JOHNSON & COUZINS

The Name in Shade Since 1866

JOHNSON & COUZINS

Concertina Louvre Design Manual

15227

December 2019 – Revision 8

JOHNSON & COUZINS CONCERTINA LOUVRE SYSTEM

Johnson & Couzins have developed an opening louvre system for use in New Zealand. The system is manufactured out of aluminium and consists of a perimeter RHS frame with either heavy or light grade louvre fins spanning in one direction loading up the frame members. The louvre roof is typically supported on aluminium SHS posts and braced against an existing structure or by the posts cantilevering from their footings.

Richards Consulting Engineers Limited has been engaged by Johnson and Couzins to prepare standard design tables and template details to assist with the design of the Concertina Louvre System.

DESIGN PHILOSOPHY

The following design flow chart, design tables and calculations have been designed using wind speeds taken from NZS3604:2011 and open ground snows load of 0.9 kPa, 1 .5 kPa and 2.0 kPa. The wind speeds shown in the tables are the Ultimate Limit State (ULS) design wind speeds. The associated pressures specific to the louvre fins and frame structure were calculated using AS/NZS 1170.2:2011, Structural Design Actions, Part 2: Wind Actions. The sectional capacities of the aluminium and stainless steel members have been determined using Aluminium Structures, Part 1: Limit State Design AS/NZS 1664.1:1997 and Steel Structures Standard, NZS3404: Part 1: 1997 respectively.

The louvre's lateral load resisting system will be provided by either cantilevering posts or by a supporting building.

The design of the louvre structure based on the tables within this document is in compliance with the New Zealand Building Code (NZBC) section B1.

SERVICEABILITY CRITERIA

The following deflection limits were used for the following elements within the Concertina Louvre System:

- 15mm maximum perimeter beam deflections where shutters are located below
- 40mm maximum perimeter and central beam deflections under SLS wind loading
- 10mm maximum perimeter and central beam deflections under gravity loading
- 60mm maximum louvre fin deflections
- 100mm maximum lateral deflection of louvre frame support posts

DESIGN LOADS AND LOAD CASES

The Ultimate Limit State wind speeds taken from NZS3604:2011 are as follows:

- Medium wind speed = 37m/s
- High wind speed = 44m/s
- Very high wind speed = 50m/s

The following design load cases have been applied to the louvre fins and frame members:

- 0.9G + Wu (ULS for wind uplift)
- 1.2G + S (ULS downward load case)
- 1.2G + 1.5Q (ULS downward load case)
- Ws (SLS for wind related deflection)
- G + ΨsQ (SLS for live load deflection)

Note: Earthquake cases do not govern due to the lightweight properties of the louvre system.

DESIGN LIMITATIONS

The following design assumptions apply to the design manual:

- The louvres will not be walked on.
- The pitch of the louvre frame is less than 10 degrees.
- The supporting frame has a maximum height of 2.7m.
- Standard Johnson & Couzins connections will be used.
- Johnson & Couzins (or an approved Johnson and Cousins installer) will install the louvre.
- If the louvre is to be connected to the roof eaves, the eaves shall not overhang the wall plate further than 600mm and the louvre will be connected to the trusses/rafters only when the specifically designed rafter brackets are installed.
- The Concertina Louvre System is restricted to a maximum total roof width of 4.0m and 6.0m length.

DESIGN EXCLUSIONS

The following items are specifically excluded from this design manual:

- Weather and waterproofing of both the louvre and the supporting structure.
- Electronic services to the louvre.
- Connections within the Johnson and Couzins louvre system.
- Flutter effects caused by wind passing over the open louvres.
- Lateral and gravity resisting strength of the building providing support to the louvre system.

MATERIAL AND SECTION PROPERTIES

The louvres will be made from aluminium with a 6060 alloy and a T5 temper. Note that "Truss Bracket Connection Detail – Type 3" is to be constructed from aluminium with a 6061 alloy and T6 temper.

The structural member properties are as follows:

200x50x3 RHS	$I_x = 6.56 \times 10^6$ mm^4
200x50x5 RHS	$I_x = 9.62 \times 10^6$ mm^4
250x50x3 RHS	$I_x = 11.48 \times 10^6$ mm^4
300x50x3.5 RHS	$I_x = 21.73 \times 10^6$ mm^4
Light Louvre	$I_x = 0.054 \times 10^6$ mm^4
Heavy Louvre	$I_x = 0.151 \times 10^6$ mm^4
Drive Box	$I_x = 1.33 \times 10^6$ mm^4

DURABILITY

The louvre system has been designed with an intended design life of not less than 20 years. Aluminum provides adequate durability for the life of the structure. All contact points between differing materials (Aluminium – Stainless Steel, Aluminium – Galvanised Steel and Galvanised Steel – Stainless Steel) shall have a grease barrier applied to them to prevent galvanic corrosion from occurring. The paved surfaces which the aluminium posts are fixed to are to be 225mm above adjacent unfinished ground surfaces (E1).

In a sea spray zone (as defined by NZS3604:2011) the aluminium shall be powder coated with Dulux Duratec by a Dulux registered applicator. Areas outside of the sea spray zone (including other corrosive environments) shall be coated in Dulux Duralloy.

There are three components required for corrosion to occur. An anode, a cathode and an electrically conductive liquid. In the case of the louvres, the anode is the aluminium and the cathode is the stainless or galvanised steel. It is the anode which corrodes sacrificially and therefore it is the aluminium which is at risk of corrosion, not the steel. A large anode with a small cathode such as a steel fixing into the louvre frame is low risk for corrosion due to the small area of the steel cathode relative to the aluminium. The connection of the flashings (steel) and the aluminium louvre is the potential area of concern for corrosion to occur, however, both the louvre frame and the flashings are powder coated. We consider the aluminium combined with powder coating provides sufficient protection between the two metal types to prevent galvanic corrosion occurring over the proposed 20 year design life.

We note that there is no effective verification method for B2 contained within the Building Code. However, we confirm that we have researched the corrosive effects between aluminium and other dissimilar metals and consider a minimum design life of 20 years to be appropriate provided the aluminium is powder coated and the grease barriers are applied to the metals.

DESIGN MANUAL NOTES

It is intended this manual will be used by people experienced with the Johnson & Couzins Concertina Louvre System. The louvre designer shall:

- Design the louvre layout within the maximum spans set out in the enclosed tables.
- Where supporting the louvre on the existing building they shall ensure the existing structure has adequate gravity and lateral load resisting capacity to support the additional loads.
- Only the attached connection details shall be used.
- No substitution with the products included in this manual is permitted.
- Where the louvre does not fit within the design manual criteria a Structural Engineer shall be engaged to specifically design the louvre.

APPENDICIES

- PS1
- Concertina Louvre Design Flow Chart
- Concept Layout
- Design Tables
- Details

Building Code Clause(s)……B1 & B2……

PRODUCER STATEMENT – PS1 – DESIGN

(Guidance on use of Producer Statements (formerly page 2) is available at www.engineeringnz.org)

ISSUED BY:....Richards Consulting Engineers Limited .....(RCE) .....
(Design Firm)

TO:…… Johnson & Couzins Limited .....
(Owner/Developer)

TO BE SUPPLIED TO:…… All Territorial Authorities within New Zealand .....
(Building Consent Authority)

IN RESPECT OF:… Johnson and Couzins standard design tables for their Concertina Louvre System .....
(Description of Building Work)

AT:…… .....
(Address)

Town/City: …… **LOT**……**DP** ……**SO**.....
(Address)

We have been engaged by the owner/developer referred to above to provide:

……engineering design of the Concertina Louvre System standard design tables.....
(Extent of Engagement)

services in respect of the requirements of Clause(s) …B1 & B2……of the Building Code for:
All ☐ or Part only ☒ (as specified in the attachment to this statement), of the proposed building work.

The design carried out by us has been prepared in accordance with: AS/NZS 1170.2:2011, AS/NZS 1664.1:1997, NZS3404: Part 1:1997 and;

☒ Compliance Documents issued by the Ministry of Business, Innovation & Employment…….B1/VM1……..or
(verification method / acceptable solution)

☐ Alternative solution as per the attached schedule……

The proposed building work covered by this producer statement is described on the drawings titled:

…Johnson & Couzins design manual titled “Johnson & Couzins Concertina Louvre Design Manual” dated December 2019…….; together with the specification, and other documents set out in the schedule attached to this statement.

On behalf of the Design Firm, and subject to:

Site verification of the following design assumptions:

(i) site loadings have been calculated correctly
(ii) louvre system has been designed and constructed within the bounds of the supplied tables and related documents/details
(iii) louvre system is constructed by an approved Johnson & Couzins installer
(iv) all other assumptions stated within the design manual have been satisfied/accounted for

I **believe on reasonable grounds** that a) the building, if constructed in accordance with the drawings, specifications, and other documents provided or listed in the attached schedule, will comply with the relevant provisions of the Building Code and that b), the persons who have undertaken the design have the necessary competency to do so. I also recommend the following level of construction monitoring/observation:

☒CM1 ☐CM2 ☐CM3 ☐CM4 ☐CM5 (Engineering Categories) or ☐ as per agreement with owner/developer (Architectural)

I, ……Sam Richards..... am: ☒ CPEng …228315…..…# ☐ Reg Arch ……#
(Name of Design Professional)

I am a member of : ☒ Engineer New Zealand ☐ NZIA and hold the following qualifications:……BE(hons)……..
The Design Firm issuing this statement holds a current policy of Professional Indemnity Insurance no less than $200,000*.
The Design Firm is a member of ACENZ: ☐

SIGNED BY ……Sam Richards ……..(signature)……
(Name of Design Professional)

ON BEHALF OF …Richards Consulting Engineers Limited……Date…19 December 2019 This PS1 is valid for 1 year only…..……
(Design Firm)

Note: This statement shall only be relied upon by the Building Consent Authority named above. Liability under this statement accrues to the Design Firm only. The total maximum amount of damages payable arising from this statement and all other statements provided to the Building Consent Authority in relation to this building work, whether in contract, tort or otherwise (including negligence), is limited to the sum of $200,000.*

