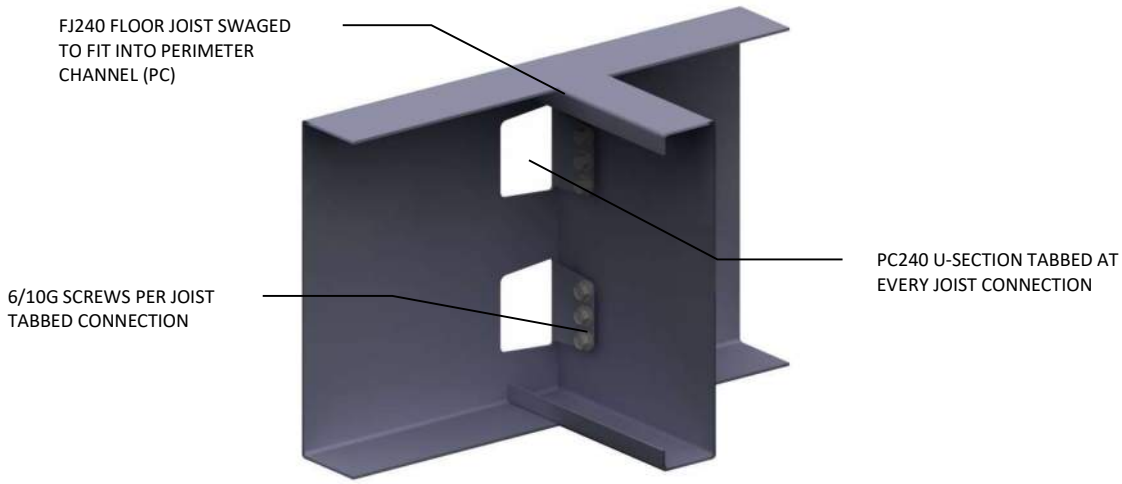
STEEL FLOOR JOIST SYSTEM



FLOOR JOIST (FJ) 240 PROFILE

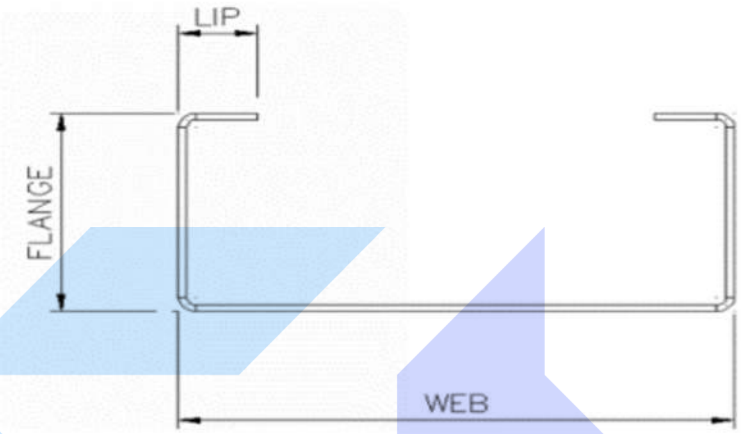


PERIMETER CHANNEL (PC) 240 PROFILE



PC/FJ 240 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% reducation 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
FJ150x1.55	150	45	16	1.55	0	N/A	3650	3650	3300
FJ190x1.55	190	45	16	1.55	90	1000	4400	4400	4050
FJ240x1.15	240	45	16	1.15	140	1000	4850	4850	4200
FJ240x1.55	240	45	16	1.55	140	1000	5350	5350	5000
FJ240x1.95	240	45	16	1.95	140	1000	5750	5750	5450
FJ290x2.50	290	45	16	2.5	140	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
FJ150x1.55	150	45	16	1.55	0	N/A	3650	3650	3300
FJ190x1.55	190	45	16	1.55	90	1000	4400	4400	4050
FJ240x1.15	240	45	16	1.15	140	1000	4650	4400	3800
FJ240x1.55	240	45	16	1.55	140	1000	5350	5350	4950
FJ240x1.95	240	45	16	1.95	140	1000	5750	5750	5450
FJ290x2.50	290	45	16	2.5	140	1000	7250	7250	7050

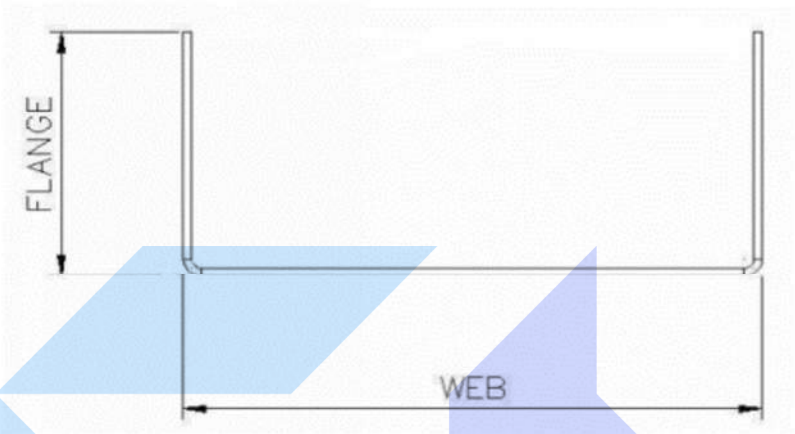
Max joist span for 3.0kPa (offices) live load & 0.5kPa dead load (typically timber flooring with carpet & gib ceiling on battens)									
Profile	Web (mm)	Flange (mm)	Lip (mm)	Material Thickness (mm)	Max Hole Diameter (mm)	Minimum Hole Spacing (mm)	Max Span (mm)		
							400cts	450cts	600cts
FJ150x1.55	150	45	16	1.55	0	N/A	3650	3600	3150
FJ190x1.55	190	45	16	1.55	90	1000	4400	4150	3600
FJ240x1.15	240	45	16	1.15	140	1000	3850	3600	3100
FJ240x1.55	240	45	16	1.55	140	1000	5000	4700	4100
FJ240x1.95	240	45	16	1.95	140	1000	5750	5500	4800
FJ290x2.50	290	45	16	2.5	140	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
FJ150x1.55	150	45	16	1.55	0	N/A	3500	3350	3000
FJ190x1.55	190	45	16	1.55	90	1000	4200	3950	3400
FJ240x1.15	240	45	16	1.15	140	1000	3600	3400	2950
FJ240x1.55	240	45	16	1.55	140	1000	4750	4450	3850
FJ240x1.95	240	45	16	1.95	140	1000	5500	5200	4500
FJ290x2.50	290	45	16	2.5	140	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
FJ150x1.55	150	45	16	1.55	0	N/A	3050	3900	2500
FJ190x1.55	190	45	16	1.55	90	1000	3500	3300	2850
FJ240x1.15	240	45	16	1.15	140	1000	3050	2850	2450
FJ240x1.55	240	45	16	1.55	140	1000	3950	3750	3250
FJ240x1.95	240	45	16	1.95	140	1000	4650	4400	3800
FJ290x2.50	290	45	16	2.5	140	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
FJ150x1.55	150	45	16	1.55	0	N/A	2950	2800	2400
FJ190x1.55	190	45	16	1.55	90	1000	3400	3200	2750
FJ240x1.15	240	45	16	1.15	140	1000	2950	2750	2300
FJ240x1.55	240	45	16	1.55	140	1000	3850	3600	3100
FJ240x1.95	240	45	16	1.95	140	1000	4500	4200	3650
FJ290x2.50	290	45	16	2.5	140	1000	5850	5550	4800

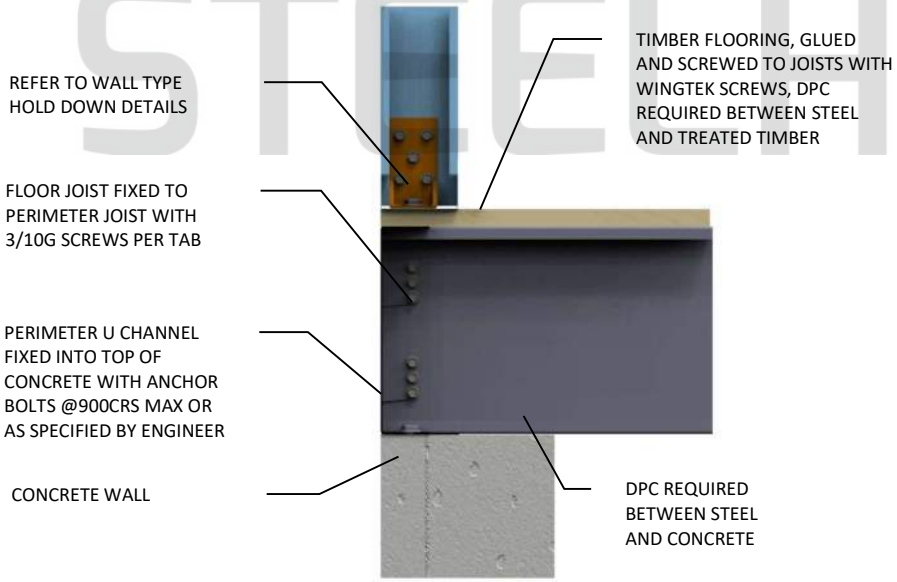
PERIMETER CHANNEL SPAN TABLES



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.

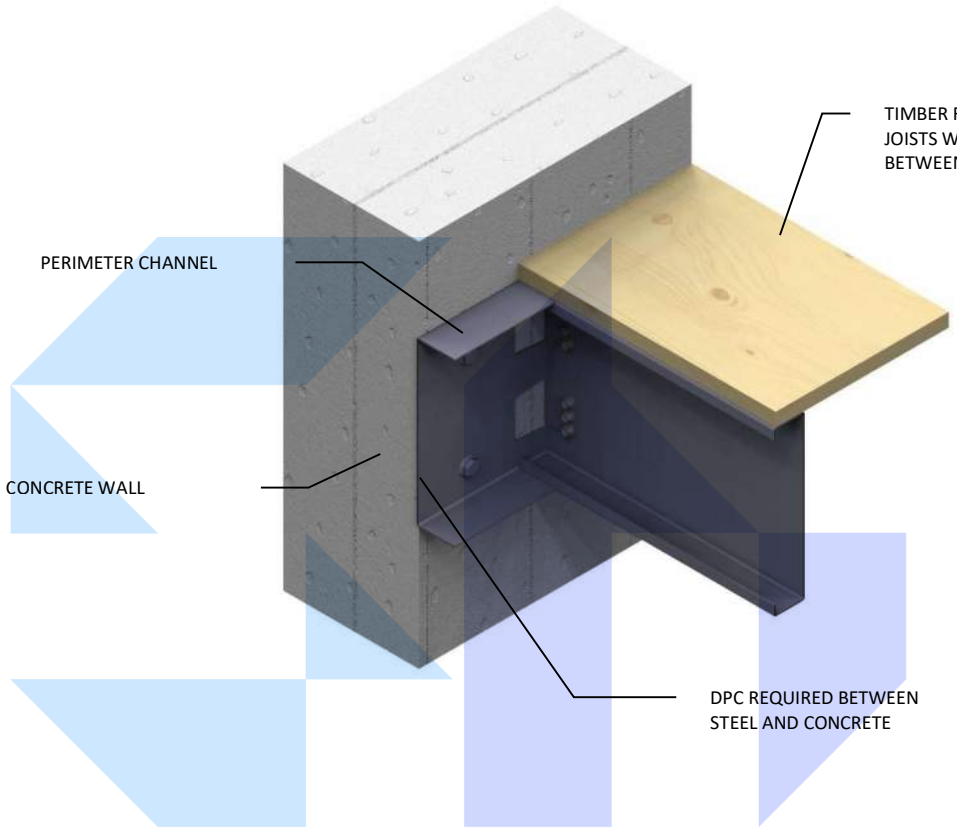
Max perimeter channel span for 0.5kPa dead load (typically timber flooring with carpet & gib ceiling on battens)					
Max Joist Span (m)	Perimeter Channel Size	Max Perimeter Channel Span (mm)			
		1.5kPa (residential)	2.0kPa (balconies)	3.0kPa (offices)	5.0kPa (storage)
3000	PC150x1.55	1800	1600	1400	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

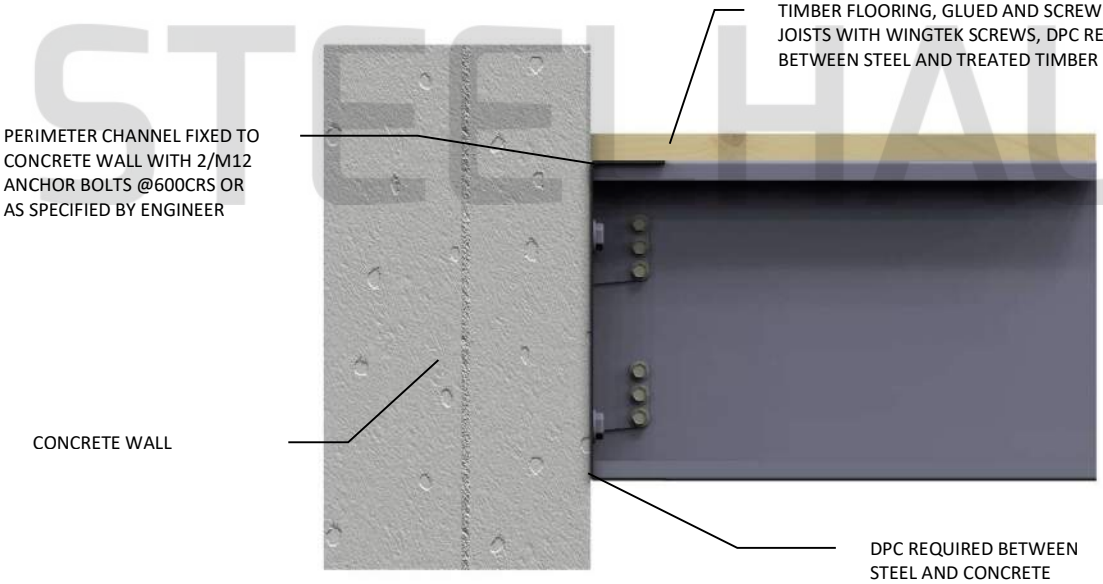
Max perimeter channel span for 1.0kPa dead load (typically timber flooring with tiling & gib ceiling on battens)					
Max Joist Span (m)	Perimeter Channel Size	Max Perimeter Channel Span (mm)			
		1.5kPa (residential)	2.0kPa (balconies)	3.0kPa (offices)	5.0kPa (storage)
3000	PC150x1.55	1700	1500	1300	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



