



NZ Louvres™

# Technical Design Manual

ENGINEERING REPORT

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## ENGINEERING REFERENCES & DESIGN INFORMATION FOR NZ LOUVRES SYSTEMS AND SUPPORT FRAMES

Design has been carried out using the following Standards and Design Codes of practice:

### Structural Design Actions:

Part 0: General principles – AS/NZS 1170.0:2002

Part 1: Permanent, imposed and other actions – AS/NZS 1170.1:2002

Part 2: Wind Actions – AS/NZS 1170.2:2011

### Aluminium Structures:

Part 1: Limit state design – AS/NZS 1664.1:1997

Part 2: Allowable stress design – AS/NZS 1664.2:1997

### Timber-framed Buildings:

NZS 3604:2011

### Louvre Blade (and Pivot system) Load Testing:

NZ Louvres has conducted a static load test on the Louvre Blade System (and Pivot System – NZ Louvres to Confirm). The tests confirmed that the Louvre Blades Pivot System is capable of resisting a downward static load greater than would be generated by the application of the structural design loads used in this publication to an equivalent structure.

The testing also verified that the vertical deflections were within acceptable and recommended limits as set out in the applicable NZ Standards and Design Codes.

More detailed test information is available from NZ Louvres upon request.

## CATEGORIES, TYPES AND INTENDED PURPOSES OF PRODUCER STATEMENTS

Design	PS1 Producer Statement Design	Used by designers to certify specific design elements comply with specified standards or codes in order to comply with the provisions of the Building Code.
	PS2 Producer Statement Design Review*	Used by people undertaking a peer review of all or part of a design to say that the design or the specified part of the design complies with specified standards or codes in order to comply with the provisions of the Building Code.
Construction	PS3 Producer Statement Construction	Used by constructors or trades people to certify that the specified building work that they have undertaken complies with the building consent.
	PS4 Producer Statement Construction Review*	Used by people undertaking a peer review of specified building work undertaken by constructors or trades people to certify that the building work that has been undertaken complies with the building consent.

\* not required

## SUMMARY OF PRODUCER STATEMENT - PS1 - DESIGN

# KEARNEY

## CONSULTING LTD

STRUCTURAL AND CIVIL ENGINEERING

### SUMMARY OF PRODUCER STATEMENT – PS1 – DESIGN

NOTE: The formal and current Producer Statement (PS1) for this technical design manual (TDM) is held on file by NZ Louvres and can be provided for all projects in which a Building Consent is required. The Producer Statement is non-site specific as it covers the generic designs of the technical design manual and the NZ Louvres manual appendix only, under the assumption that the tabulated information and specific site conditions are correctly applied. The information below is a summary of this only.

ISSUED BY: Kearney Consulting Limited

TO: NZ Louvres Ltd, New Zealand

TO BE SUPPLIED TO: Relevant Territorial Authority

IN RESPECT OF: NZ Louvres Technical Design Manual 2021: Engineering Report

AT: Throughout New Zealand

Kearney Consulting Ltd have been engaged by NZ Louvres New Zealand Ltd to provide structural design services in respect of the requirements of Clauses B1/VM1 and B2 (insofar as is covered by the relevant structural materials codes listed on this PS1) of the Building Code (in part) for the proposed building work.

The design carried out by us has been prepared in accordance with Compliance Documents issued by the Ministry of Business, Innovation & Employment including AS/NZS 1170:2011; AS/NZ 1664:1997; NZS 3604:2011. The design work covered by this producer statement is described in the NZ Louvres Technical Design Manual

Design Manual 2021: – Engineering Report (by NZ Louvres Ltd), and calculations referenced 20-68 by Kearney Consulting Ltd and the NZ Louvres Design Manual appendix.

On behalf of the Design Firm, and subject to:

- (i) Site verification of the following design assumptions: Tabulated information correctly applied to physical conditions on site.
- (ii) All proprietary products meeting their performance specification requirements;
- (iii) Max. total roof area covered by this design statement is up to < 30m<sup>2</sup>

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.



**Ian Kearney** (CPEng #1151481) Principal Structural Engineer / Director

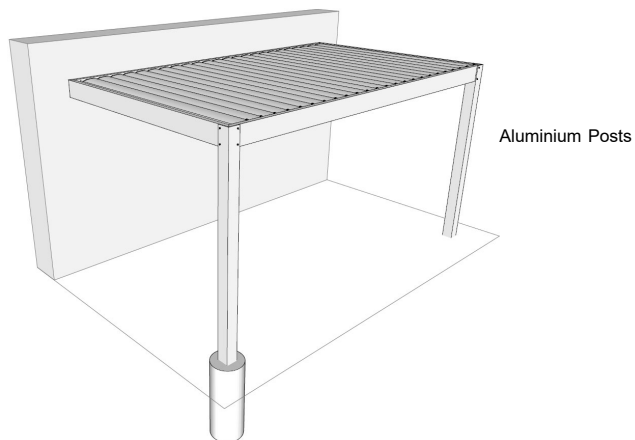
BEng (Civil), CPEng, CMEngNZ, CEng (UK) MICE

Date: 29/09/2021

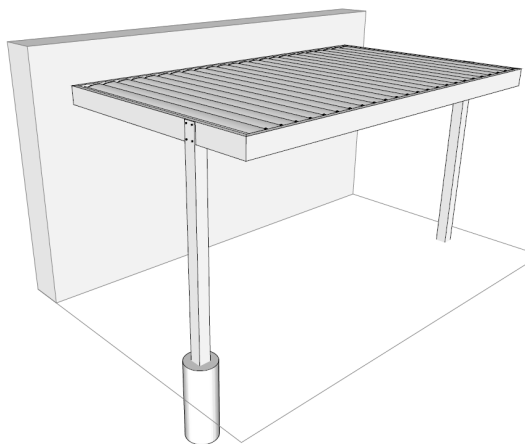
## TYPICAL DETAILS: ALUMINIUM BEAM & POST STRUCTURES

### THREE BASIC BEAM DESIGNS

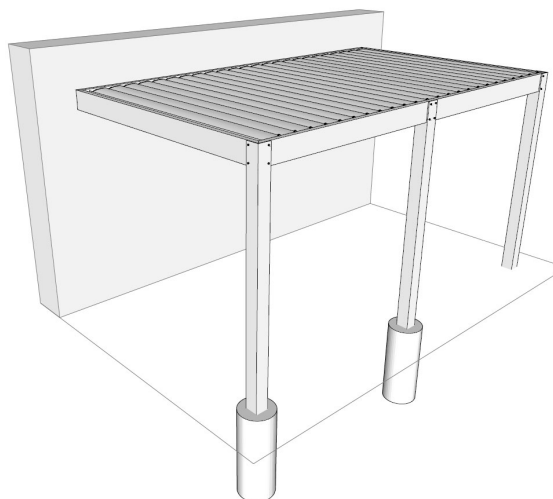
#### 1. SIMPLY SUPPORTED



#### 2. SINGLE CANTILEVER



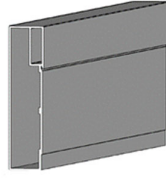
#### 3. CONTINUOUS SPAN



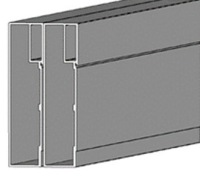
**BEAM TYPES**



200 x 50 x 3



225 x 55 x 3



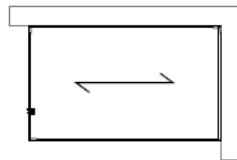
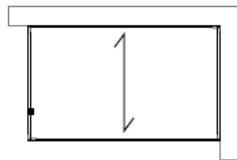
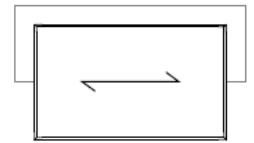
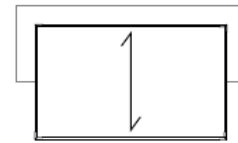
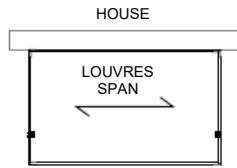
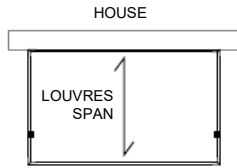
2/225 x 55 x 3

ALUMINIUM BEAMS
200 x 50 x 3
2/200 x 50 x 3
225 x 50 x 3
2/225 x 50 x 3

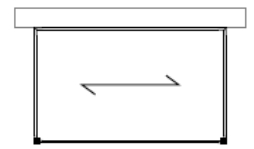
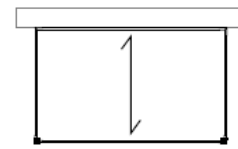
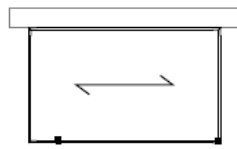
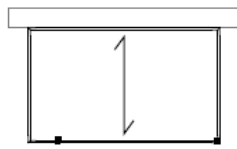
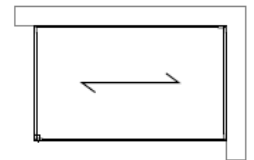
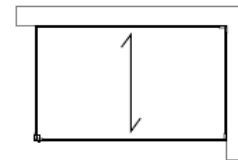
ALUMINIUM POST
150 x 150 x 3

**CONFIGURATIONS AVAILABLE**

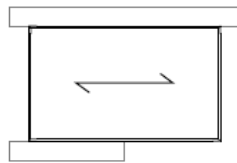
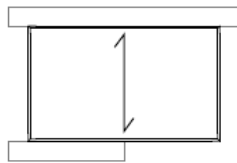
**CANTILEVER**



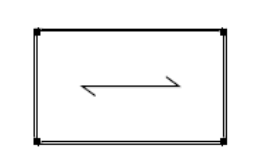
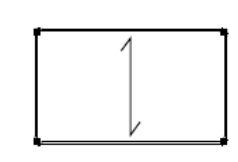
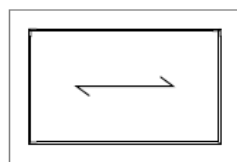
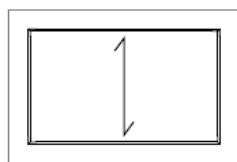
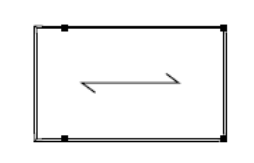
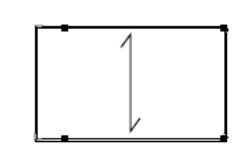
**CANTILEVER**



**CANTILEVER**



**CANTILEVER**



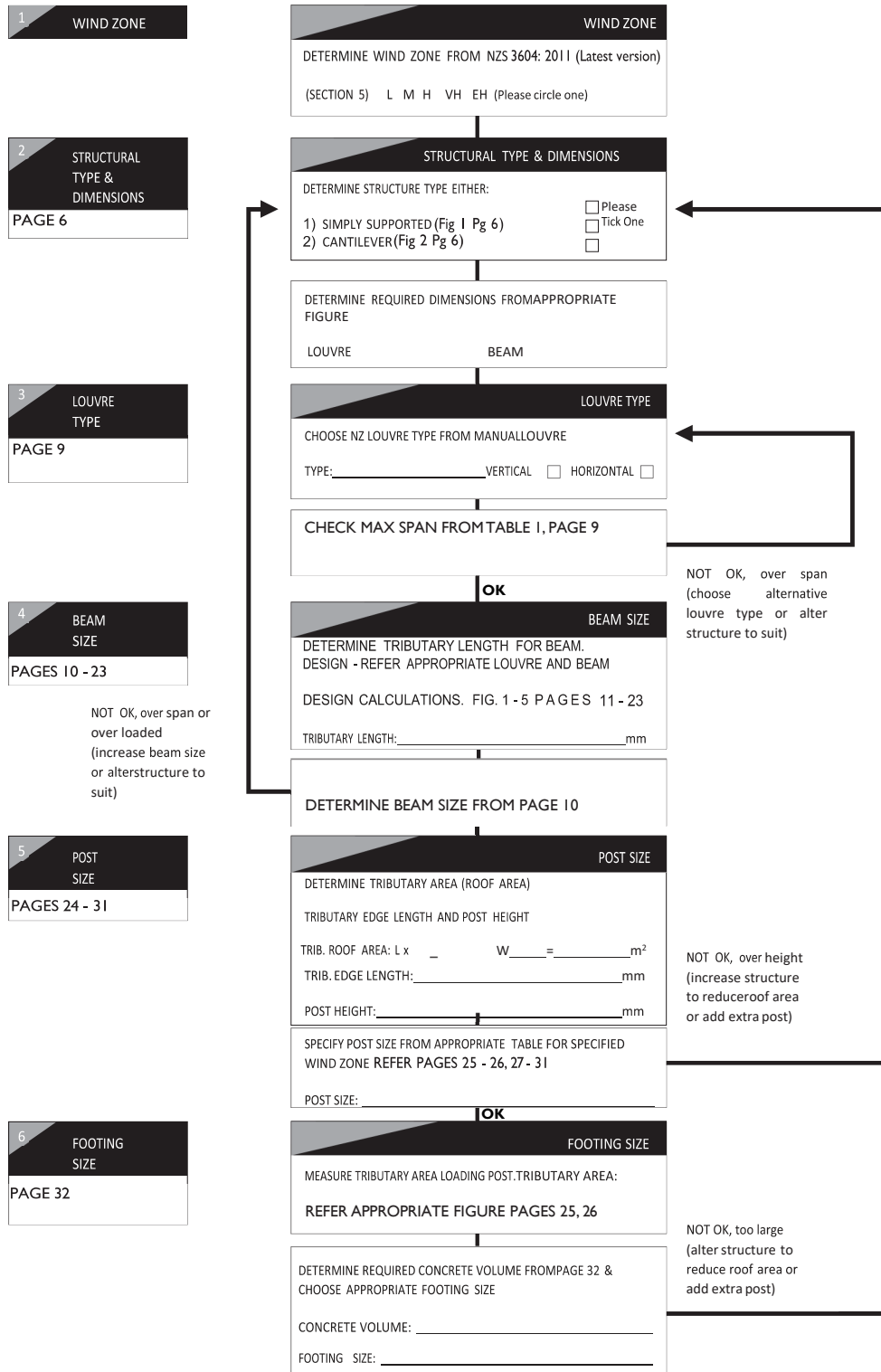
**\*Note:**

Refer to standard NZL fixing details as per pre-approved engineering diagrams, if any details exceed the standard engineering parameters an SED (Specific engineering design) will be required.



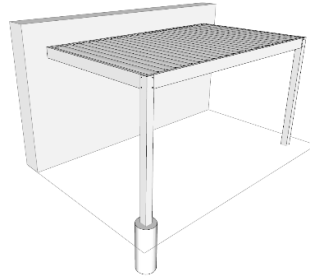
# ENGINEERING SPECIFIERS GUIDE

ALL PAGES REFER TO - ENGINEERING REPORT

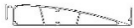


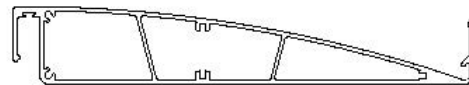
## CHART: CALCULATE OPENING ROOF SPANS

**TABLE I**



OVERHEAD ADJUSTABLE AND FIXED

	wind zone	inside (self wt)	L	M	H	VH	EH
	ultimate design factored wind speed at building		115km/h	133km/h	158km/h	179km/h	198km/h
			32 m/s	37 m/s	44 m/s	50 m/s	55 m/s
	ultimate limit state loads (kPa)	downthrust	+0.92	+1.23	+1.74	+2.24	+2.71
		uplift	-1.15	-1.53	-2.17	-2.80	-3.39
louvre image	louvre type	inside	L	M	H	VH	EH
	NZL	4000	4000	4000	4000	4000	4000



**BLADE SECTION**

## CHART: BEAM CALCULATION

**TABLE 2**

**TO CALCULATE TRIBUTARY LENGTH FOR BEAMS**

Typically, the tributary length for simply supported beams only is half the length of the louvre span (refer note below). Determining the tributary length is shown through figures 1 - 5 on pages 11 to 23 of this engineering Design Manual report.

Note: Care must be taken when calculating the tributary length for mid beams on continuous spanning structures as half the louvre span on either side of the beam may not be equal.

Roof Beams		Max Beam Span (mm)				
Wind Zone	Tributary length of louvre	1	1.25	1.5	1.75	2
	Beam Size (mm)					
LOW	200x50x3 RHS	5250	5000	4850	4650	4500
	225x55x3 RHS	5850	5500	5150	4900	4700
	2-225x55x3 RHS	6500	6450	6400	6200	5850
MEDIUM	200x50x3 RHS	4900	4600	4300	4100	3900
	225x55x3 RHS	5500	5250	5000	4750	4500
	2-225x55x3 RHS	6950	6800	6700	6400	6100
HIGH	200x50x3 RHS	4500	4000	3800	3550	3300
	225x55x3 RHS	5400	4600	4200	4000	3600
	2-225x55x3 RHS	6500	6250	6000	5700	5500

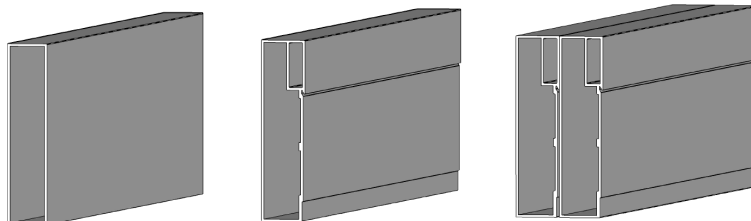
**TABLE 3**

**TO CALCULATE TRIBUTARY LENGTH FOR BEAMS**

Roof Beams		Max Beam Span (mm)				
Wind Zone	Tributary length of louvre	1	1.25	1.5	1.75	2
	Beam Size (mm)					
VERY HIGH	200x50x3 RHS	3950	3700	3300	3100	2850
	225x55x3 RHS	4500	4000	3550	3400	3250
	2-225x55x3 RHS	5900	5450	5150	4600	4400
EXTRA HIGH	200x50x3 RHS	3700	3350	3000	2800	2600
	225x55x3 RHS	3950	3500	3200	3000	2800
	2-225x55x3 RHS	5250	4900	4550	4200	3950

Fix double beams together with min. 2/12g x 20mm Hardtek Stainless Drillers self-tapping screws 66mm in from bottom of box section and 126mm from bottom for top screws at max. 600mm centre spacing. Use continuous flexible sealant/adhesive along top and bottom between box sections.