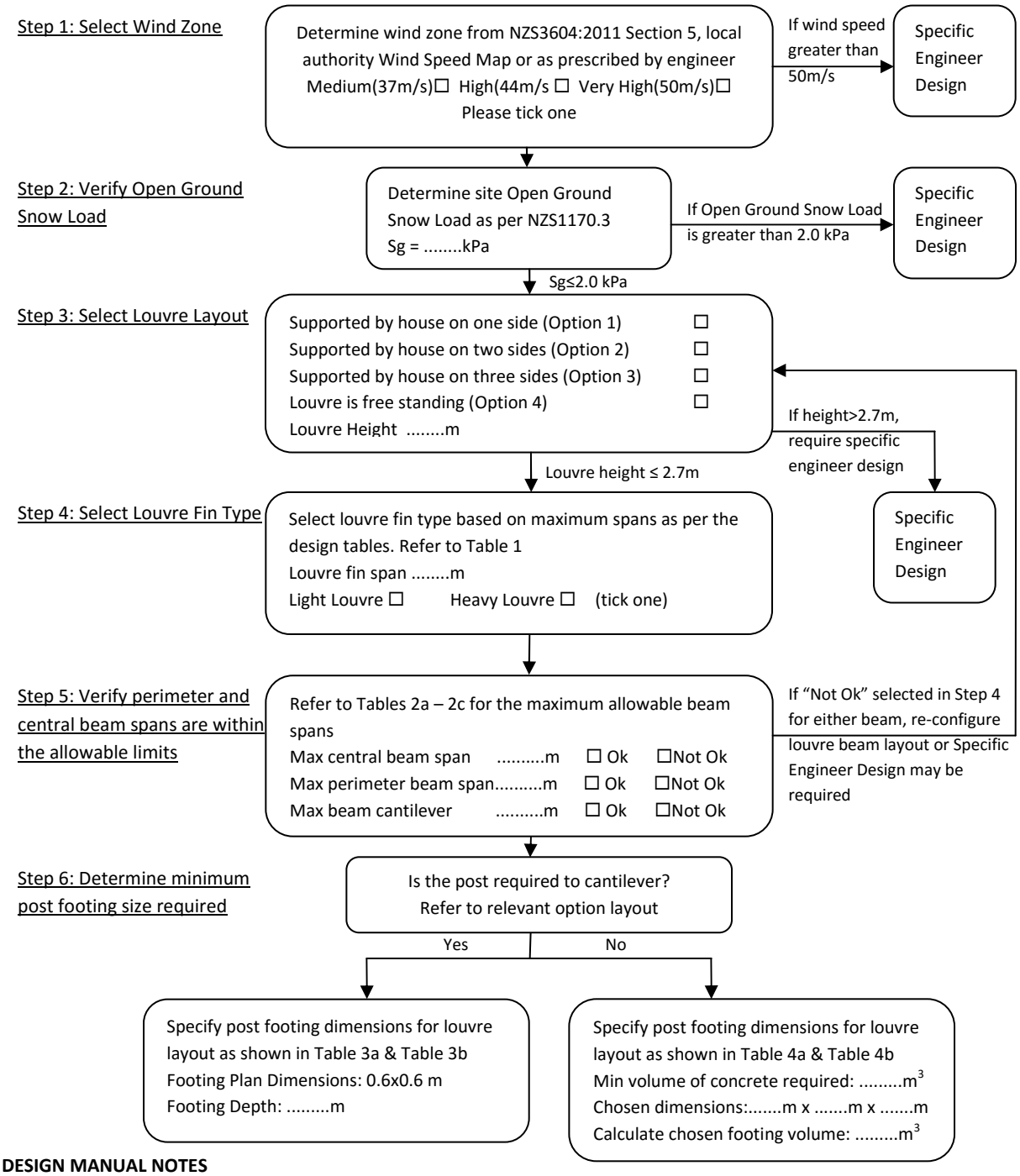
This form is to accompany Form 2 of the Building (Forms) Regulations 2004 for the application of a Building Consent.

JOHNSON & COUZINS
The Name in Shade Since 1966

Site address: .....

Designer's name: .....

Concertina Louvre Design Flow Chart

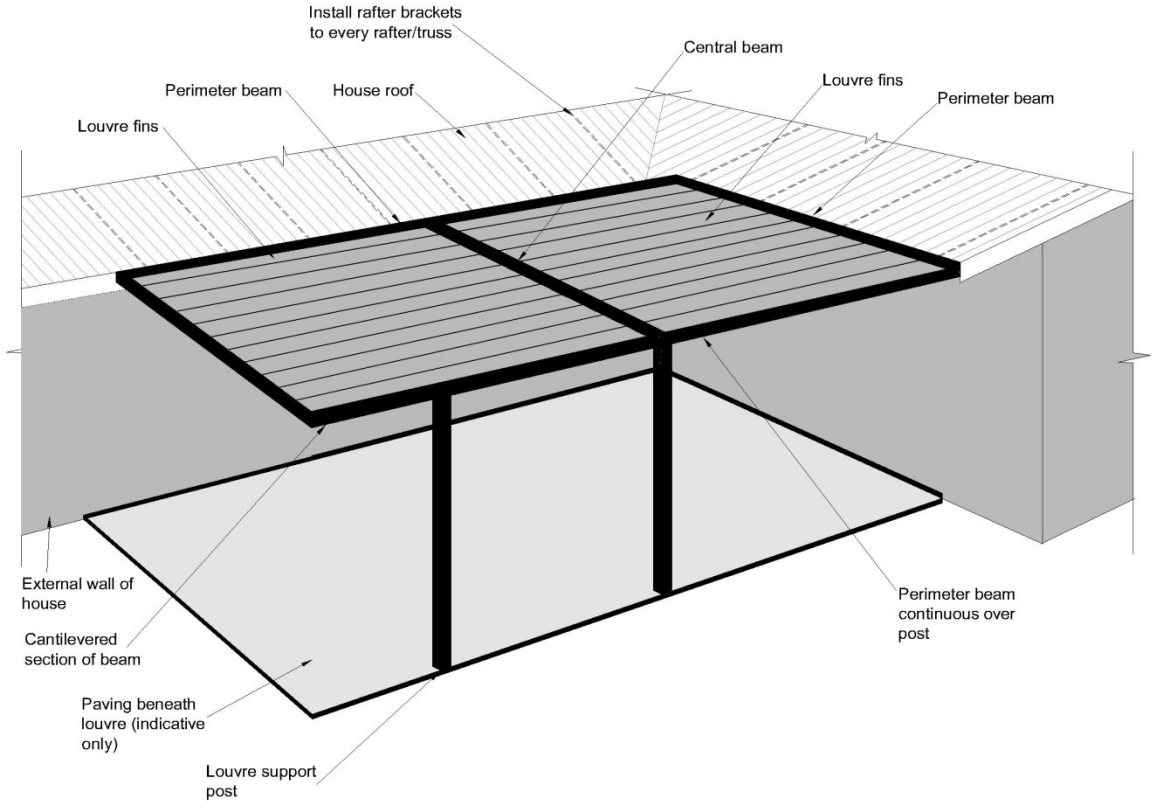


DESIGN MANUAL NOTES

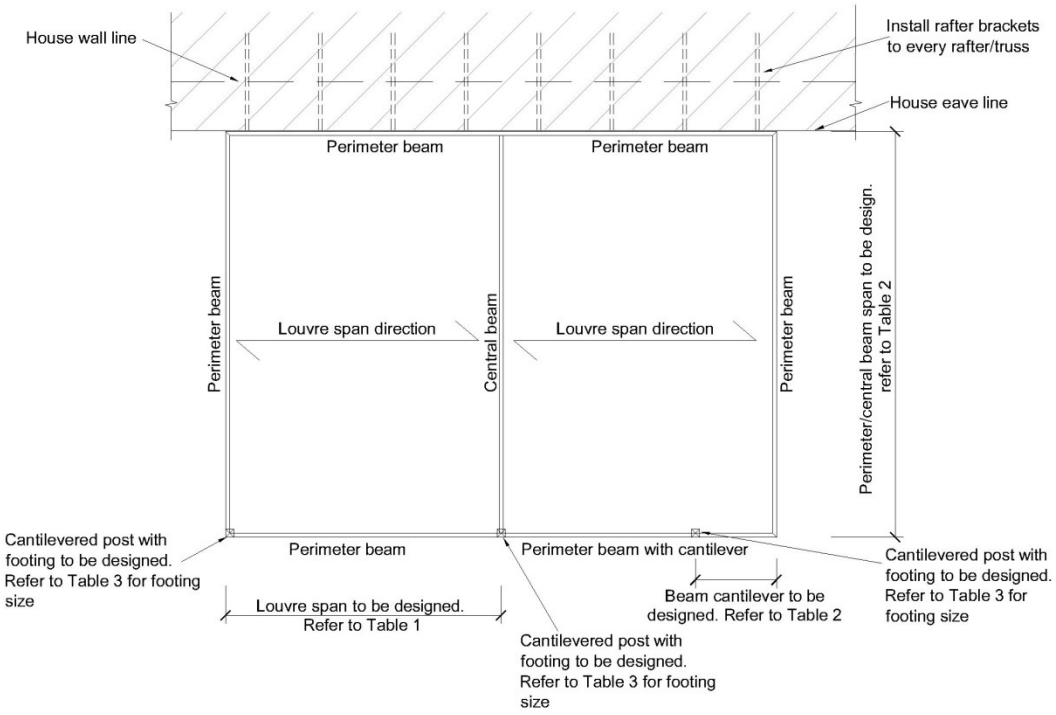
It is intended this manual will be used by people experienced with the Johnson & Couzins Concertina Louvre System. The louvre designer shall:

- Design the louvre layout within the maximum spans set out in the enclosed tables.
- Where supporting the louvre on the existing building they shall ensure the existing structure has adequate gravity and lateral load resisting capacity to support the additional loads.
- Only the attached connection details shall be used.
- No substitution with the products included in this manual is permitted.
- Where the louvre does not fit within the design manual criteria a Structural Engineer shall be engaged to specifically design the louvre.