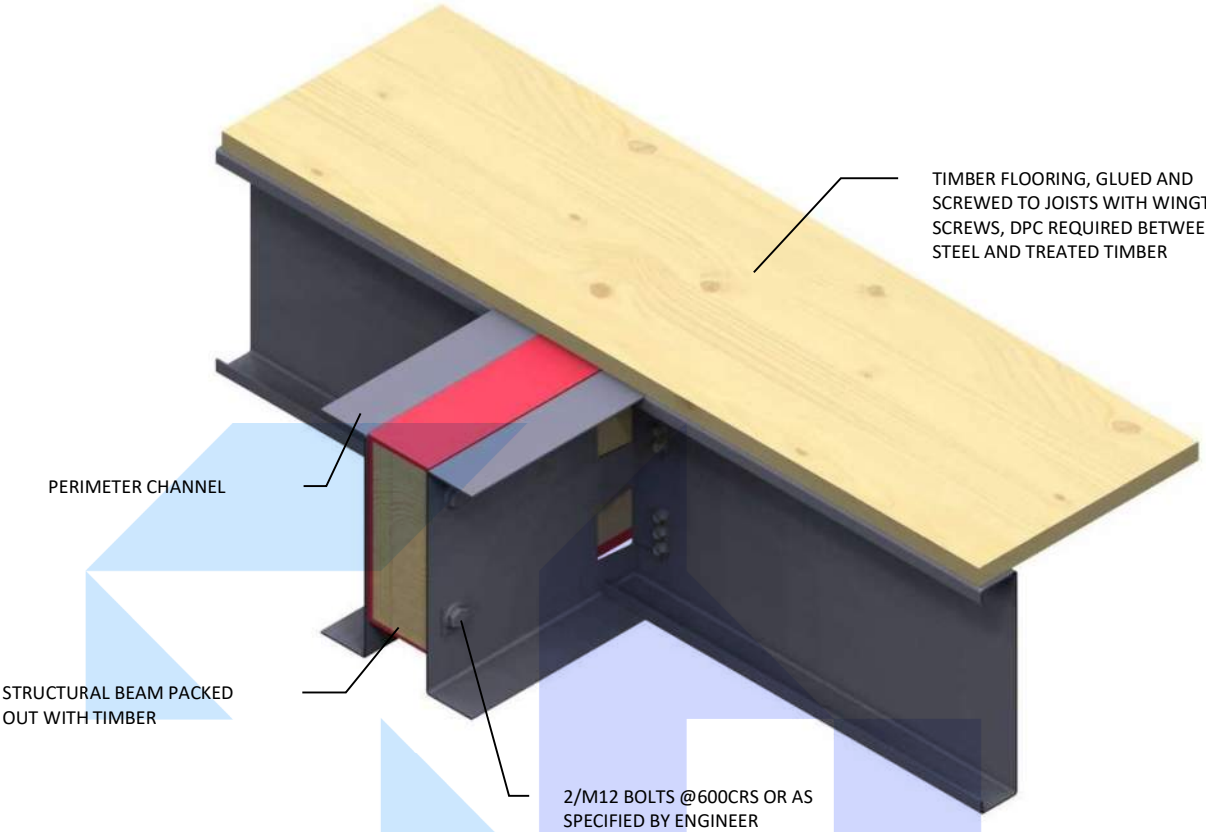
3D VIEW

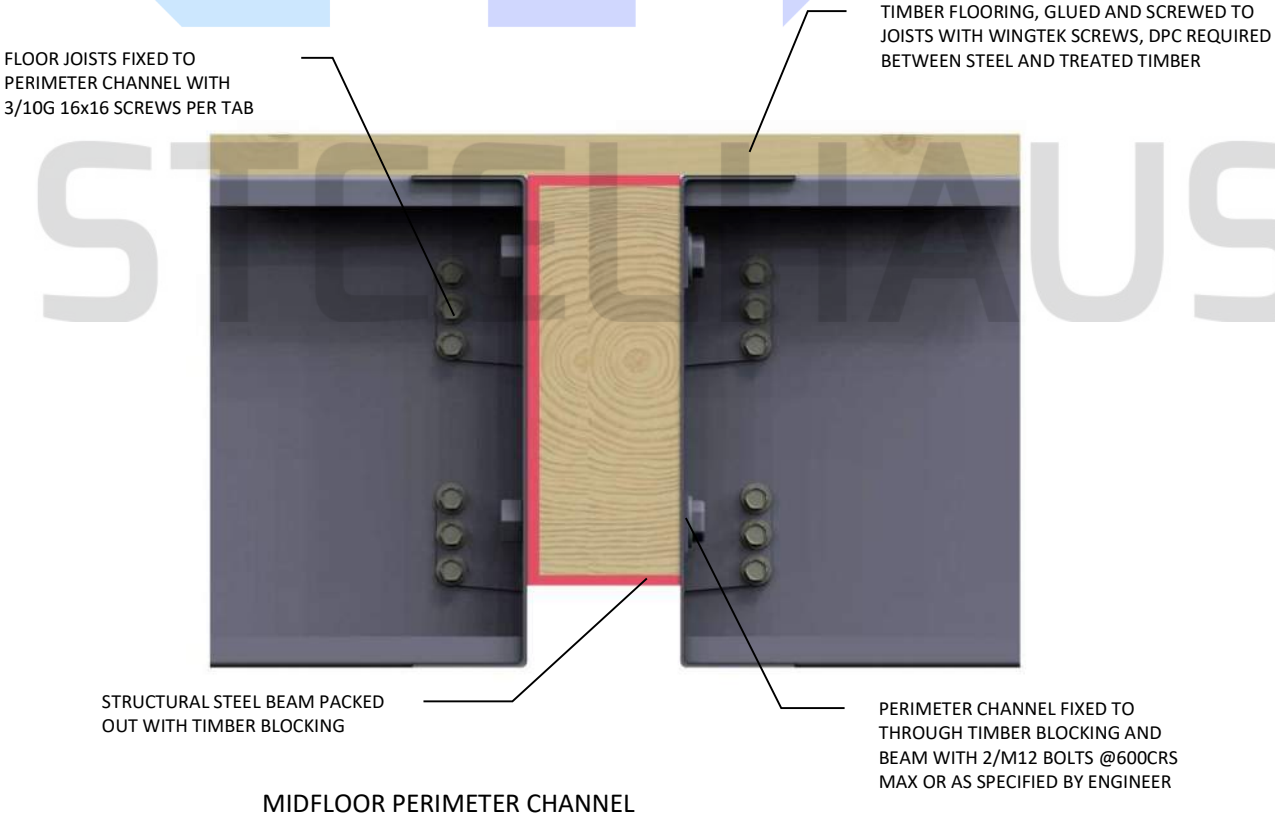
MIDFLOOR PERIMETER CHANNEL
FIXED OVER CONCRETE WALL



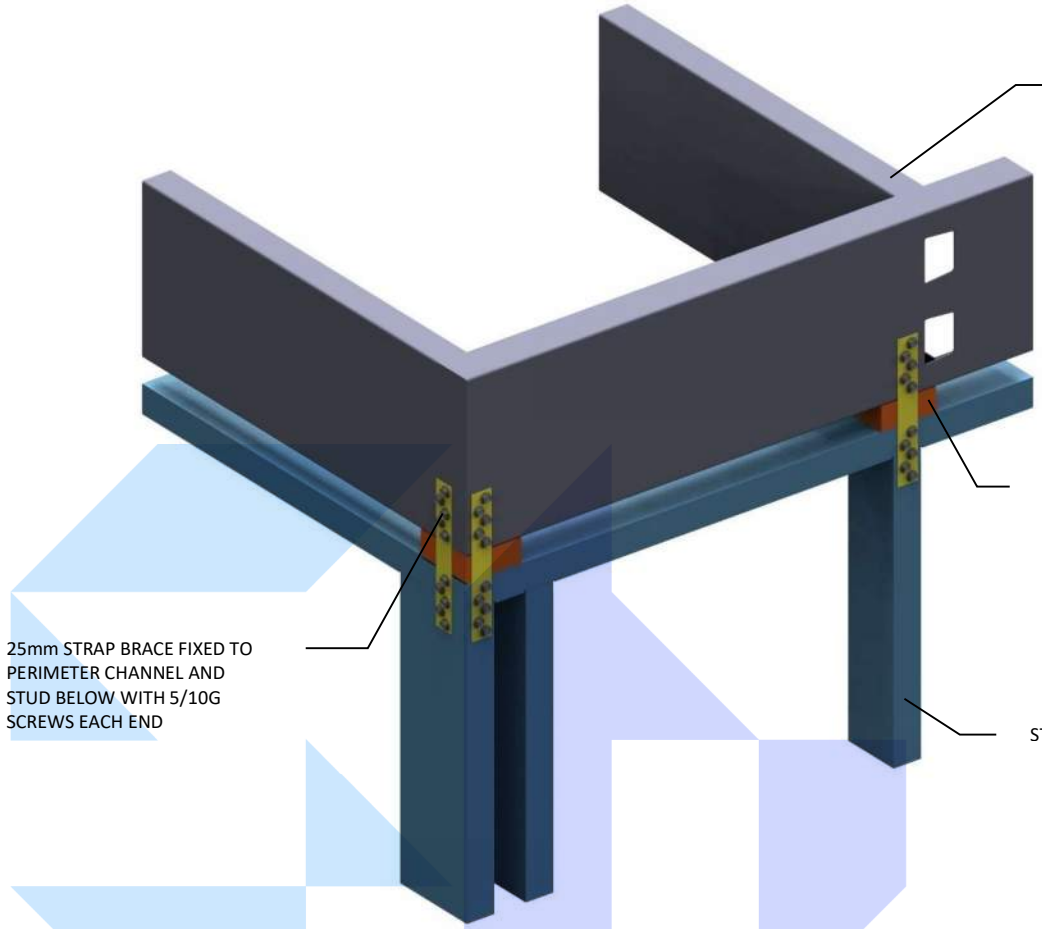


MIDFLOOR PERIMETER CHANNEL
FIXED AGAINST CONCRETE WALL

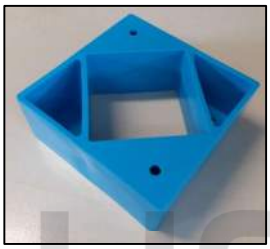




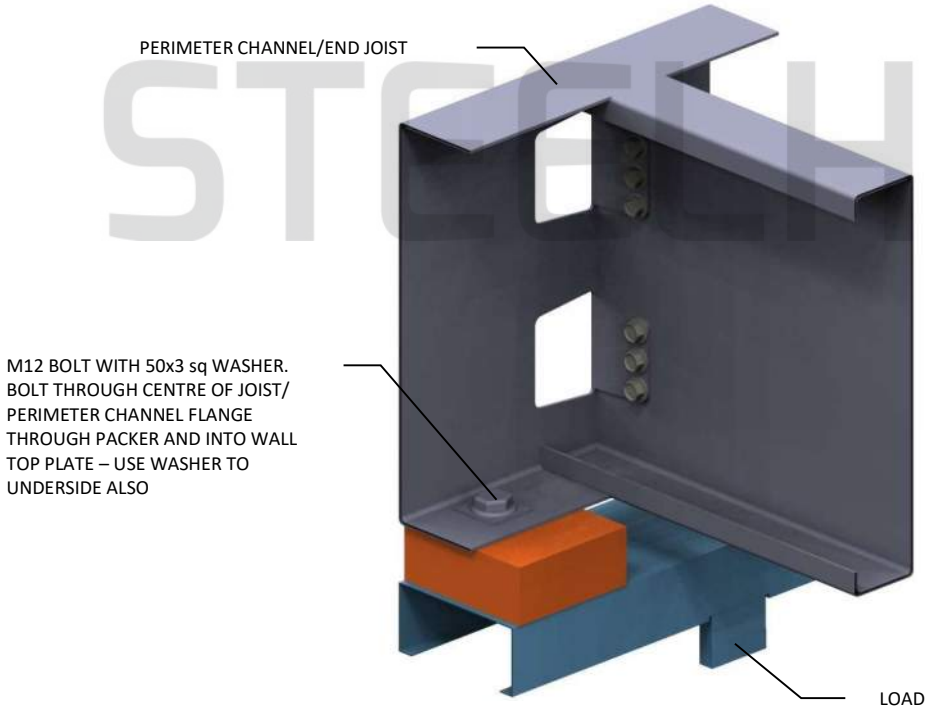
MIDFLOOR PERIMETER CHANNEL FIXED TO STRUCTURAL BEAM



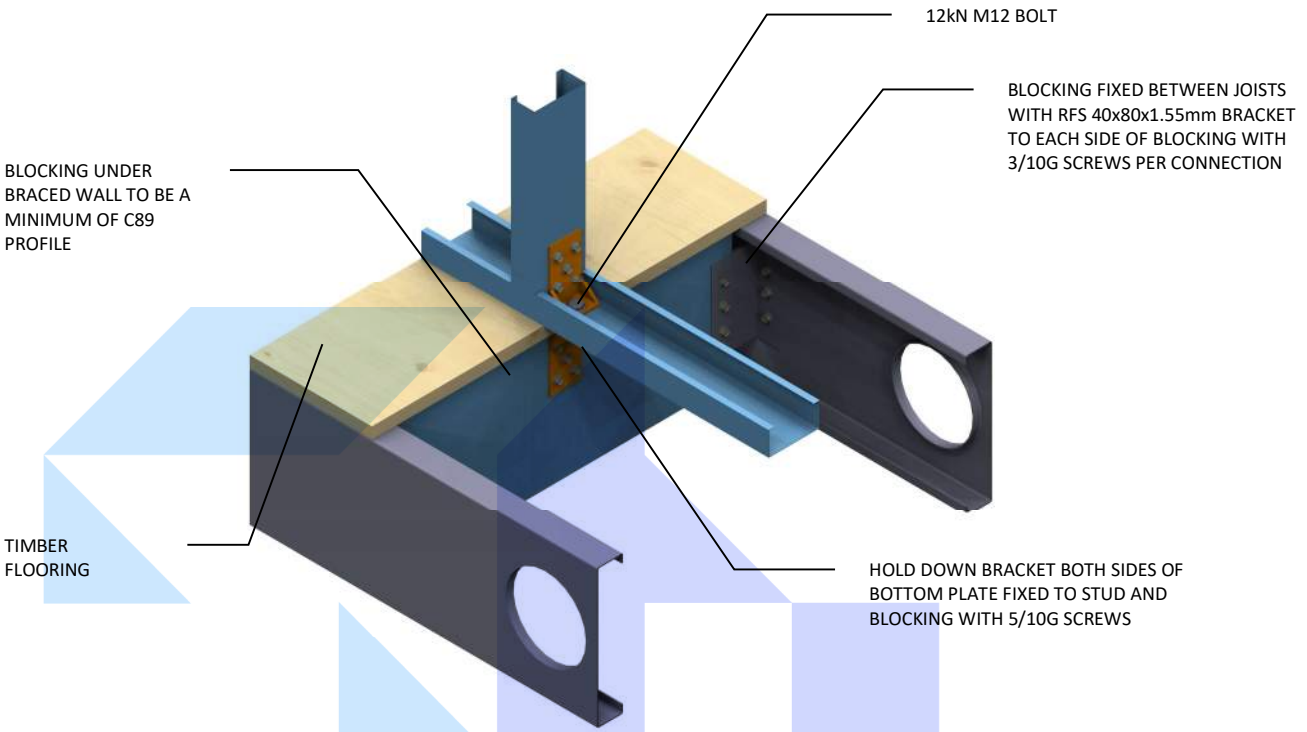
MIDFLOOR JOIST OVER LOAD-BEARING WALLS – STRAP OPTION



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

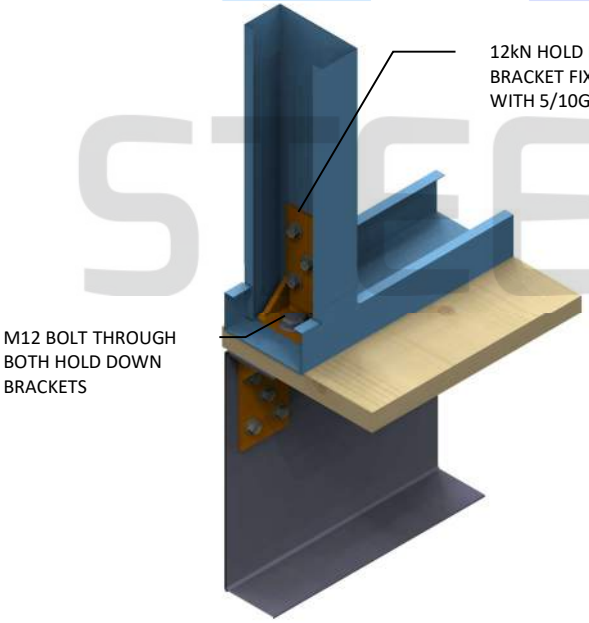


MIDFLOOR JOIST OVER LOAD-BEARING WALLS – BOLT OPTION

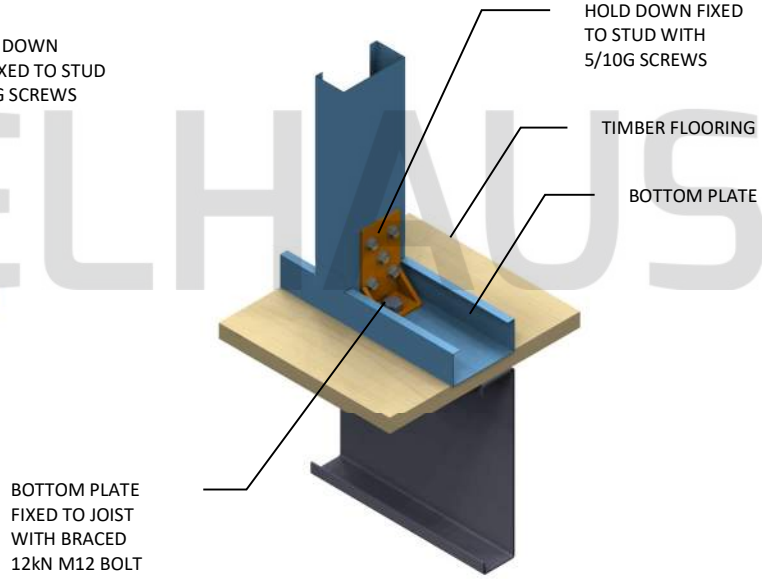


12kN BRACED WALL HOLD DOWN
(WALL BETWEEN JOISTS)

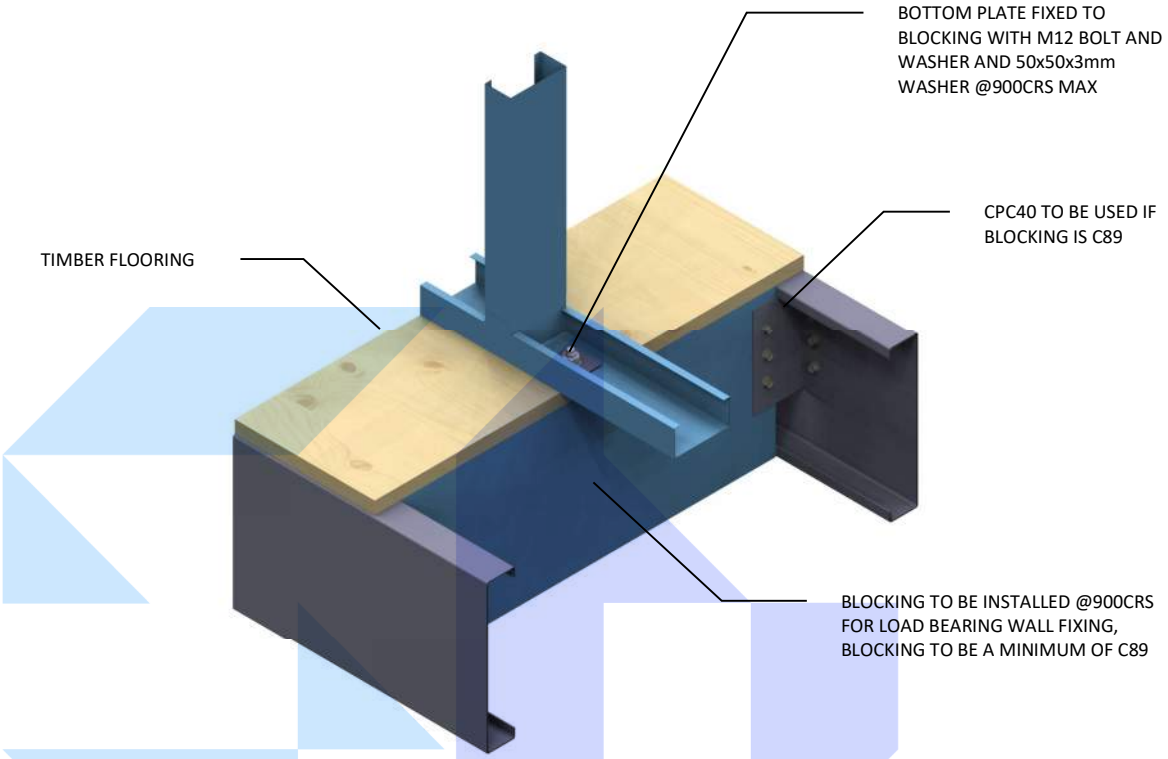
DPC LAYER REQUIRED BETWEEN STEEL AND TREATED TIMBER.



12kN BRACED WALL HOLD DOWN
(WALL ALONG BOUNDARY JOIST)

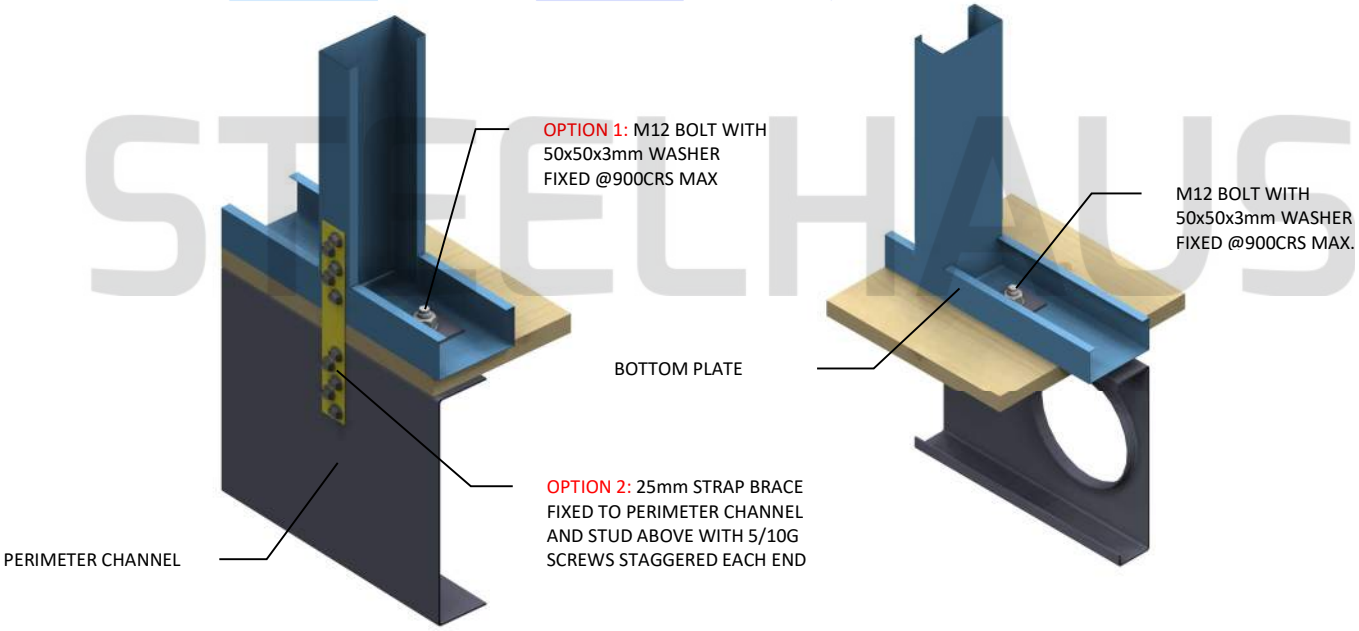


12kN BRACED WALL HOLD DOWN
(WALL ALONG JOIST)



LOAD-BEARING WALL HOLD DOWN
(WALL BETWEEN JOISTS)

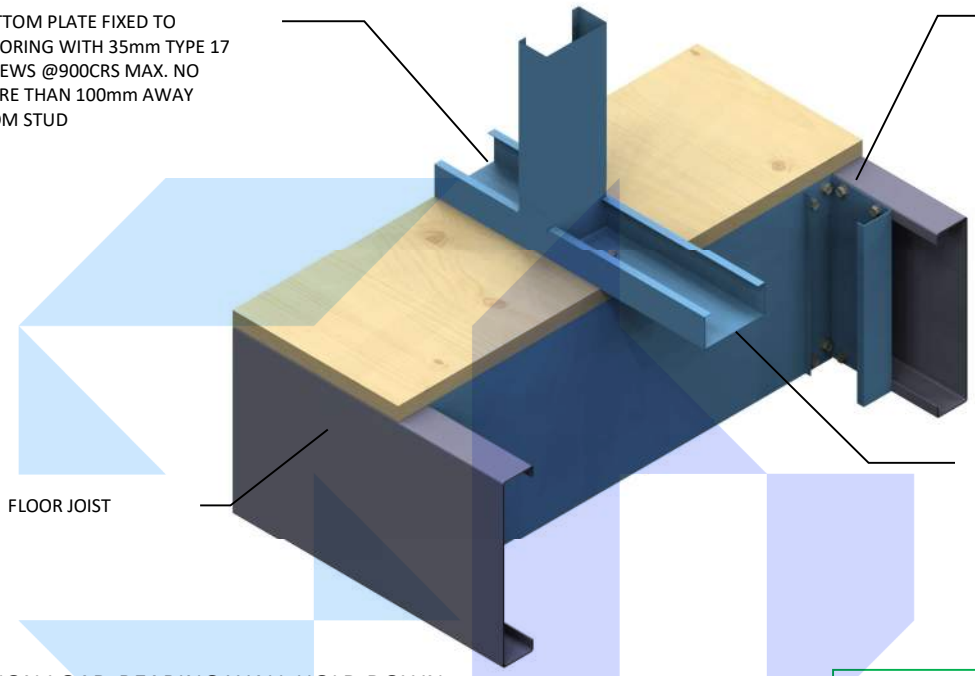
DPC LAYER REQUIRED BETWEEN STEEL AND TREATED TIMBER.



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

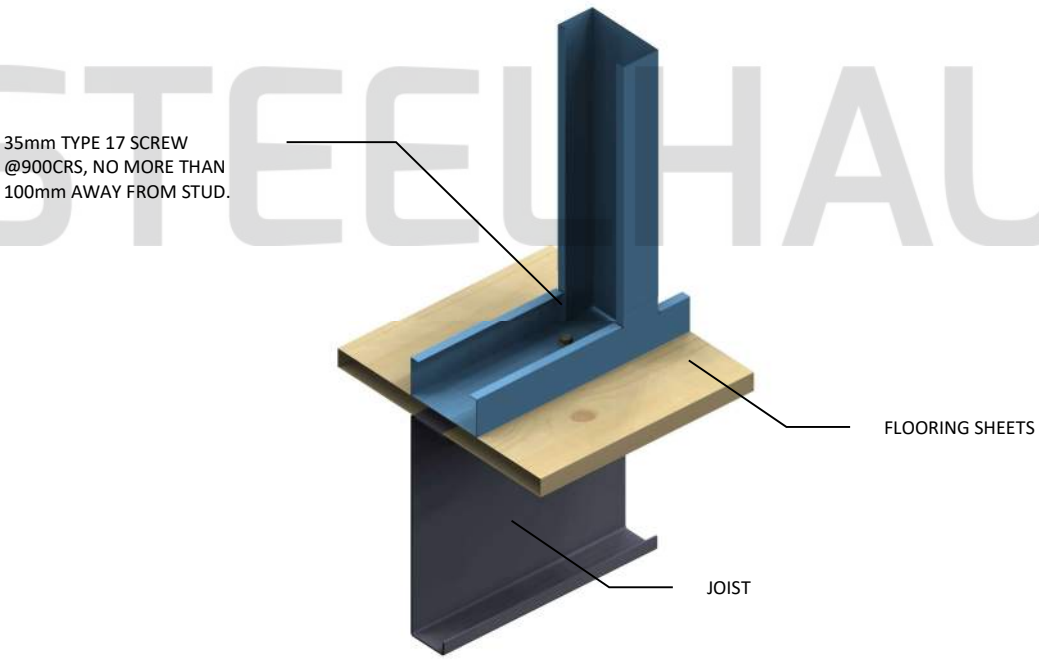
LOAD-BEARING WALL HOLD DOWN
(WALL ALONG JOIST)

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

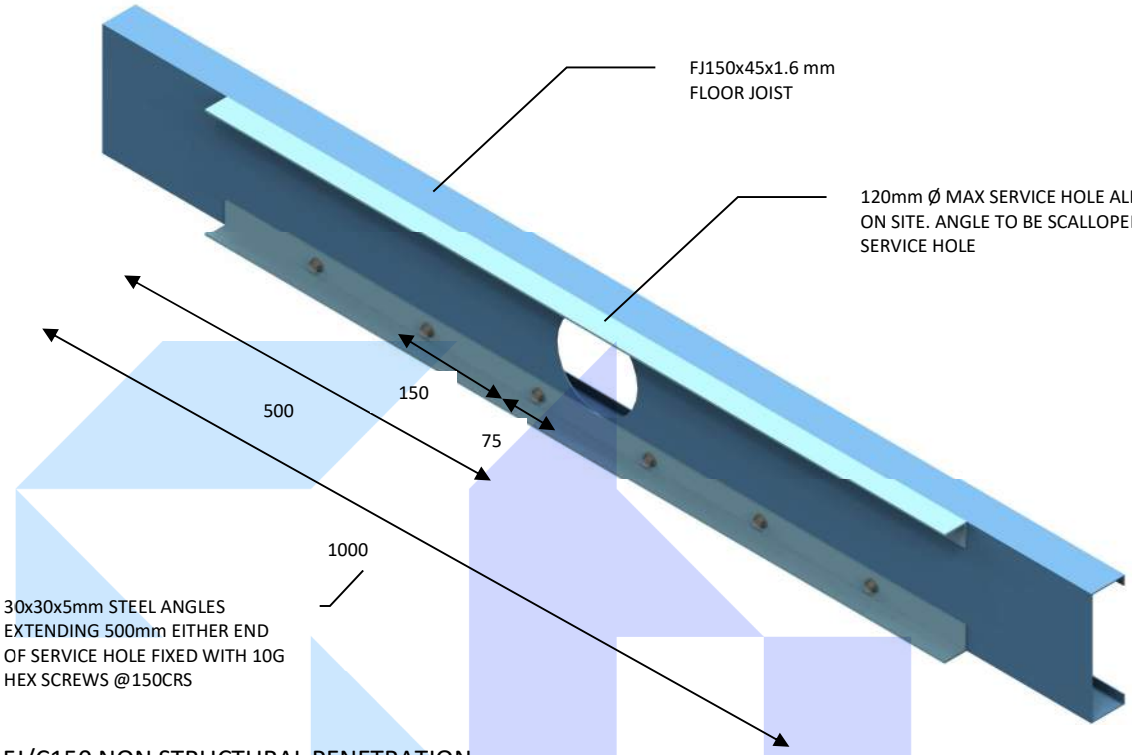


NON LOAD-BEARING WALL HOLD DOWN
(WALL BETWEEN JOISTS)

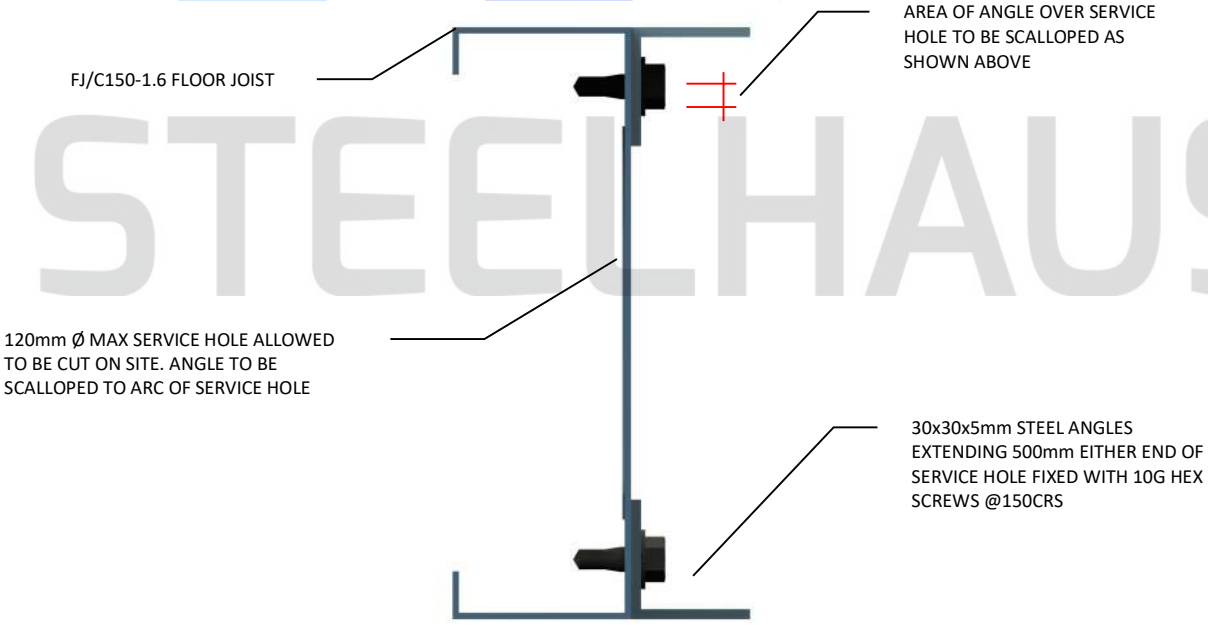
DPC LAYER REQUIRED BETWEEN STEEL AND TREATED TIMBER.