**BEAM TYPES**



200 x 50 x 3

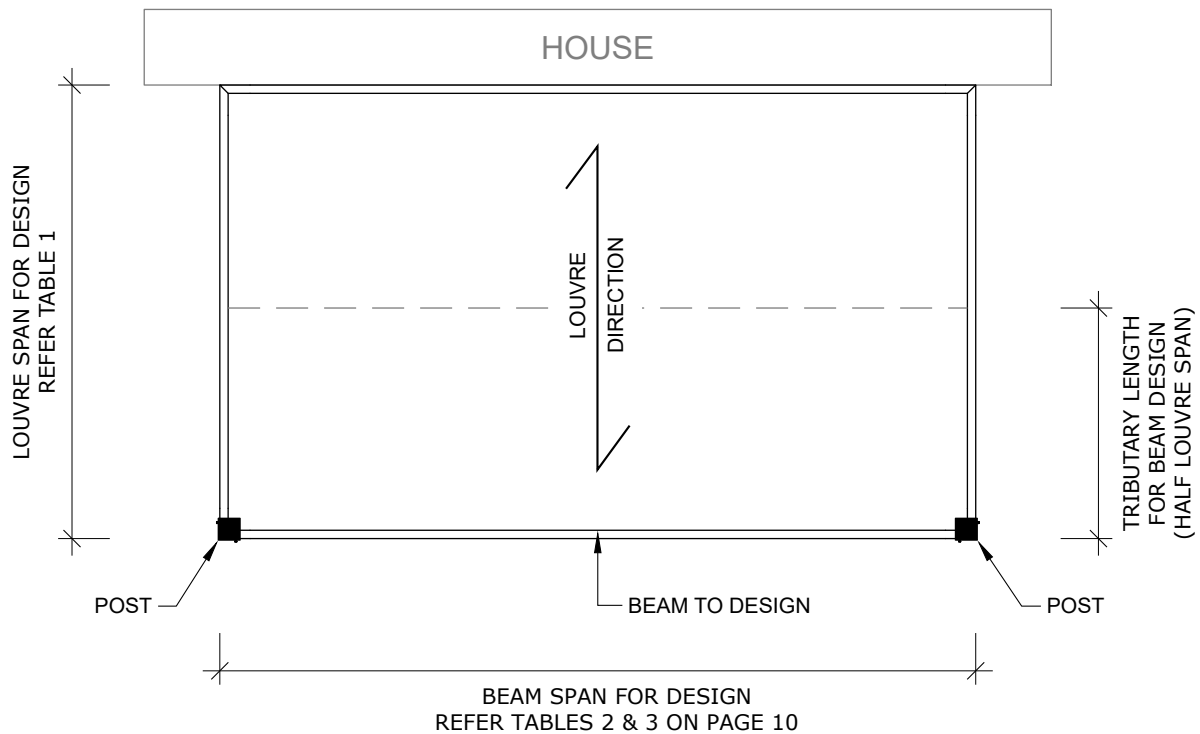
225 x 55 x 3

2/225 x 55 x 3

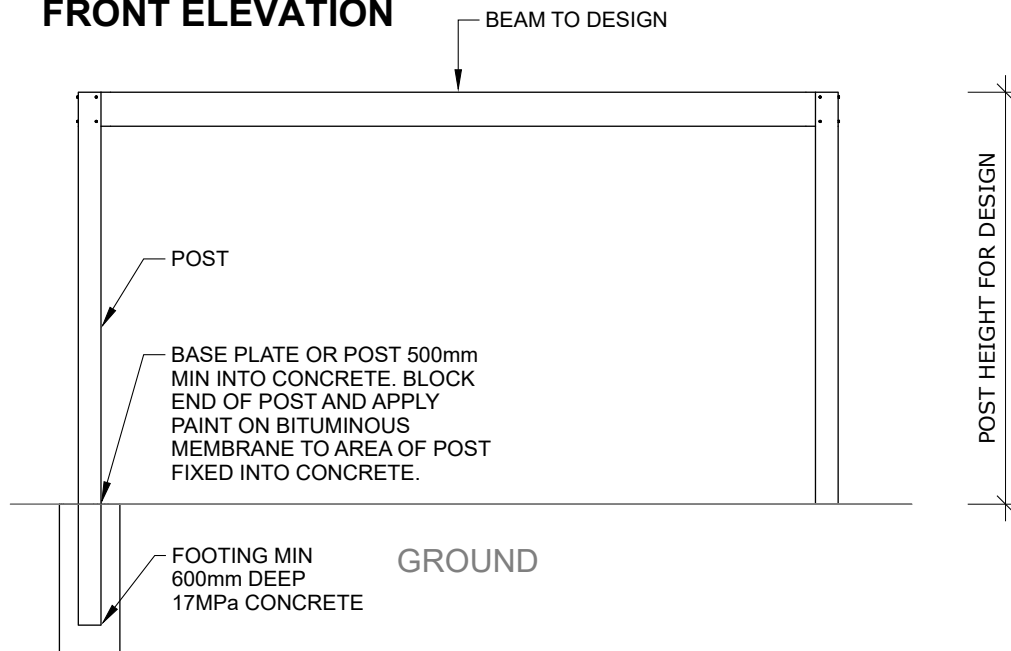
# TECHNICAL DETAILS: STRUCTURE ATTACHED TO HOUSE - TYPICAL STRUCTURE

TYPICAL DETAIL: SIMPLY SUPPORTED BEAM FIGURE 1

## PLAN VIEW - LOUVRE AND BEAM DESIGN



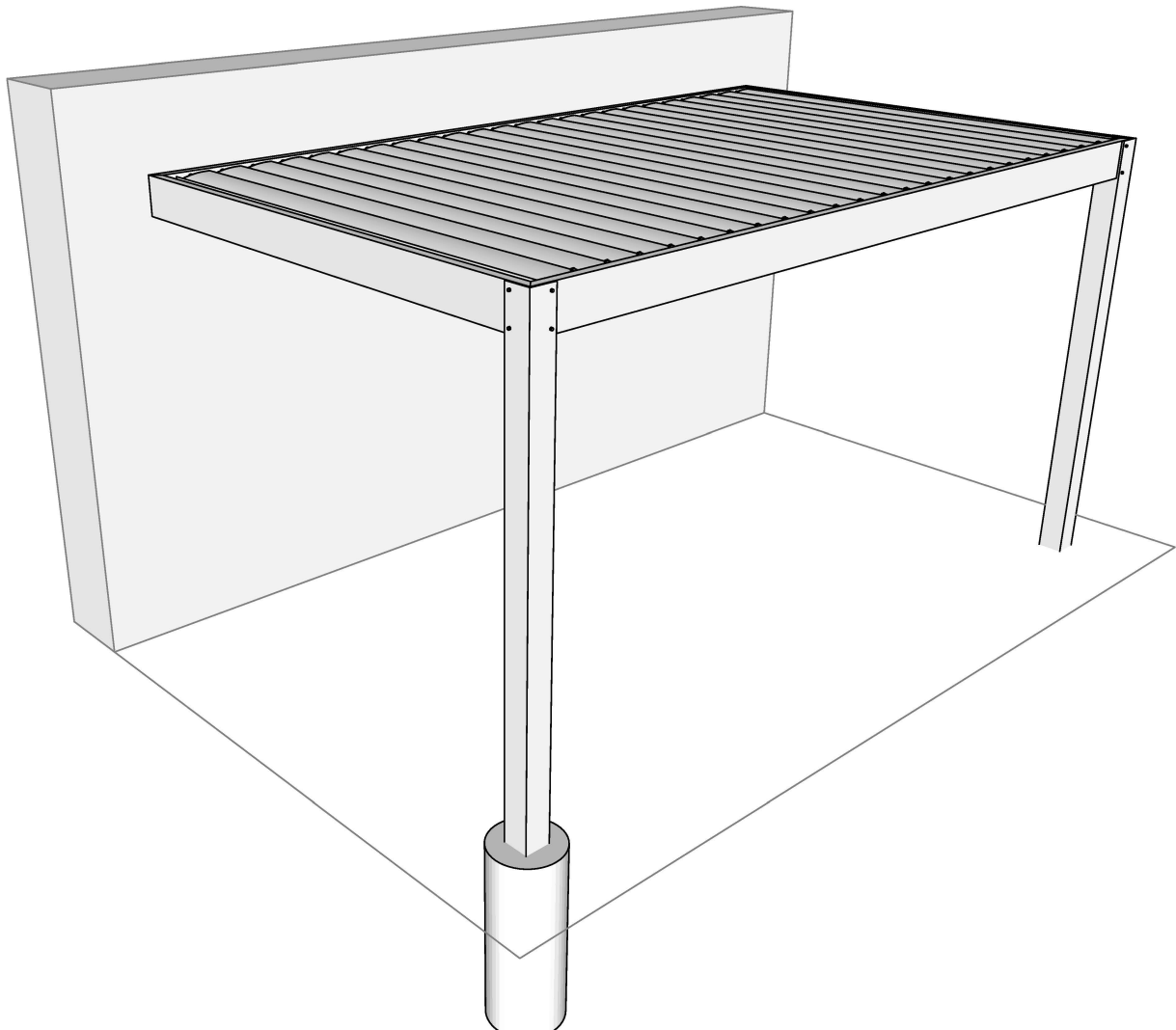
## FRONT ELEVATION



**TECHNICAL DETAILS: STRUCTURE ATTACHED TO HOUSE – TYPICAL STRUCTURE**

TYPICAL DETAIL: **SIMPLY SUPPORTED BEAM** FIGURE 1 - 3D ISOMETRIC VIEW

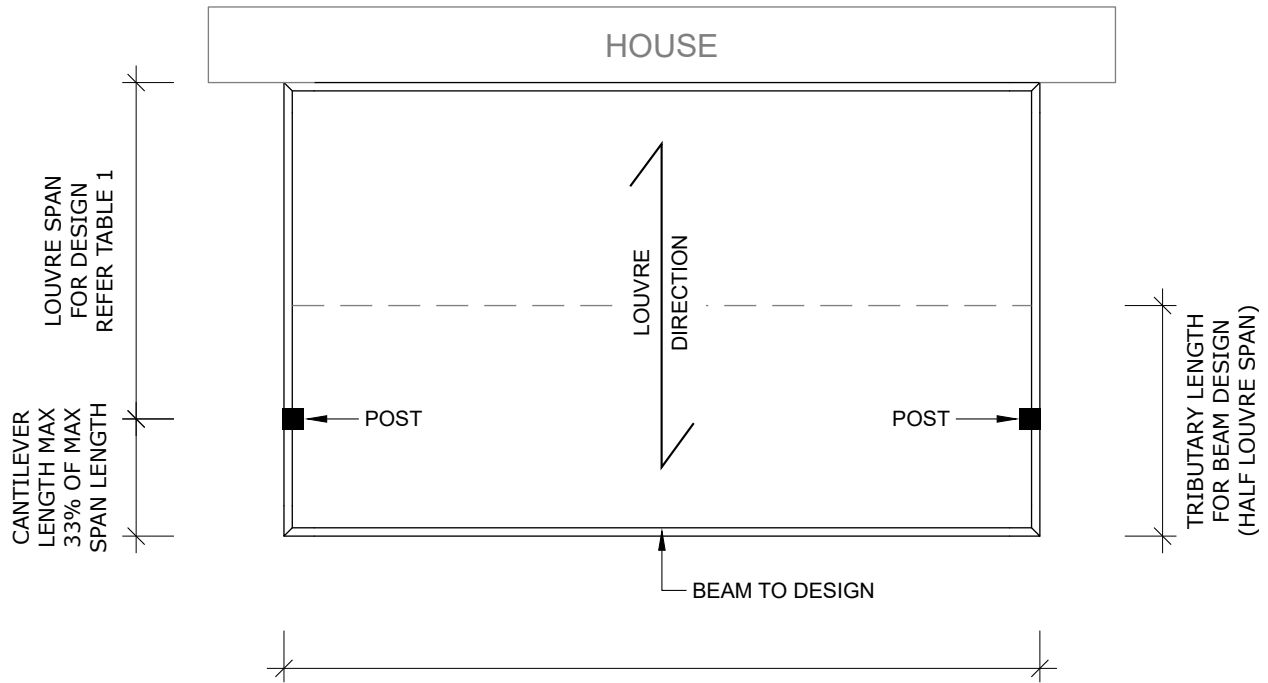
**3D VIEW - LOUVRE ROOF**



**TECHNICAL DETAILS: STRUCTURE ATTACHED TO HOUSE – TYPICAL STRUCTURE**

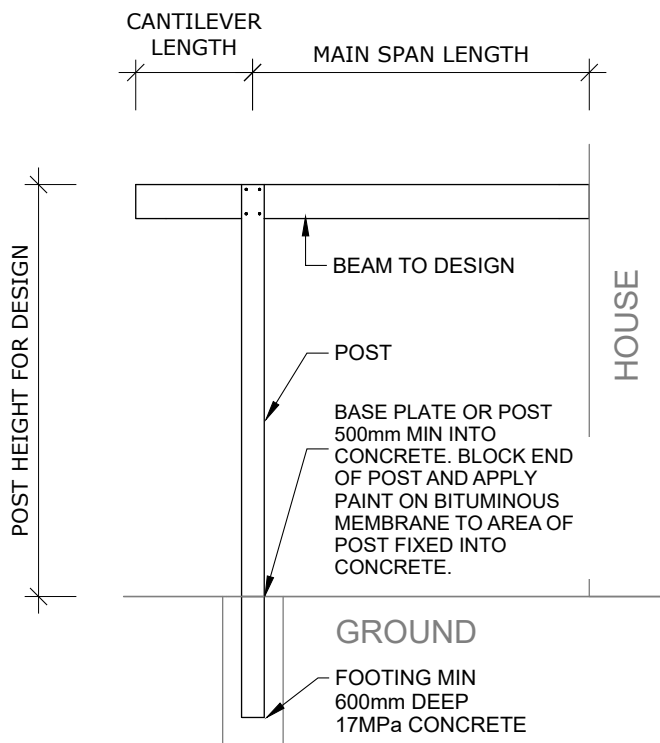
**TYPICAL DETAIL: CANTILEVER BEAM FIGURE 2**

**PLAN VIEW - LOUVRE AND BEAM DESIGN**



**SIDE ELEVATION**

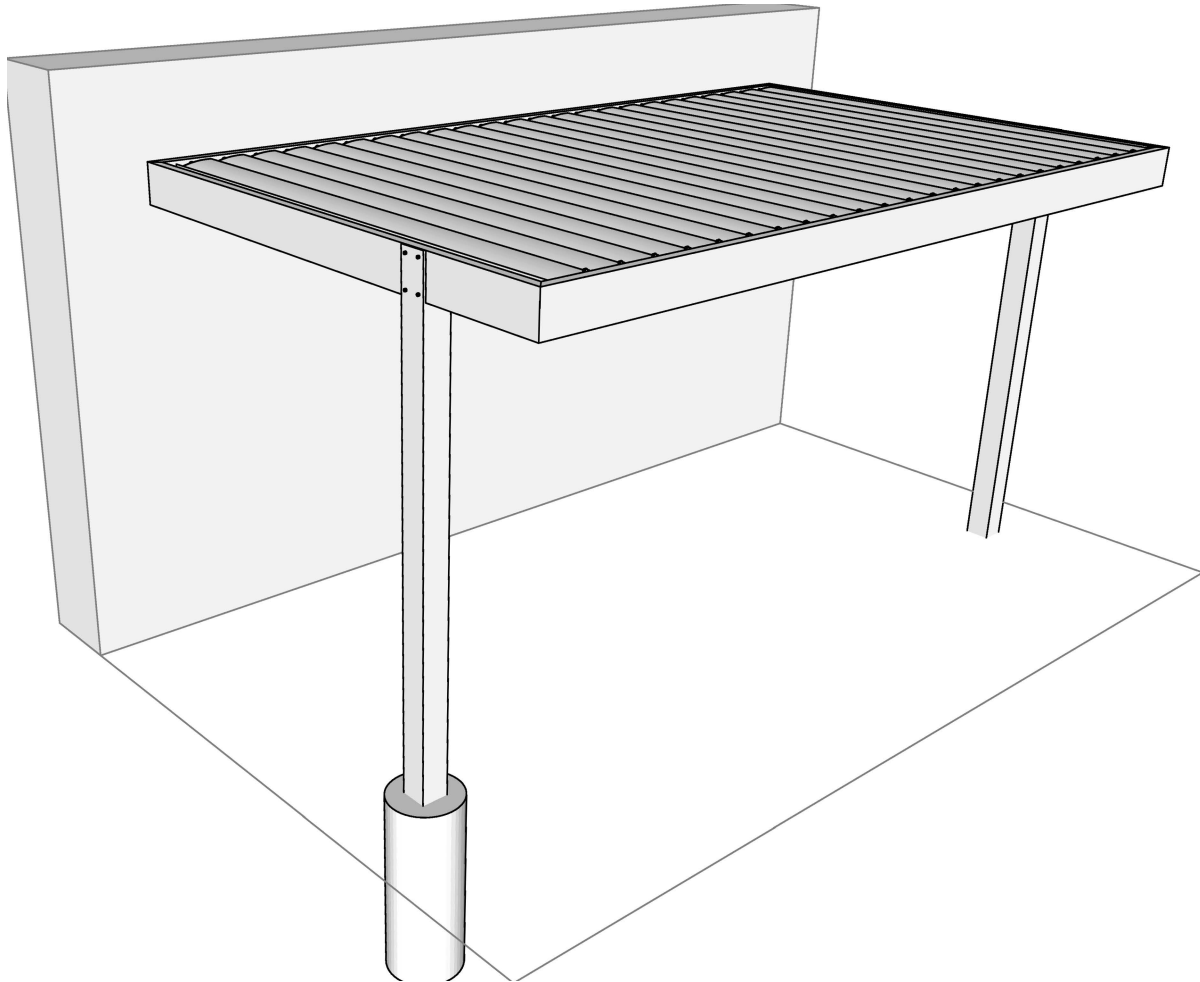
REFER TABLES 1 - 3 ON PAGES 9 - 10



**TECHNICAL DETAILS: STRUCTURE ATTACHED TO HOUSE – TYPICAL STRUCTURE**

TYPICAL DETAIL: CANTILEVER BEAM FIGURE 2 – 3D ISOMETRIC VIEW

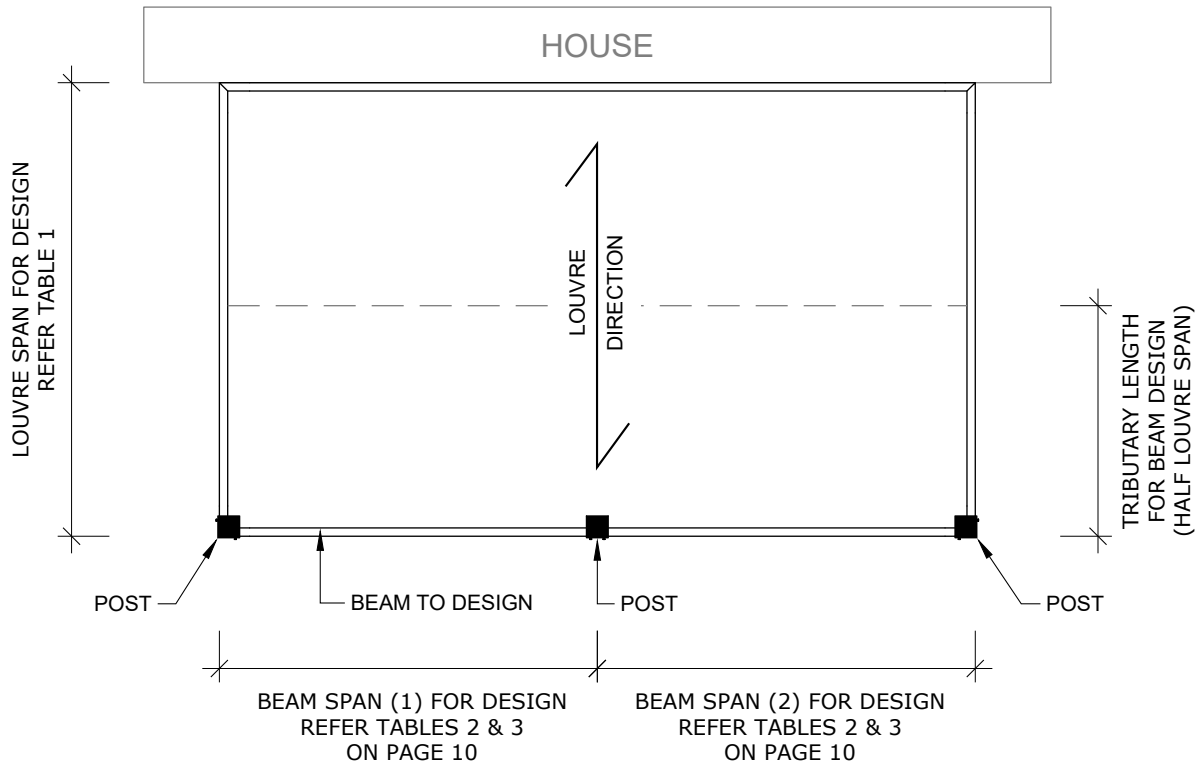
**3D VIEW - LOUVRE ROOF**



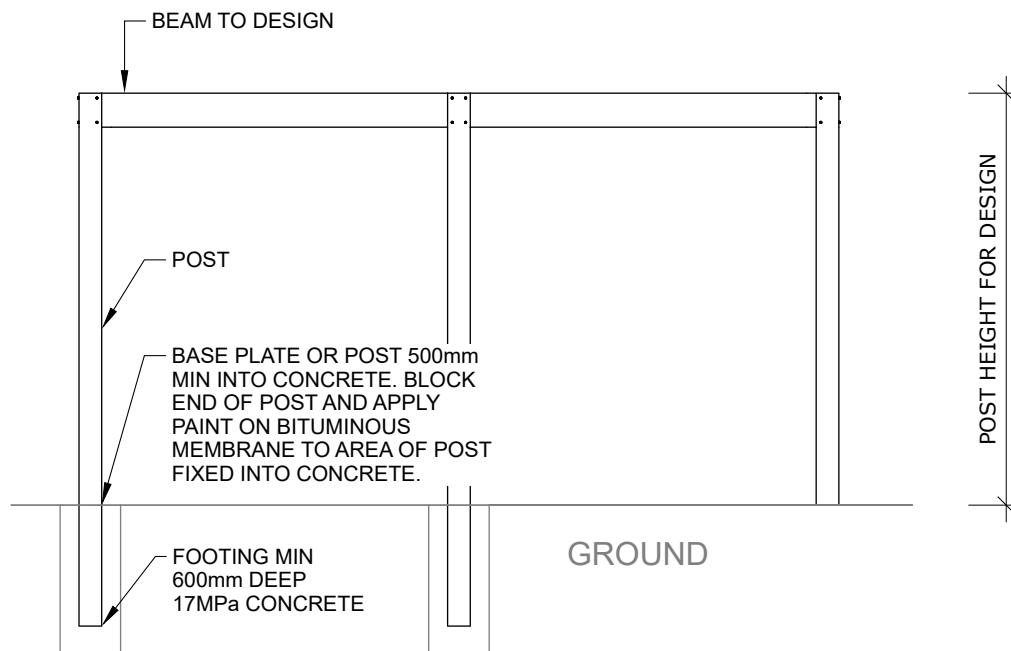
**TECHNICAL DETAILS: STRUCTURE ATTACHED TO HOUSE – TYPICAL STRUCTURE**

TYPICAL DETAIL: CONTINUOUS BEAM SPAN OPTION 1 FIGURE 3