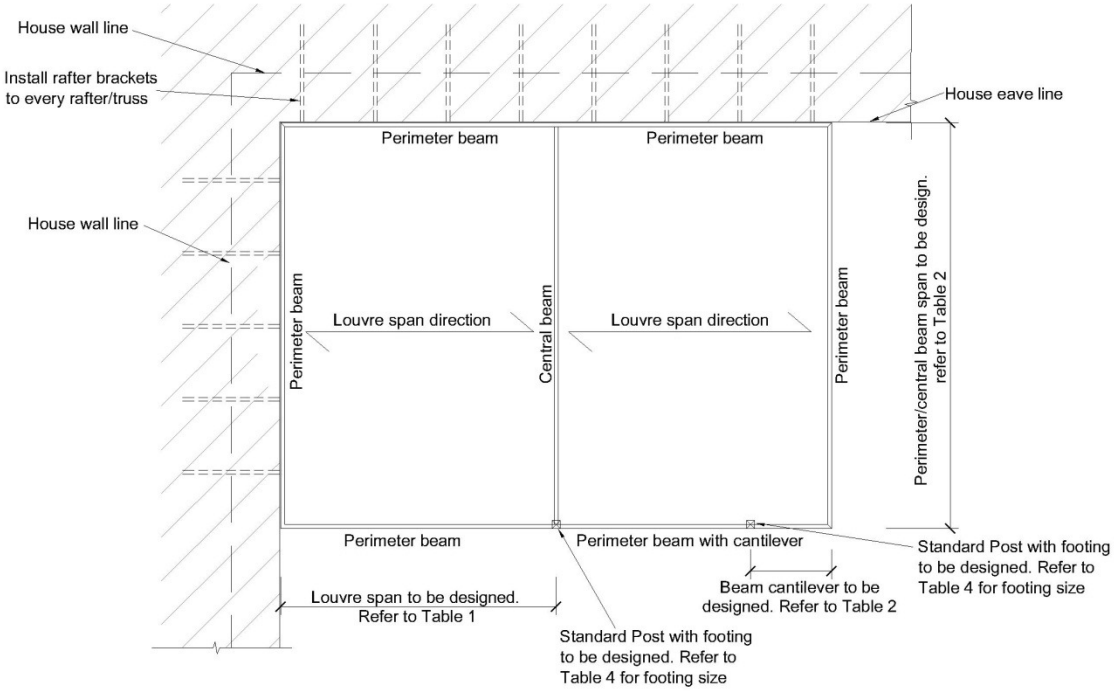
CONCEPT LOUVRE LAYOUT



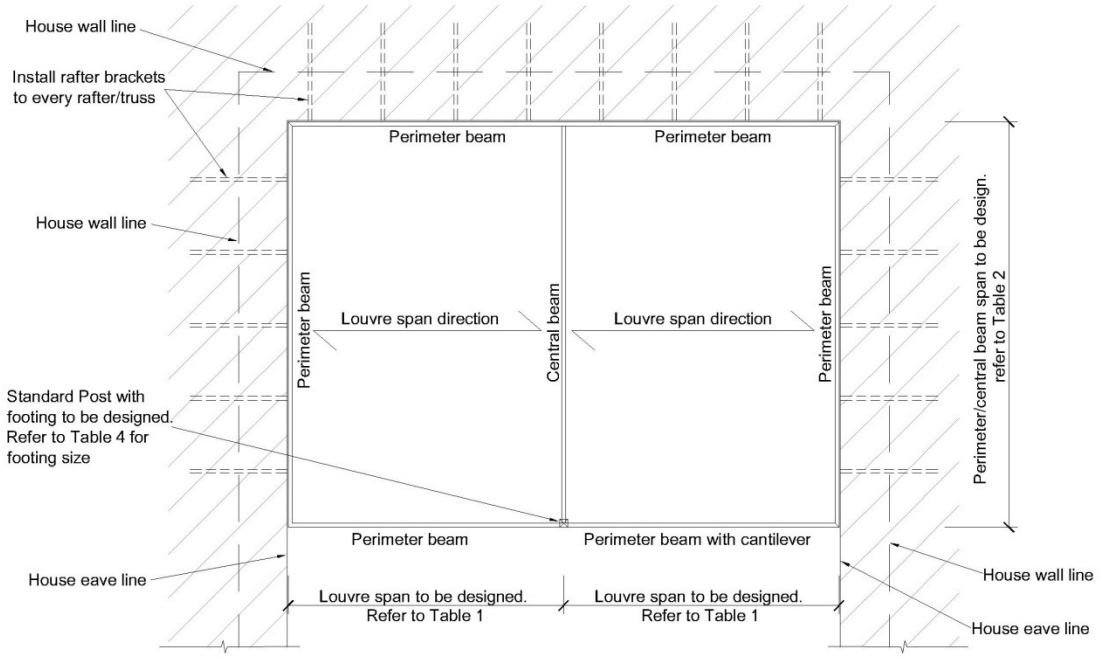
LOUVRE LAYOUT OPTION 1 – LOUVRE SUPPORTED ON ONE SIDE OF THE HOUSE



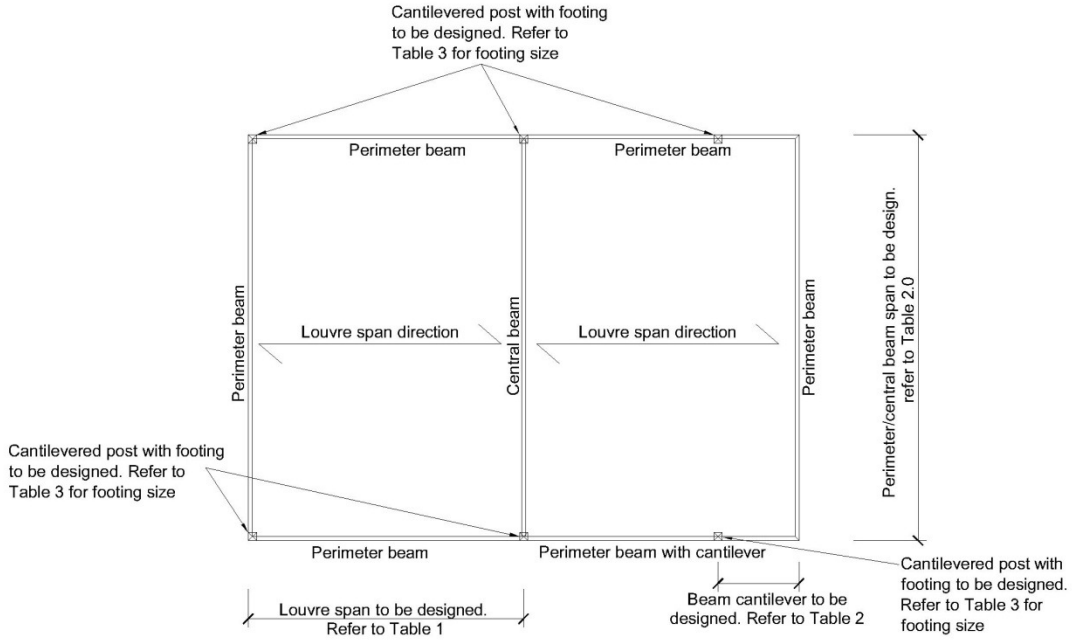
LOUVRE LAYOUT OPTION 2 – LOUVRE SUPPORTED ON TWO SIDES OF THE HOUSE



LOUVRE LAYOUT OPTION 3 – LOUVRE SUPPORTED ON THREE SIDES OF THE HOUSE



LOUVRE LAYOUT OPTION 4 – LOUVRE IS FREESTANDING



LOUVRE FIN SPANS

Table 1 – Johnson & Couzins Maximum Louvre Fin Spans

Louvre Fin Type	Medium wind zone (37m/s)	High wind zones (44 m/s)	Very High wind zone (50 m/s)
Light Louvre	3.4 m	3.0 m	2.6 m
Heavy Louvre	3.645 m	3.645 m	3.645 m

Notes:

1. Site wind speed is to be verified by others.
2. Includes allowance to resist up to 2.0 kPa open ground snow load.
3. A maximum louvre fin deflection of 60mm has been used. Specific Engineering Design is required for louvres which will be located within areas sensitive to deflections.
4. All spans shown above are maximum values.
5. It has been assumed that the louvres will remain in an "open" position during a heavy snow event.
6. The louvre fins will not be walked on.
7. The Concertina Louvre System is restricted to a maximum total roof width of 4.0m and 6.0m length.
8. The fin span is measured from between the inside edges of the drive boxes.

CONCERTINA LOUVRE FRAME MEMBER SPANS

General Notes:

1. Site wind speed is to be verified by others.
2. Perimeter beam supports half of the louvre span while a central beam supports louvres on both sides.
3. Spans calculated rely on correct selection of louvre fin.
4. A maximum beam deflection limit of 40mm has been used for members aside from Table 2e. Specific Engineering Design is required for louvres which will be located within areas sensitive to deflections.
5. All spans shown below are maximum values and are measured from the inside edges of the posts.
6. It has been assumed that the louvres will remain in an "open" position during a heavy snow event.
7. Note that the central beam in the Concertina Louvre System is a double beam.
8. We have assumed a drive box will be located adjacent to the beams.

Table 2a – Johnson & Couzins Maximum Beam (200x50x3 RHS) Spans Snow Load ≤ 0.9kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	6.2 m	5.7 m	5.6 m	4.8 m	5.2 m	4.3 m
Central	6.2 m	5.8 m	5.8 m	5.4 m	5.7 m	5.2 m
Cantilever	1.9 m	1.8 m	1.9 m	1.8 m	1.9 m	1.7 m

Table Specific Notes:

1. Includes allowance to resist up to 0.9 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2b – Johnson & Couzins Maximum Beam (200x50x3 RHS) Spans Snow Load ≤ 1.5kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	5.9 m	5.1 m	5.6 m	4.8 m	5.2 m	4.3 m
Central	6.2 m	5.8 m	5.8 m	5.4 m	5.7 m	5.2 m
Cantilever	1.7 m	1.4 m	1.8 m	1.5 m	1.9 m	1.6 m

Table Specific Notes:

1. Includes allowance to resist up to 1.5 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2c – Johnson & Couzins Maximum Beam (200x50x3 RHS) Spans for Snow Load ≤ 2.0kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	5.1 m	4.5 m	5.5 m	4.5 m	5.2 m	4.3 m
Central	6.2 m	5.8 m	5.8 m	5.4 m	5.7 m	5.2 m
Cantilever	1.5 m	1.3 m	1.6 m	1.3 m	1.7 m	1.4 m

Table Specific Notes:

1. Includes allowance to resist up to 2.0 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2d – Johnson & Couzins Max Double Beam (2/200x50x3 RHS) Spans with Snow Load ≤ 2.0kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	7.4 m	6.3 m	7.0 m	6.3 m	6.8 m	6.2 m
Central	6.2 m	5.8 m	5.8 m	5.4 m	5.7 m	5.2 m
Cantilever	2.0 m	2.0 m	2.0 m	2.0 m	2.0 m	2.0 m

Table Specific Notes:

1. Includes allowance to resist up to 2.0 kPa open ground snow load.
2. These beam spans are relevant for double beams made from a 200x50x3 and a 300x50x3.5 beam.
3. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2e – Johnson & Couzins Max Perimeter Beam (200x50x3 RHS) Spans Supporting Shutters for various snow loads

Maximum Site Snow Loading	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
0.9 kPa	4.8 m	4.5 m	4.6 m	4.2 m	4.4 m	4.0 m
1.5 kPa	4.8 m	4.5 m	4.6 m	4.2 m	4.4 m	4.0 m
2.0 kPa	4.7 m	4.2 m	4.6 m	4.2 m	4.4 m	4.0 m

Table Specific Notes:

1. A maximum beam deflection limit of 15mm has been used. Specific Engineering Design is required for louvres which will be located within areas sensitive to deflections.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2f– Johnson & Couzins Max Beam (250x50x3 RHS) Spans with Snow Load ≤ 0.9kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	7.0 m	6.4 m	6.3 m	5.4 m	5.9 m	4.9 m
Central	7.0 m	6.5 m	6.6 m	6.1 m	6.4 m	5.8 m
Cantilever	1.9 m	1.9 m	1.9 m	1.9 m	1.9 m	1.9 m

Table Specific Notes:

1. Includes allowance to resist up to 0.9 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2g– Johnson & Couzins Max Beam (250x50x3 RHS) Spans with Snow Load ≤ 1.5kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	6.4 m	5.5 m	6.3 m	5.4 m	5.9 m	4.9 m
Central	7.0 m	6.5 m	6.6 m	6.1 m	6.4 m	5.8 m
Cantilever	1.7 m	1.7 m	1.7 m	1.7 m	1.7 m	1.7 m

Table Specific Notes:

1. Includes allowance to resist up to 1.5 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2h– Johnson & Couzins Max Beam (250x50x3 RHS) Spans with Snow Load ≤ 2.0kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	5.6 m	4.9 m	6.0 m	5.1 m	5.9 m	4.9 m
Central	7.0 m	6.5 m	6.6 m	6.1 m	6.4 m	5.8 m
Cantilever	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m	1.5 m

Table Specific Notes:

1. Includes allowance to resist up to 2.0 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2i– Johnson & Couzins Max Beam (300x50x3.5 RHS) Spans with Snow Load ≤ 0.9kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	7.1 m	6.3 m	6.2 m	5.4 m	5.8 m	4.8 m
Central	8.1 m	7.6 m	7.7 m	7.1 m	7.4 m	6.8 m
Cantilever	2.0 m	2.0 m	2.0 m	2.0 m	2.0 m	2.0 m

Table Specific Notes:

1. Includes allowance to resist up to 0.9 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2j– Johnson & Couzins Max Beam (300x50x3.5 RHS) Spans with Snow Load ≤ 1.5 kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	6.6 m	5.7 m	6.2 m	5.4 m	5.8 m	4.8 m
Central	8.1 m	7.6 m	7.7 m	7.1 m	7.4 m	6.8 m
Cantilever	1.8 m	1.8 m	1.8 m	1.8 m	1.8 m	1.8 m

Table Specific Notes:

1. Includes allowance to resist up to 1.5 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2k– Johnson & Couzins Max Double Beam (300x50x3.5 RHS) Spans with Snow Load ≤ 2.0kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	5.8 m	5.0 m	6.2 m	5.2 m	5.8 m	4.8 m
Central	8.1 m	7.2 m	7.7 m	7.1 m	7.4 m	6.8 m
Cantilever	1.6 m	1.6 m	1.6 m	1.6 m	1.6 m	1.6 m

Table Specific Notes:

1. Includes allowance to resist up to 2.0 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2l – Johnson & Couzins Max Single Beam (200x50x5 RHS) Spans with Snow Load ≤ 0.9kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	6.8 m	6.3 m	6.4 m	5.8 m	6.2 m	5.2 m
Central	6.8 m	6.3 m	6.4 m	5.9 m	6.2 m	5.7 m
Cantilever	2.0 m	1.9 m	2.0 m	1.9 m	2.0 m	1.9 m

Table Specific Notes:

1. Includes allowance to resist up to 0.9 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2m – Johnson & Couzins Max Single Beam (200x50x5 RHS) Spans with Snow Load ≤ 1.5kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	6.8 m	5.9 m	6.4 m	5.8 m	6.2 m	5.2 m
Central	6.8 m	6.3 m	6.4 m	5.9 m	6.2 m	5.7 m
Cantilever	1.8 m	1.5 m	1.9 m	1.6 m	2.0 m	1.7 m

Table Specific Notes:

1. Includes allowance to resist up to 1.5 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

Table 2n – Johnson & Couzins Max Single Beam (200x50x5 RHS) Spans with Snow Load ≤ 2.0kPa

Beam Location	Medium wind zone (37m/s)		High wind zone (44m/s)		Very High wind zone (50m/s)	
	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre	Light Louvre	Heavy Louvre
Perimeter	6.0 m	5.2 m	6.4 m	5.4 m	6.2 m	5.2 m
Central	6.8 m	6.3 m	6.4 m	5.9 m	6.2 m	5.7 m
Cantilever	1.6 m	1.4 m	1.7 m	1.4 m	1.8 m	1.5 m

Table Specific Notes:

1. Includes allowance to resist up to 2.0 kPa open ground snow load.
2. Refer to the "General Notes" for all other notes which are not specific to this particular table.

CANTILEVERED POST FOOTING SIZES

Table 3a – Min cantilevered post footing dimensions – Central post between two bays of louvres

Louvre Fin Type	Medium wind zone (37m/s)	High wind zones (44 m/s)	Very High wind zone (50 m/s)
Light Louvre	1350 mm deep	1500 mm deep	Specific Design
Heavy Louvre	1300 mm deep	1450 mm deep	Specific Design

Notes:

1. Site wind speed to be verified by others. All cantilevered footings are to be 600mm square.
2. Footing depths calculated rely on correct selection of louvre fin.
3. A maximum lateral deflection limit of 100mm has been used for the louvre posts. Specific design is required for louvres which will be located within areas sensitive to deflections.
4. The 75x75x5 SHS stainless steel insert shall extend a minimum of 1600mm above ground level inside of the aluminium post for a medium wind zone and 1800mm above ground level for a high wind (height of socket inside of the aluminium post).
5. All cantilevered posts in Very High wind zones require specific engineering design.

Table 3b – Min cantilevered post footing dimensions required – Corner post

Louvre Fin Type	Medium wind zone (37m/s)	High wind zones (44 m/s)	Very High wind zone (50 m/s)
Light Louvre	1000 mm deep	1150 mm deep	Specific Design
Heavy Louvre	1000 mm deep	1100 mm deep	Specific Design

Notes:

1. Site wind speed to be verified by others. All cantilevered footings are to be 600mm square.
2. Footing depths calculated rely on correct selection of louvre fin.
3. A maximum lateral deflection limit of 100mm has been used for the louvre posts. Specific design is required for louvres which will be located within areas sensitive to deflections.
4. The 75x75x5 SHS stainless steel insert will extend a minimum of 400mm above ground level inside of the aluminium post for a medium wind zone and 900mm above ground level for a high wind (height of socket inside of the aluminium post).
5. All cantilevered posts in Very High wind zones require specific engineering design.

STANDARD POST FOOTING SIZES

Table 4a – Min standard post footing dimensions – No slab beneath louvre

Louvre Fin Type	Medium wind zone (37m/s)	High wind zones (44 m/s)	Very High wind zone (50 m/s)
Light Louvre	0.45 m^3	0.55 m^3	0.6 m^3
Heavy Louvre	0.55 m^3	0.65 m^3	0.8 m^3

Notes:

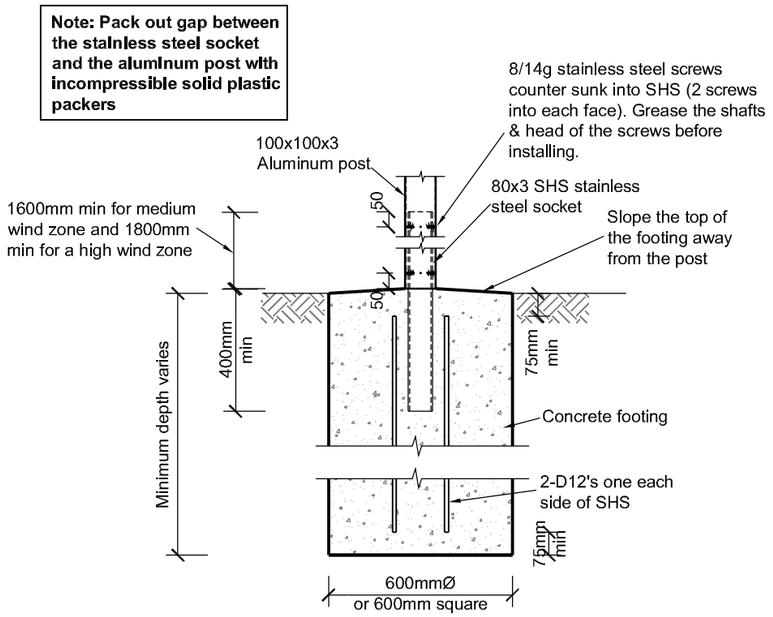
1. These footings do not cantilever and provide resistance to vertical loads only.
2. For corner posts, the required volume of concrete can be halved.
3. Site wind speed to be verified by others.
4. Concrete volumes calculated rely on correct selection of louvre fin.
5. Concrete footings have been designed using a concrete weight of 23.5 kN/m^3.
6. Posts which are located in the center of a louvre (ie a 2x2 bay louvre) require Specific Engineering Design.

Table 4b – Min standard post footing dimensions – Slab beneath louvre

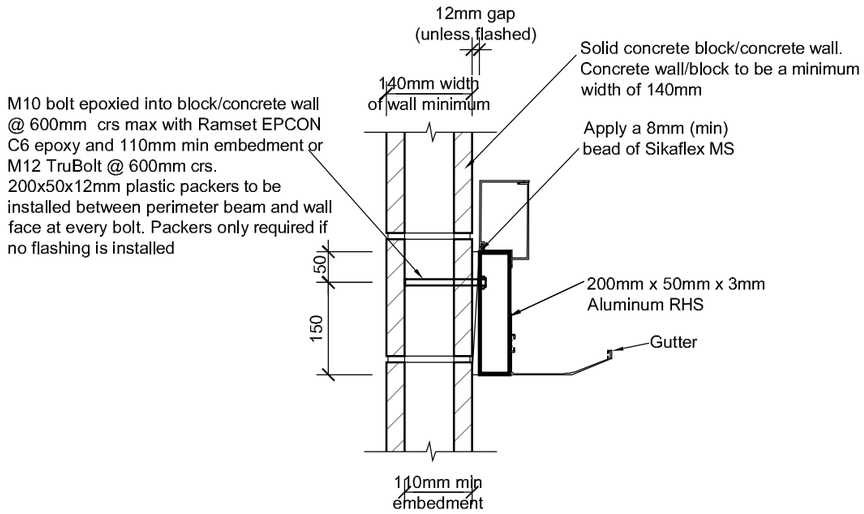
Louvre Fin Type	Medium wind zone (37m/s)	High wind zones (44 m/s)	Very High wind zone (50 m/s)
Light Louvre	No additional footing required	No additional footing required	0.3 m^3
Heavy Louvre	No additional footing required	No additional footing required	0.3 m^3

Notes:

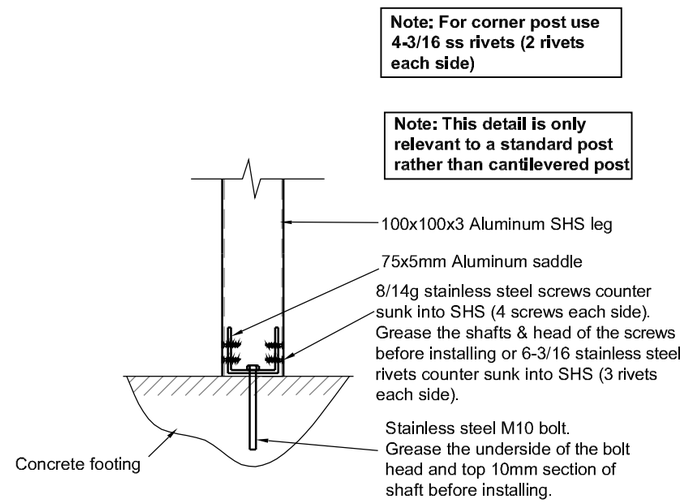
1. These footings do not cantilever and provide resistance to vertical loads only.
2. For corner posts, the required volume of concrete can be halved.
3. Site wind speed to be verified by others.
4. Concrete volumes calculated rely on correct selection of louvre fin.
5. Concrete footings have been designed using a concrete weight of 23.5 kN/m^3.
6. Posts which are located in the center of a louvre (ie a 2x2 bay louvre) require Specific Engineering Design.
7. It has been assumed that a 100mm (minimum) thick slab which is reinforced is located beneath the louvre's footprint.