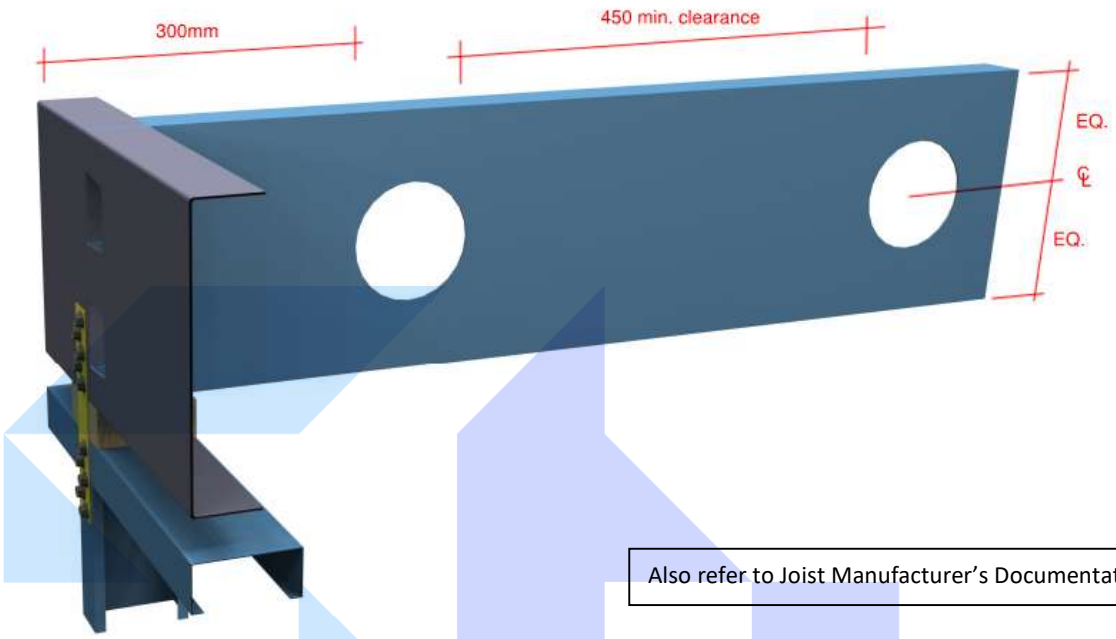
NON LOAD-BEARING WALL HOLD DOWN
(WALL ALONG JOISTS)



FJ/C150 NON STRUCTURAL PENETRATION
(ON SITE)



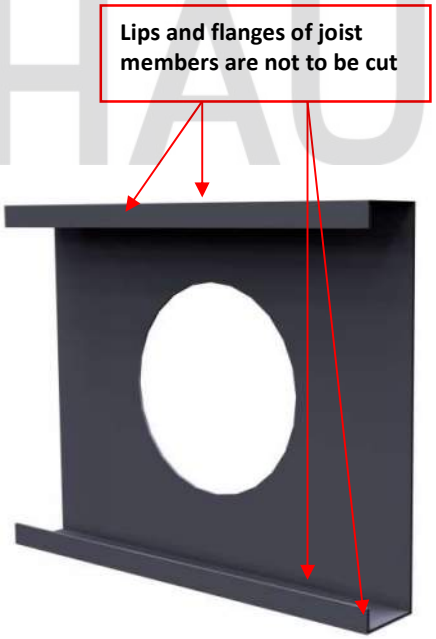
FJ/C150 NON STRUCTURAL PENETRATION
ELEVATION

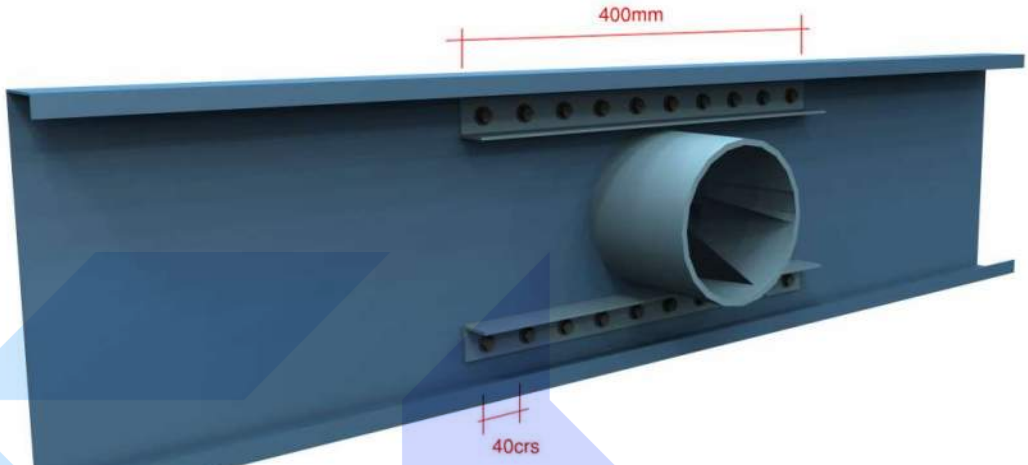


Also refer to Joist Manufacturer's Documentation

-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



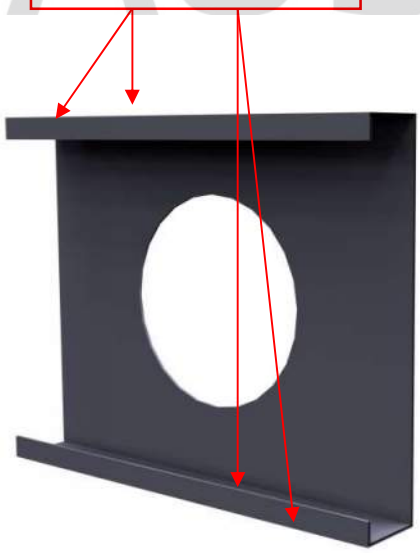


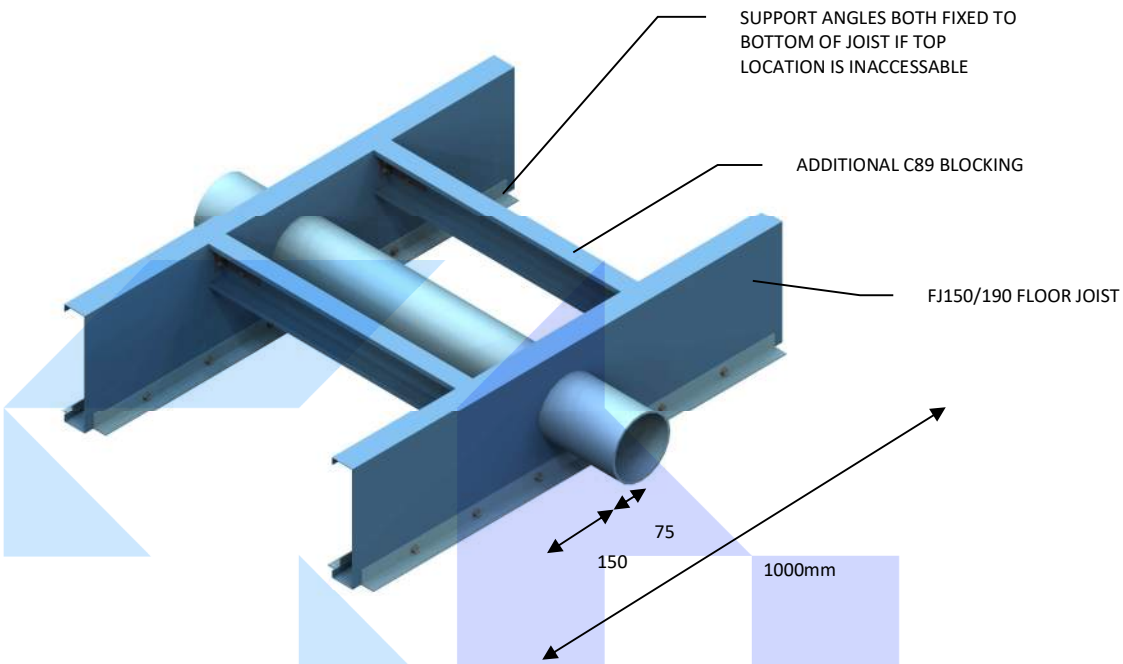
Also refer to Joist Manufacturer's Documentation

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

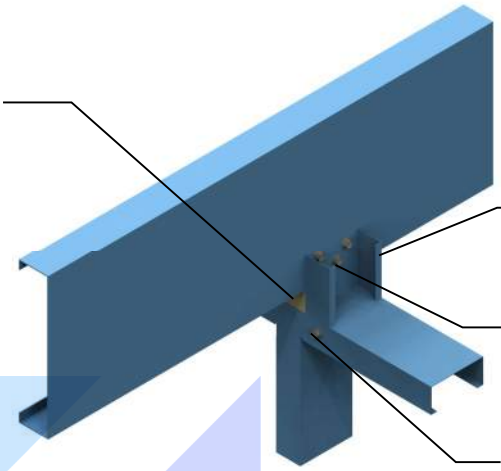
Lips and flanges of joist members are not to be cut



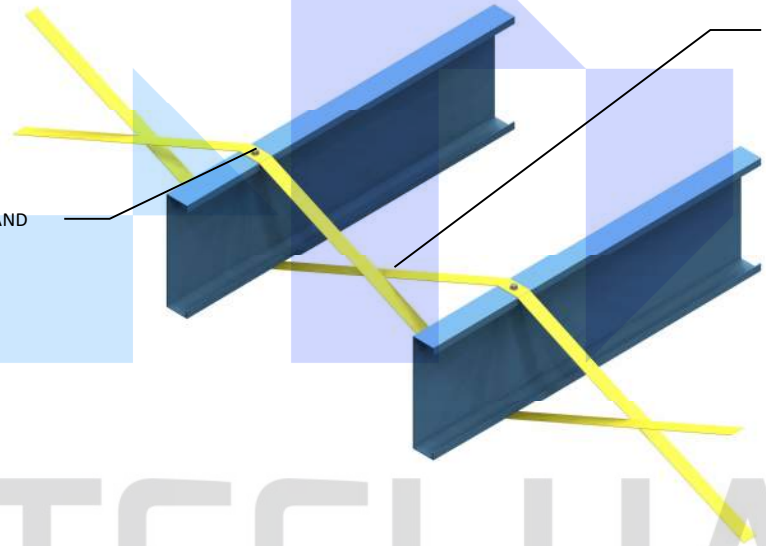


FJ150/190 FLOOR JOIST PENETRATION
ALTERNATIVE SUPPORT OPTION

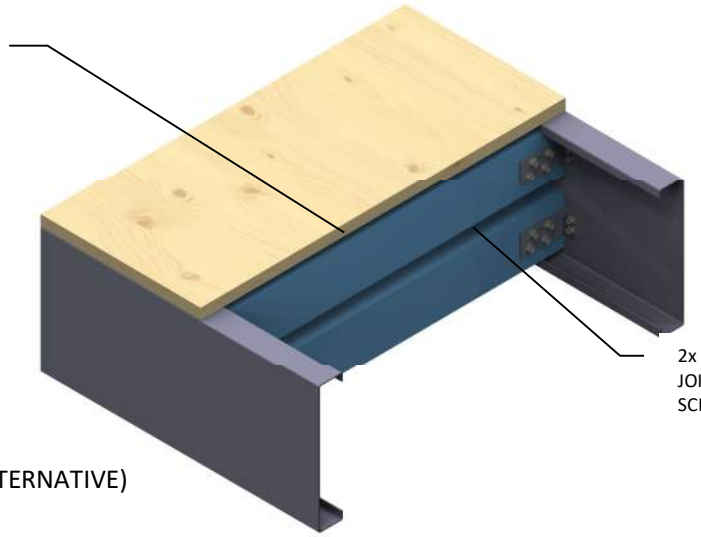
FJ150/190 FLOOR JOIST PENETRATION
ALTERNATIVE SUPPORT OPTION
(SECTION)



JOIST OVER LOAD BEARING WALL

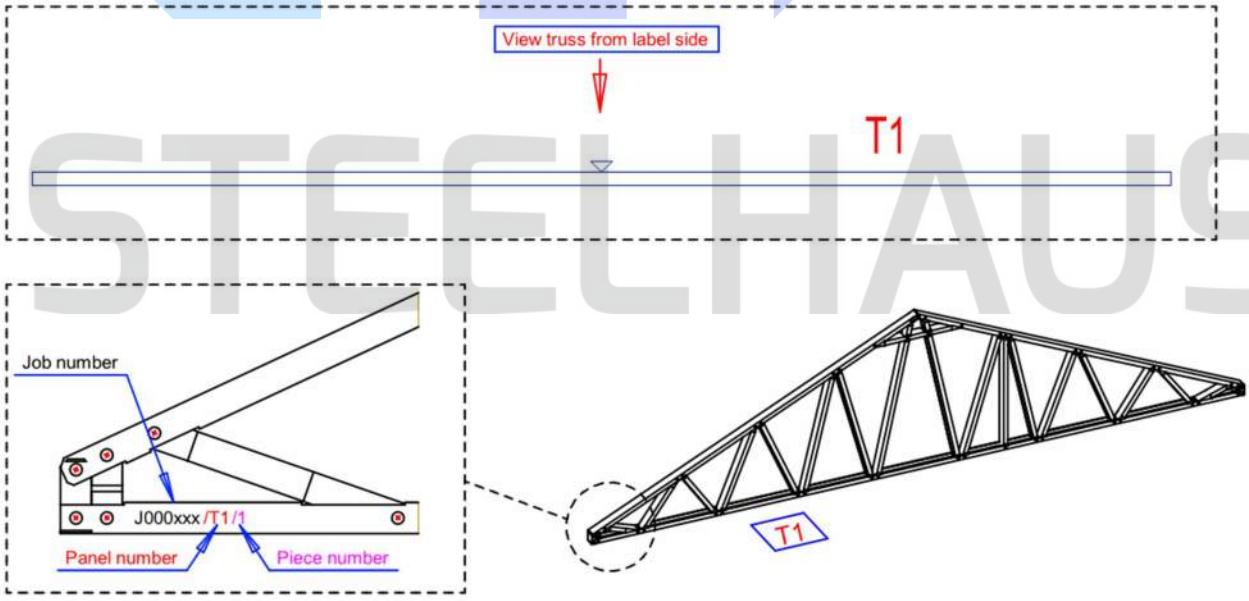


MID-SPAN STRAP BRACING

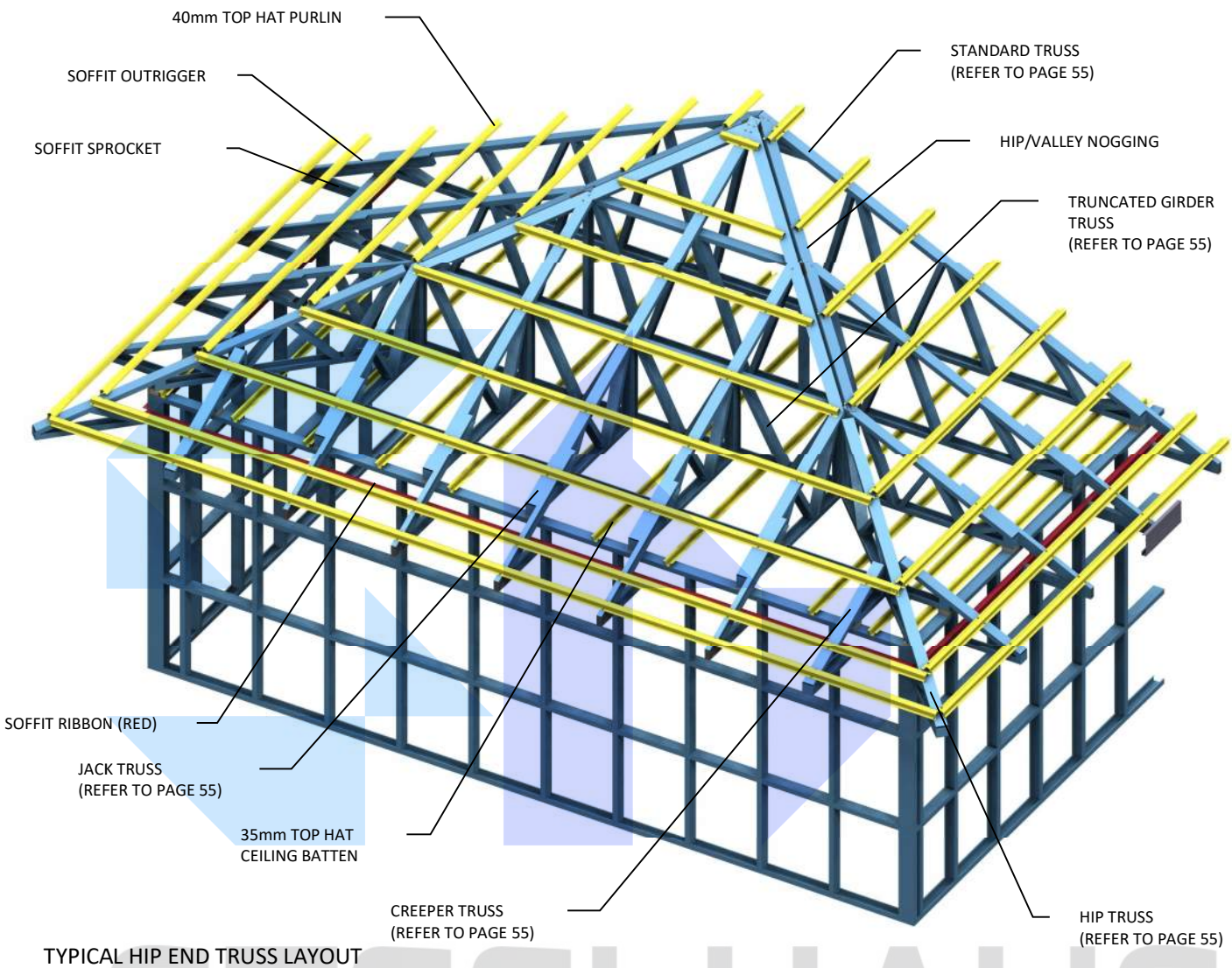


MID-SPAN BRACING (ALTERNATIVE)

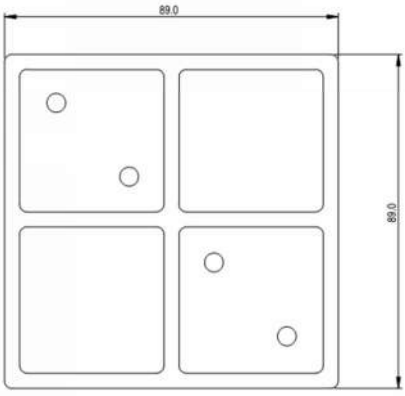
SECTION 3
ROOF FRAMING

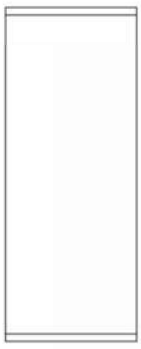


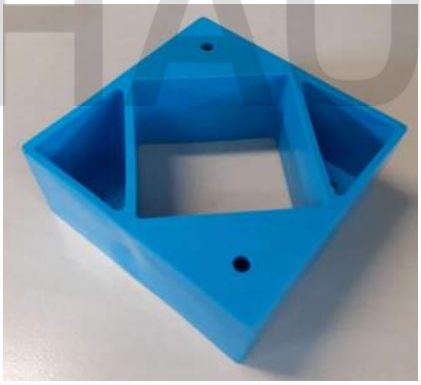
Truss Orientation



TYPICAL HIP END TRUSS LAYOUT

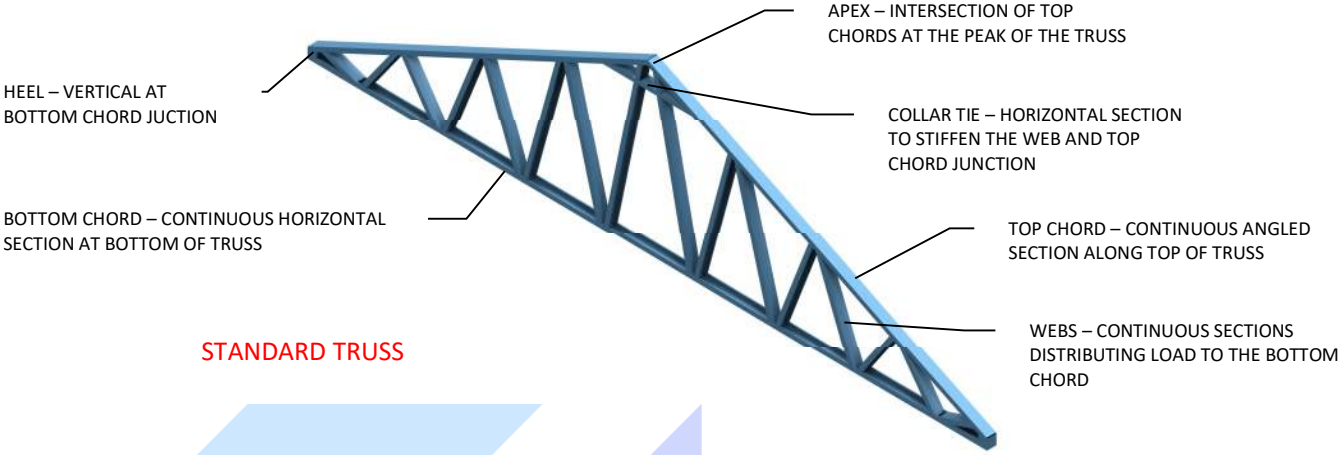




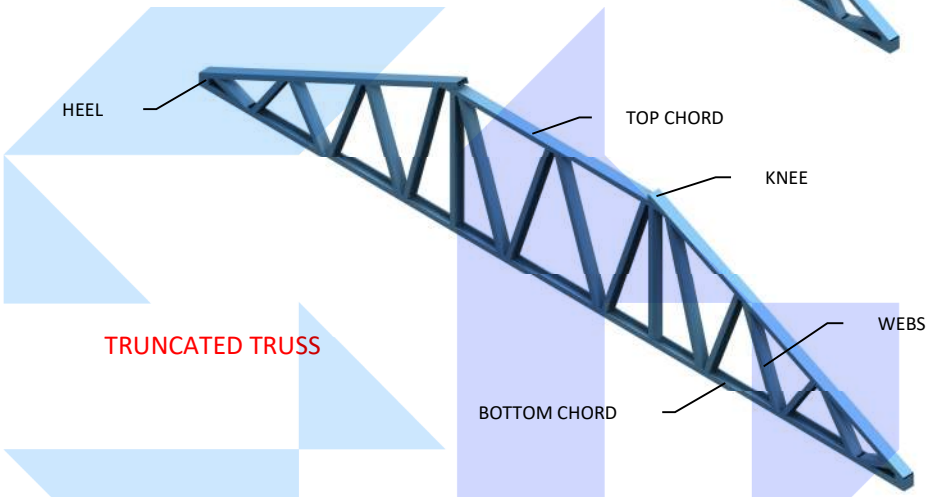


Polyethylene high density, PEH
Thermal Conductivity
- k -
W/(m K)
0.42 - 0.51

TOP PLATE PACKER/THERMAL BLOCK

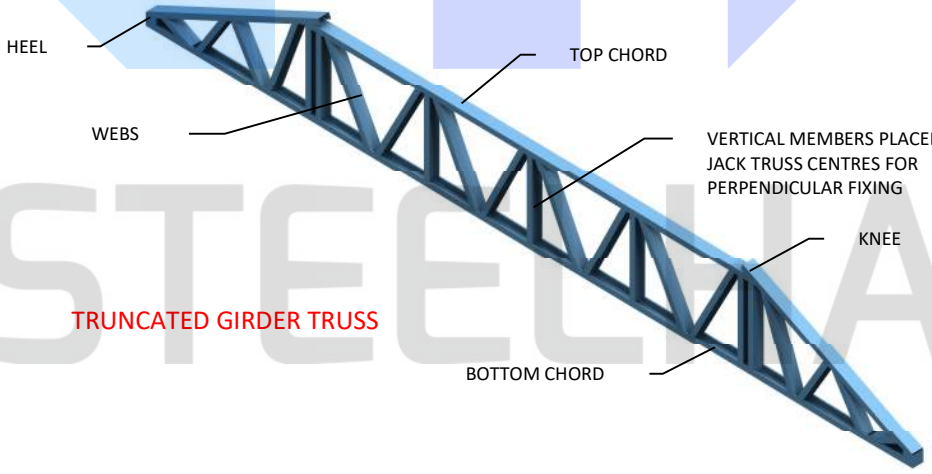


STANDARD TRUSS

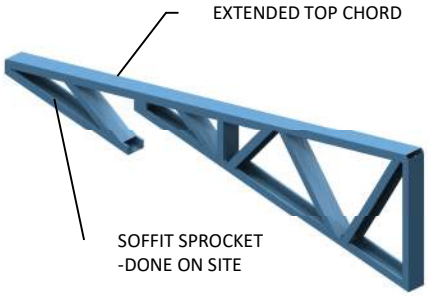


TRUNCATED TRUSS

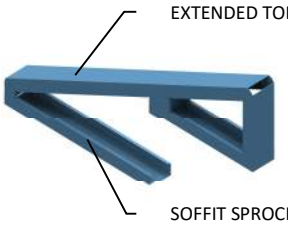
NOTE;
OUTRIGGERS, SOFFIT SPROCKETS AND WEBS TO BE INSTALLED ON SITE.