**PLAN VIEW - LOUVRE AND BEAM DESIGN**



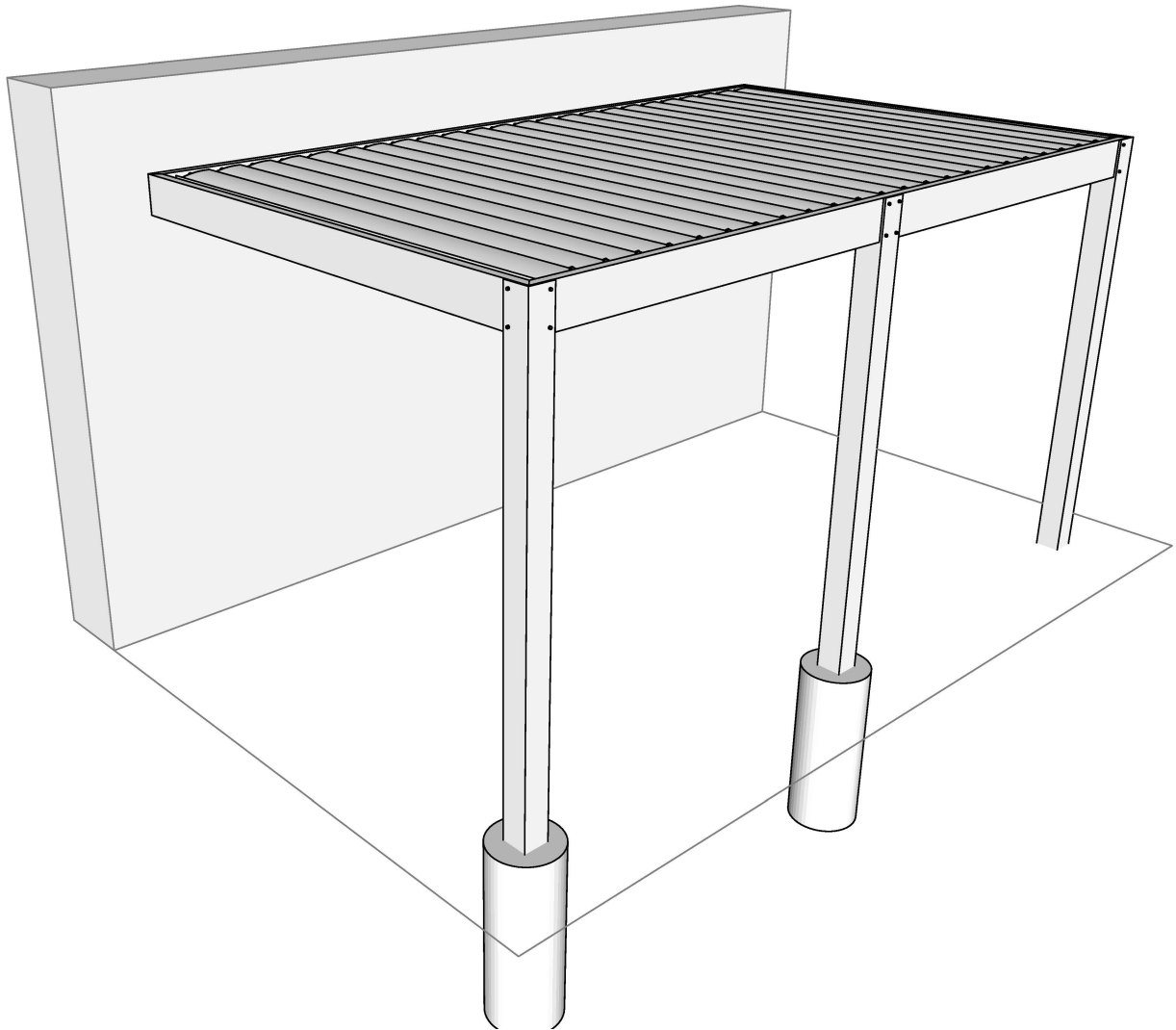
**FRONT ELEVATION**





**TECHNICAL DETAILS: STRUCTURE ATTACHED TO HOUSE – TYPICAL STRUCTURE**

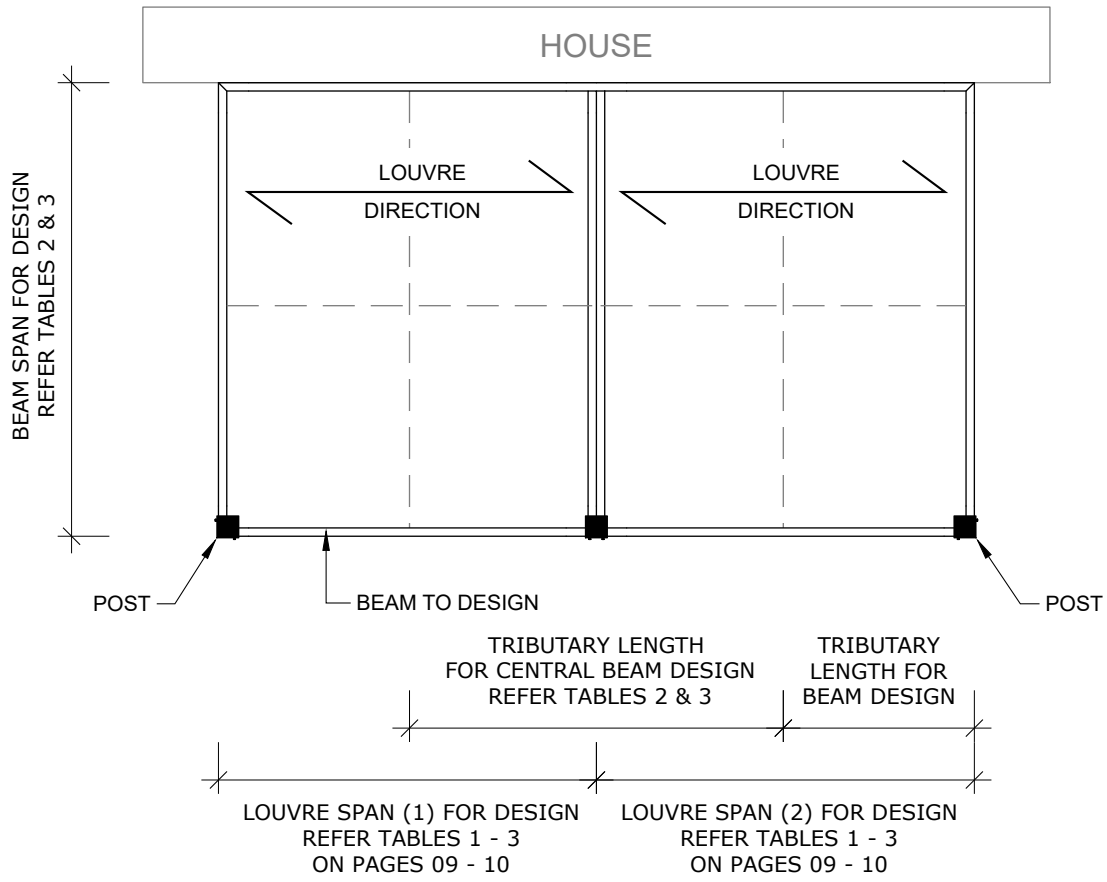
**TYPICAL DETAIL: CONTINUOUS BEAM SPAN OPTION 1** FIGURE 3 – 3D ISOMETRIC VIEW



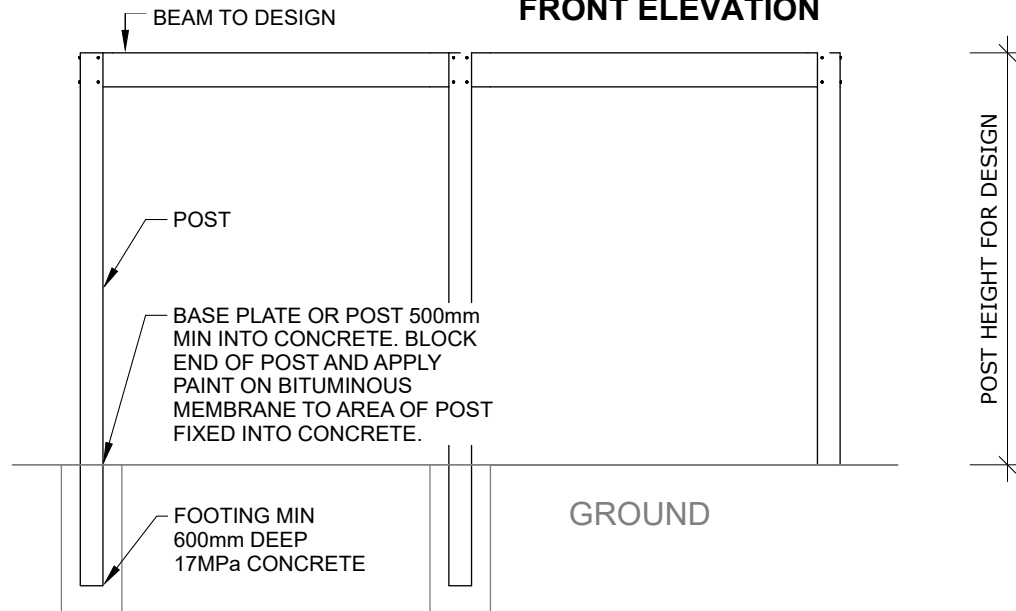
**TECHNICAL DETAILS: STRUCTURE ATTACHED TO HOUSE – TYPICAL STRUCTURE**

TYPICAL DETAIL: CONTINUOUS BEAM SPAN OPTION 2 FIGURE 4

**PLAN VIEW - LOUVRE AND BEAM DESIGN**

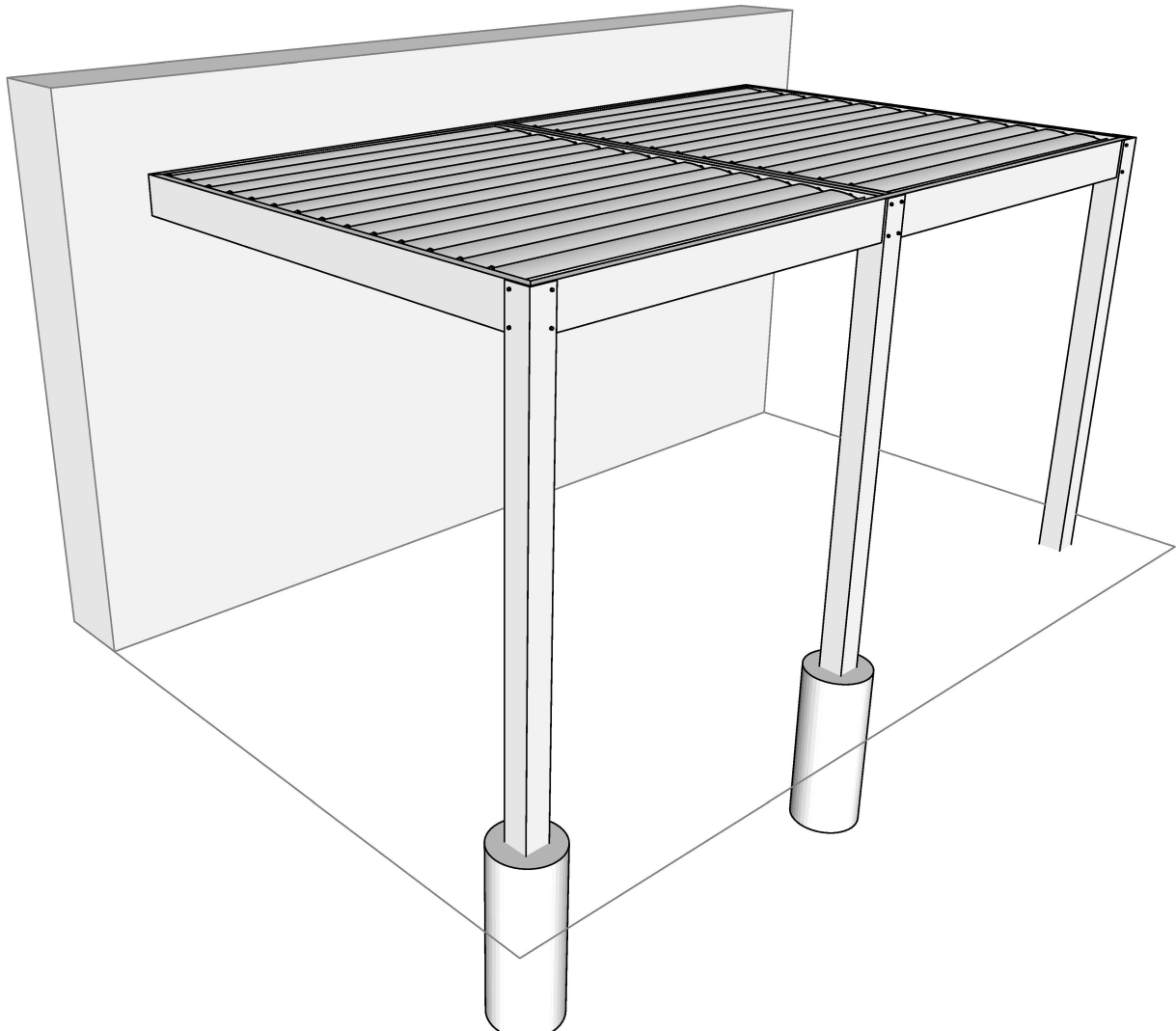


**FRONT ELEVATION**



**TECHNICAL DETAILS: STRUCTURE ATTACHED TO HOUSE – TYPICAL STRUCTURE**

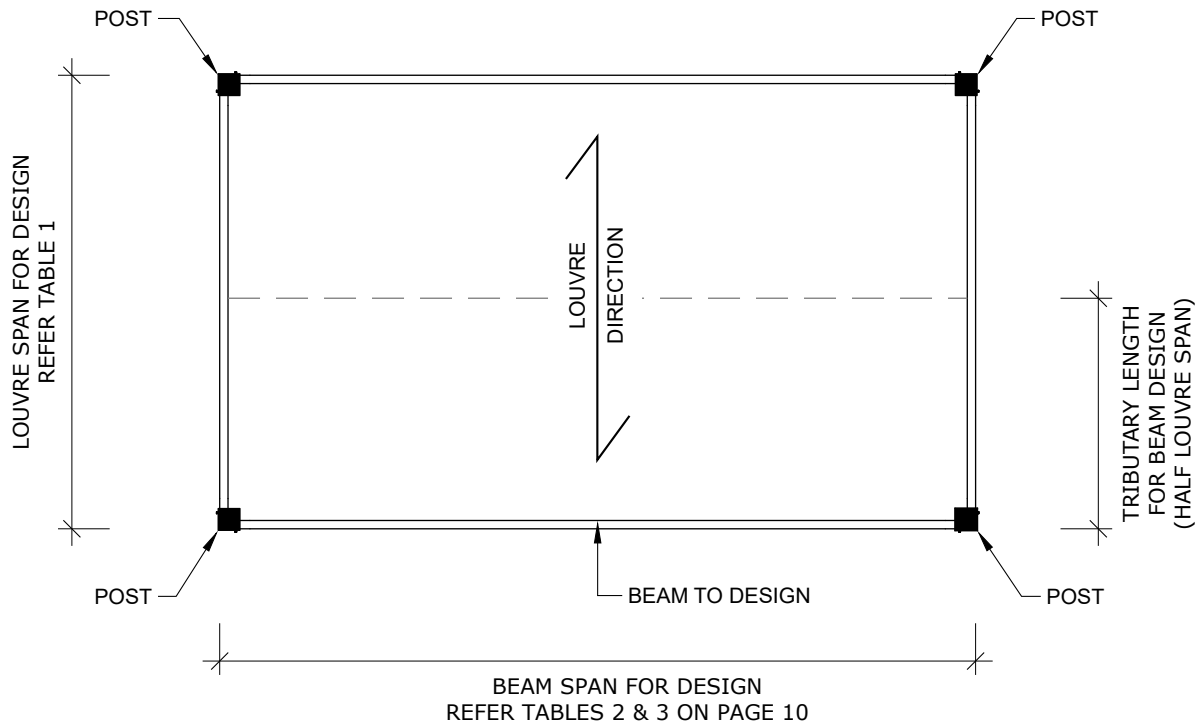
**TYPICAL DETAIL: CONTINUOUS BEAM SPAN OPTION 2 FIGURE 4 – 3D ISOMETRIC VIEW**



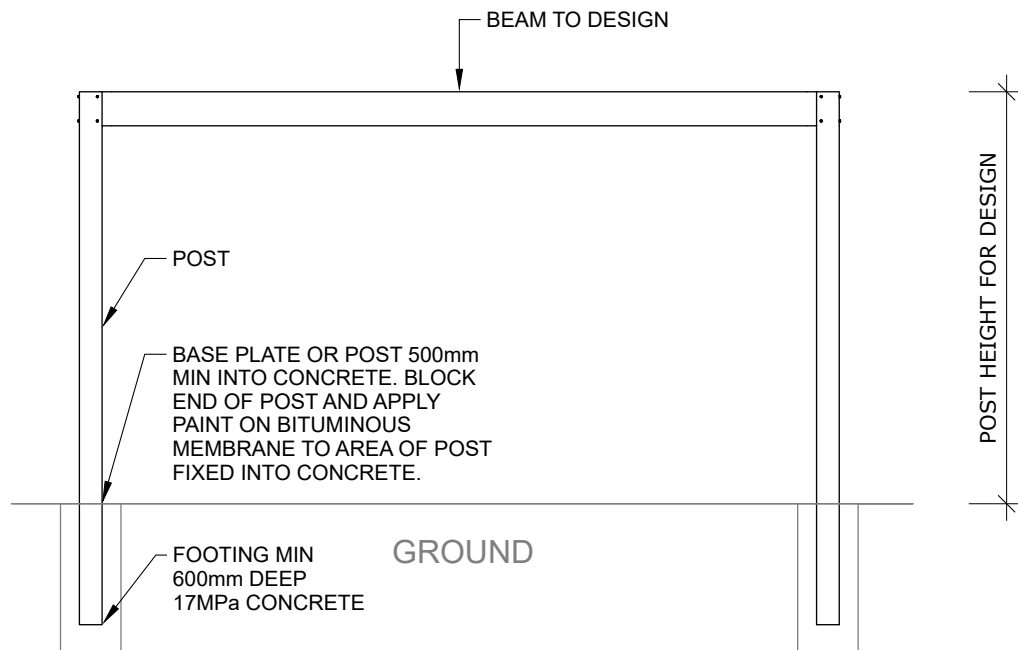
## TECHNICAL DETAILS: FREESTANDING - TYPICAL STRUCTURE

TYPICAL DETAIL: FREESTANDING SIMPLY SUPPORTED BEAM OPTION 1 FIGURE 5A

### PLAN VIEW - LOUVRE AND BEAM DESIGN

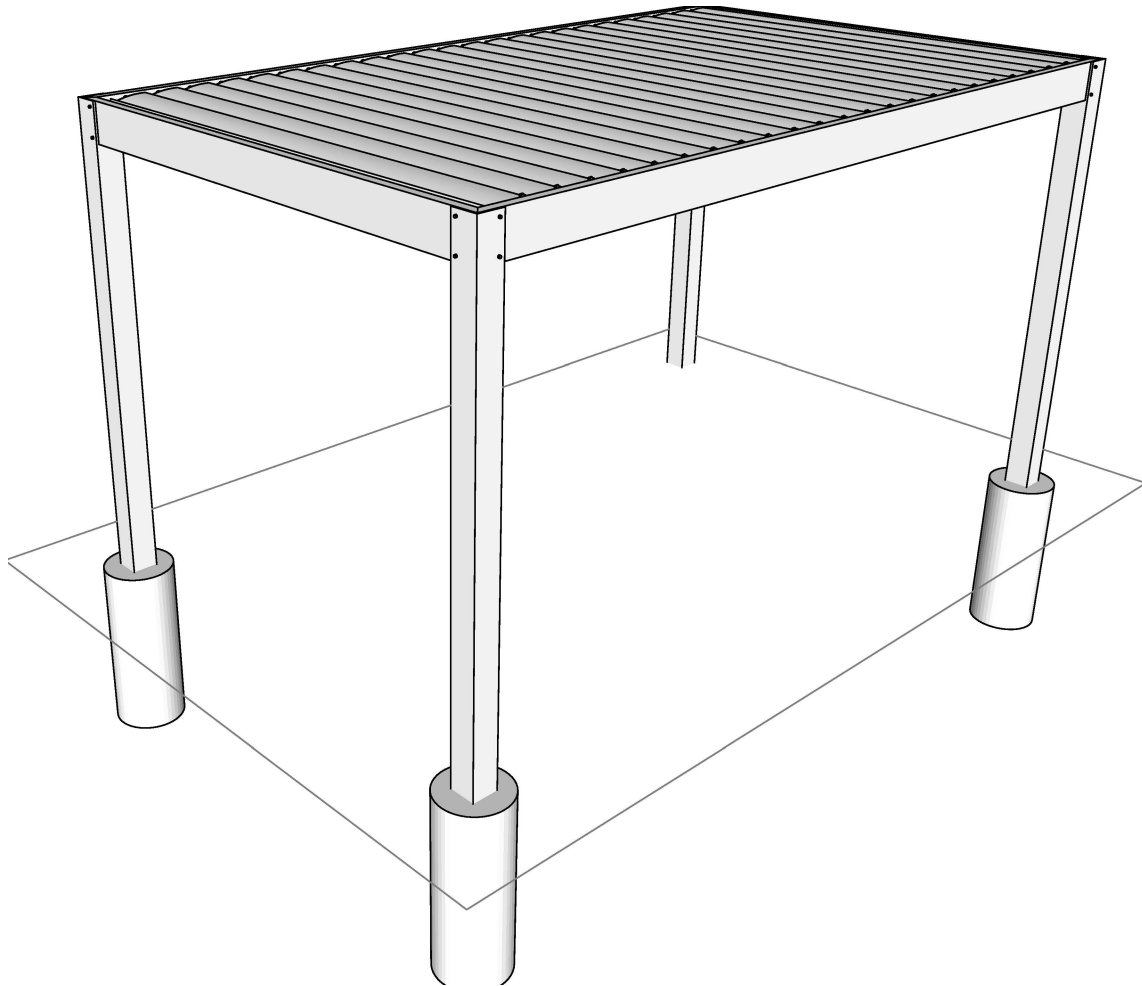


### FRONT ELEVATION



**TECHNICAL DETAILS: FREESTANDING – TYPICAL STRUCTURE**

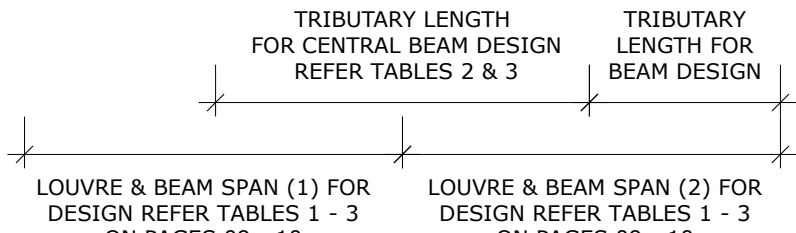
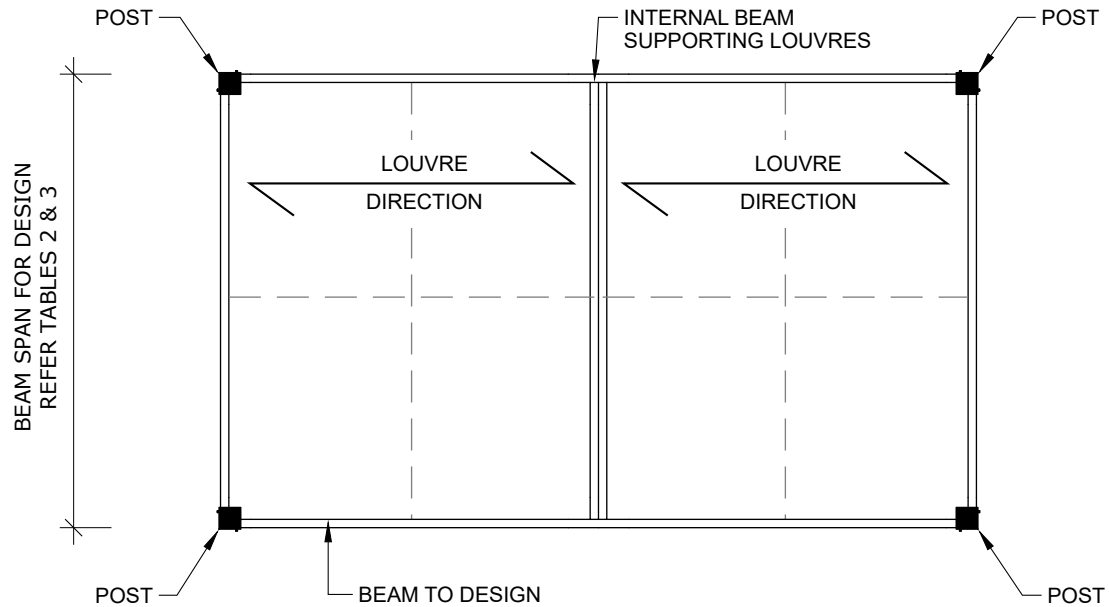