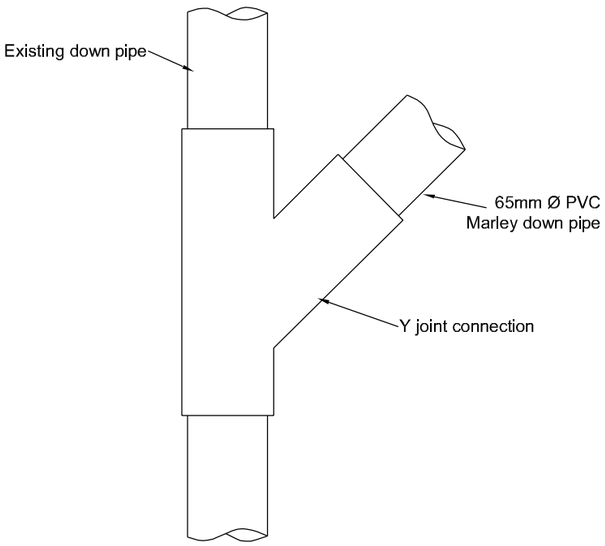
BRACED (cantilever) POST FOOTING
SCALE 1:20



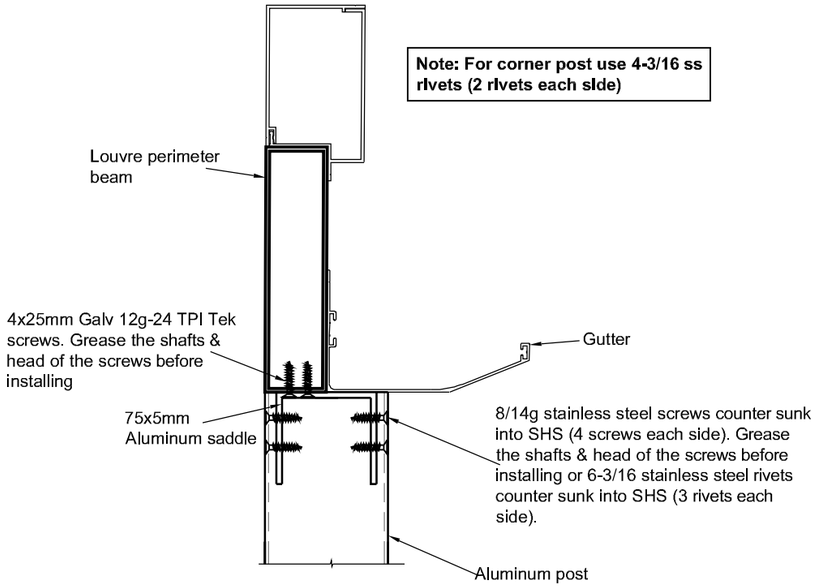
PERIMETER BEAM TO CONCRETE/BLOCK WALL
SCALE 1:10



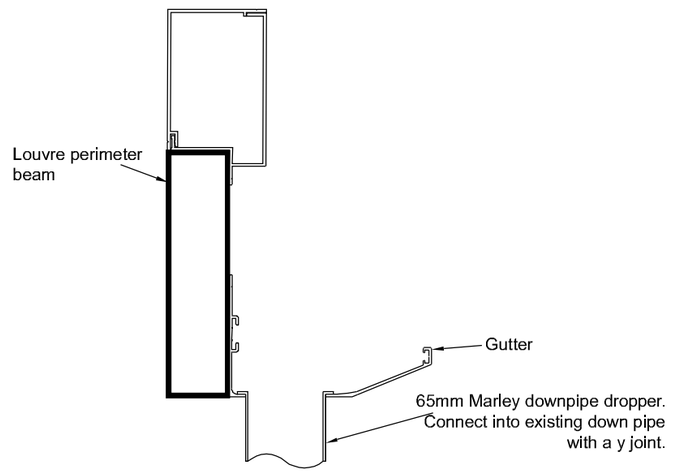
LOUVRE STANDARD POST BASE CONNECTION
SCALE 1:10



Y JOINT CONNECTION
SCALE 1:5



CONCERTINA LOUVRE PERIMETER BEAM TO LEG DETAIL
SCALE 1:5



STORM WATER CONNECTION
SCALE 1:5

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PROJECT TITLE
JOHNSON & COUZINS
CONCERTINA LOUVRE
STANDARD DETAILS

DRAWING TITLE
DETAILS

REV NO.	REVISION	DATE	APPROVED
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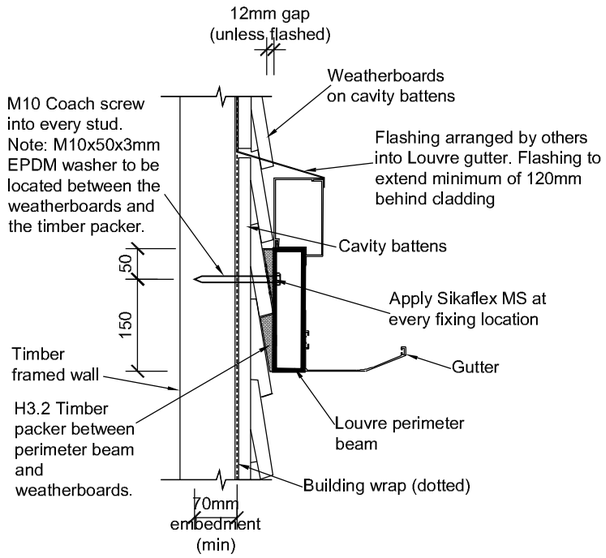
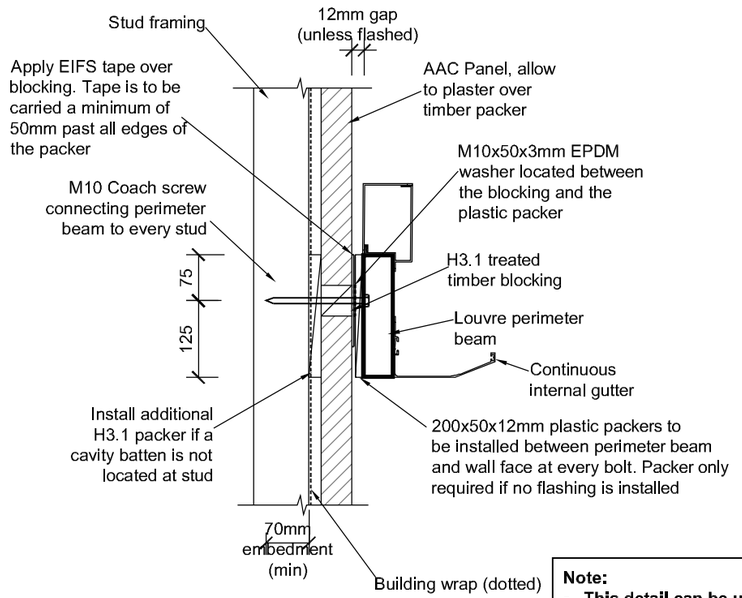
4.	FOR CONSTRUCTION	MAY 2017	SR

PROJECT NO. 15227
SCALE @ A3 1:20,1:10, 1:5
REV NO. 4
DESIGNED NB
DRAWN YB
SHEET NO. S1.01



PERIMETER BEAM TO WEATHERBOARD CLAD WALL

SCALE 1:10

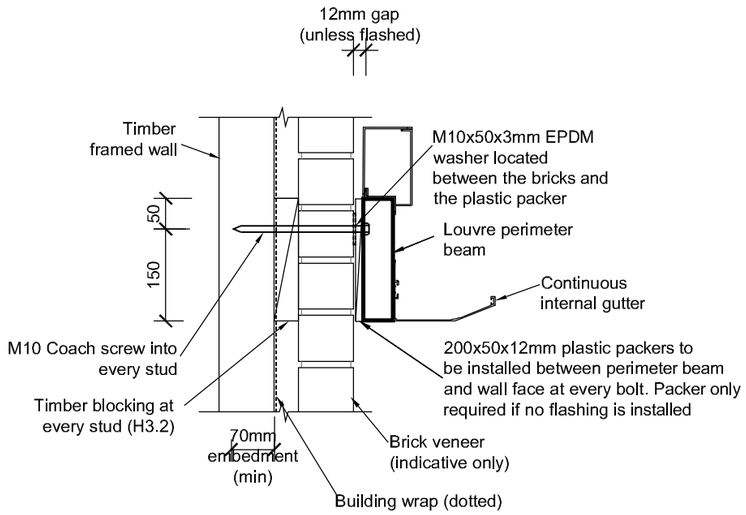


PERIMETER BEAM TO AAC PANEL CLAD WALL

SCALE 1:10

Note:

- **This detail can be used and adjusted to suit plaster on polystyrene cladding systems**
- **If 12mm gap is not desired a flashing is to be detailed by building designer**