TRUNCATED GIRDER TRUSS

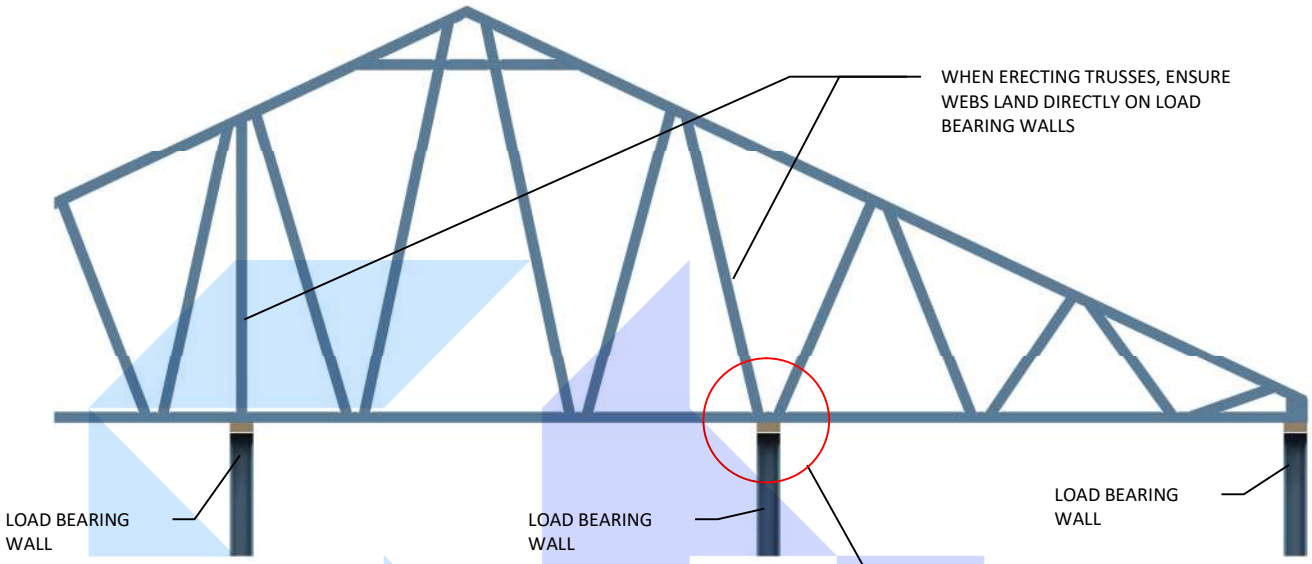


HIP TRUSS

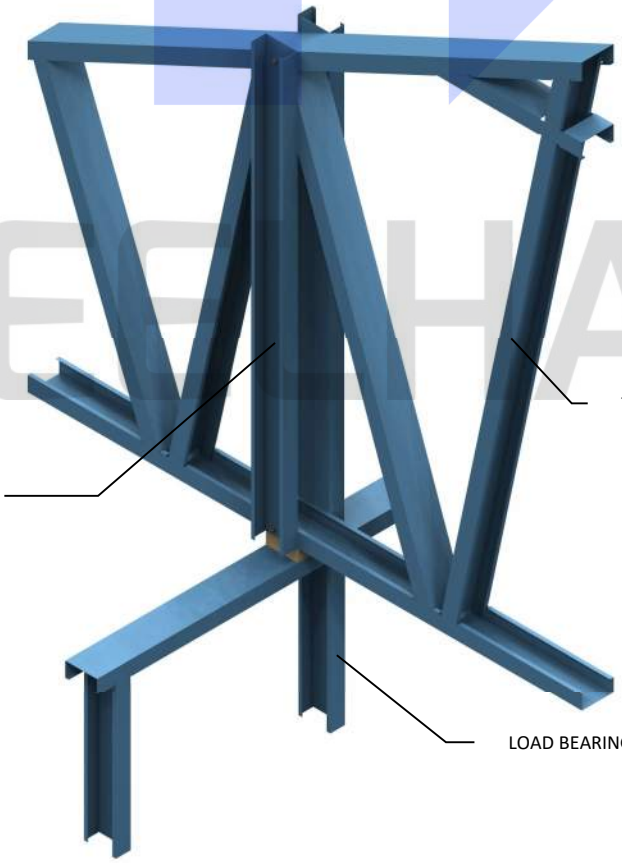


CREEPER TRUSS

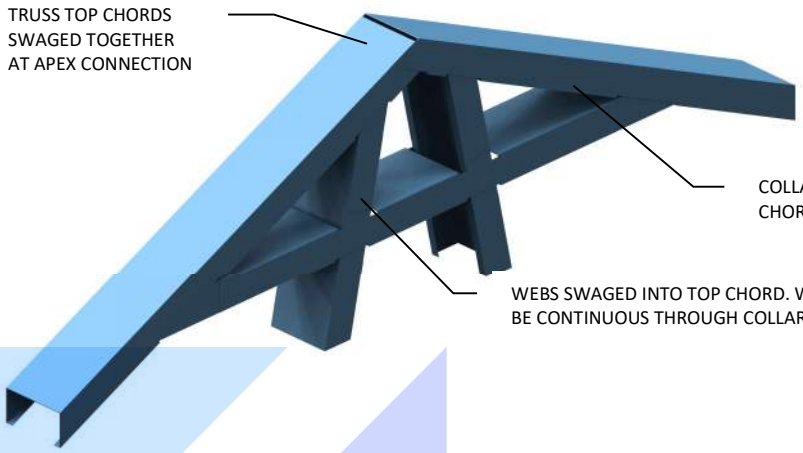
JACK TRUSS



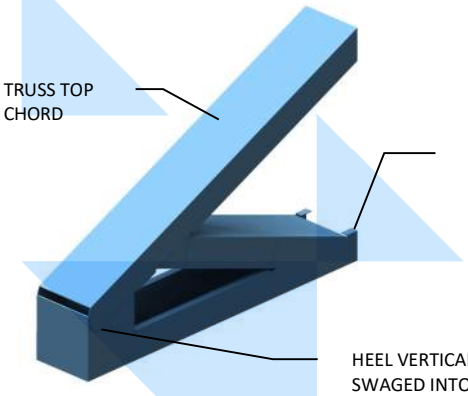
TRUSS POSITIONING ONTO LOAD BEARING WALLS



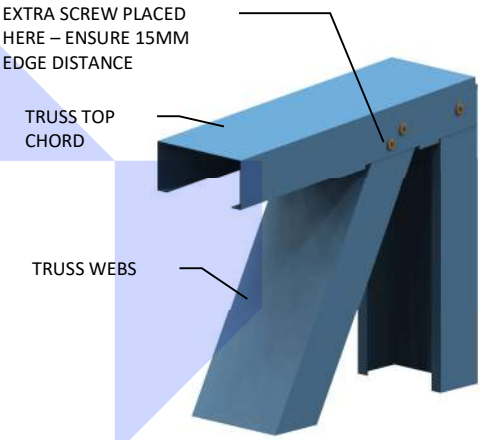
TRUSS POSITIONING ONTO LOAD BEARING WALLS- REMEDIAL



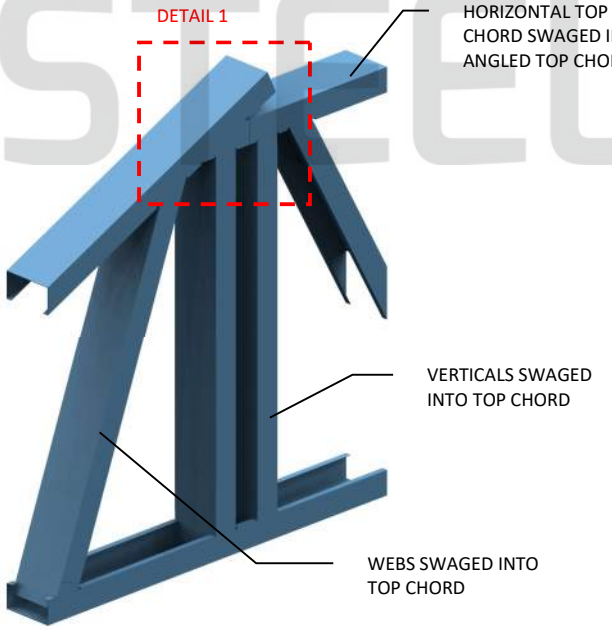
TRUSS APEX CONNECTION



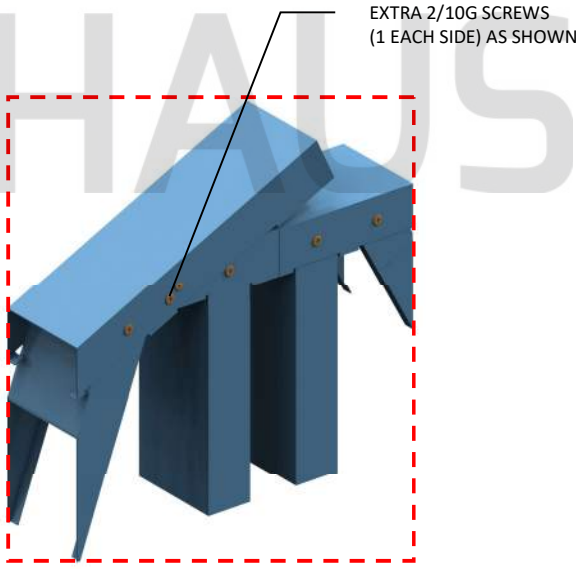
TRUSS HEEL CONNECTION



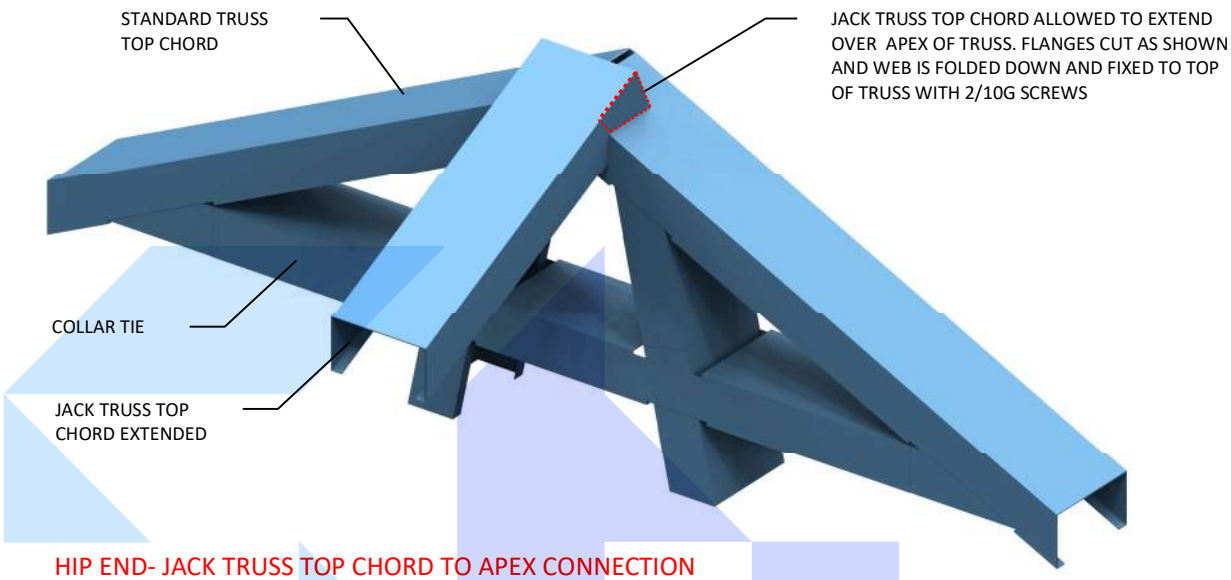
DOUBLE SCREW CONNECTION



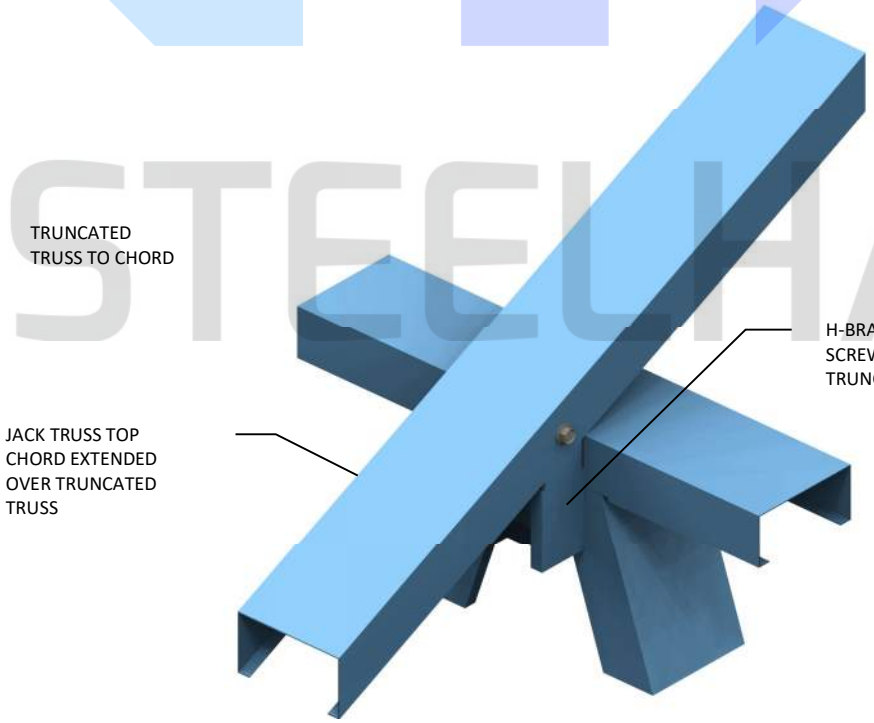
TRUNCATED TRUSS KNEE CONNECTION



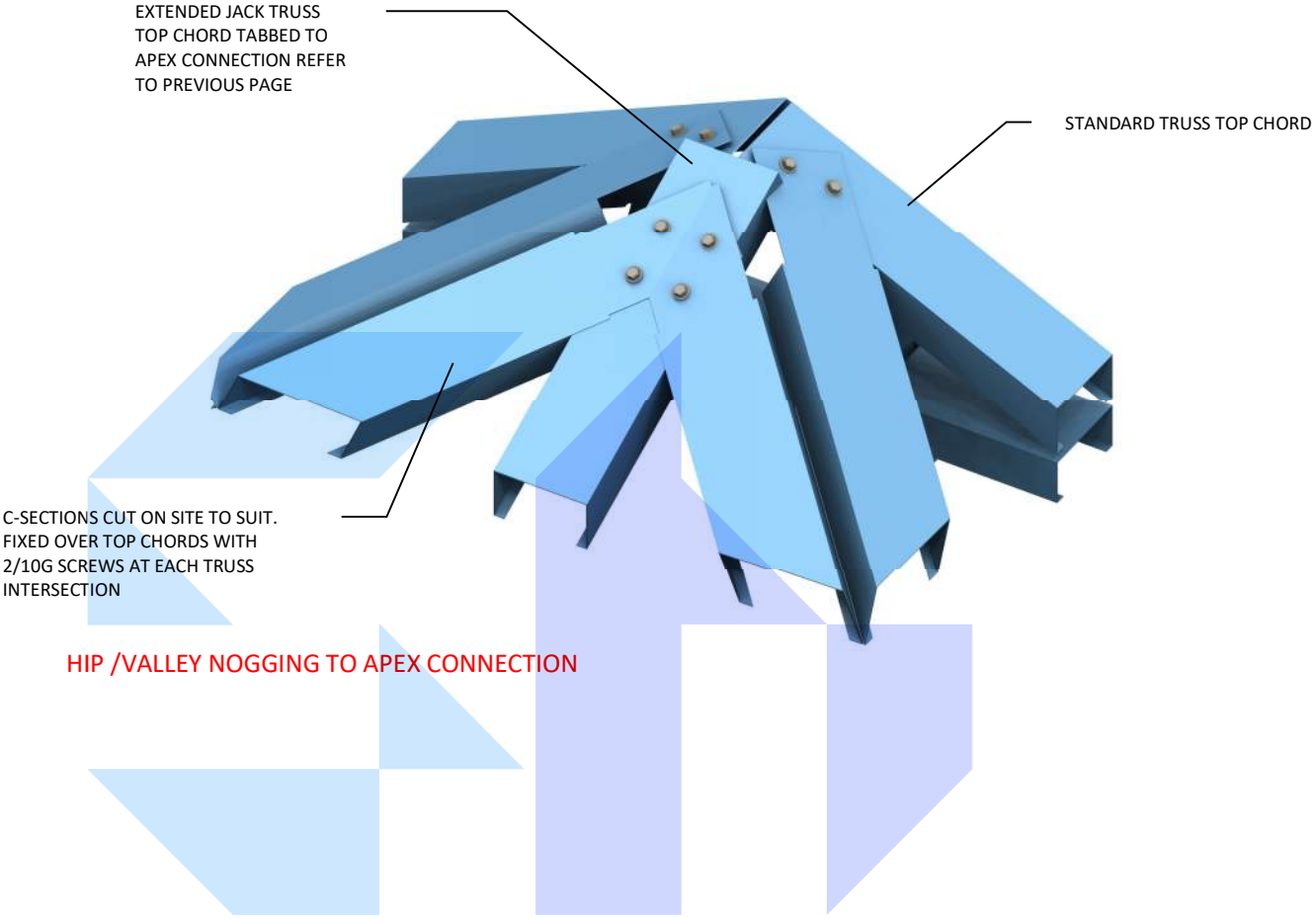
DETAIL 1



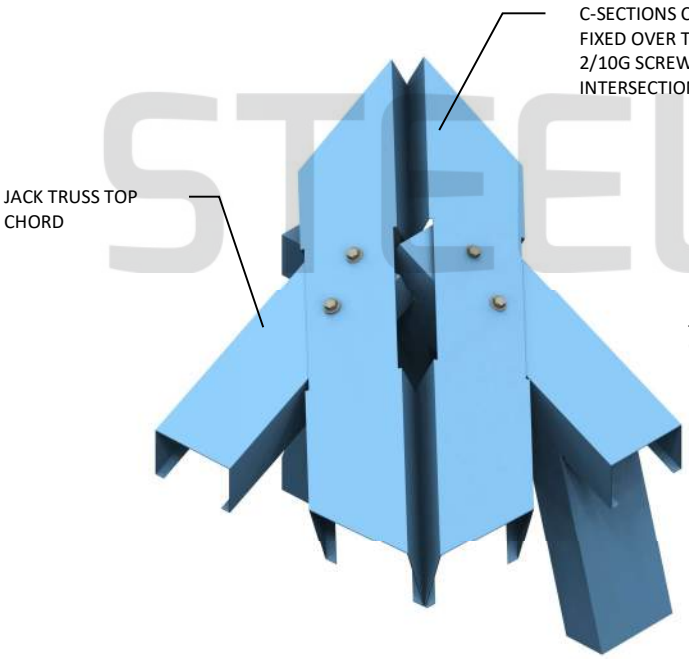
HIP END- JACK TRUSS TOP CHORD TO APEX CONNECTION



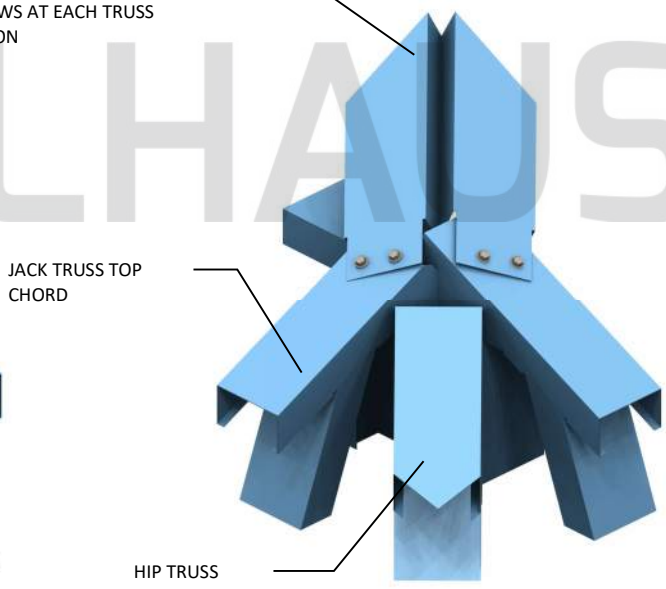
HIP END- JACK TRUSS TOP CHORD TO TRUNCATED TRUSS CONNECTION



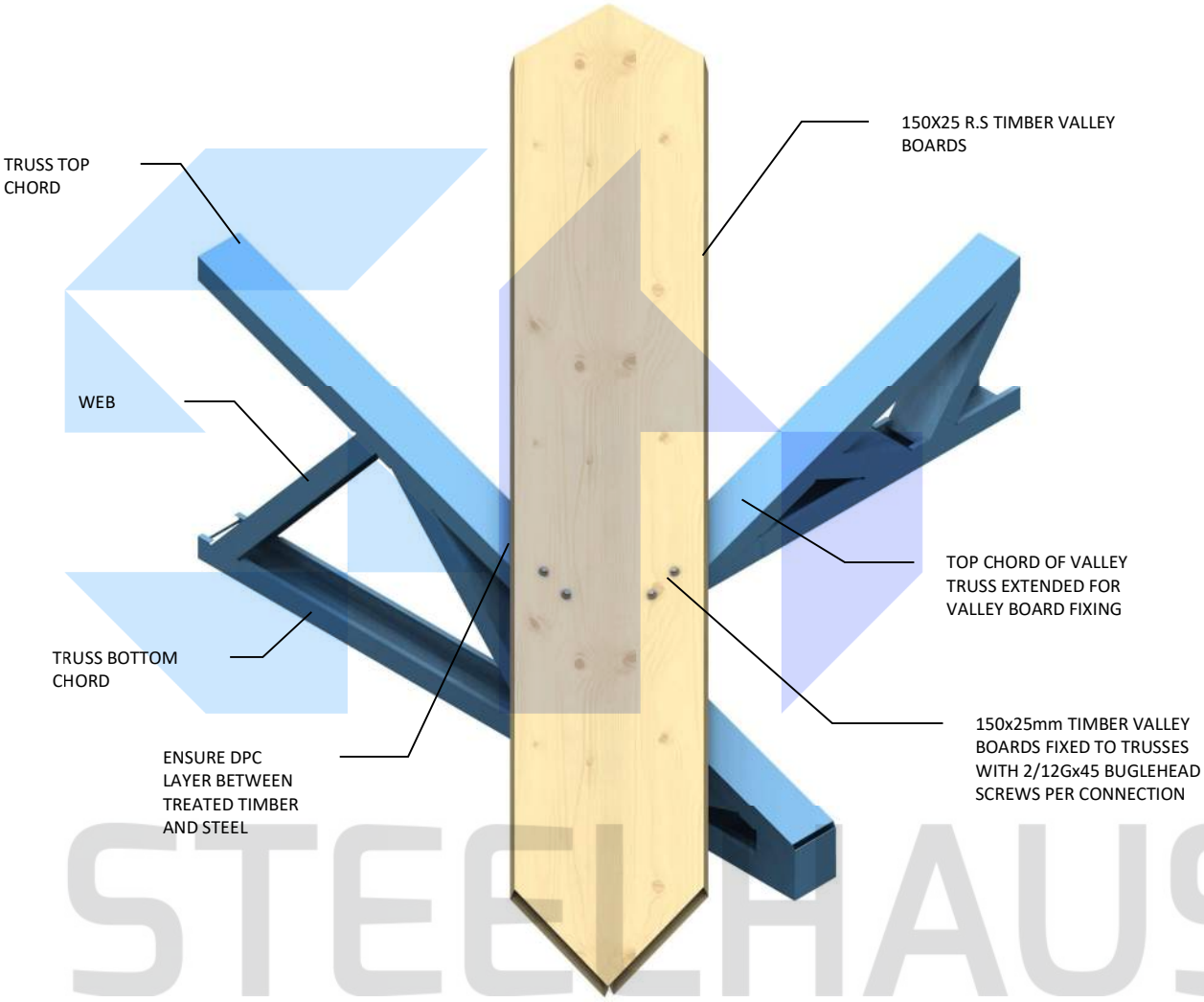
HIP /VALLEY NOGGING TO APEX CONNECTION



HIP /VALLEY NOGGING OVER TRUNCATED TRUSS CONNECTION

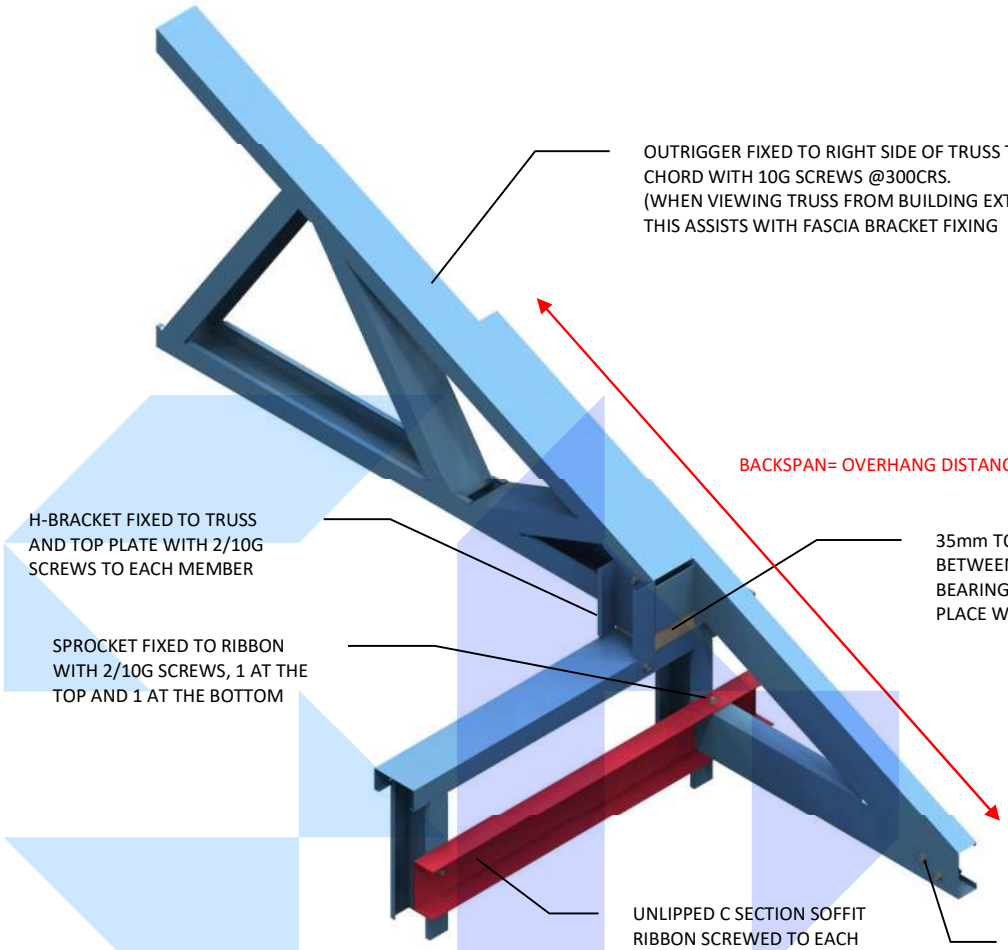


HIP /VALLEY NOGGING AT HIP TRUSS CONNECTION



VALLEY BOARDS TO TRUSS CONNECTION

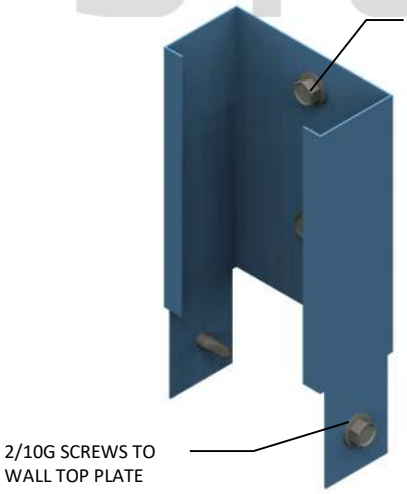
VALLEY BOARD FIXING – 12Gx45mm BUGLE HEAD SCREW



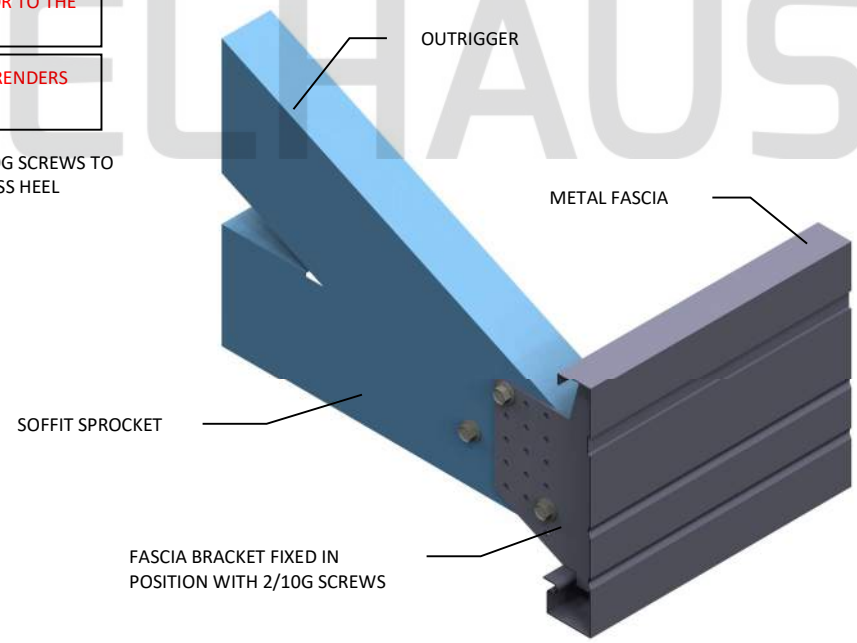
TRUSS HOLD-DOWN INCLUDING SOFFIT CONSTRUCTION

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.