**TYPICAL DETAIL: FREESTANDING SIMPLY SUPPORTED OPTION 1** FIGURE 5A – 3D ISOMETRIC VIEW



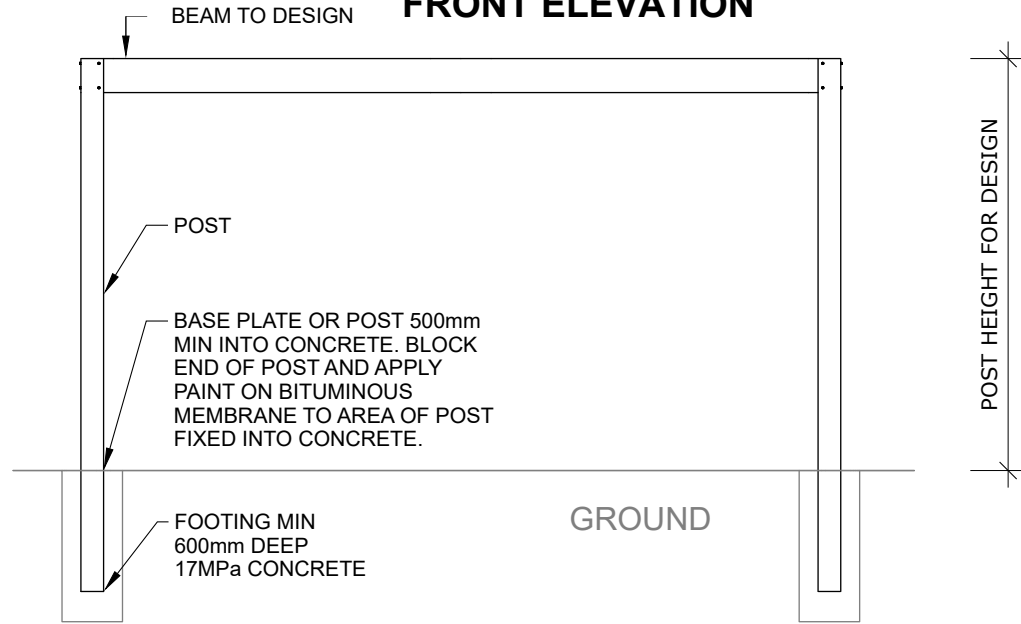
**TECHNICAL DETAILS: FREESTANDING – TYPICAL STRUCTURE**

TYPICAL DETAIL: FREESTANDING SIMPLY SUPPORTED OPTION 2 FIGURE 5B

**PLAN VIEW - LOUVRE AND BEAM DESIGN**

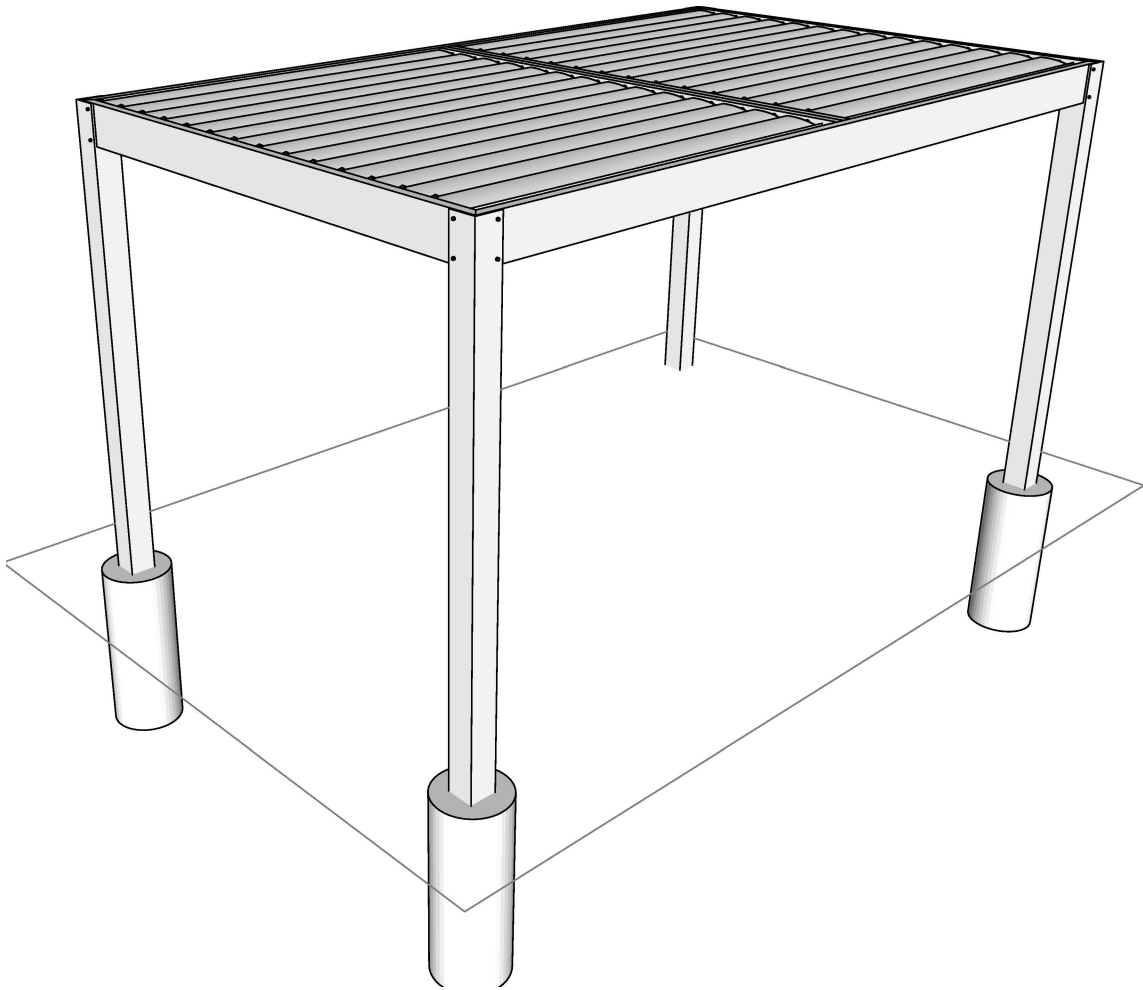


**FRONT ELEVATION**



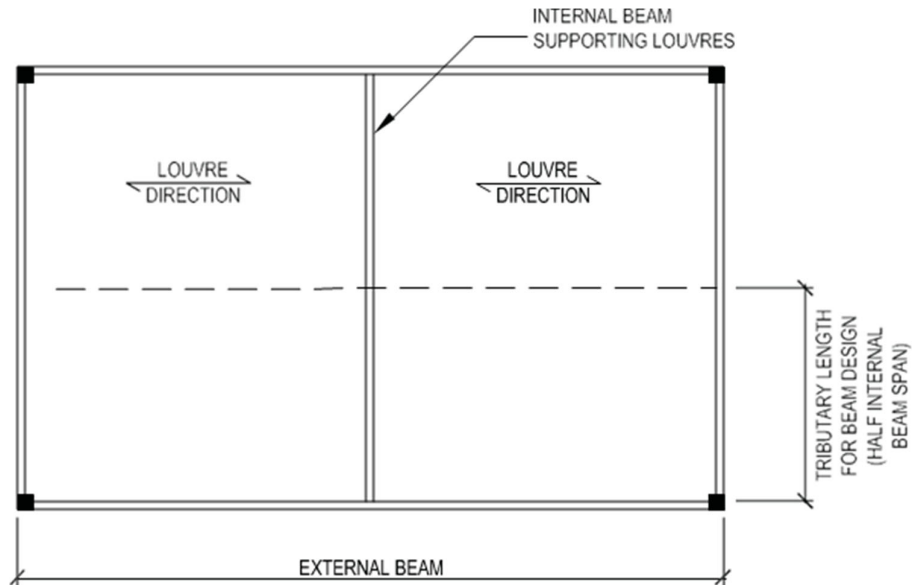
**TECHNICAL DETAILS: FREESTANDING – TYPICAL STRUCTURE**

**TYPICAL DETAIL: FREESTANDING SIMPLY SUPPORTED OPTION 2 FIGURE 5B – 3D ISOMETRIC VIEW**



**NOTES:**

1. WHERE A PERIMETER BEAM SUPPORTS ONE INTERNAL BEAM THAT SUPPORTS THE LOUVRES, THE EXTERNAL BEAM SHOULD BE DESIGNED USING A LOUVRE TRIBUTARY LENGTH EQUAL TO HALF OF THE LENGTH OF THE INTERNAL BEAM. THE INTERNAL BEAM SHALL BE DESIGNED AS A TYPICAL BEAM SUPPORTING LOUVRES.
2. THE INTERNAL BEAM CAN BE LOCATED ANYWHERE ALONG THE LENGTH OF THE EXTERNAL BEAM.





## CHART: POST CALCULATION

### SPECIFYING POSTS

To use the following tables, you need to know the Tributary Area (Roof Area) on the post, the Tributary Edge Length (LE) and the height of the post. For Tributary Area and Tributary Edge refer to pages 25 & 26

### POST LOADS

Wind speeds taken from NZS 3604: 2011, are ultimate limit state wind speeds.