PERIMETER BEAM TO BRICK CLAD WALL

SCALE 1:10

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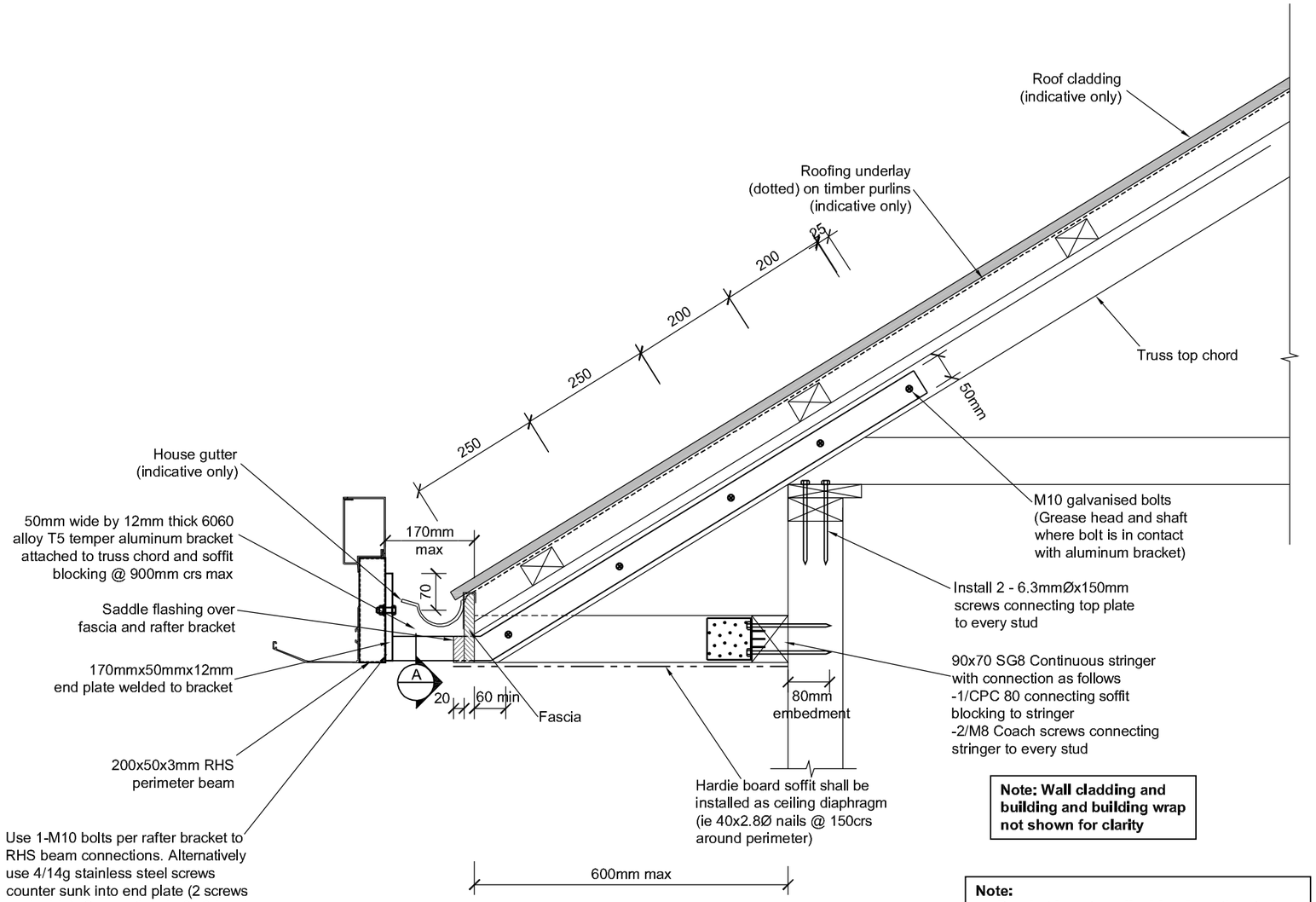
4.	FOR CONSTRUCTION	MAY 2017	SR

PROJECT NO.	15227	DESIGNED	NB
SCALE @ A3	1:10	DRAWN	YB
REV NO.	4	SHEET NO.	S1.02



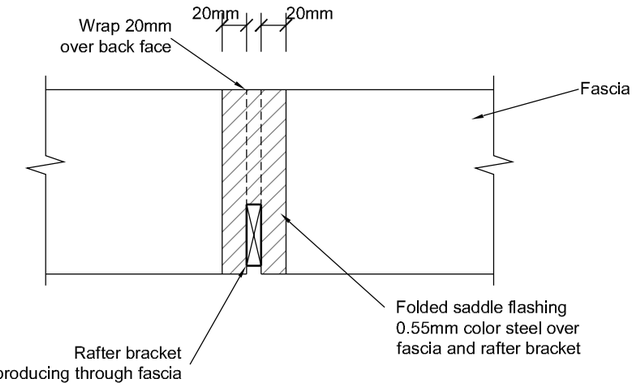
Note: Wall cladding and building and building wrap not shown for clarity

TRUSS BRACKET CONNECTION DETAIL- STANDARD TRUSS SOFFIT (TYPE 1)

SCALE 1:10

Note:

- **Bracket is not applicable where the studs don't span from floor to ceiling (re over door/window openings)**
- **An Engineer is to check the capacity of any lintels below the rafter brackets for the louvers added loading.**
- **Bracket is only to be used in wind zones up the "High" as per NZS3604:2011 and where the open snow ground load is less then or equal to Sg=0.9kPa**



A FLASHING DETAIL

SCALE 1:5

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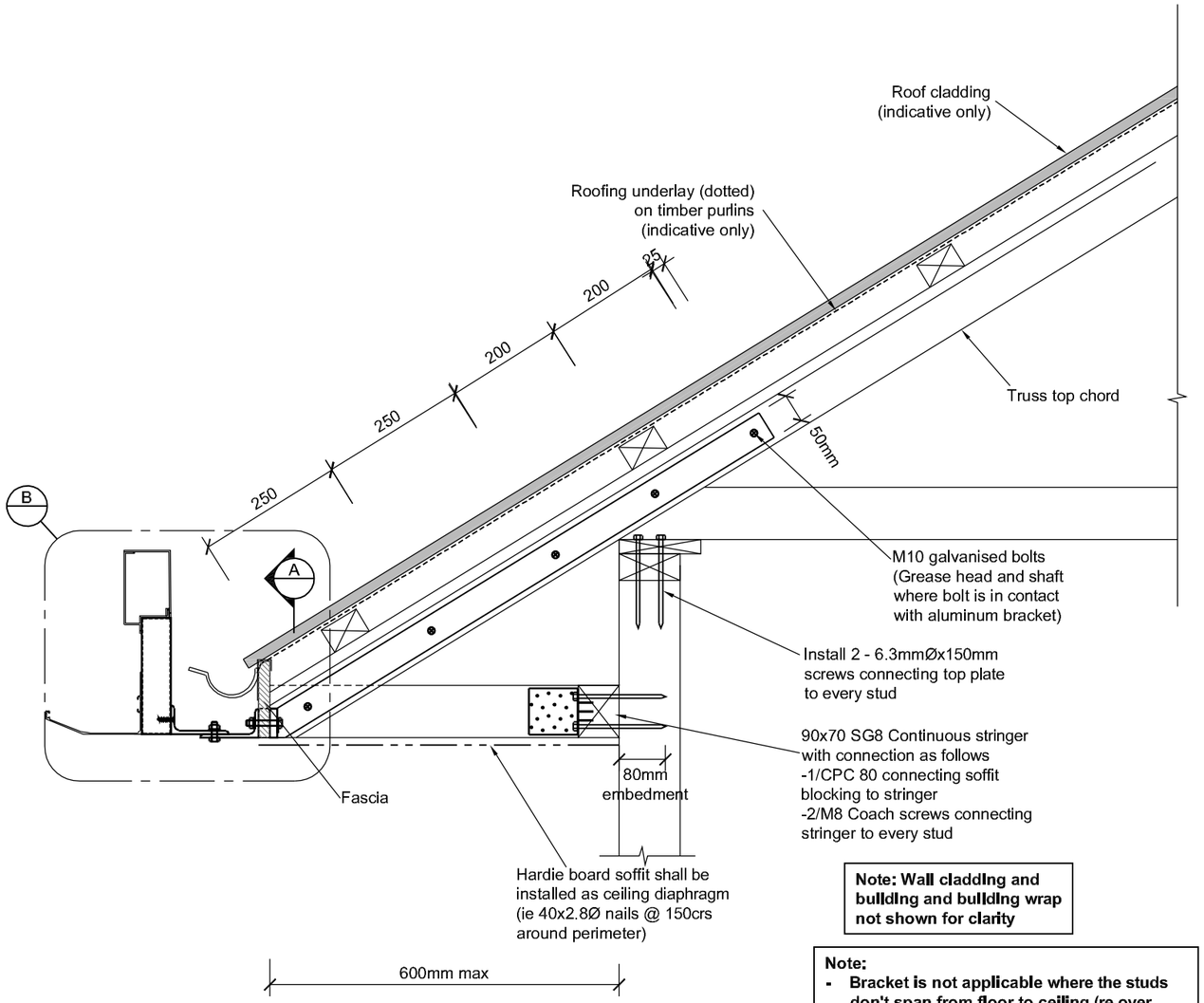
4.	FOR CONSTRUCTION	MAY 2017	SR

PROJECT NO. 15227
SCALE @ A3 1:10, 1:5
REV NO. 4
DESIGNED NB
DRAWN YB
SHEET NO. S1.03



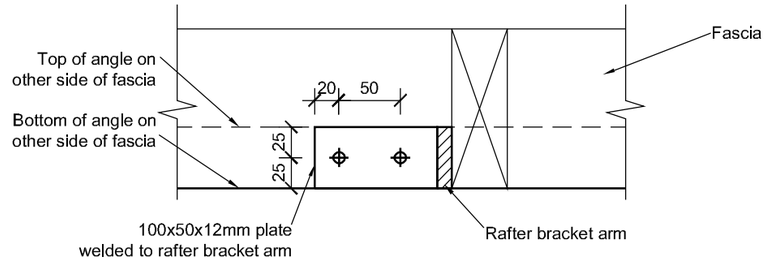
TRUSS BRACKET CONNECTION DETAIL- (TYPE 2)

SCALE 1:10

Note: Wall cladding and building and building wrap not shown for clarity

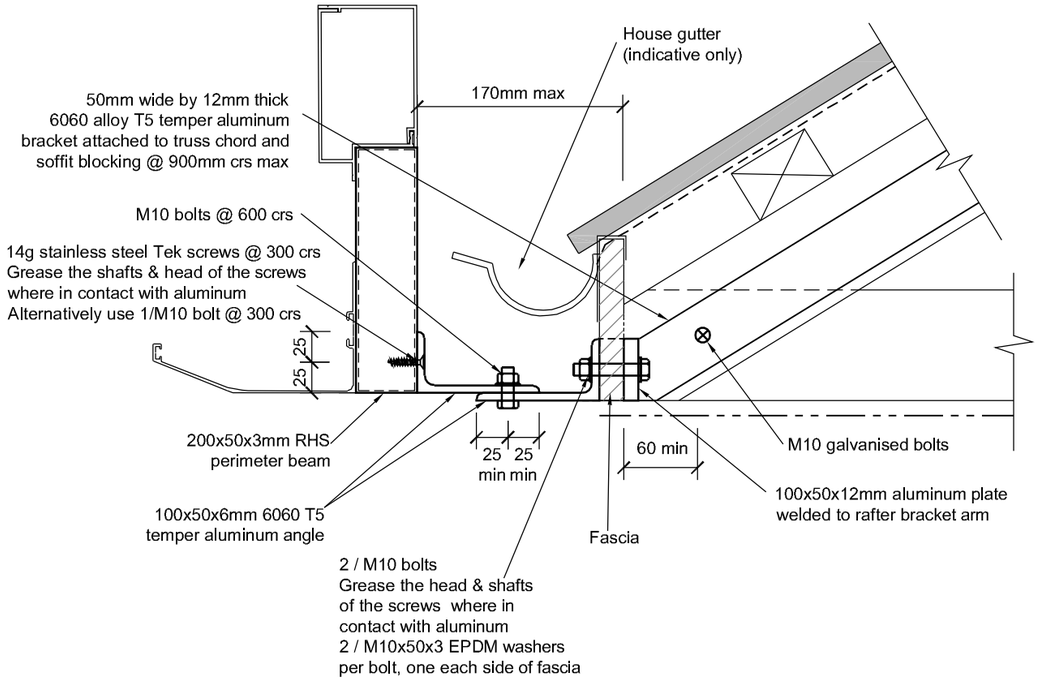
Note:

- **Bracket is not applicable where the studs don't span from floor to ceiling (re over door/window openings)**
- **An Engineer is to check the capacity of any lintels below the rafter brackets for the louvers added loading.**
- **Bracket is only to be used in wind zones up the "High" as per NZS3604:2011 and where the open snow ground load is less then or equal to Sg=0.9kPa**