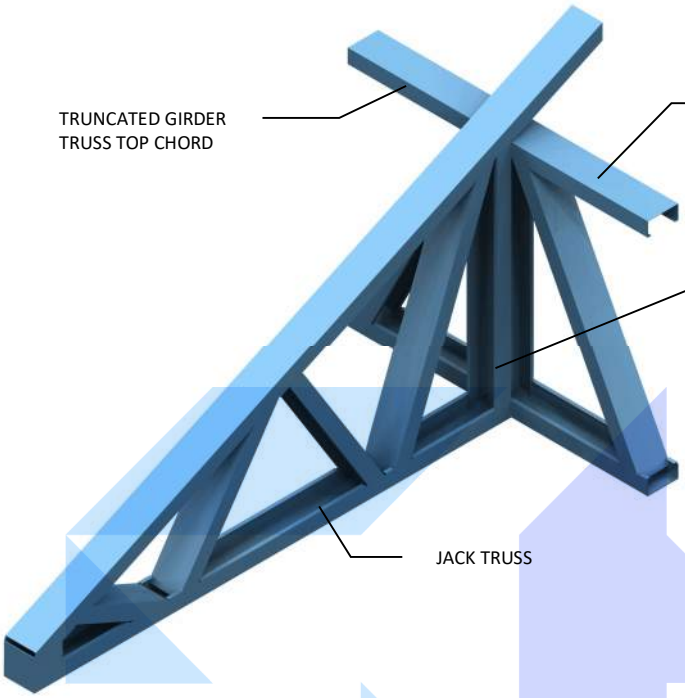
THERMAL BREAK AND BUILDING PAPER IS NOT SHOWN IN RENDERS FOR VISUAL CLARITY



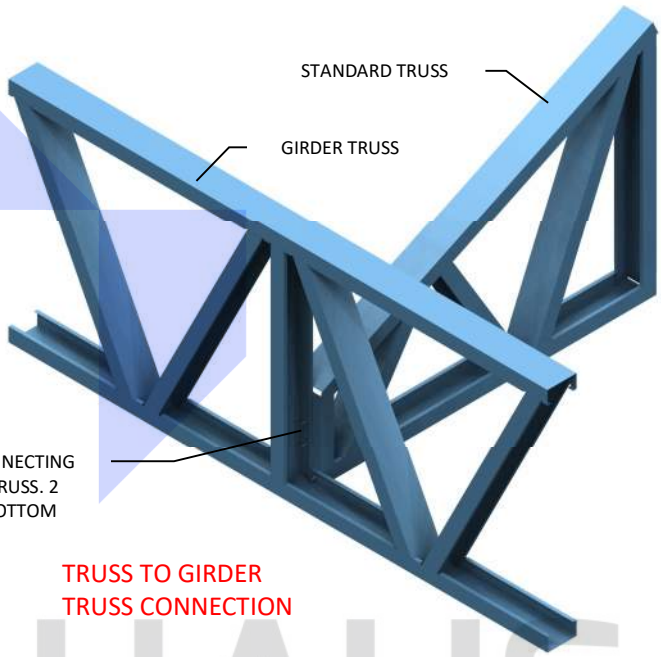
H-BRACKET CLOSE-UP



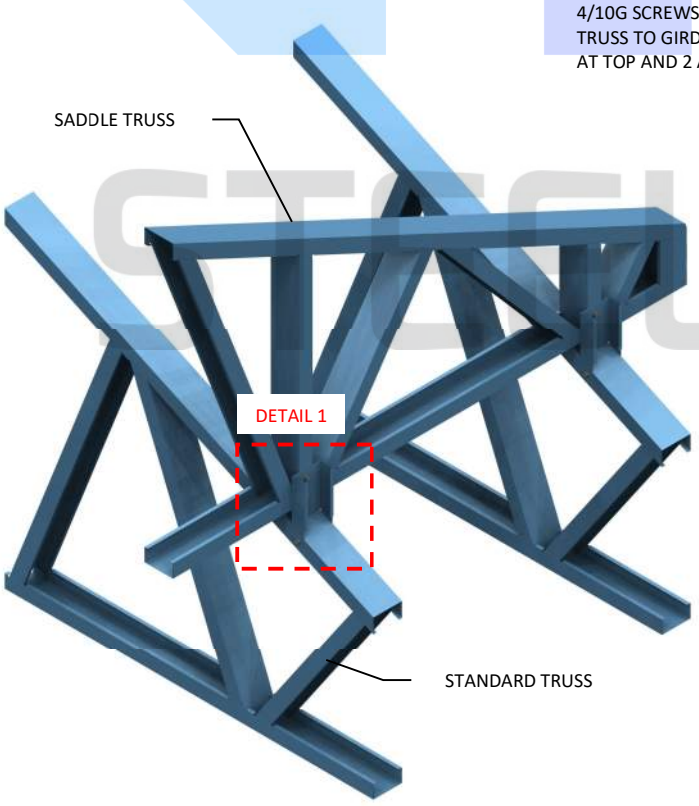
FASCIA BRACKET FIXING DETAIL



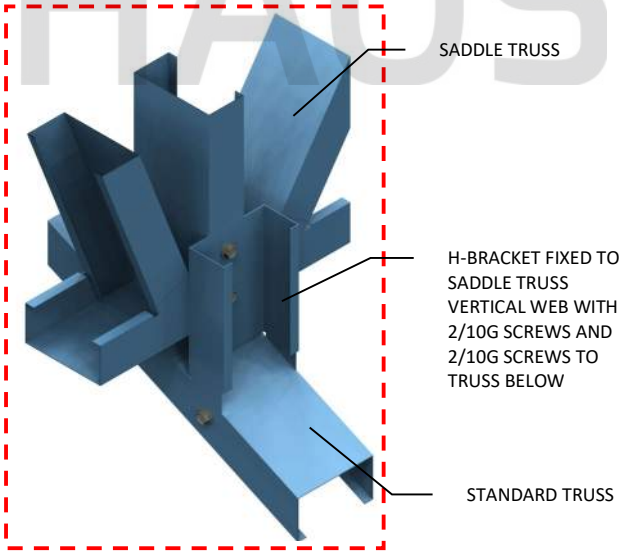
JACK TRUSS TO TRUNCATED GIRDER TRUSS CONNECTION



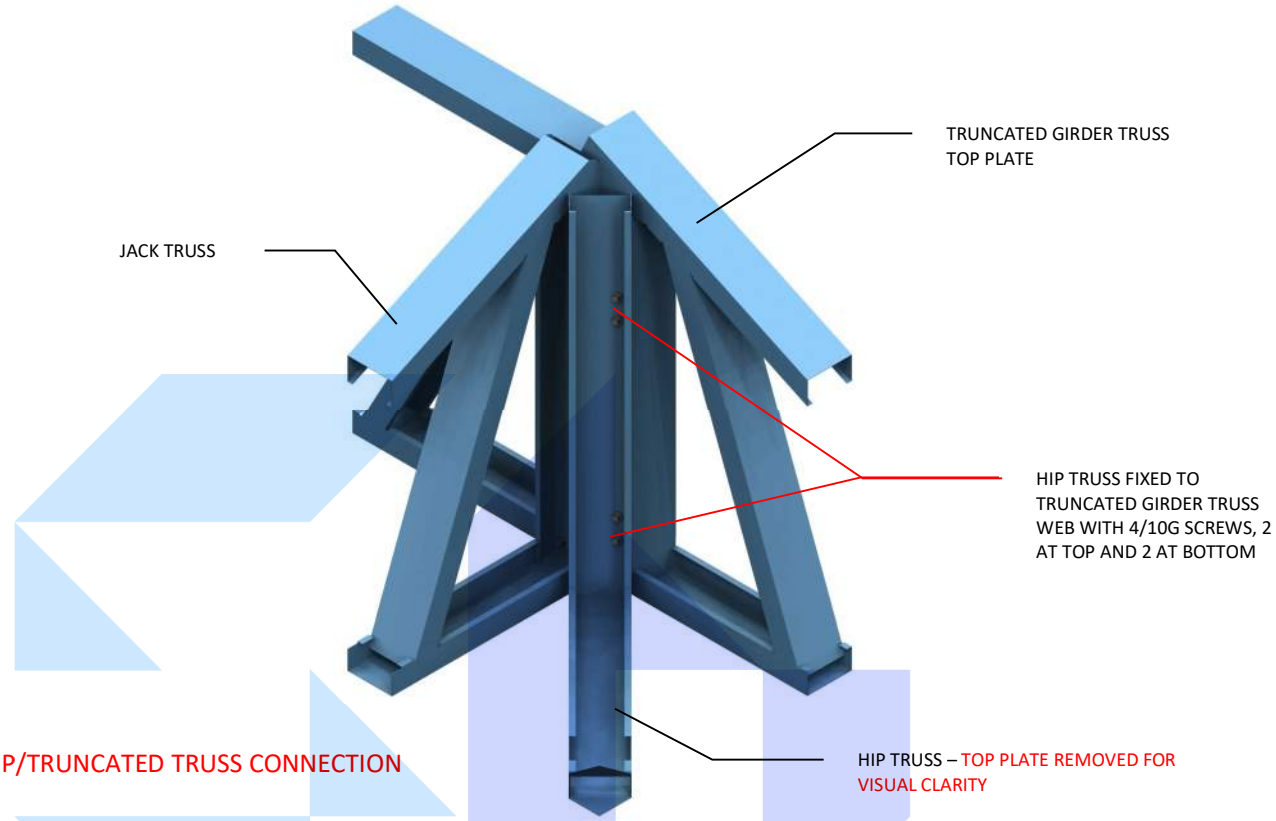
TRUSS TO GIRDER TRUSS CONNECTION



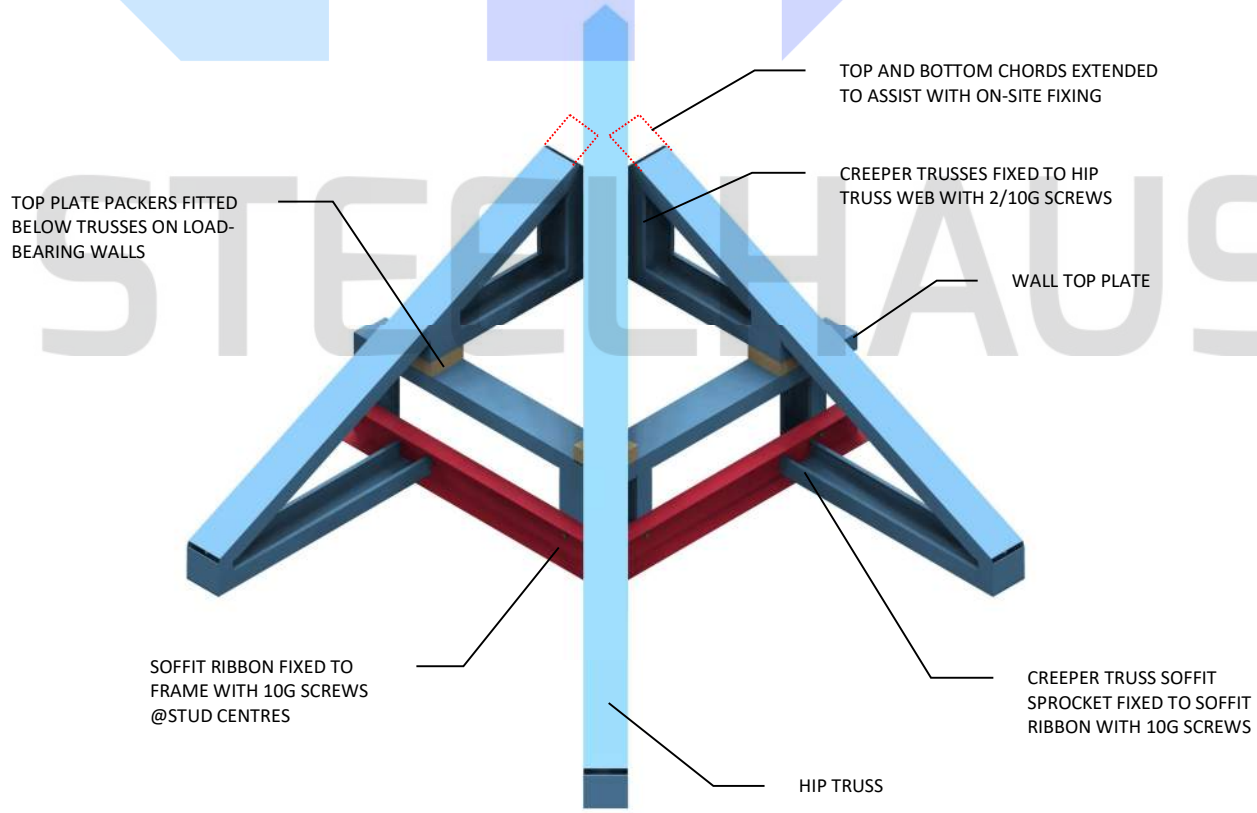
SADDLE TRUSS TO STANDARD TRUSS CONNECTION



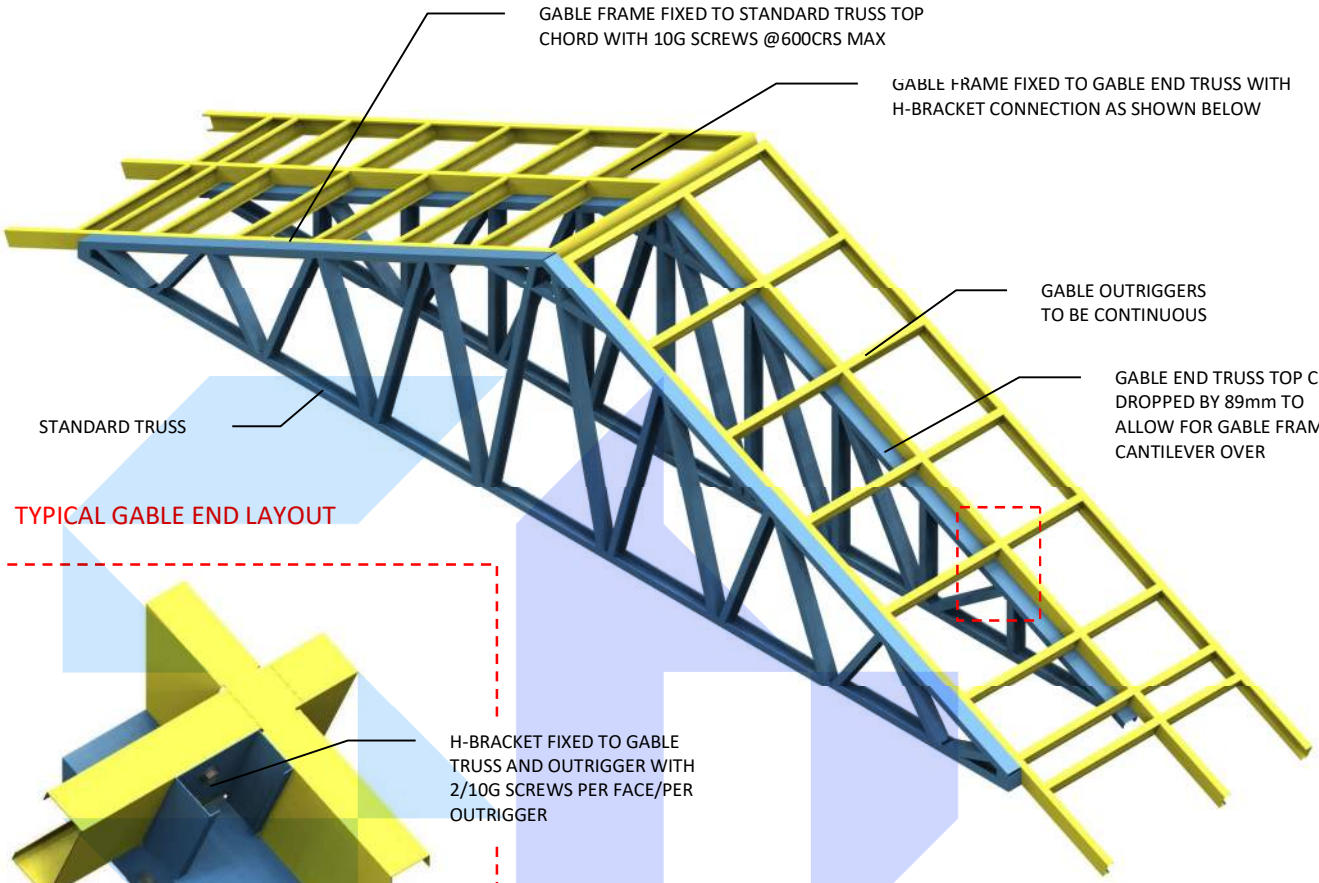
DETAIL 1



HIP/TRUNCATED TRUSS CONNECTION



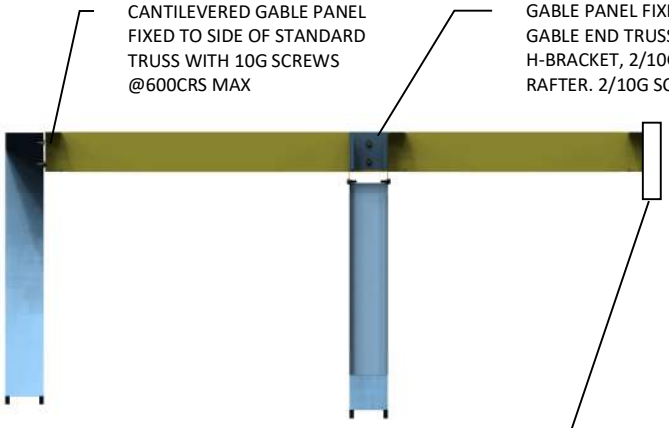
SADDLE TRUSS TO STANDARD TRUSS CONNECTION



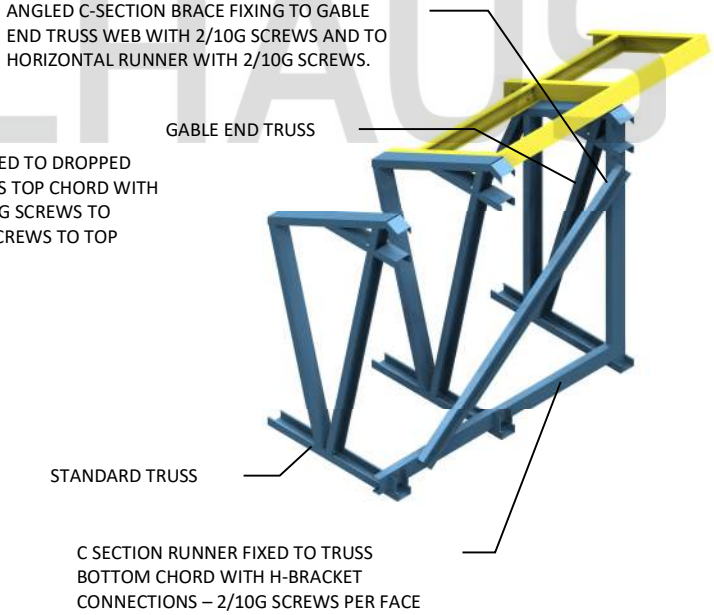
TYPICAL GABLE END LAYOUT

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

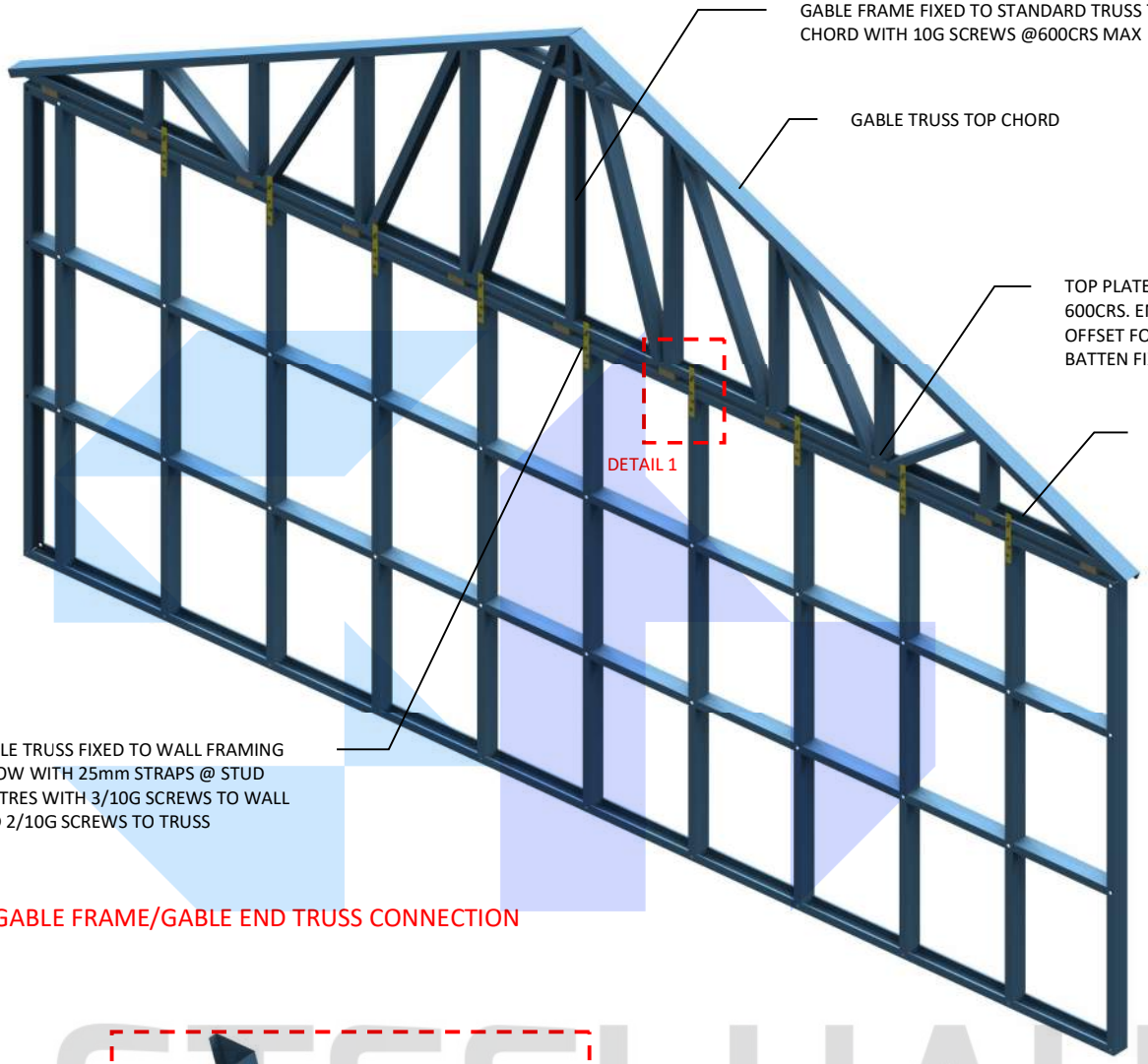
GABLE FRAME/GABLE END TRUSS CONNECTION



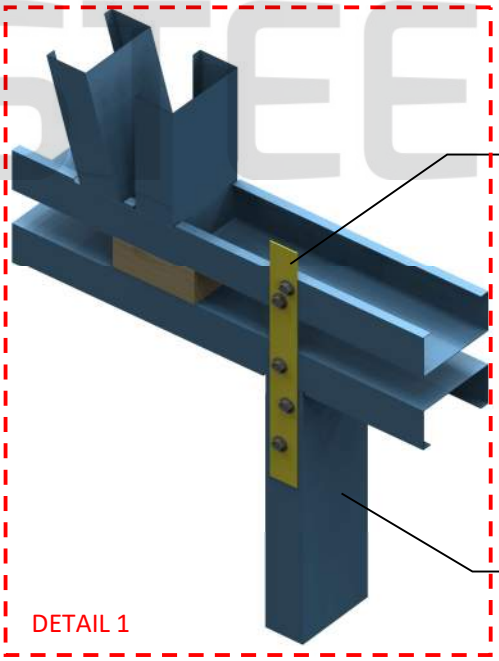
SADDLE TRUSS TO STANDARD TRUSS CONNECTION

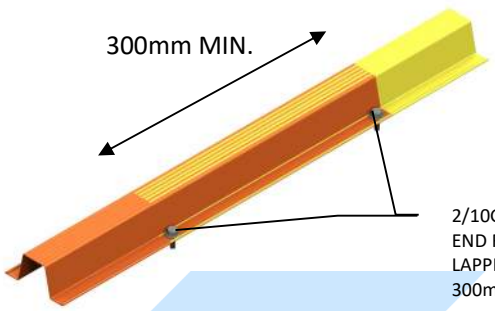


GABLE END TRUSS BRACING

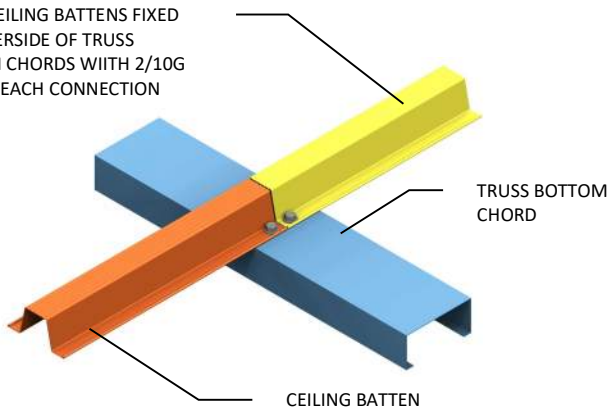


GABLE FRAME/GABLE END TRUSS CONNECTION

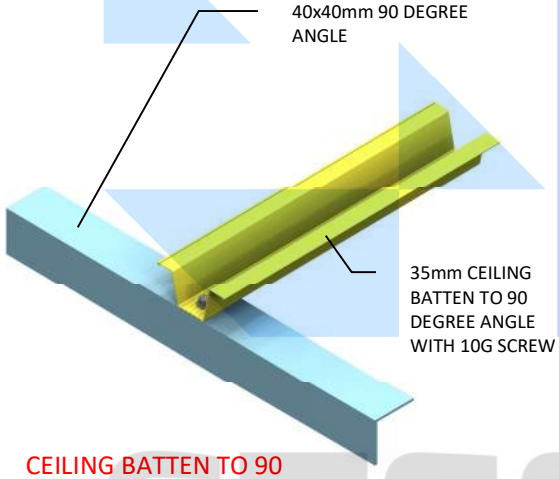




CEILING BATTEN JOINT (NOT ON TRUSS)



CEILING BATTEN JOINT (ON TRUSS)