- L = Low wind speed
- M = Medium wind speed
- H = High wind speed
- VH = Very high wind speed EH = Extra high wind speed

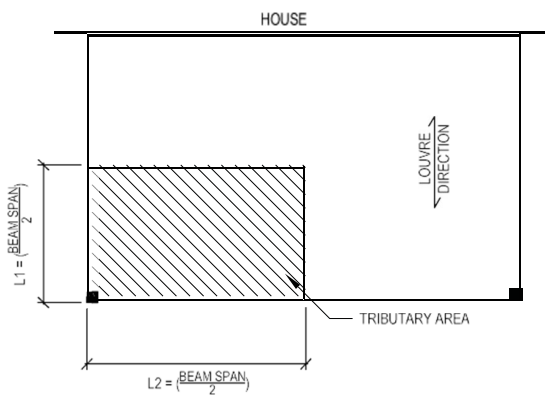
Wind Zone	ULS (capacity)					SLS (deflection)				
	L	M	H	VH	EH	L	M	H	VH	EH
Factored design wind speed at building (m/s)	32	37	44	50	55	27	31	37	42	46
Drag pressure on beam (kPa) (for $C_{fig} = 1.45$ )	0.74	0.99	1.40	1.81	2.18	0.54	0.71	1.01	1.30	1.55
Drag pressure on roof (kPa) (for $C_{fig} = 0.04$ )	0.02	0.03	0.04	0.05	0.06	0.01	0.02	0.03	0.04	0.04

## POST AND FOOTING DESIGN: FIGURES

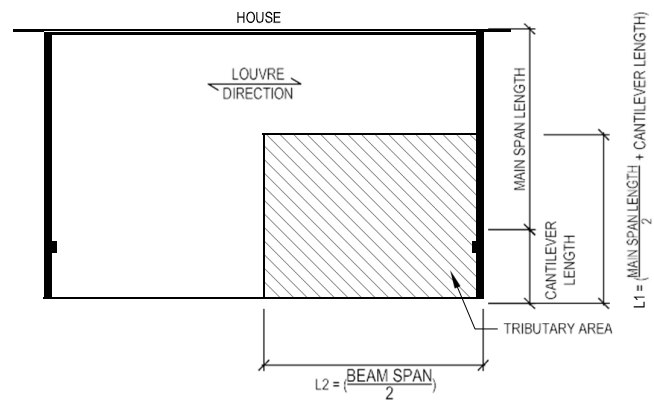
### TYPICAL DETAIL

#### SIMPLY SUPPORTED BEAM (FIGURE 6) AND CANTILEVERED BEAM (FIGURE 7)

**FIGURE 6**  
PLAN VIEW SIMPLY SUPPORTED BEAM



**FIGURE 7**  
PLAN VIEW CANTILEVERED BEAM

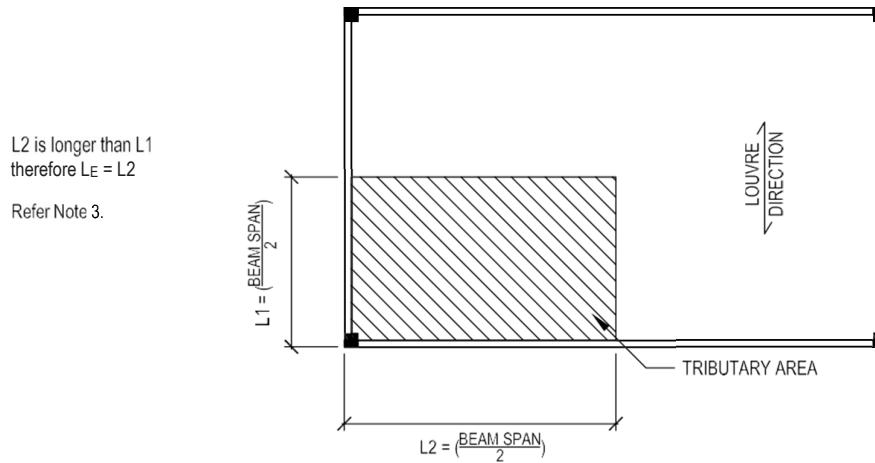


### NOTES

1. THE TRIB AREA FOR A POST AND FOOTING IS THE PRODUCT OF HALF THE DISTANCE TO THE ADJACENT SUPPORTS IN EACH DIRECTION IE;  $L_1 \times L_2$  (SEE FIG.6)
2. WHERE A POST SUPPORTS A CANTILEVER, CONSIDER FOR THE FULL CANTILEVER LENGTH (SEE FIG.7)
3. TRIBUTARY EDGE LENGTH ( $L_e$ ) IS USED TO SELECT POST SIZE.  
FOR A STRUCTURE ATTACHED TO A HOUSE,  $L_e = L_1$  (PERPENDICULAR TO HOUSE)  
FOR A FREE STANDING STRUCTURE,  $L_e =$  THE LONGER OF  $L_1$  &  $L_2$  (SEE FIG.8)

**TYPICAL DETAIL SIMPLY SUPPORTED BEAM (FIGURE 8)**

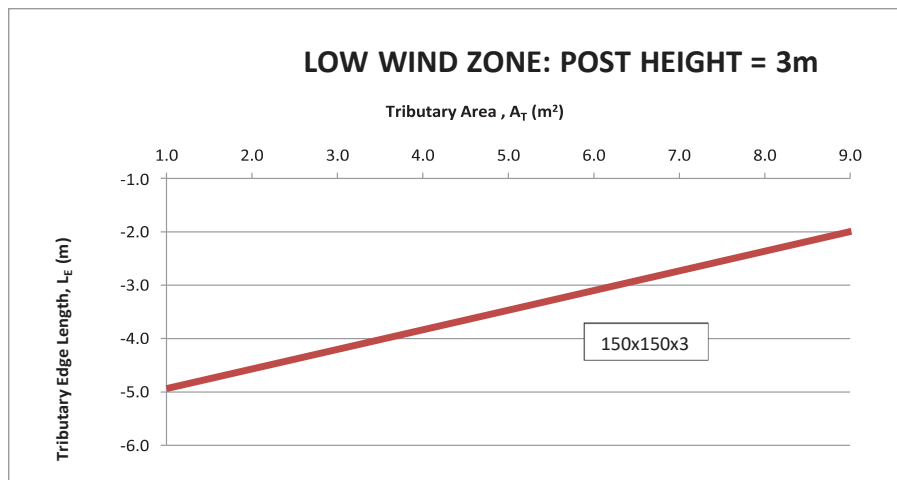
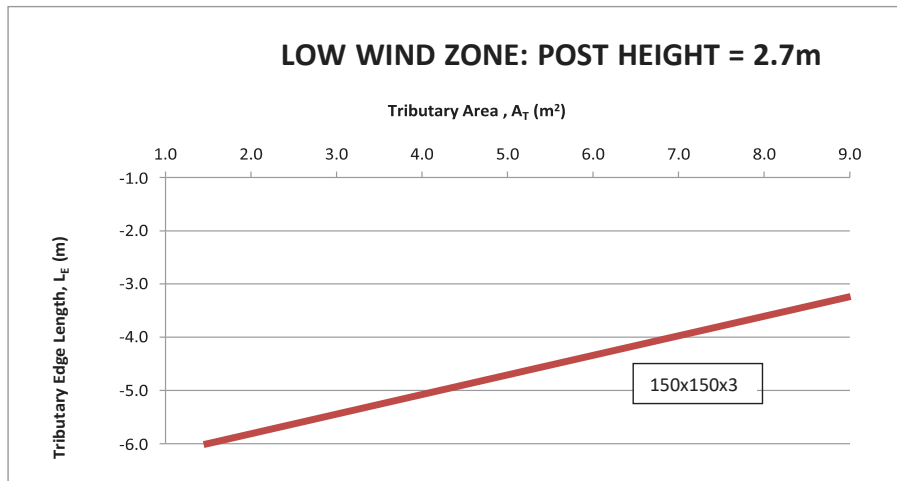
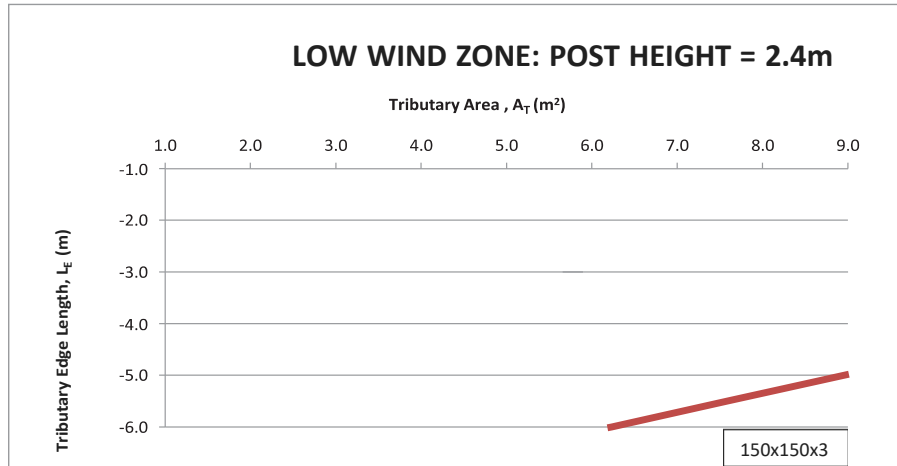
**FIGURE 8**  
**PLAN VIEW**



**NOTES**

1. THE TRIB AREA FOR A POST AND FOOTING IS THE PRODUCT OF HALF THE DISTANCE TO THE ADJACENT SUPPORTS IN EACH DIRECTION IE;  $L1 \times L2$  (SEEFIG.6)
2. WHERE A POST SUPPORTS A CANTILEVER, CONSIDER FOR THE FULL CANTILEVER LENGTH (SEE FIG.7)
3. TRIBUTARY EDGE LENGTH ( $L_e$ ) IS USED TO SELECT POST SIZE.  
FOR A STRUCTURE ATTACHED TO A HOUSE,  $L_e = L1$  (PERPENDICULAR TO HOUSE)  
FOR A FREE-STANDING STRUCTURE,  $L_e =$  THE LONGER OF  $L1$  &  $L2$  (SEE FIG.8)

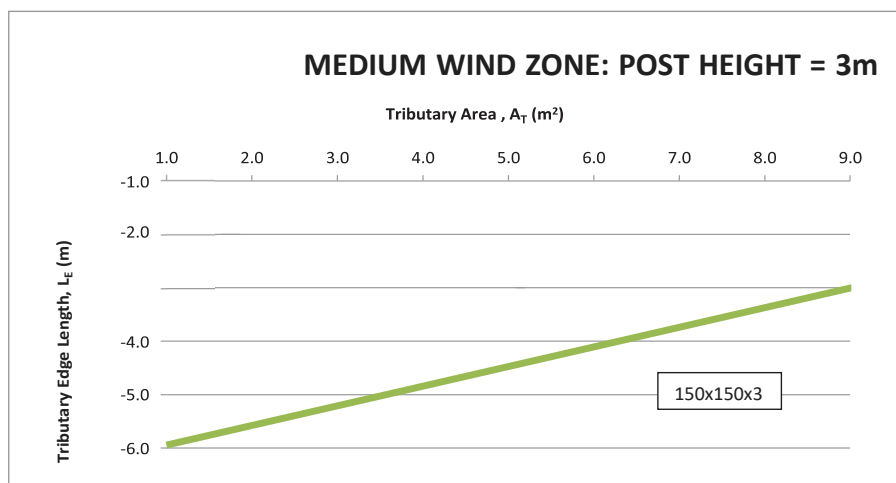
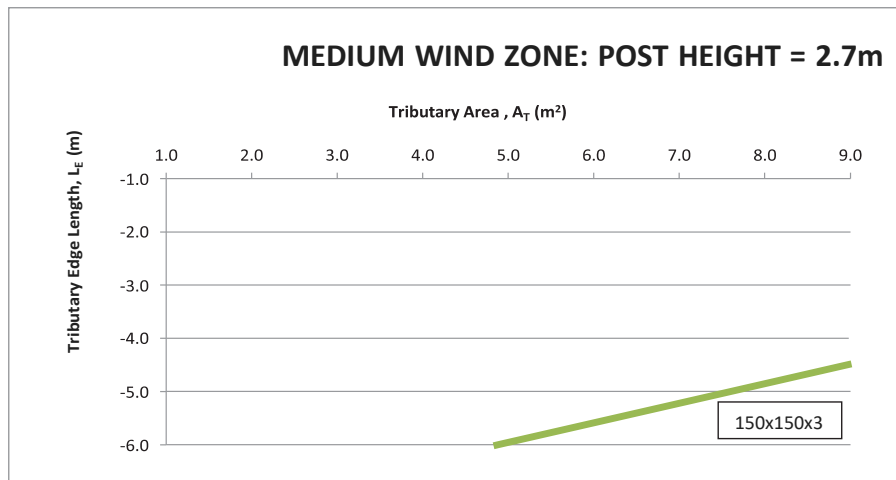
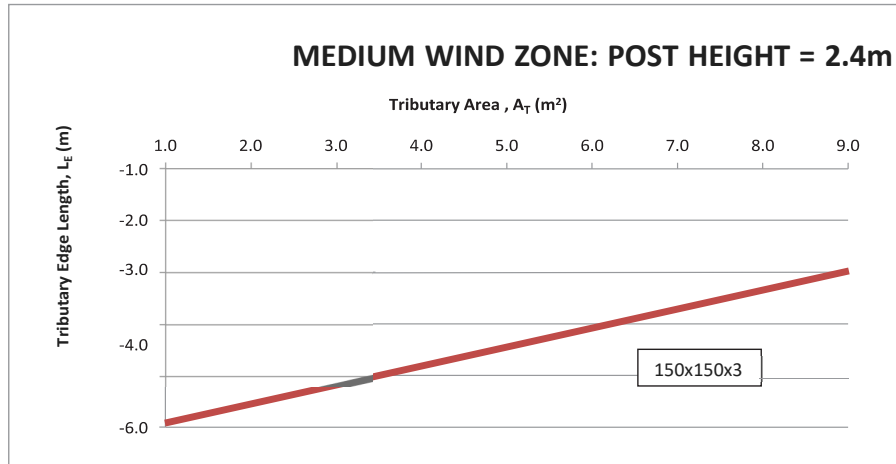
## POST CALCULATION: LOW WIND ZONE



**note**

150x150x3 ALUMINIUM POST CAN BE SUBSTITUTED WITH 100x100x4 STEEL POST

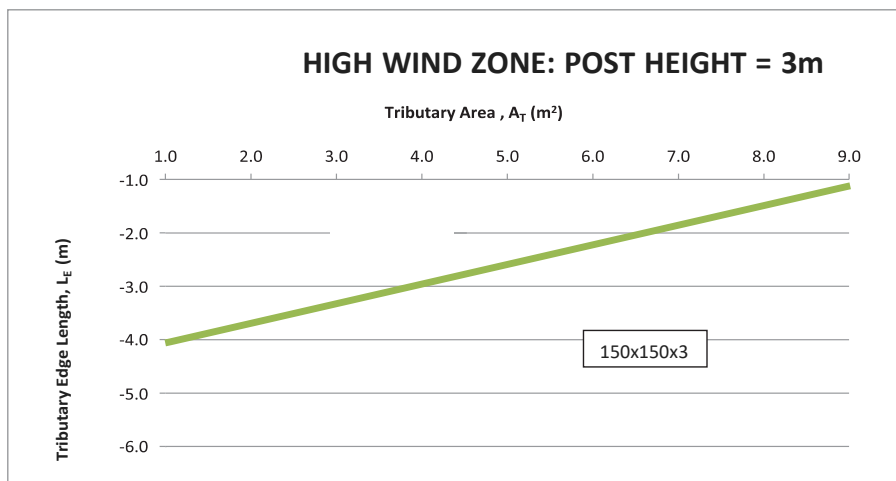
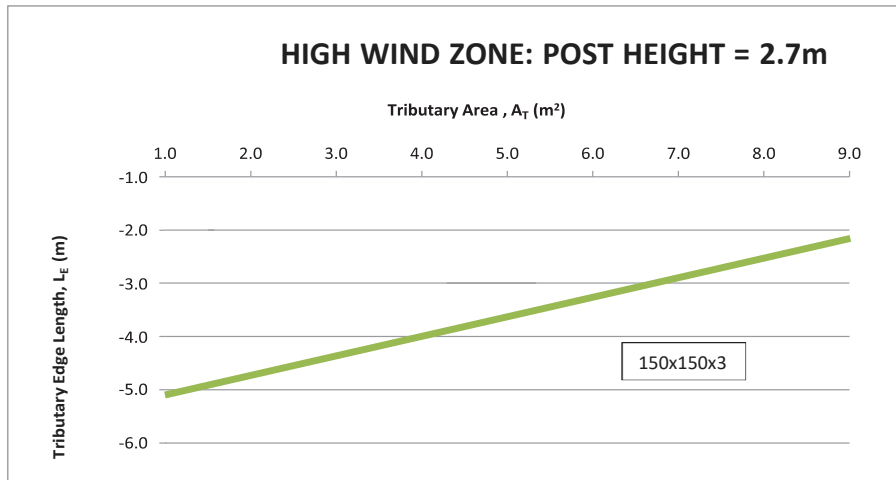
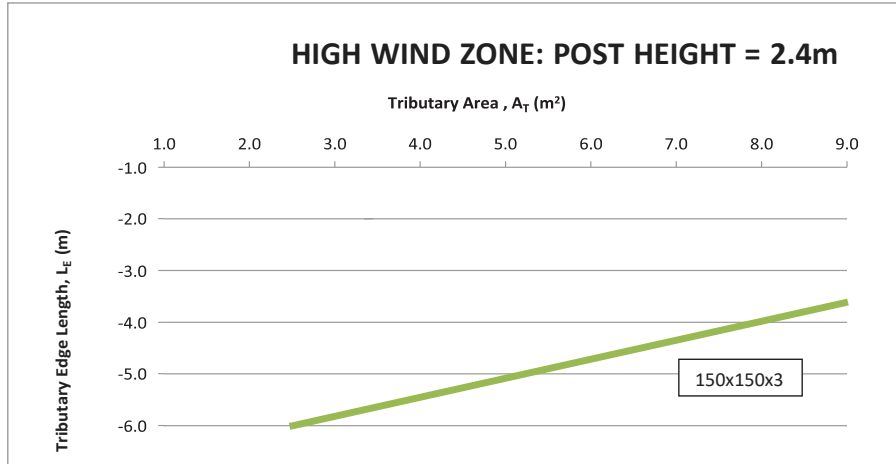
## POST CALCULATION: MEDIUM WIND ZONE



**NOTE:** 150 X 3 ALUMINIUM POST CAN BE SUBSTITUTED WITH 100 X 4 SHS STEEL POST.

No Aluminium posts to be substituted without verification by a CPEng Structural Engineer.