A ARM TO CHANNEL CONNECTION

SCALE 1:5



B DETAIL

SCALE 1:5

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4.	FOR CONSTRUCTION	MAY 2017	SR

PROJECT NO.	15227
SCALE @ A3	1:10, 1:5
REV NO.	4
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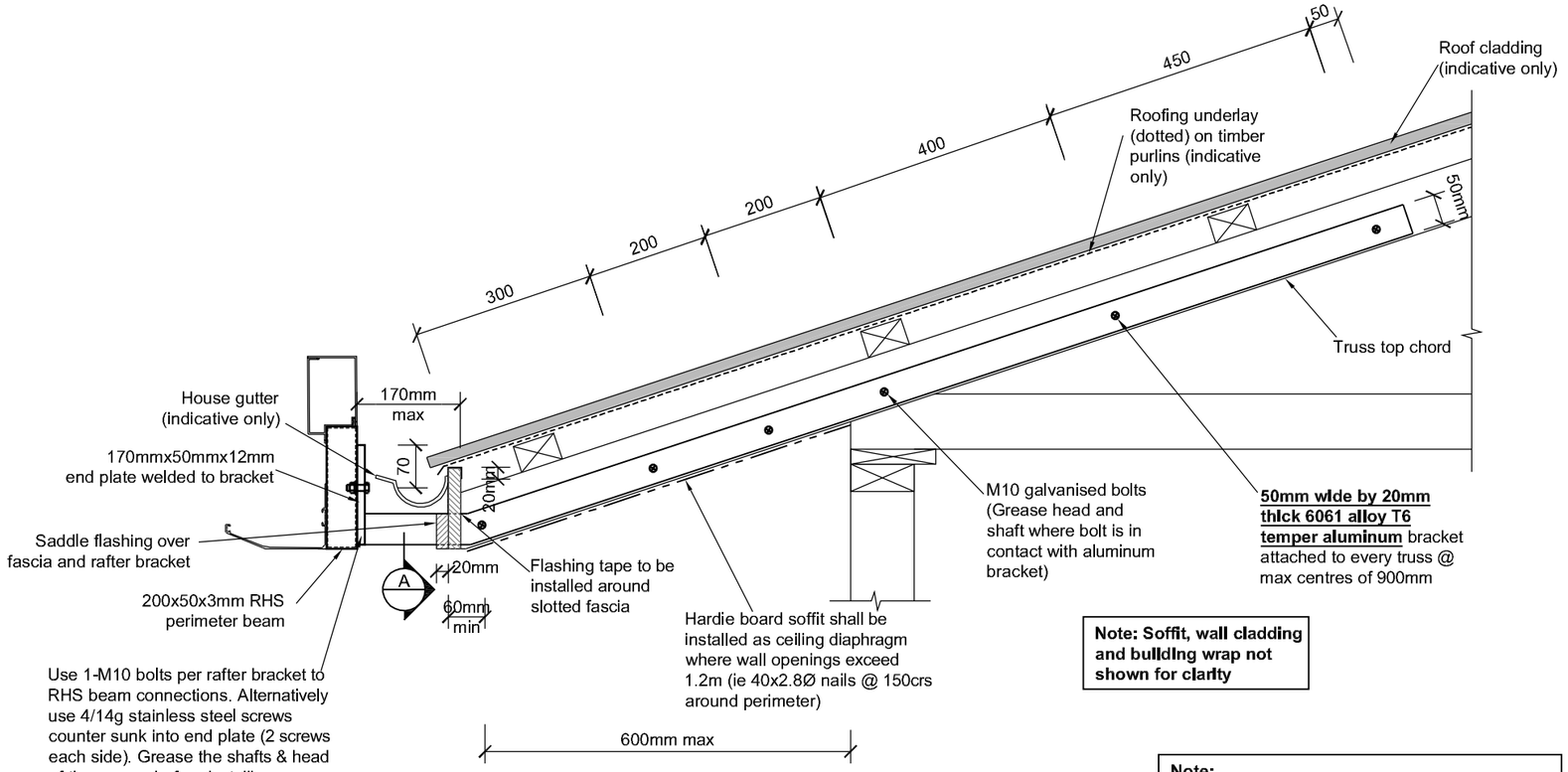
DRAWN	YB
SHEET NO.	S1.04

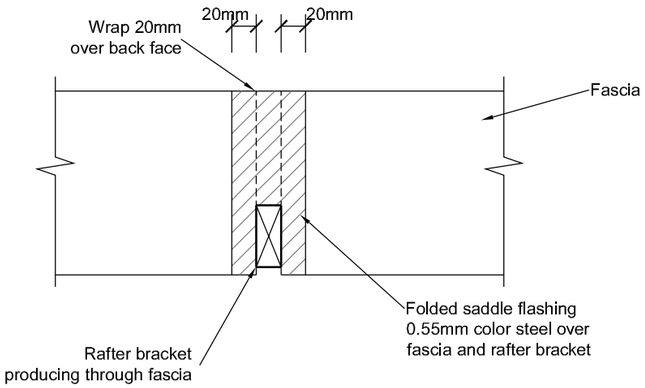


TRUSS BRACKET CONNECTION DETAIL - RAKING SOFFIT (TYPE 3)

SCALE 1:10

Note: Soffit, wall cladding and building wrap not shown for clarity

Note:
- **Bracket is not applicable where the studs don't span from floor to ceiling (re over door/window openings)**
- **An Engineer is to check the capacity of any lintels below the rafter brackets for the louvers added loading.**
- **Bracket is only to be used in wind zones up the "High" as per NZS3604:2011 and where the open snow ground load is less then or equal to Sg=0.9kPa**



A FLASHING DETAIL

SCALE 1:5

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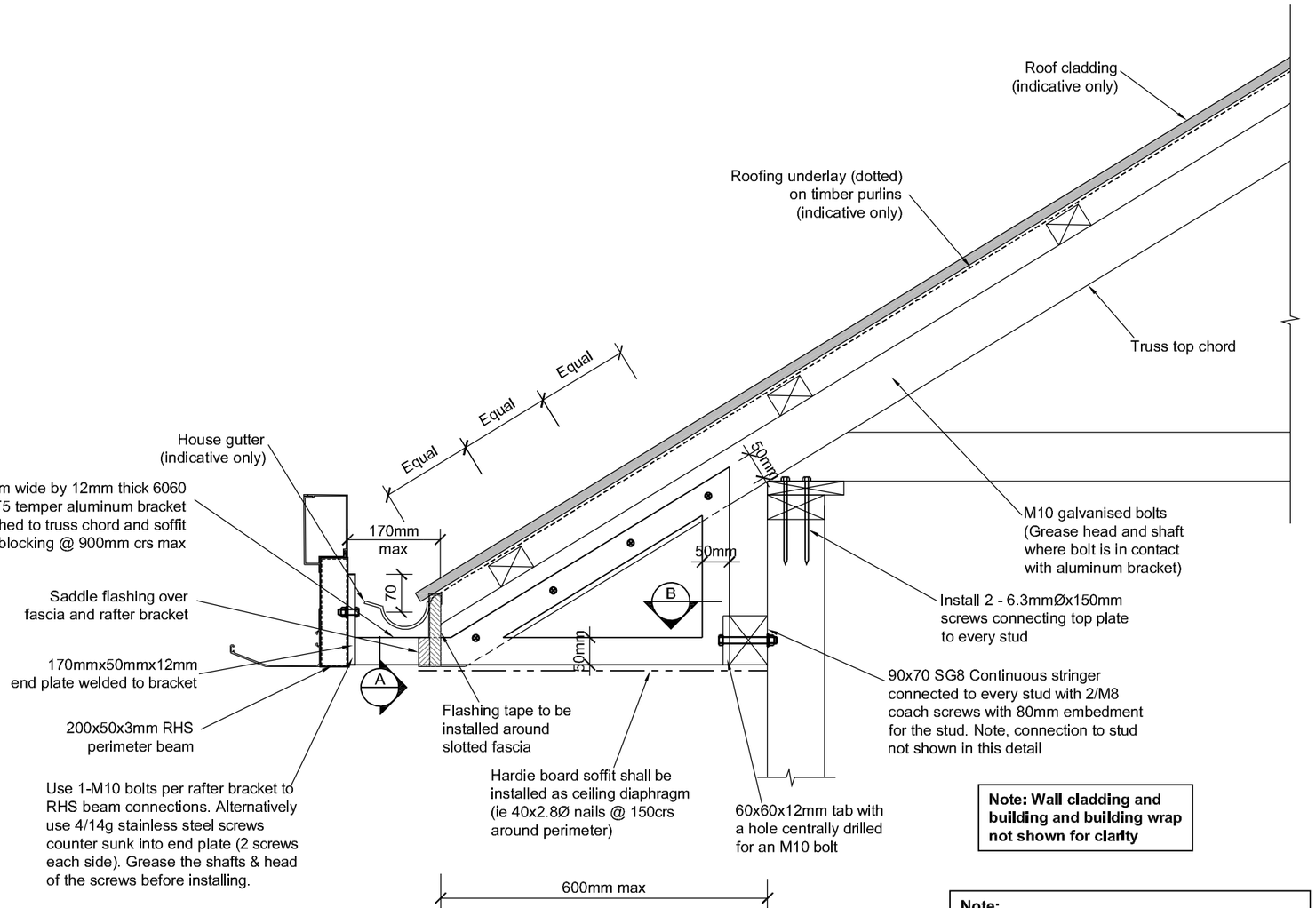
3.	FOR CONSTRUCTION	APR 2017	SR
4.	FOR CONSTRUCTION	MAY 2017	SR

PROJECT NO. 15227
SCALE @ A3 1:10, 1:5
REV NO. 4
DESIGNED NB
DRAWN YB
SHEET NO. S1.05

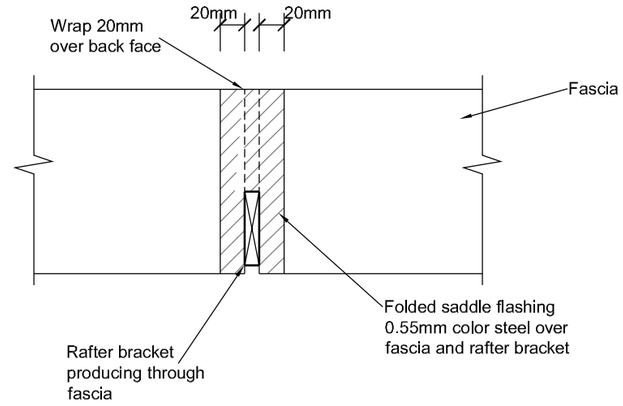


Note: Wall cladding and building and building wrap not shown for clarity

Note:
- **Bracket is not applicable where the studs don't span from floor to ceiling (re over door/window openings)**
- **An Engineer is to check the capacity of any lintels below the rafter brackets for the louvers added loading.**
- **Bracket is only to be used in wind zones up the "High" as per NZS3604:2011 and where the open snow ground load is less then or equal to Sg=0.9kPa**