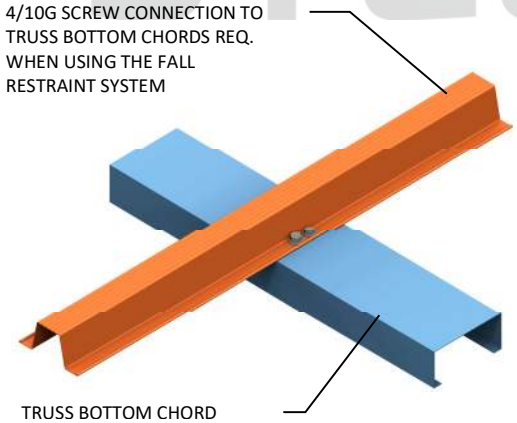


CEILING BATTEN TO 90 DEGREE BEND ANGLE

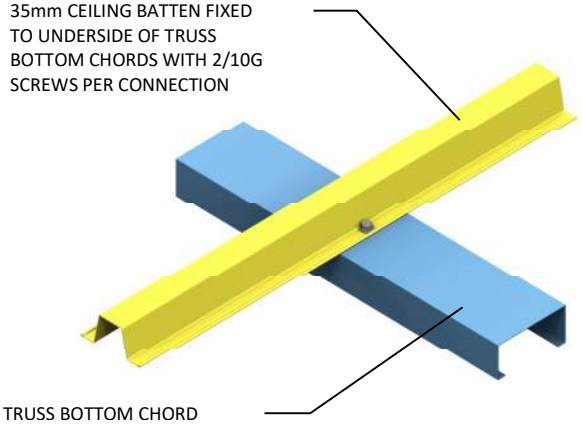
Ceiling Battens
35mm Top Hat Section
Proprietary ceilings with 0.5kPa Live load

Table of max span vs. Spacings

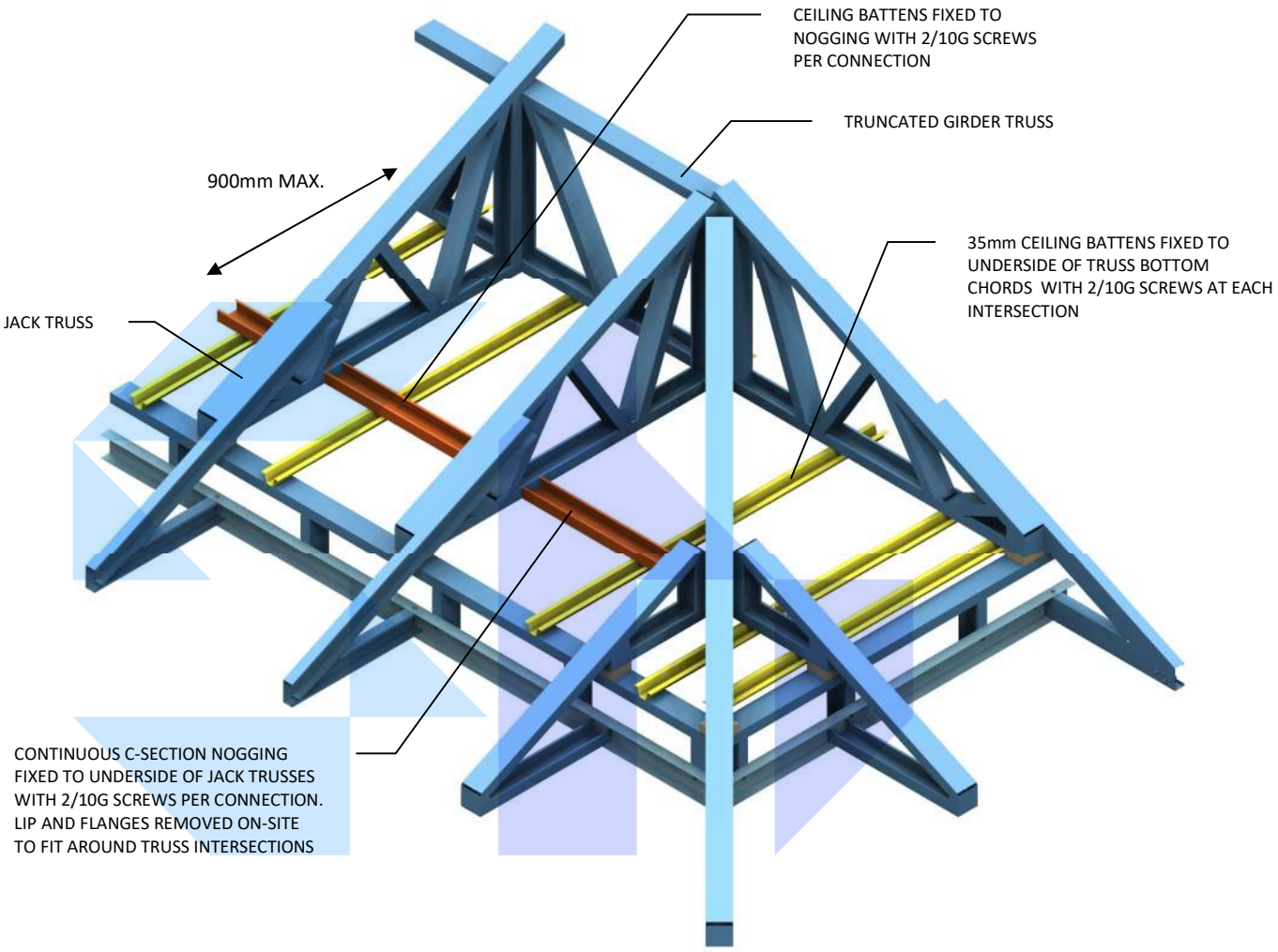
	Section Spacings (mm) 400 Span (m)	450 Span (m)	600 Span (m)	Fias based on Deflection L/500
Using 10mm gib ceilings	1.7	1.5	1.4	
Using 13mm gib ceilings	1.5	1.4	1.3	
Using 16mm gib Ceilings	1.4	1.4	1.2	
Using 20mm gib Ceilings	1.3	1.3	1.2	



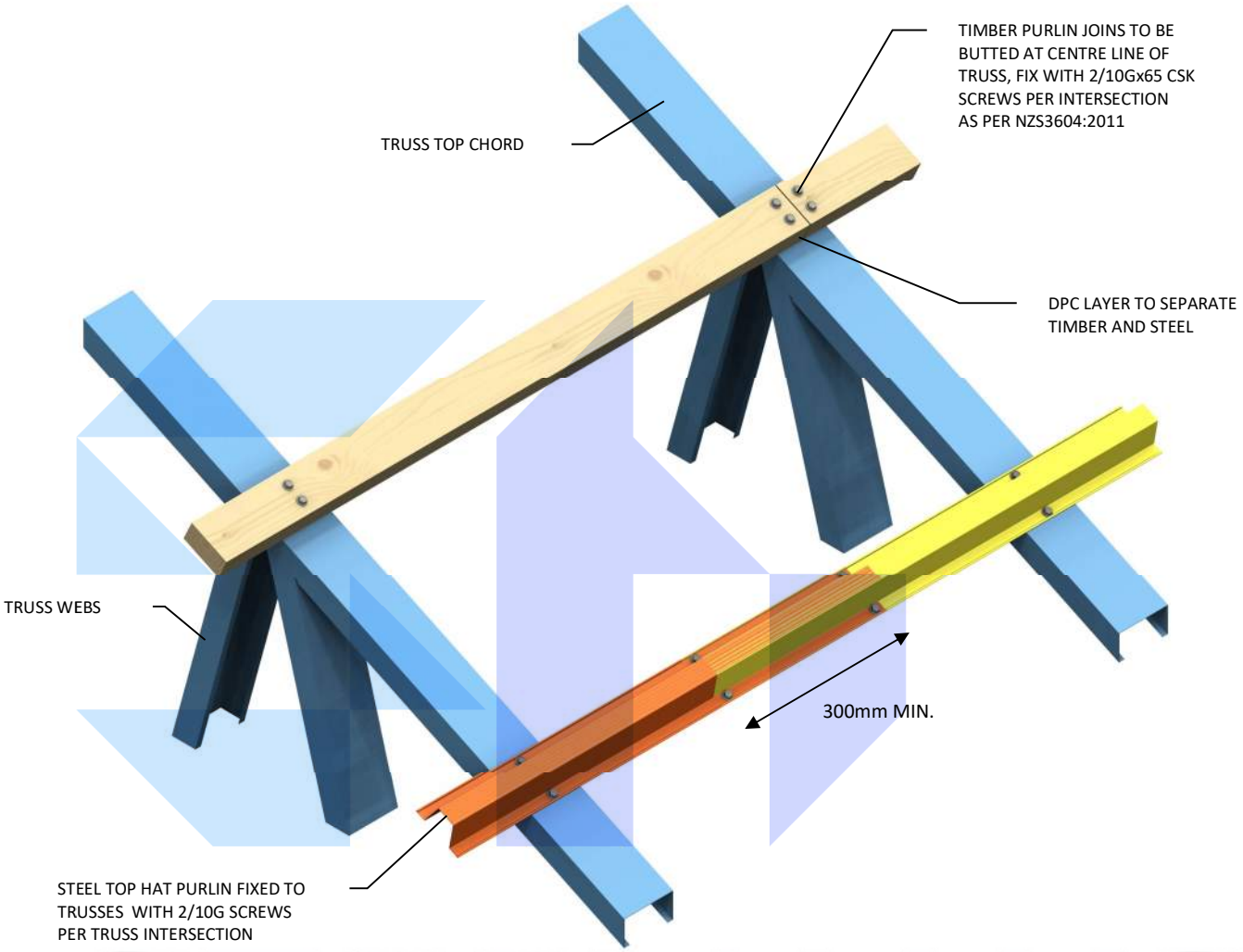
CEILING BATTEN TO TRUSS CONNECTION (IF USED WITH FALL RESTRAIN SYSTEM)



CEILING BATTEN TO TRUSS CONNECTION (STANDARD)



CEILING BATTEN NOGGING ON HIP-END ROOF



STEEL/TIMBER PURLINS TO TRUSS CONNECTIONS

40 x 74 x 0.75BMT Tophat Purlins

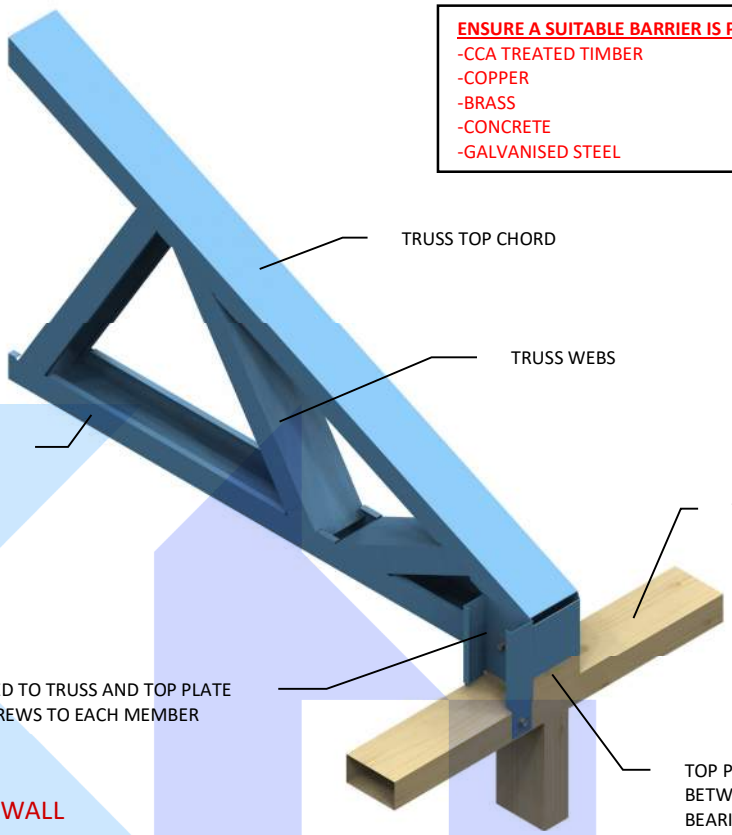
Purlin Spacing	Purlin Span	Low kN	32 Type	Med kN	37 Type	High kN	44 Type	V High kN	50 Type	E High kN	55 Type
0.9	0.9	0.77	A	1.05	A	1.50	A	1.96	A	2.38	B
0.9	1.2	1.03	A	1.40	A	2.01	B	2.61	B	N/A	N/A

Type	Fastener
A	2 x 10G 16x16 Hex Head screws
B	3 x 10G 16x16 Hex Head screws

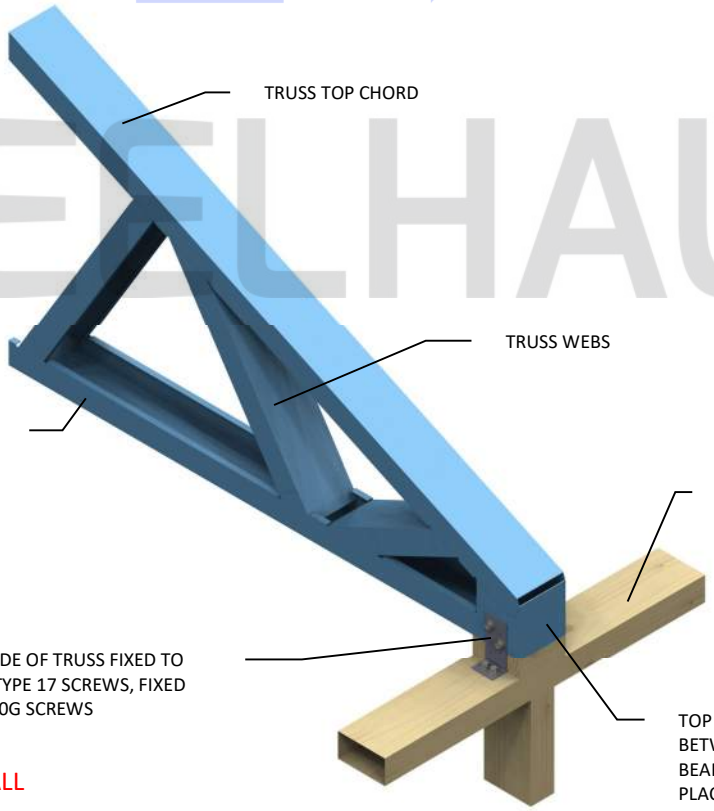
Suitable for elevations < 200 metres (All snow regions), otherwise refer to structural engineer.