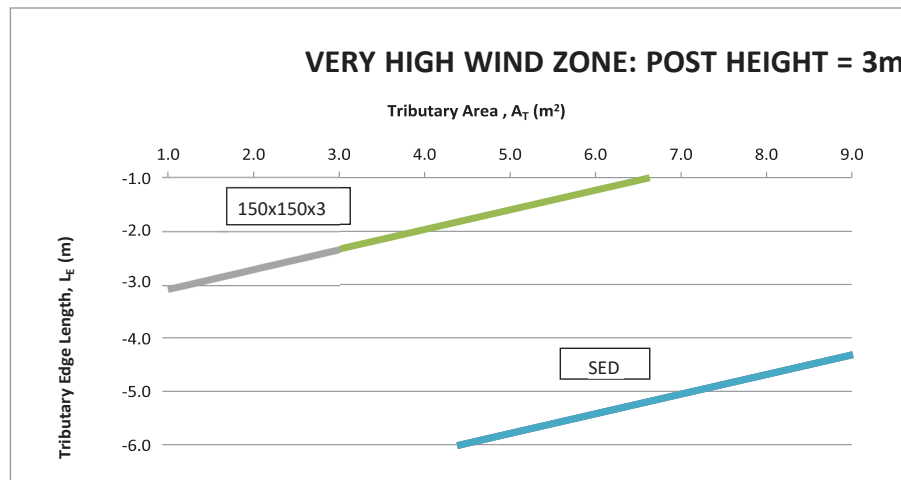
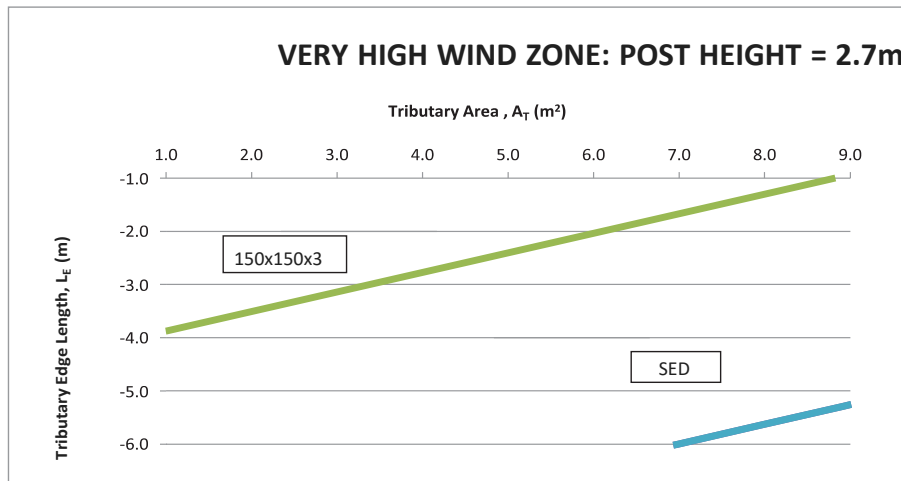
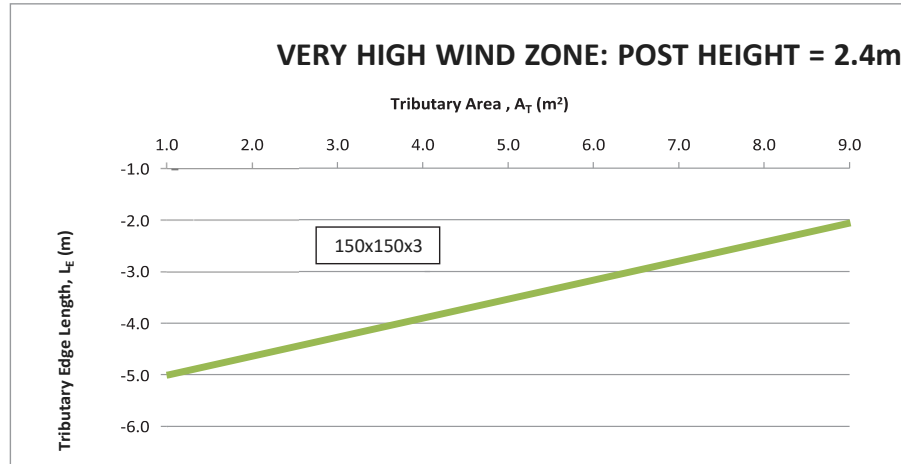
## POST CALCULATION: HIGH WIND ZONE



**NOTE:**

150x150x3 ALUMINIUM POST CAN BE SUBSTITUTED WITH 100x100x4 STEEL POST

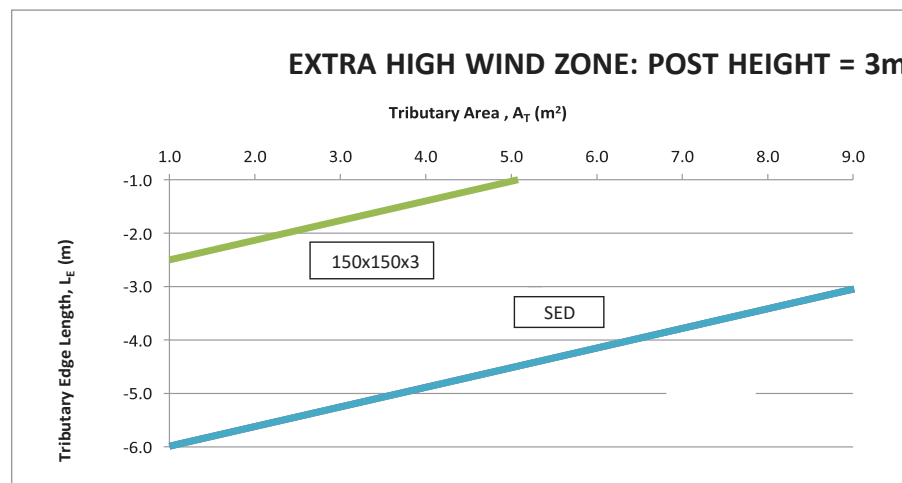
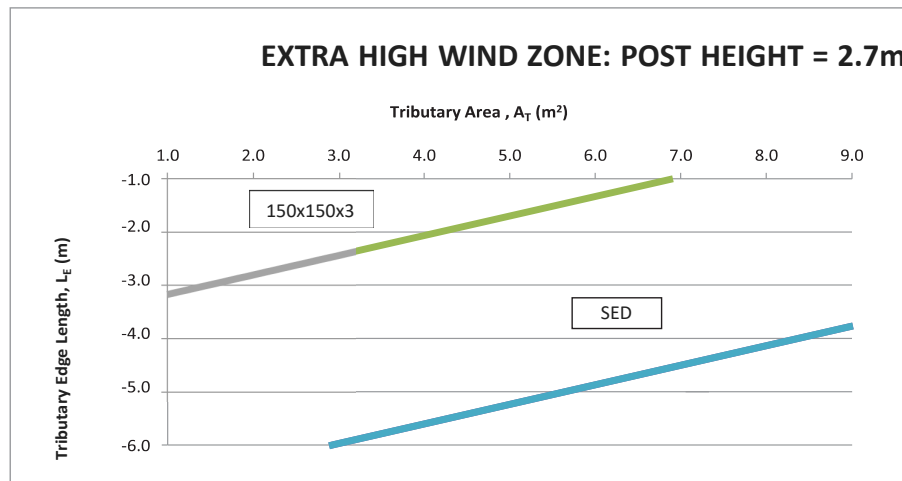
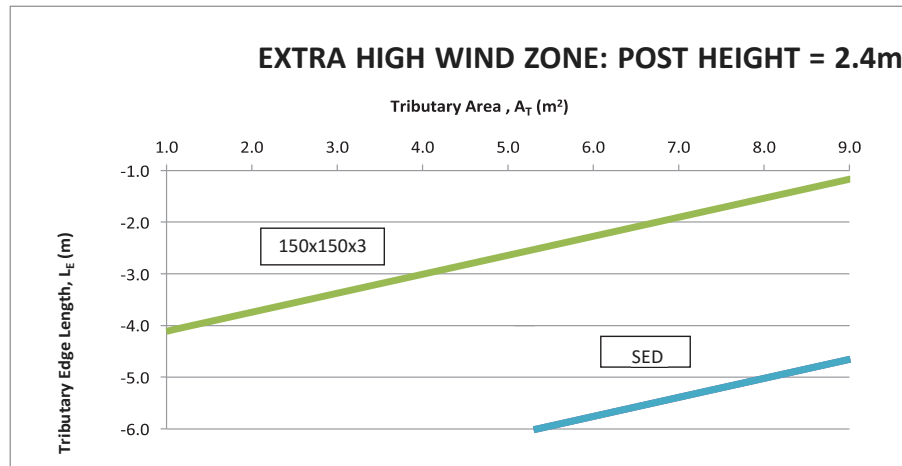
## POST CALCULATION: VERY HIGH WIND ZONE



**NOTE:**

150x150x3 ALUMINIUM POST CAN BE SUBSTITUTED WITH 100x100x4 STEEL POST

## POST CALCULATION: EXTRA HIGH WIND ZONE



**NOTE:**

150x150x3 ALUMINIUM POST CAN BE SUBSTITUTED WITH 100x100x4 STEEL POST



## POST FOOTING CALCULATION

**Post Footing Calculations**      Ground conditions are considered a minimum of "good ground" as per NZS3604, within minimum soil properties as follow:

Geotechnical ultimate bearing capacity = 300kPa (apply 0.5 safety factor)  
Undrained shear strength = 100kPa (apply 0.5 safety factor)

Geotechnical ultimate skin friction capacity = 20kPa (apply 0.5 safety factor)

**Questionable ground conditions must be reviewed by engineer!**

**"GOOD GROUND"**

- If louvre frame is supported by building on less than 2 sides, uplift AND bracing must be considered for footing calculations (Tables 1a, 1b & 2)

- If louvre frame is supported by building on 2 or more sides, uplift only need be considered (Tables 1a & 1b only)

**TABLE 1a MINIMUM CONCRETE VOLUME FOR ROOF TRIBUTARY ROOF AREA ON POST TO RESIST UPLIFT**

Wind Zone:	Concrete Volume Required (m <sup>3</sup> )				
	L	M	H	VH	EH
Tributary Area (m <sup>2</sup> )					
1.0	0.03	0.04	0.06	0.08	0.10
2.0	0.06	0.09	0.12	0.16	0.20
3.0	0.09	0.13	0.19	0.25	0.30
4.0	0.12	0.17	0.25	0.33	0.40
5.0	0.15	0.21	0.31	0.41	0.50
6.0	0.18	0.26	0.37	0.49	0.60
7.0	0.22	0.30	0.44	0.57	0.70
8.0	0.25	0.34	0.50	0.65	0.80
9.0	0.28	0.38	0.56	0.74	0.90

**TABLE 1b FOOTING DIMENSIONS REQUIRED FOR PARTICULAR VOLUMES FOR UPLIFT RESISTANCE**

Volume (m <sup>2</sup> )	Round Piles	
	450 Diameter	600 Diameter
	minimum depth (mm)	
0.1	600	550
0.2	750	650
0.3	850	700
0.4	1000	800
0.6	1250	1000
0.8	1550	1200
1.0	1800	1400

**TABLE 2 MINIMUM FOOTING SIZES REQUIRED FOR BRACING OF EACH POST SIZE**

Post Size	Round Piles		Square Piles	
	450 Diameter	600 Diameter	Square pad 300mm deep	Square pad 600mm deep
	minimum depth (mm)			
150x150x3	1200	1200	1400	1100
100x100x4 SHS	1200	1200	1400	1100

**Design Procedure:**

- (1) Determine tributary area on post (determined previously for post design)
- (2) From Table 1a, determine minimum concrete volume to resist uplift based on tributary area
- (3) From Table 1b, determine footing dimensions required for minimum volume calculated in (2). If bracing is required to be considered, follow steps (4) and (5) below.
- (4) From Table 2, determine footing dimensions based on post size selected. For ease of comparing, select same footing type as selected in (3)
- (5) Use maximum of dimensions from (3) and (4)

**Note:**  
Round piles depths are calculated including skin friction so final concrete volume will differ to that in first column. For most projects the minimum footing depth will be 1000mm. for 450mm dia. and 600mm dia. round concrete footings.

## SNOW LOADS

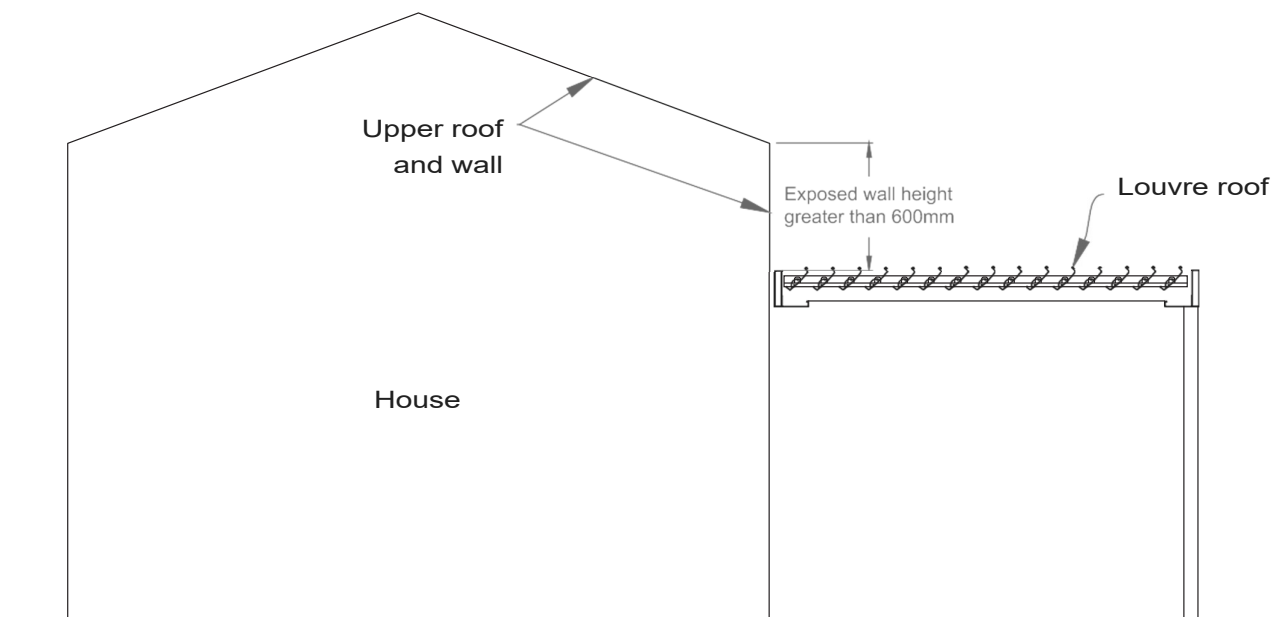
Snow loadings: As required by NZS3604:2011 (Section 15)

1. if snow loads are required to be considered, the following equivalent wind zones should be referred to:

- for 1.0kPa snow load - apply minimum Medium Wind Zone
- for 1.5kPa snow load - apply minimum Very High Wind Zone
- for 2.0kPa snow load - apply minimum Extra High Wind Zone

2. where a louvre roof forms part of a lower roof meeting an upper wall and the exposed height of the upper wall is greater than 0.6m, the roof is defined as an abutting roof (similar to NZS3604:2011 15.3). in this situation, the louvre spans and beam spans determined from the NZ Louvre tables shall be multiplied by 0.8

**Figure 9**



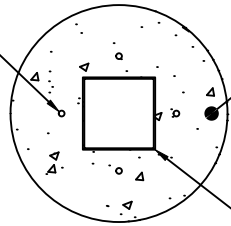
### **Standards NZ 1.5 and 2.5 kPa snow loading zones NZS 3604:2011**

For information about snow zones in New Zealand please see Figure 15.1 from NZS 3604:2011 Timber Framed Buildings.

PFC-CO/450

4/ D12 REO BAR TIED TO HORIZONTAL BAR

450mmØ CONCRETE FOOTING (CONCRETE STRENGTH  $f_c = 20\text{MPa}$ )



150 x 150mm POST

150 x 150mm POST

D12 REO BAR

GROUND LEVEL

4/ D12 REO BAR TIED TO HORIZONTAL BAR

450mmØ CONCRETE FOOTING (CONCRETE STRENGTH  $f_c = 20\text{MPa}$ )

250mm LONG D12 REO BAR

100 MIN. CONCRETE COVER

GOOD GROUND TO NZS 3604

1000

150

125

600

50

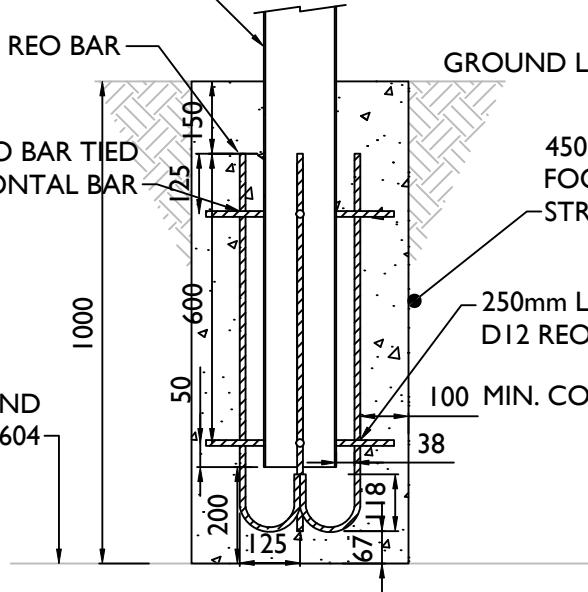
200

125

67

18

38



CLIENT

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POST FOOTING CONNECTION  
CONCRETE 450

DATE 23.09.2020

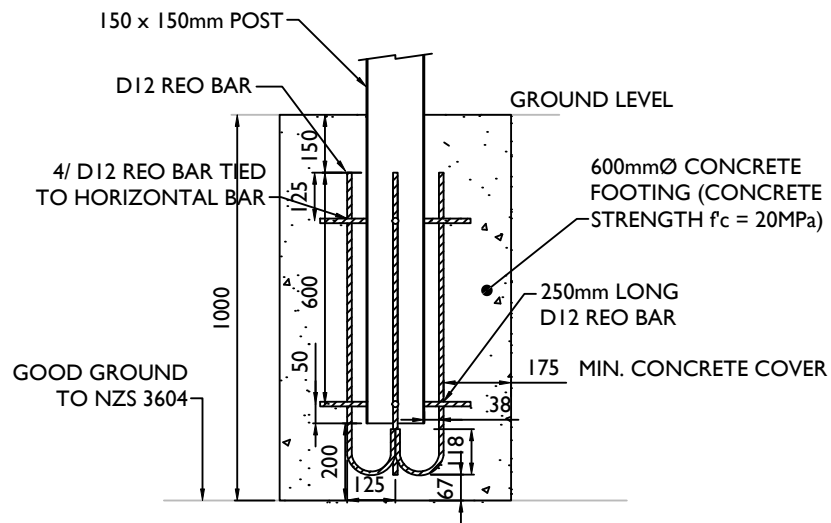
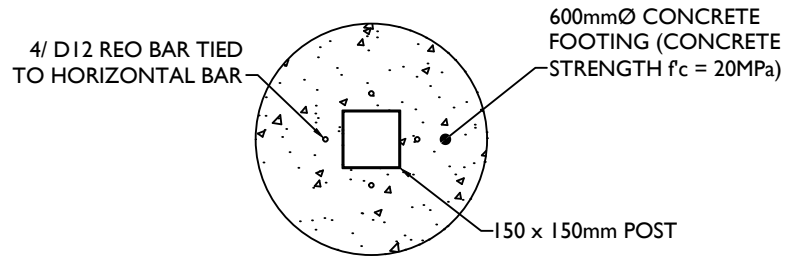
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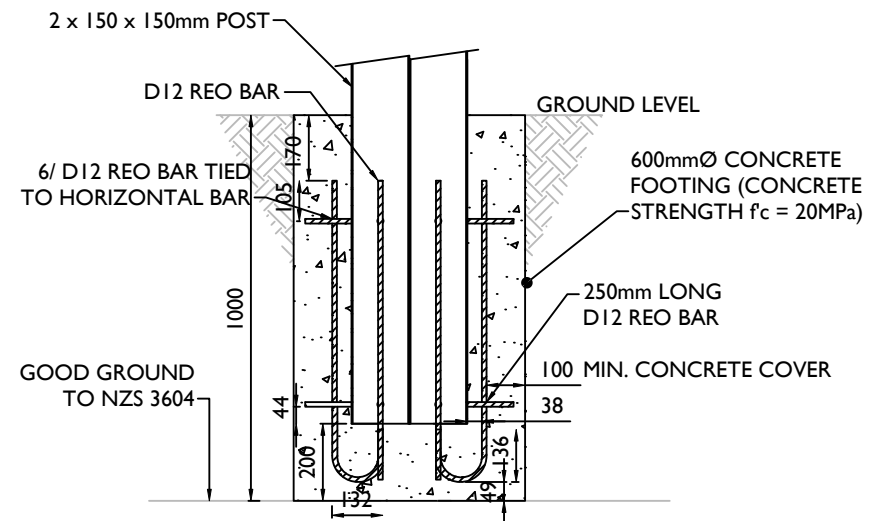
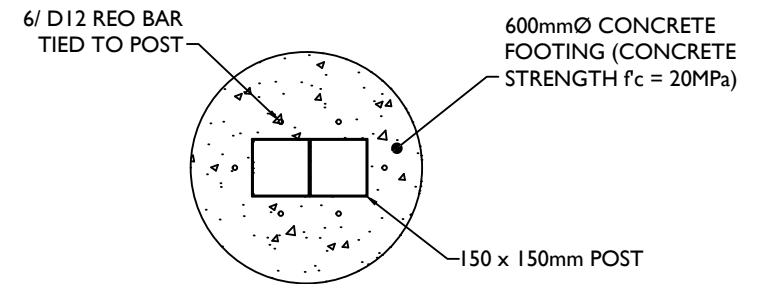
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ISSUE A