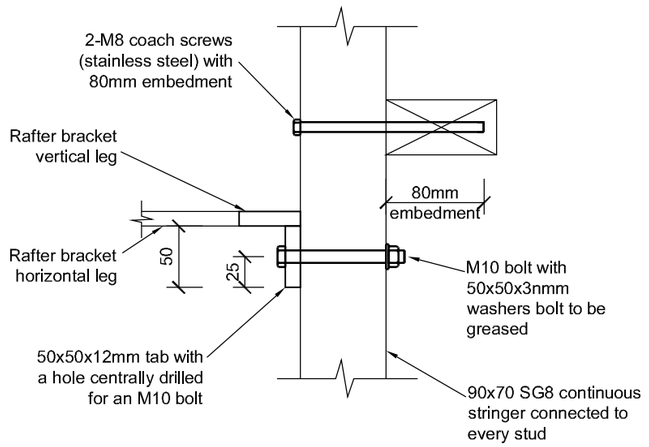
TRUSS BRACKET (WITH BLOCKING) CONNECTION DETAIL- STANDARD TRUSS SOFFIT (TYPE 4)

SCALE 1:10



A FLASHING DETAIL

SCALE 1:5



B BRACKET TO STRINGER CONNECTION

SCALE 1:5

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DRAWING TITLE
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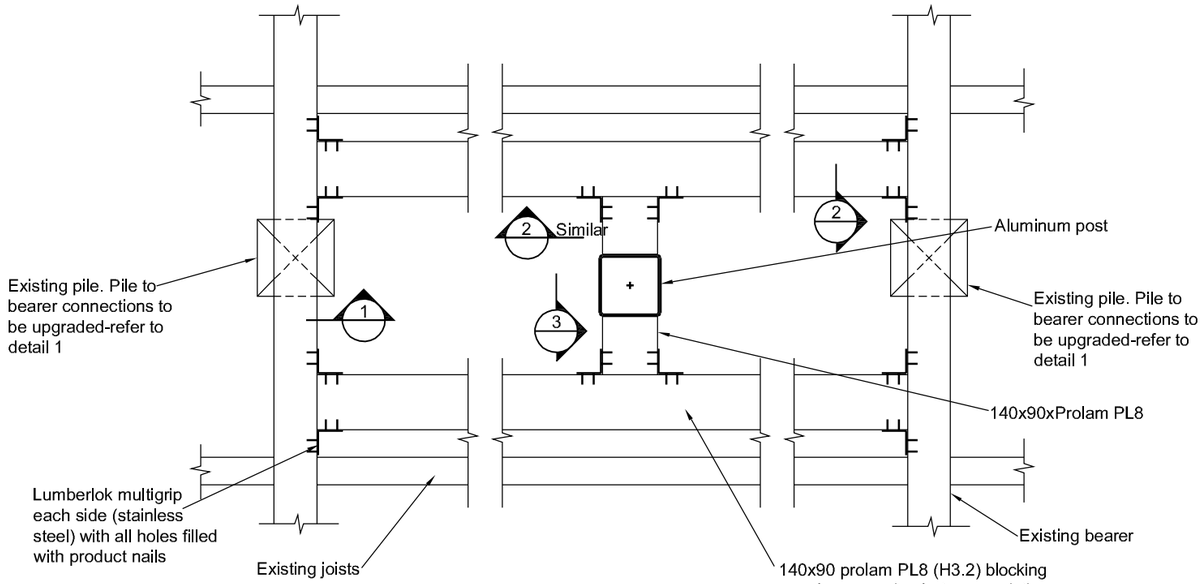
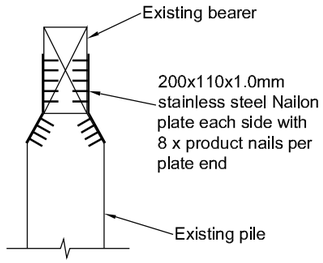
4.	FOR CONSTRUCTION	MAY 2017	SR

PROJECT NO. 15227
SCALE @ A3 1:10, 1:5
REV NO. 4
DESIGNED NB
DRAWN YB
SHEET NO. S1.06



LOUVRE POST TO DECK CONNECTION - PLAN VIEW

SCALE 1:10

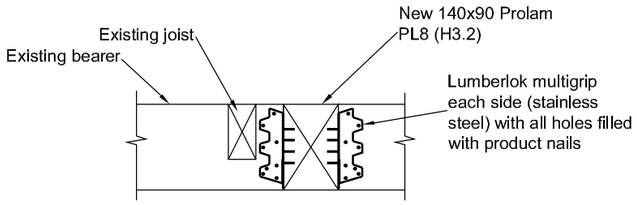


1 UPGRADED BEARER TO PILE CONNECTION

SCALE 1:10

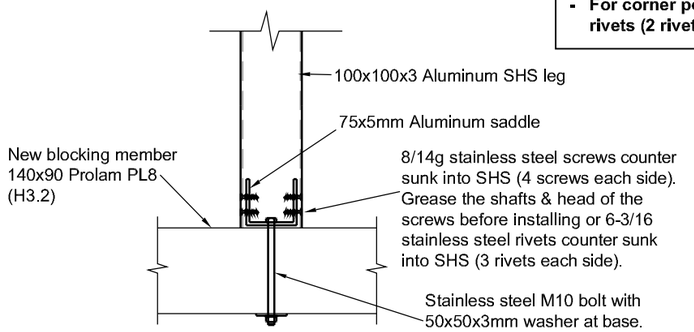
Note:

- **This detail is only relevant to a standard post rather than cantilevered post**
- **For corner post use 4-3/16 ss rivets (2 rivets each side)**



2 BLOCKING MEMBER TO BEARER CONNECTION

SCALE 1:10



3 LOUVRE POST TO DECK BEARER CONNECTION

SCALE 1:10

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PROJECT TITLE
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STANDARD DETAILS

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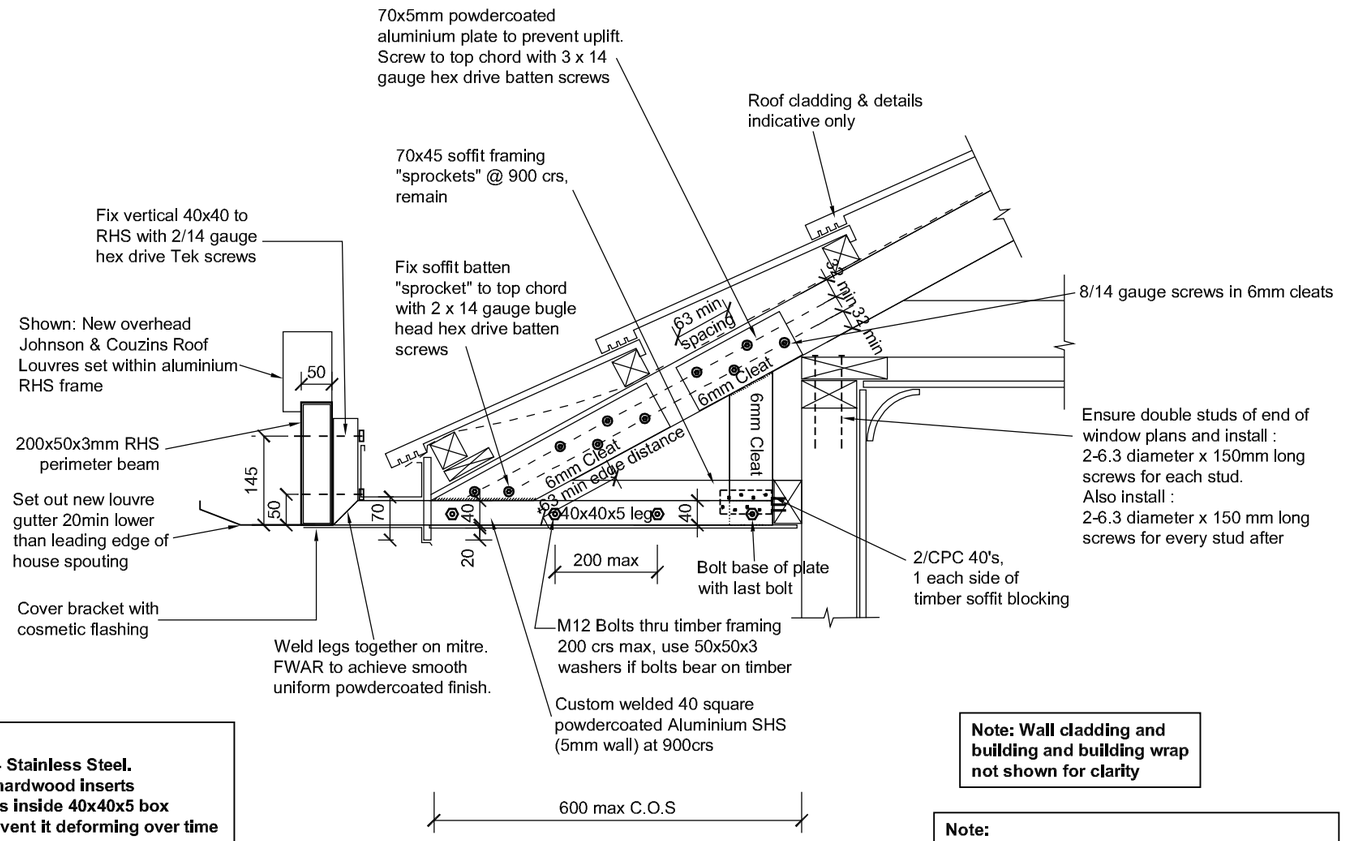
2.	FOR CONSTRUCTION	MAR 2017	SR
3.	FOR CONSTRUCTION	MAY 2017	SR

PROJECT NO.	15227
SCALE @ A3	1:10
REV NO.	3
DESIGNED	NB
DRAWN	YB
SHEET NO.	S1.07



Note
- **All fixings 304 Stainless Steel. Allow to use hardwood inserts at fixing points inside 40x40x5 box section to prevent it deforming over time**
- **Fix to every Rafter / Top Chord of every truss. Screw Spacing: Min 63mm screw spacing & 32 mm to edge of timber (perpendicular to grain) & 63mm to end of timber (parallel to grain)**

Note: Wall cladding and building and building wrap not shown for clarity

Note:
- **Bracket is not applicable where the studs don't span from floor to ceiling (re over door/window openings)**
- **An Engineer Is to check the capaclty of any lintels below the rafter brackets for the louvers added loading.**
- **Bracket is only to be used in wind zones up the "High" as per NZS3604:2011 and where the open snow ground load is less then or equal to Sg=0.9kPa**

TRUSS BRACKET (WITH BLOCKING) CONNECTION DETAIL-TYPE 5

SCALE 1:10

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DRAWING TITLE: DETAILS

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PROJECT NO. 15227 | DESIGNED NB | SCALE @ A3 1:10 | DRAWN YB | REV NO. 1 | SHEET NO. S1.08