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

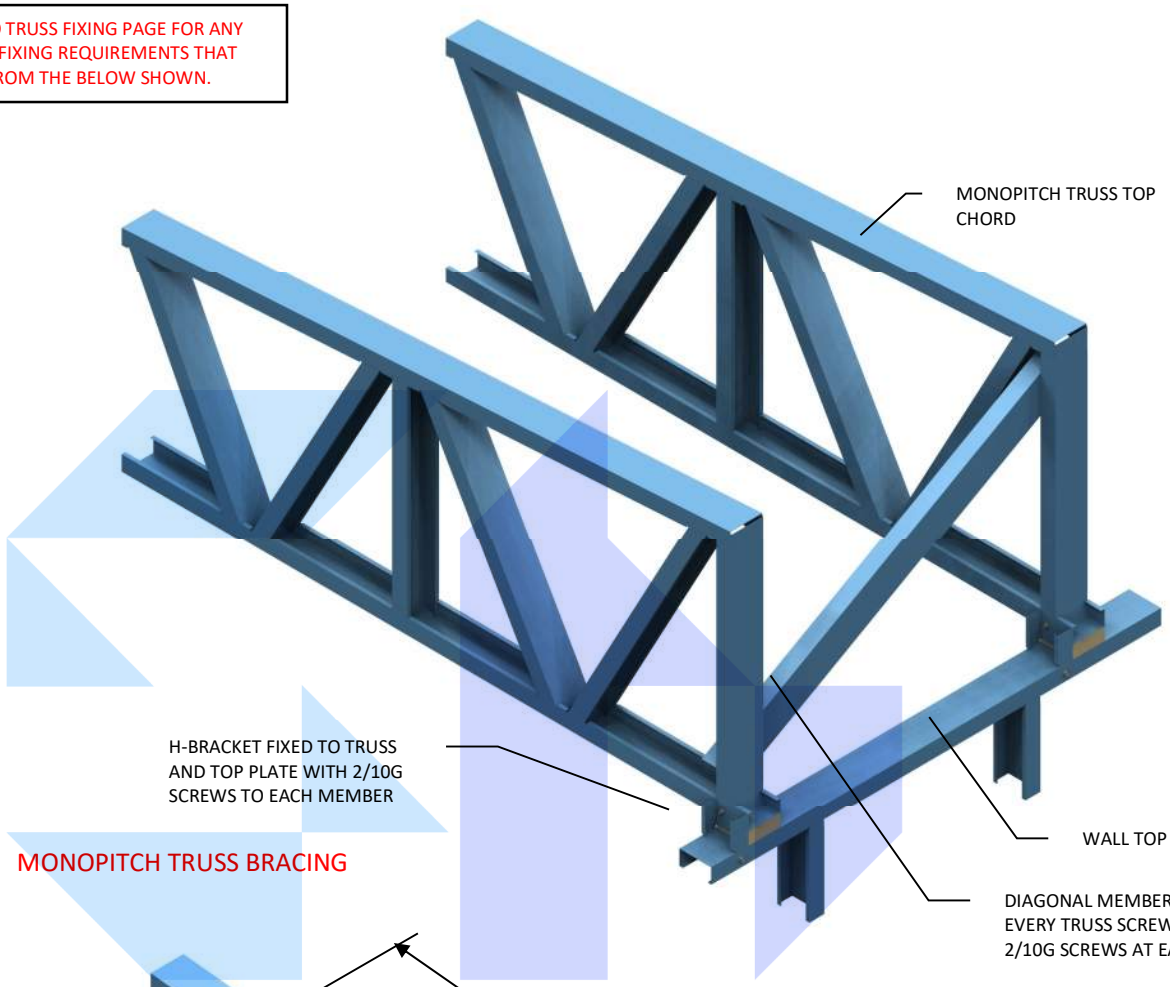


STEEL TRUSS TO TIMBER WALL OPTION 1

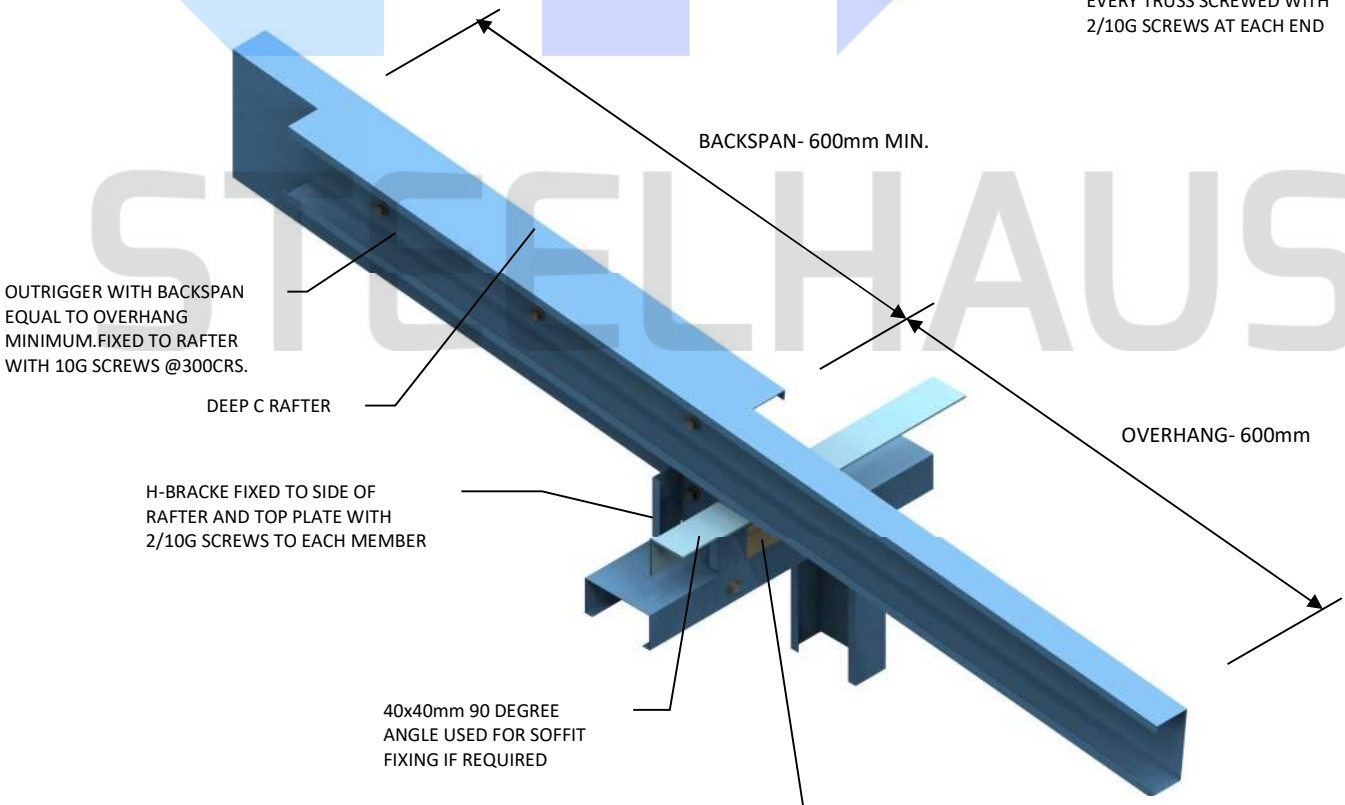


STEEL TRUSS TO TIMBER WALL OPTION 2

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



MONOPITCH TRUSS BRACING



MONO-SOFFIT CONSTRUCTION

STEELHAUS

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

MONOPITCH BRACING/ SOFFIT CONSTRUCTION

DATE	March 19, 2020
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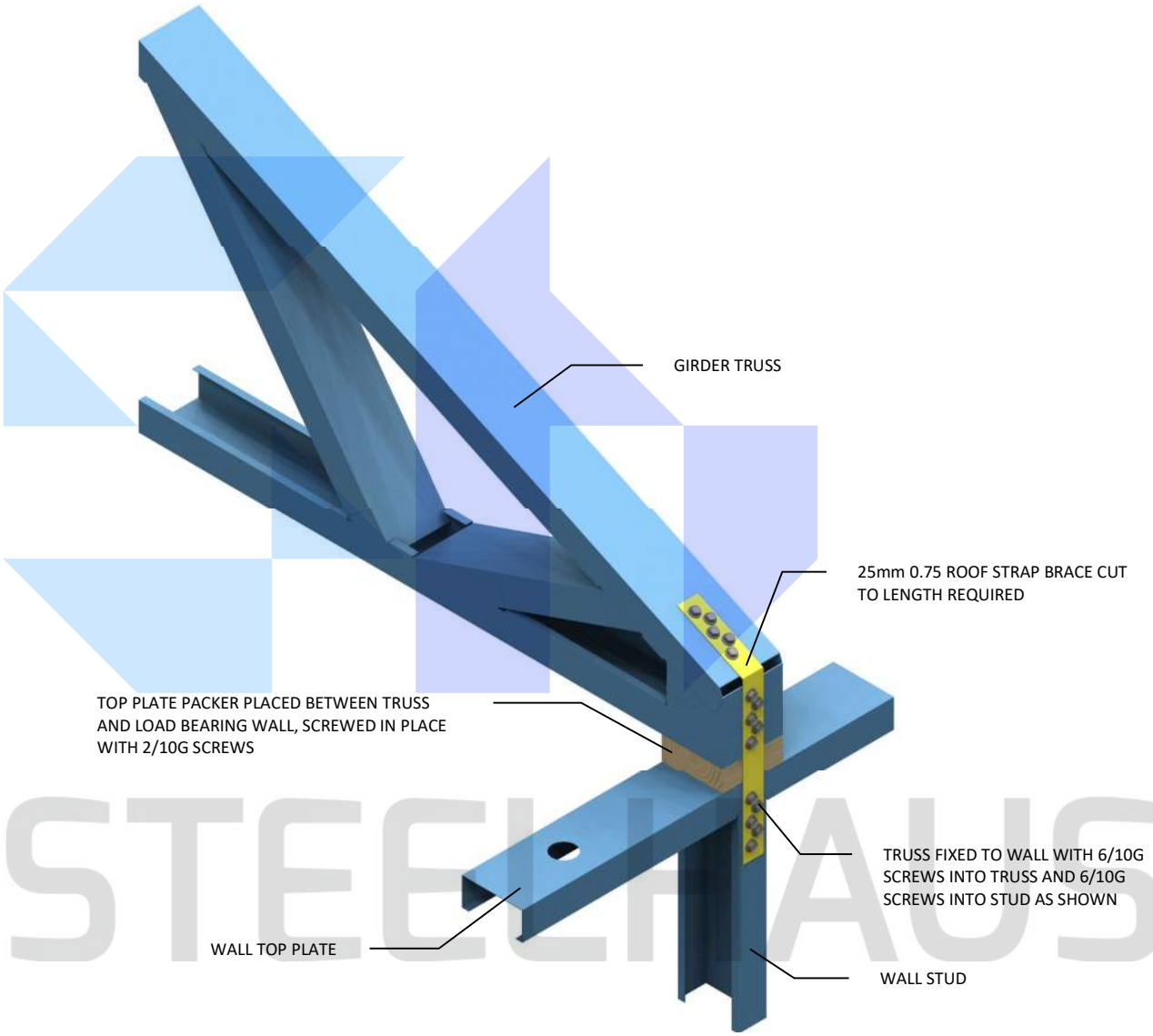
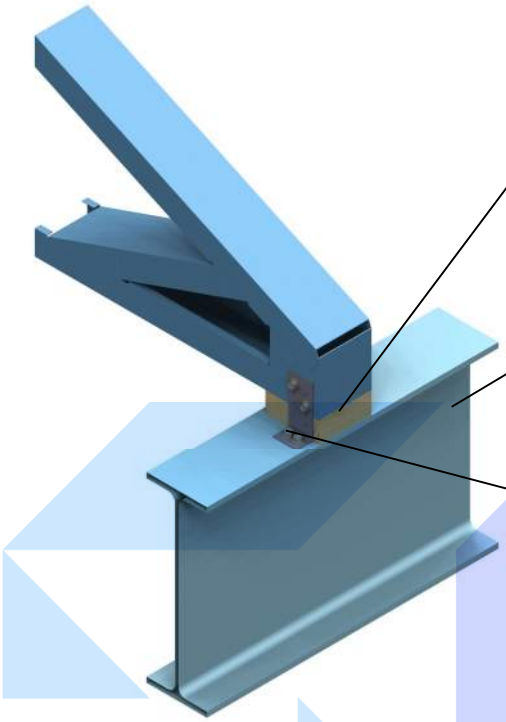
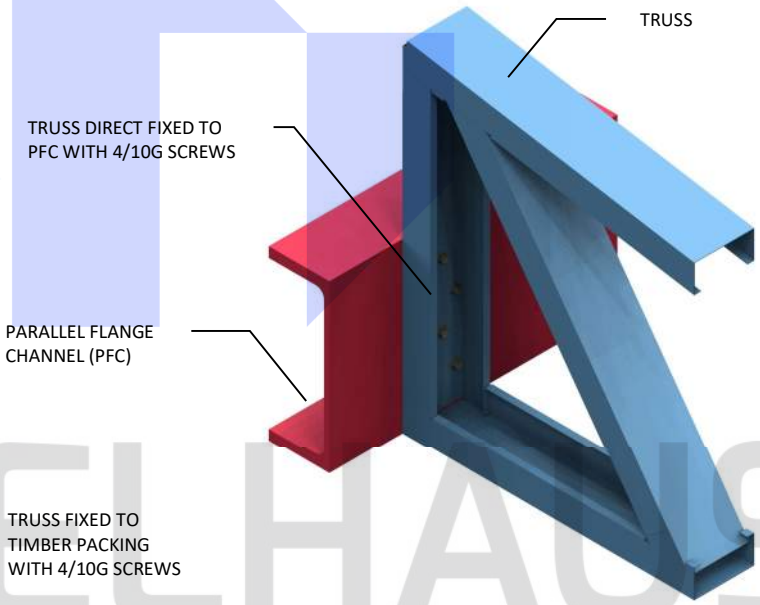
REFER TO TRUSS FIXING PAGE FOR ANY SPECIFIC FIXING REQUIREMENTS THAT DIFFER FROM THE BELOW SHOWN.



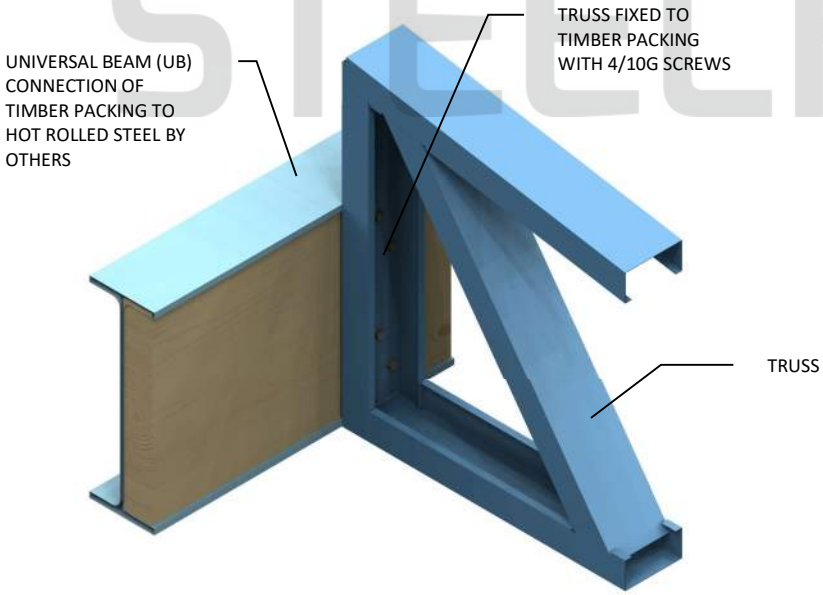
GIRDER TRUSS TO WALL HOLD-DOWN CONNECTION



TRUSS END FIXING OVER UNIVERSAL BEAM (UB)

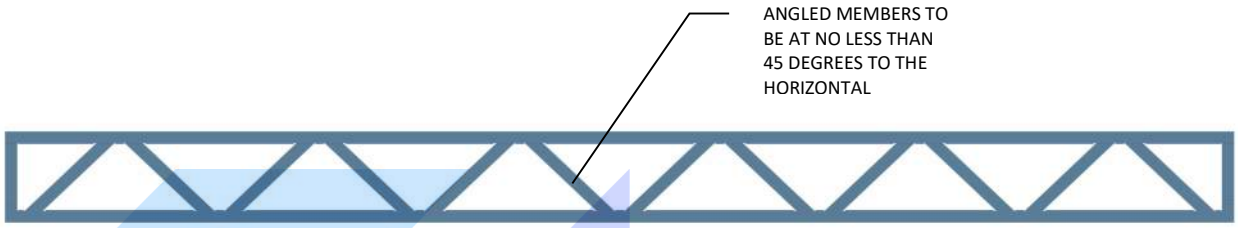


TRUSS TO PFC CONNECTION



TRUSS TO UB CONNECTION

STEELHAUS	SteelHaus (2014) Ltd Unit 1 31 Ha Crescent, Wiri, Auckland 2104 0508 826 766 www.steelhaus.co.nz	TRUSS TO STRUCTURAL STEEL CONNECTIONS DATE March 19, 2020 PAGE # 72



FLAT WEBBED RAFTER

ANGLED WEBBED RAFTER

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

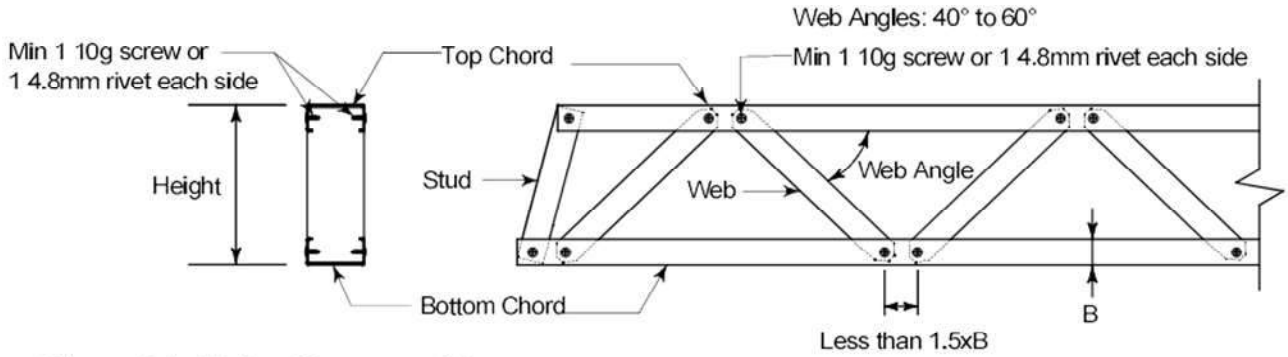


Figure 6.1. Web rafter assembly

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

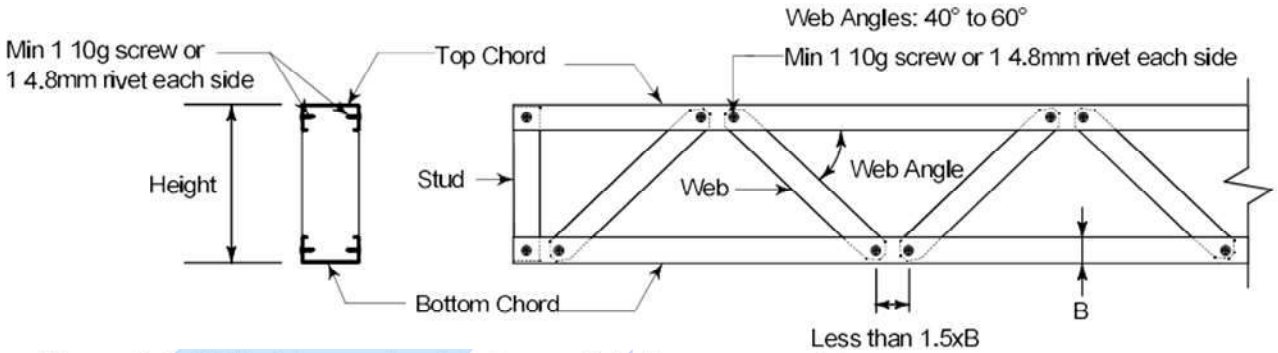


Figure 6.2. Web ridge and web intermediate beam assembly

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

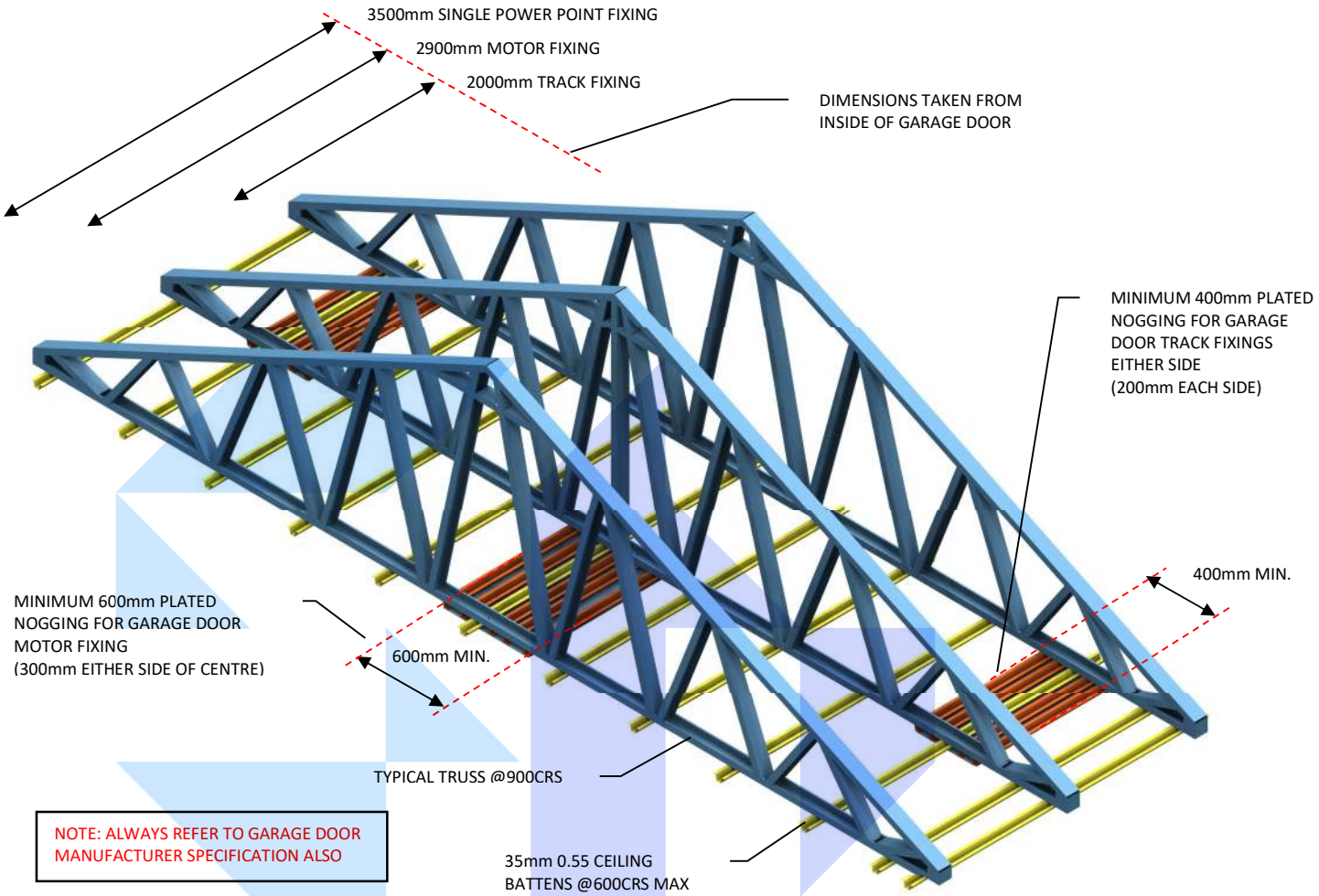
Table 6.6. Support span Table for 300mm high web ridge or web intermediate beams