PFC-CO/600



PFC-CO/600/DBL



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CONCRETE 600

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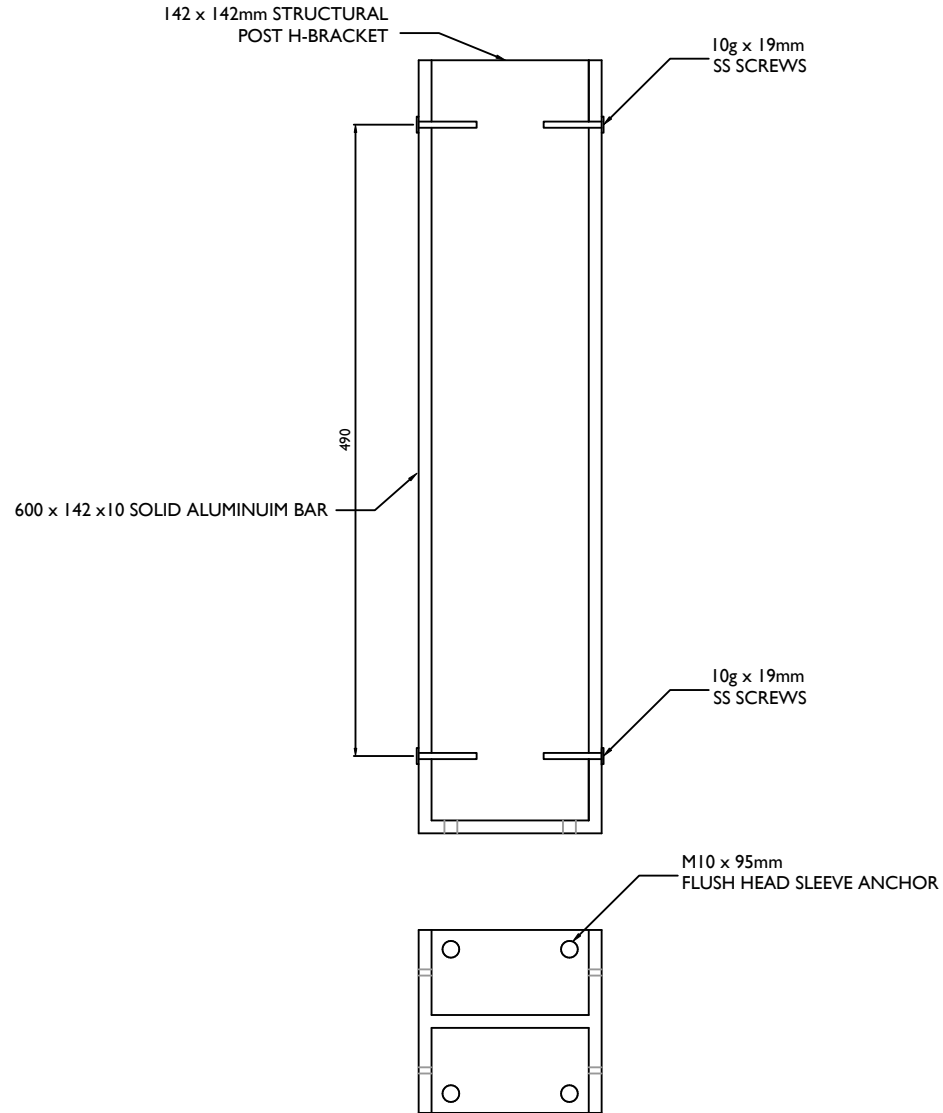
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ISSUE A

PFC-BRC



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POST FOOTING CONNECTION  
BRACKET

DATE 23.09.2020

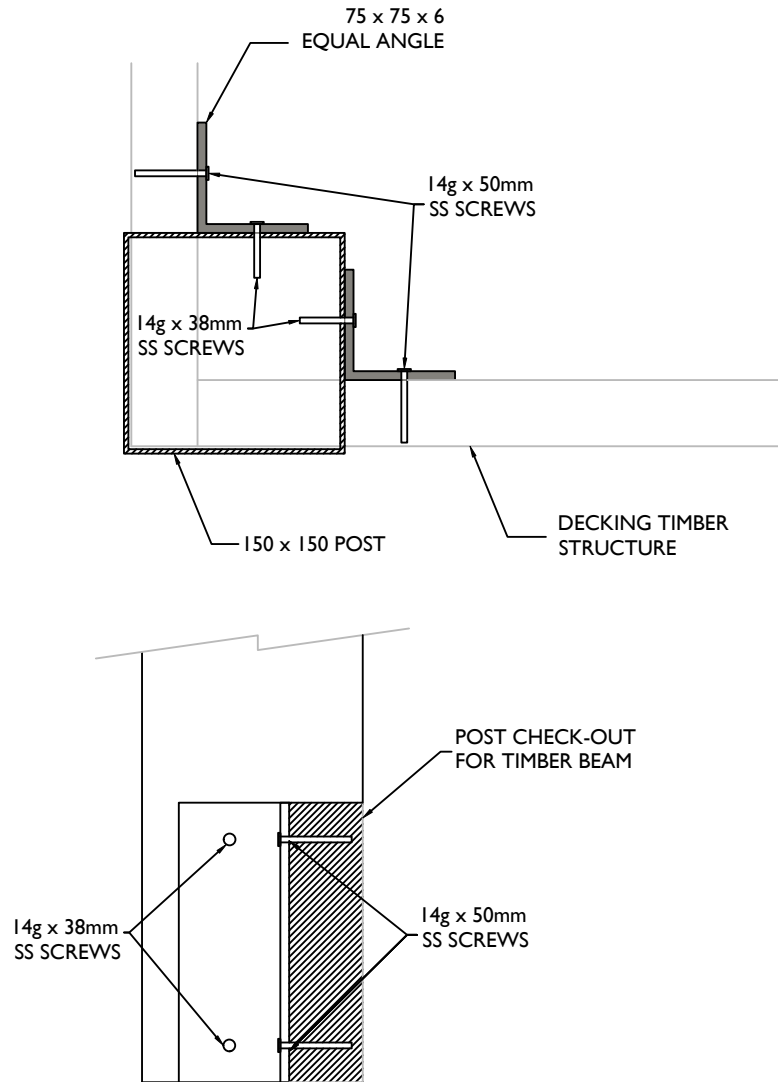
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DRAWN BY DDP

DRAWING NO. PFC-BRC

ISSUE A

**PFC-DAB**



CLIENT

DRAWING TITLE  
POST FOOTING CONNECTION  
DECK ANGLE BRACKET

DRAWING NO. PFC-DAB

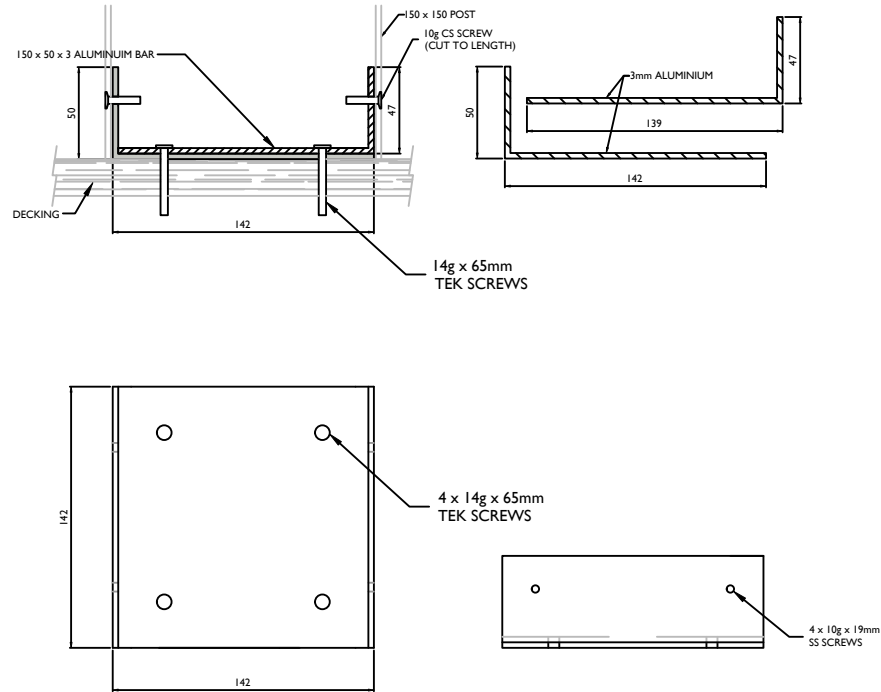
DATE 23.09.2020

SCALE 1:1 (A4)

DRAWN BY DDP

ISSUE A

PFC-FD



CLIENT

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POST FOOTING CONNECTION  
FLUSH TO DECK

DATE 18.09.2020

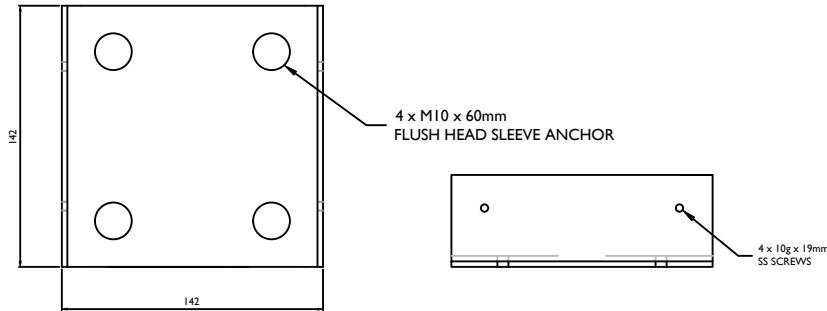
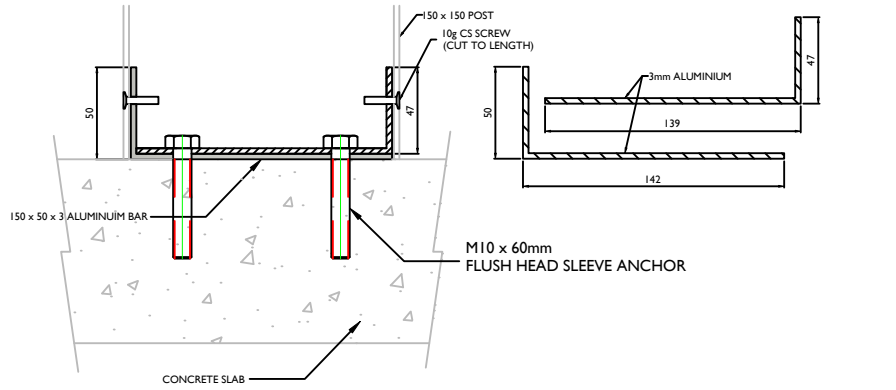
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DRAWING NO. PFC-FD

ISSUE A

**PFC-FP**



CLIENT

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POST FOOTING CONNECTION  
FLUSH TO PATIO

DATE 18.09.2020

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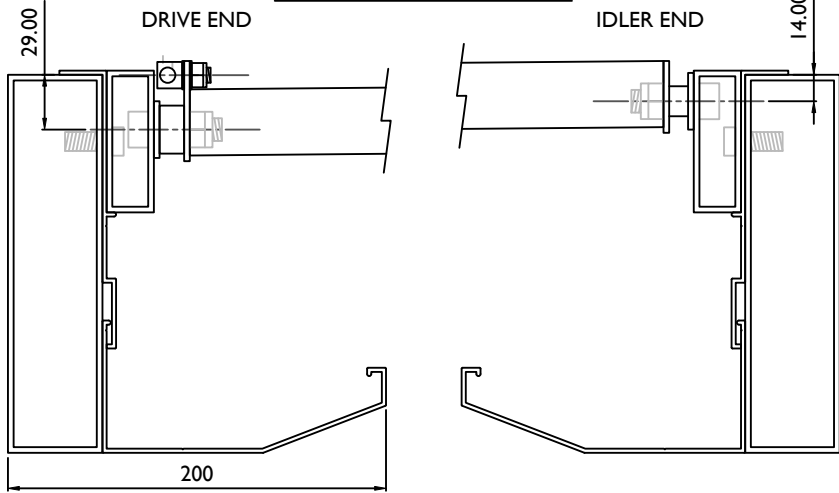
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ISSUE A

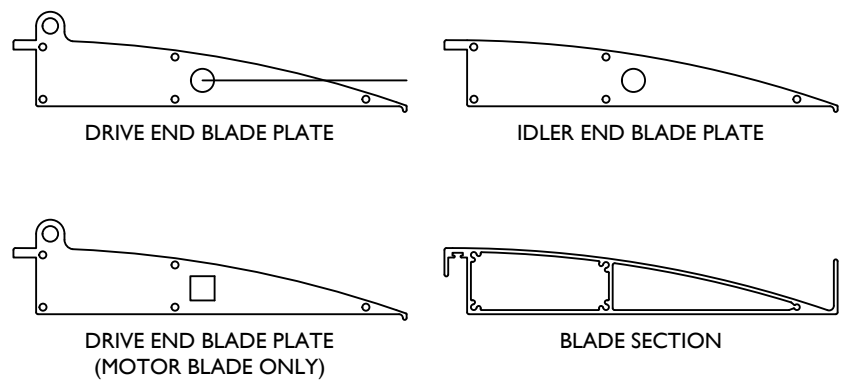


## TECHNICAL DETAILS – TYPICAL STRUCTURE FIXING DETAILS

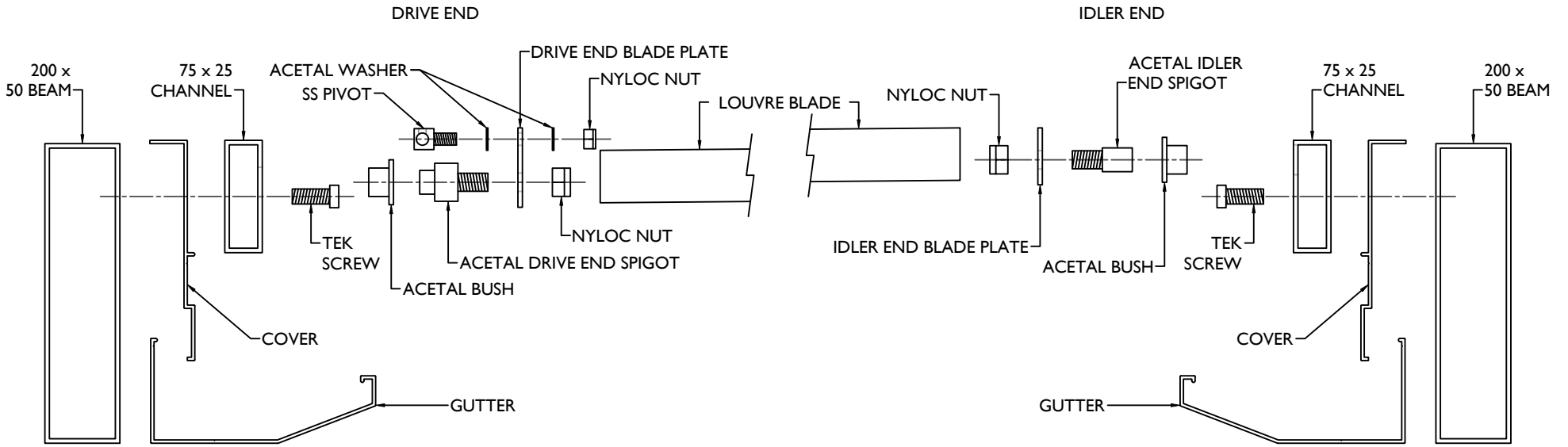
**200 x 50 FULL ASSEMBLY**



**END PLATE PROFILES**



**MULTIBODY PARTS**



CLIENT

DRAWING TITLE  
COMPONENT ASSEMBLY  
200 x 50mm BEAM

DRAWING NO. 200 ASSEMBLY

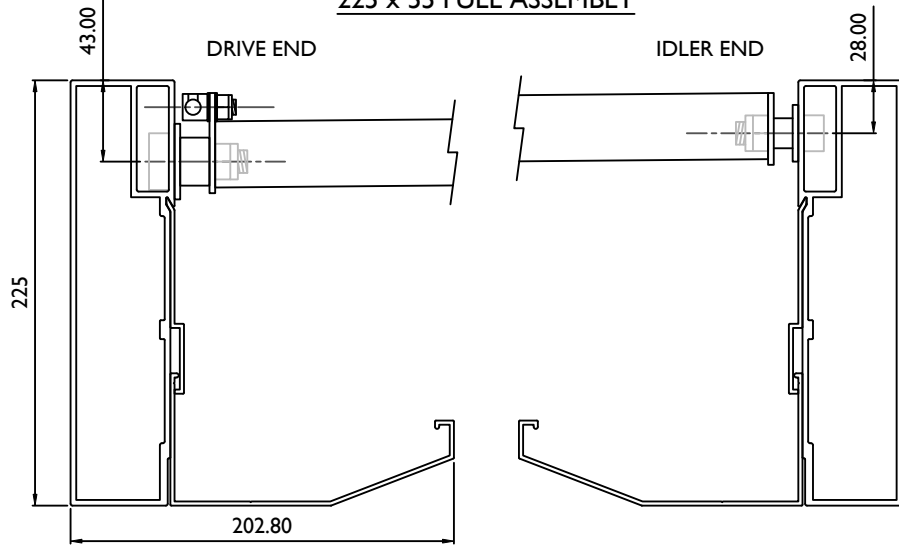
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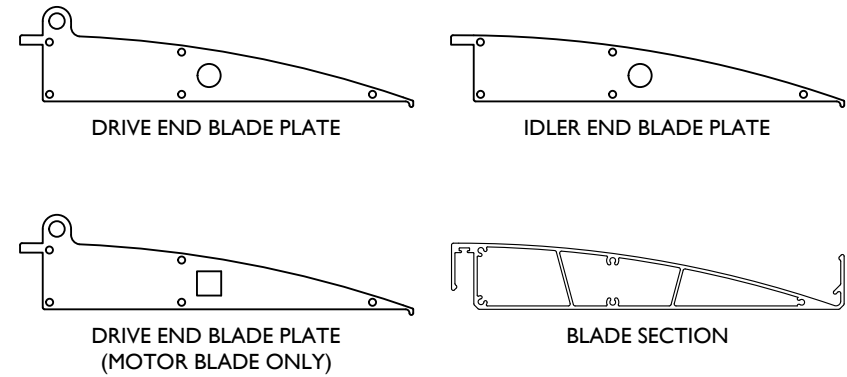
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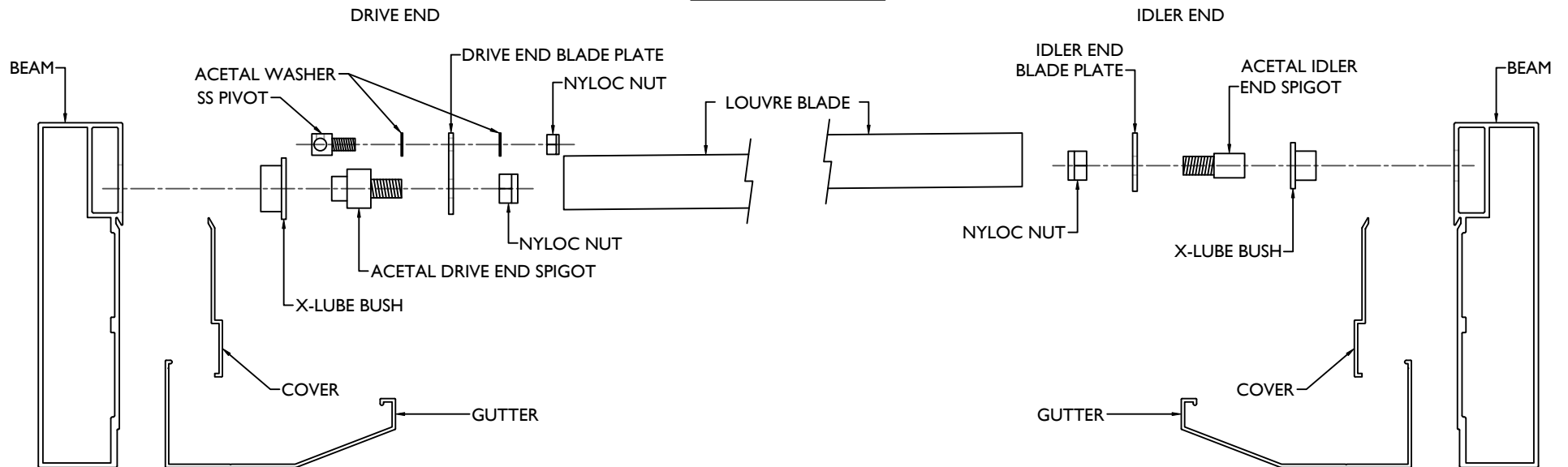
**225 x 55 FULL ASSEMBLY**