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

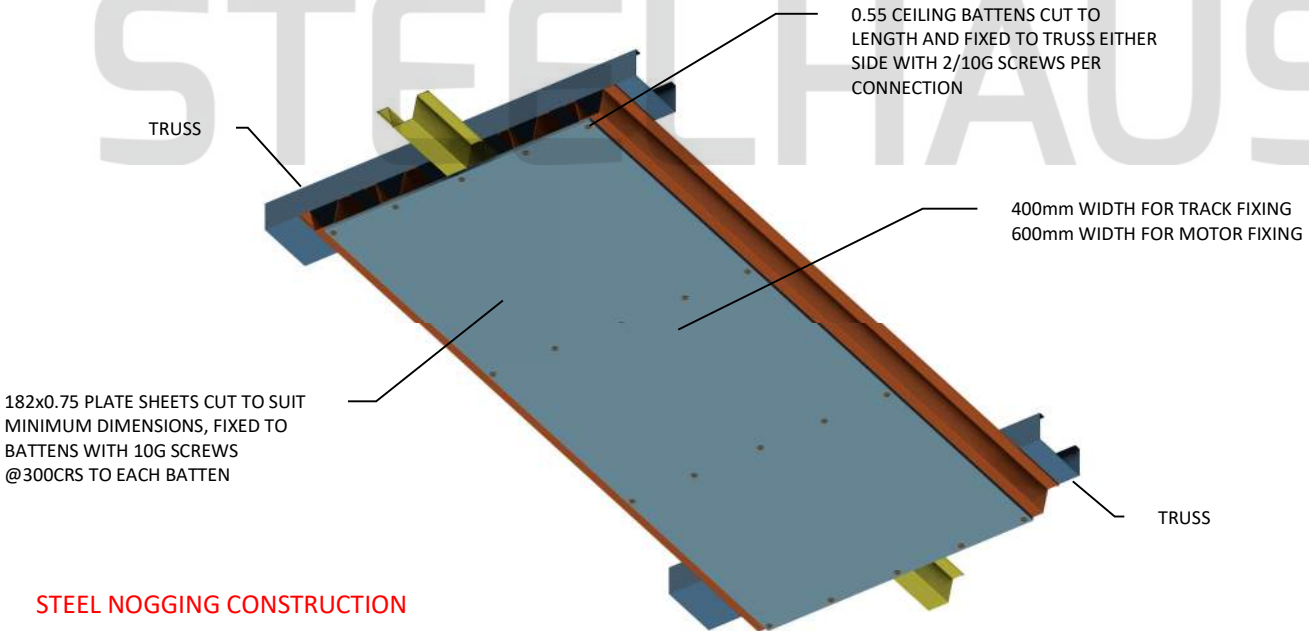
Table 6.7. Support span Table for 350mm high web ridge or web intermediate beams

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

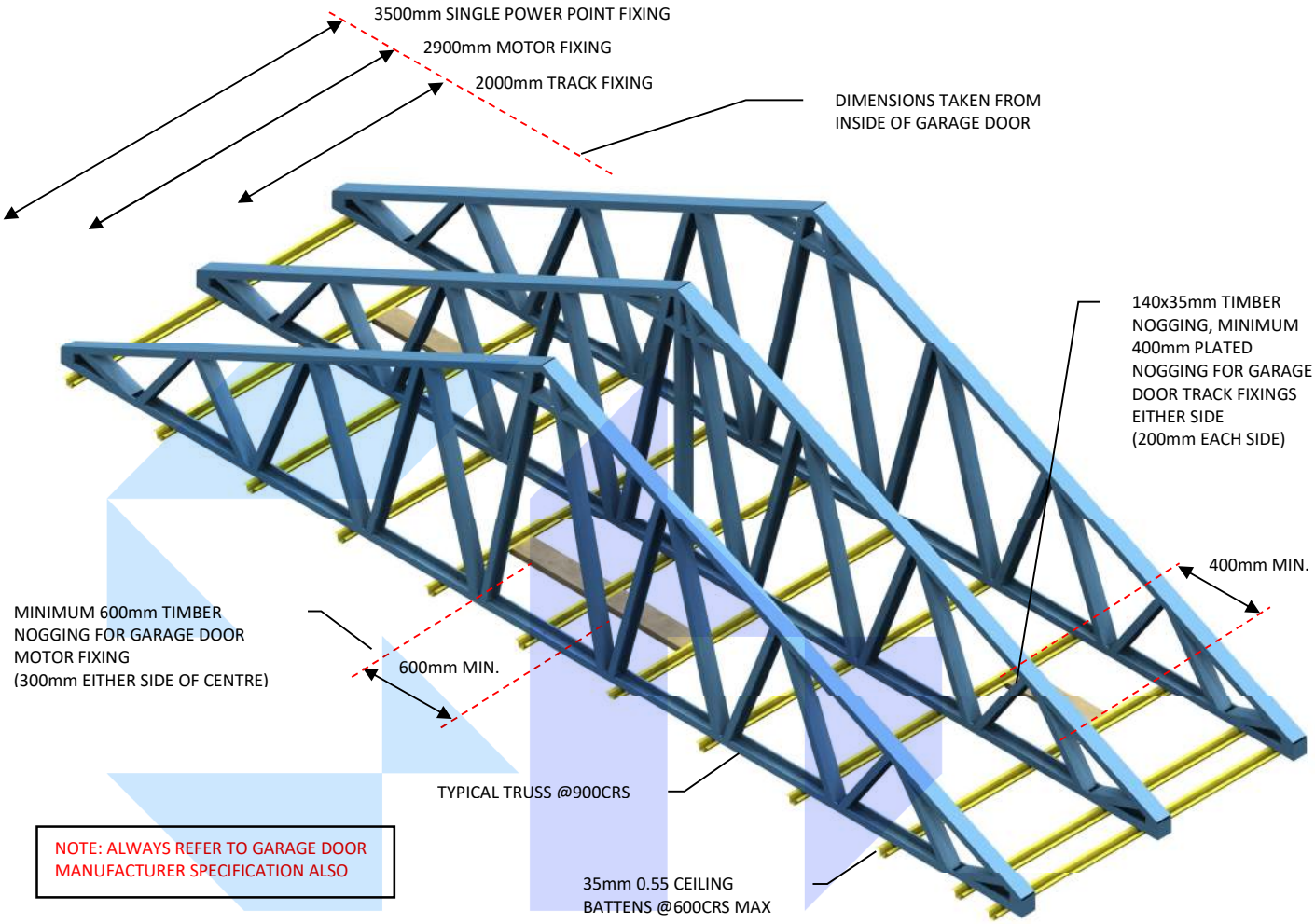
SECTION 4
ON-SITE FIXINGS



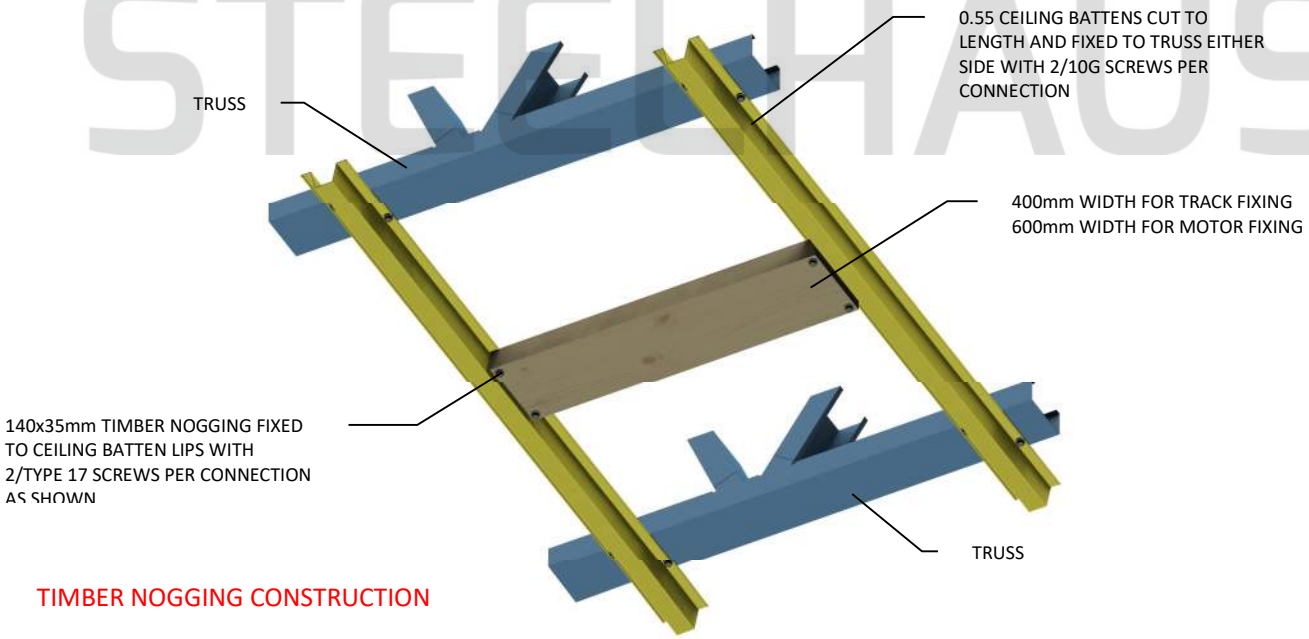
STEEL BATTEN NOGGING FOR GARAGE DOOR FIXING



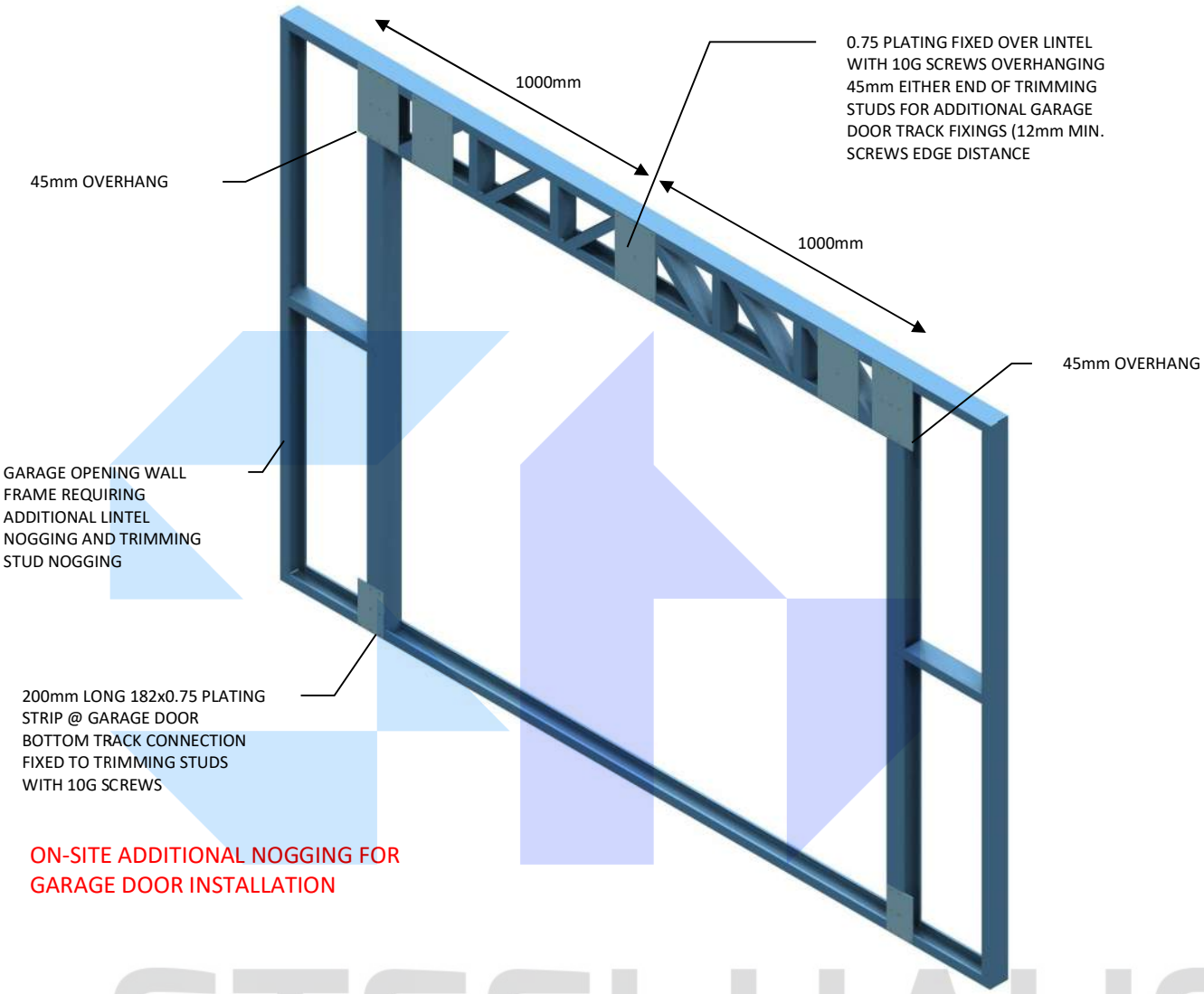
STEEL NOGGING CONSTRUCTION



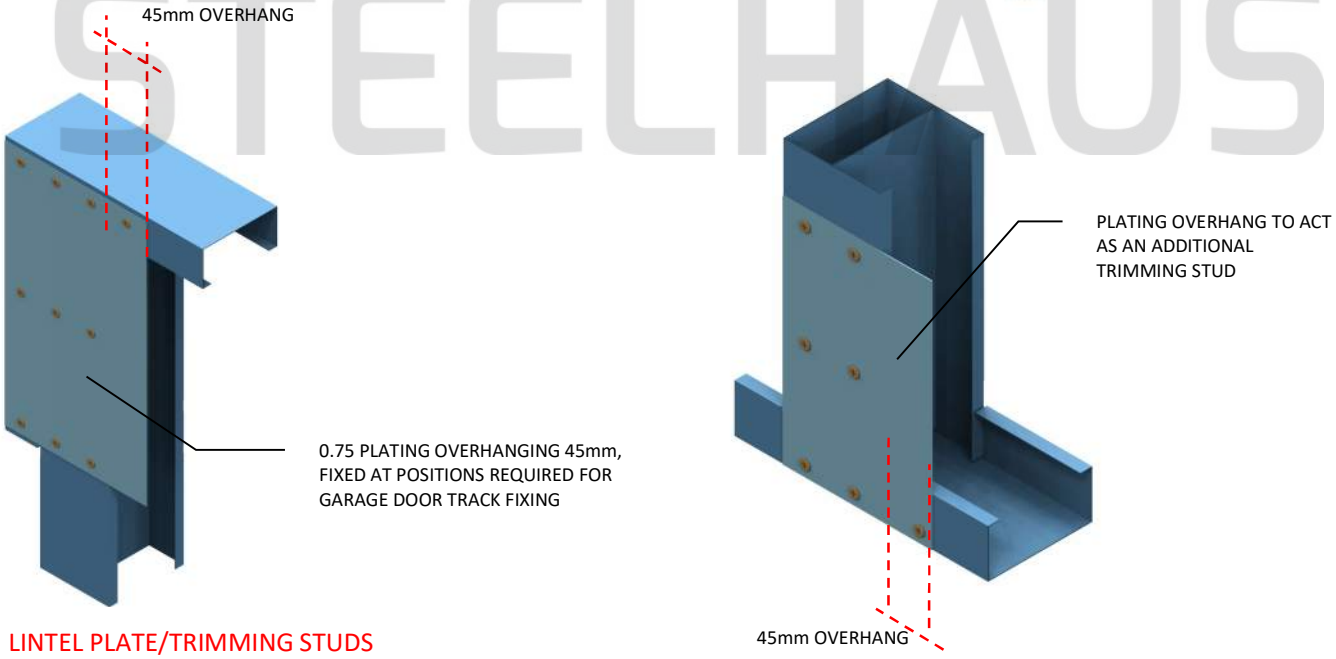
TIMBER NOGGING FOR GARAGE DOOR FIXING



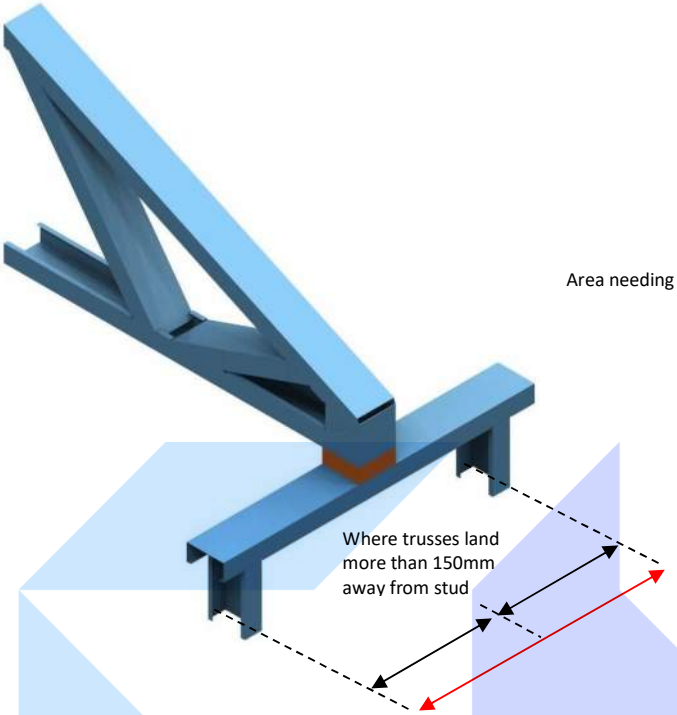
TIMBER NOGGING CONSTRUCTION

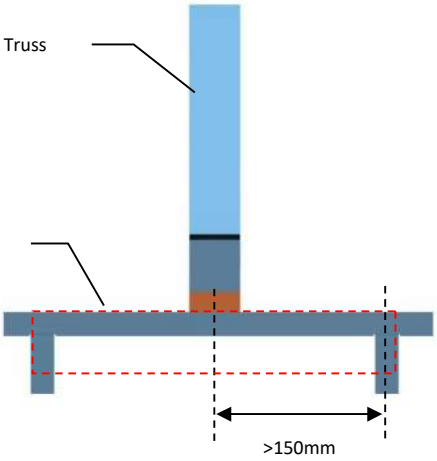


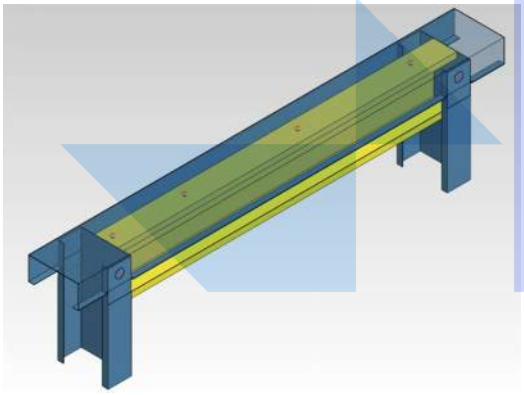
ON-SITE ADDITIONAL NOGGING FOR GARAGE DOOR INSTALLATION



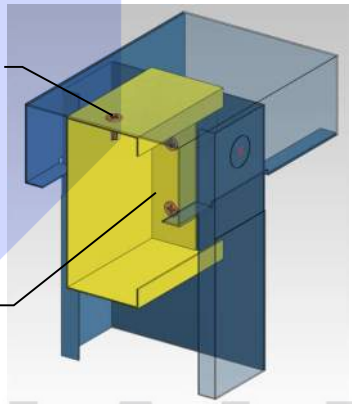
LINTEL PLATE/TRIMMING STUDS CONNECTION







Fix strengthening member to top plate with 10g screws @200crs



Fold web of strengthening member and fix to studs either side using 2/10g screws

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

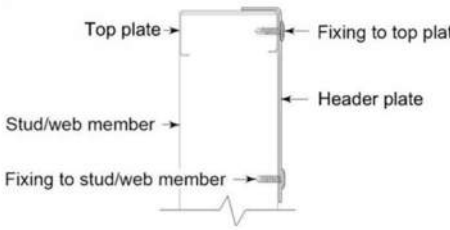
OPTION A

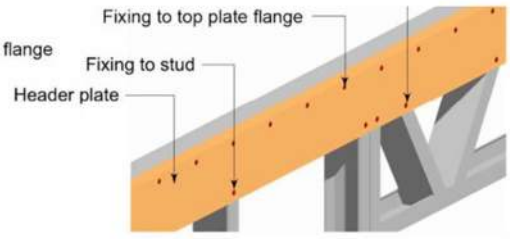
HEADER PLATES/ TOP PLATE STIFFENING WHERE SPECIFED SHALL BE FIXED AS PER BELOW;

-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

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)