**END PLATE PROFILES**



**MULTIBODY PARTS**

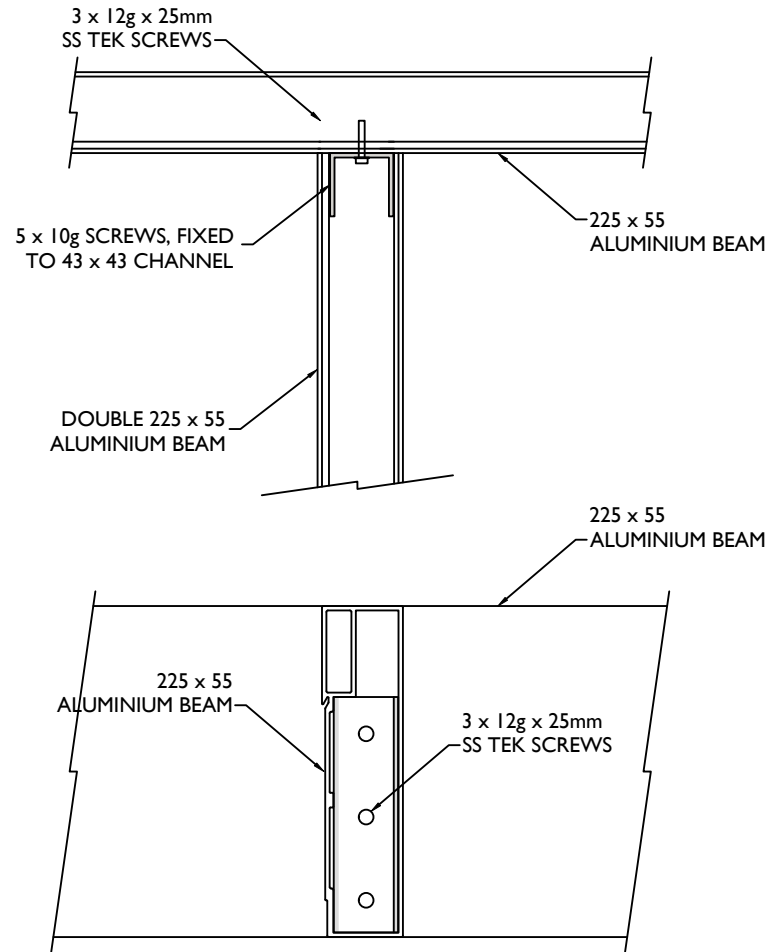


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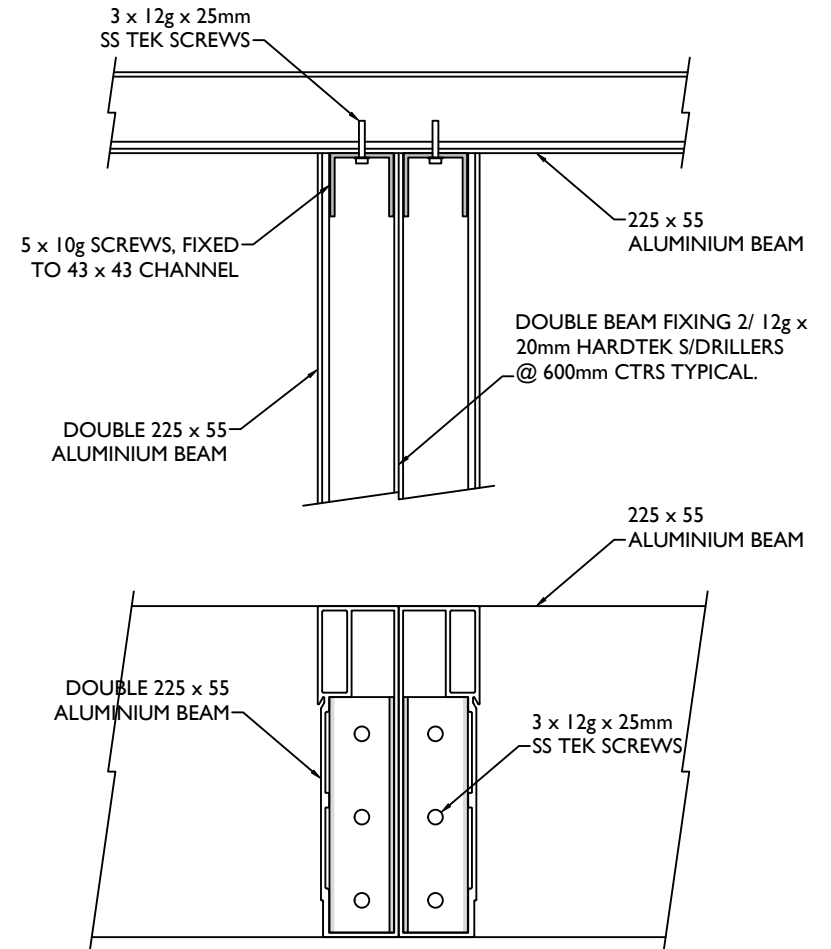
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 225 x 55mm BEAM  
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DATE	03.09.2020
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ISSUE	A

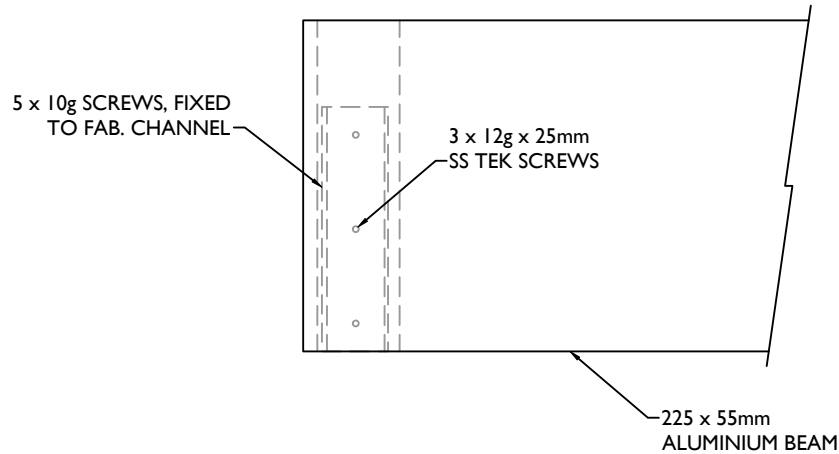
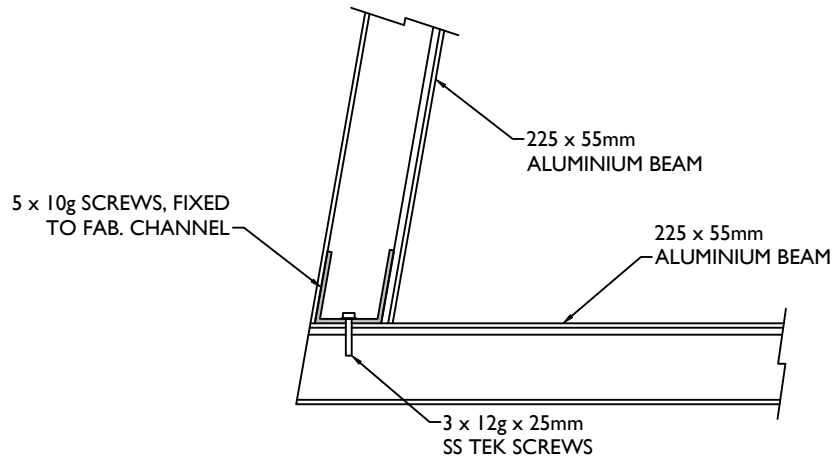
BC-BJ/90



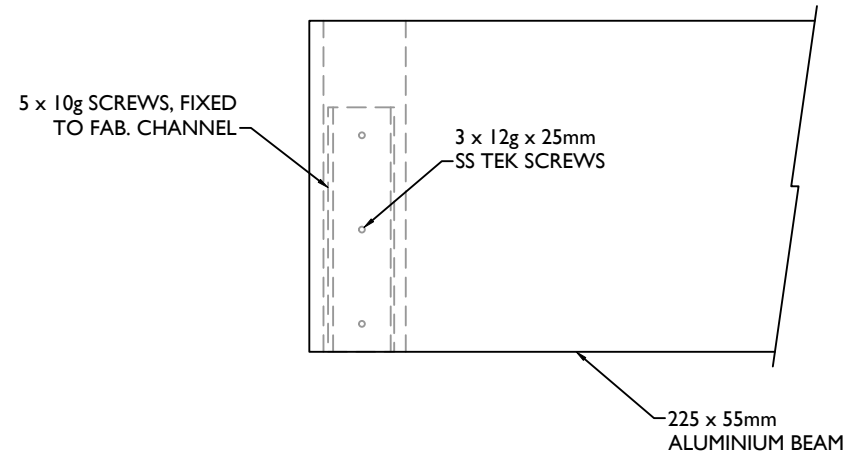
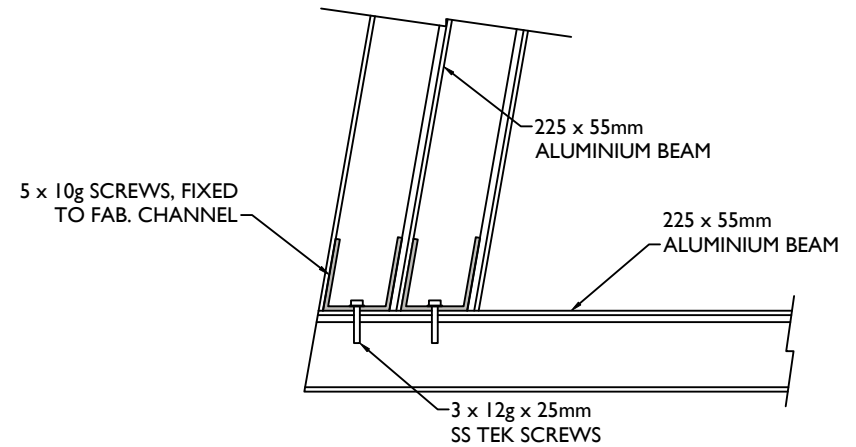
BC-BJ/90/DBL



BC-BJ/ANG



BC-BJ/ANG/DBL



CLIENT

DRAWING TITLE

BEAM CONNECTION  
BUTT JOIN ANGLE

DRAWING NO.

BC-BJ/ANG

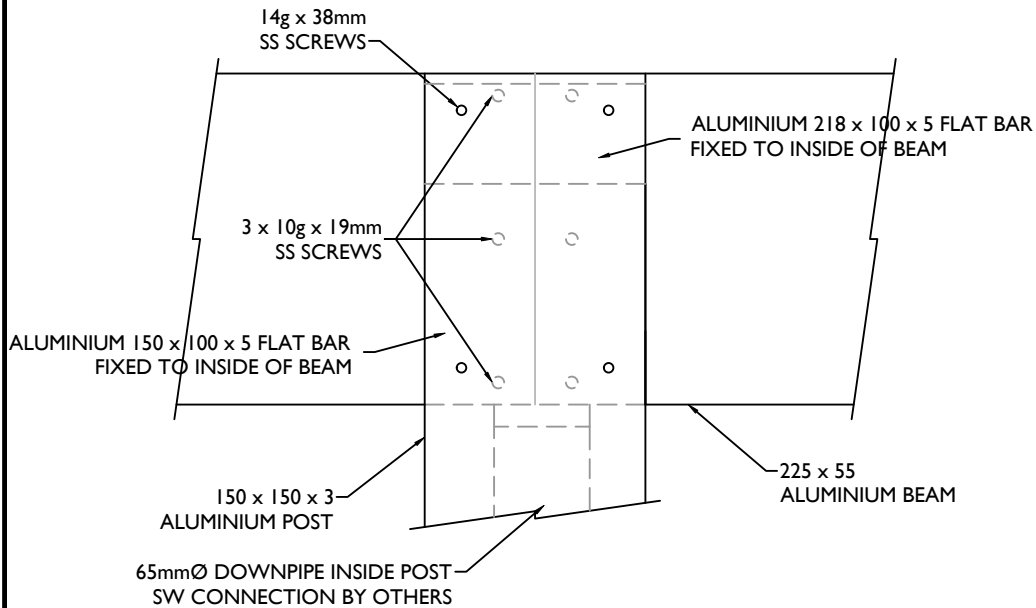
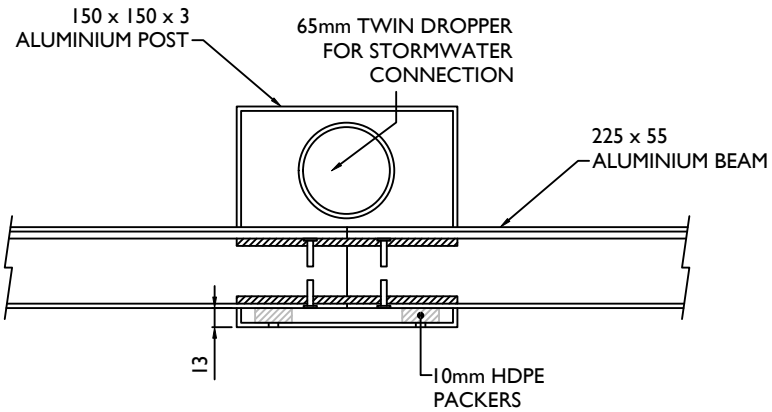
DATE 21.09.2020

SCALE 1:1 (A4)

DRAWN BY DDP

ISSUE A

**BC-BJ/STR**



CLIENT

DRAWING TITLE

BEAM CONNECTION  
BUTT JOIN STRAIGHT

DRAWING NO.

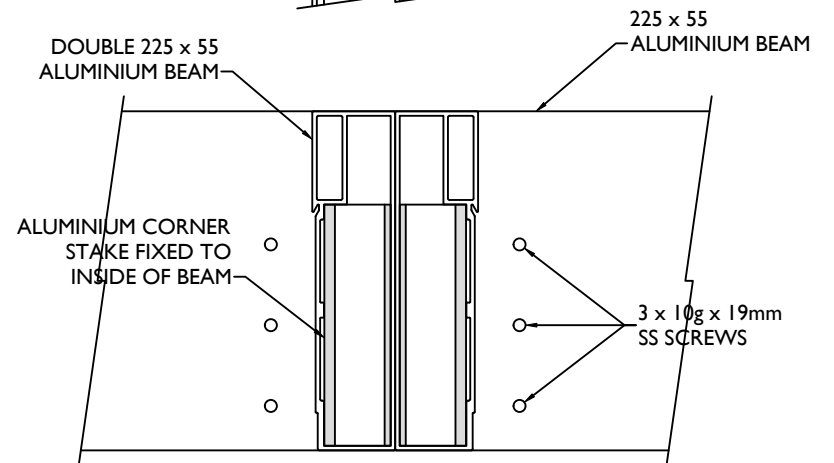
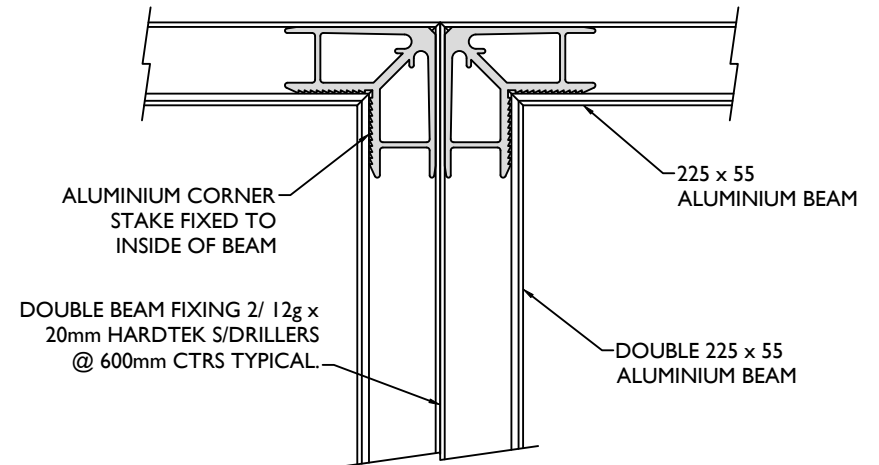
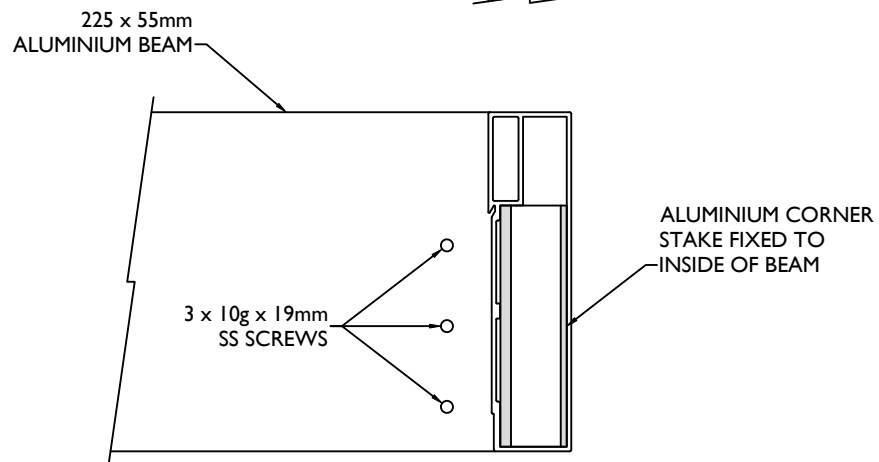
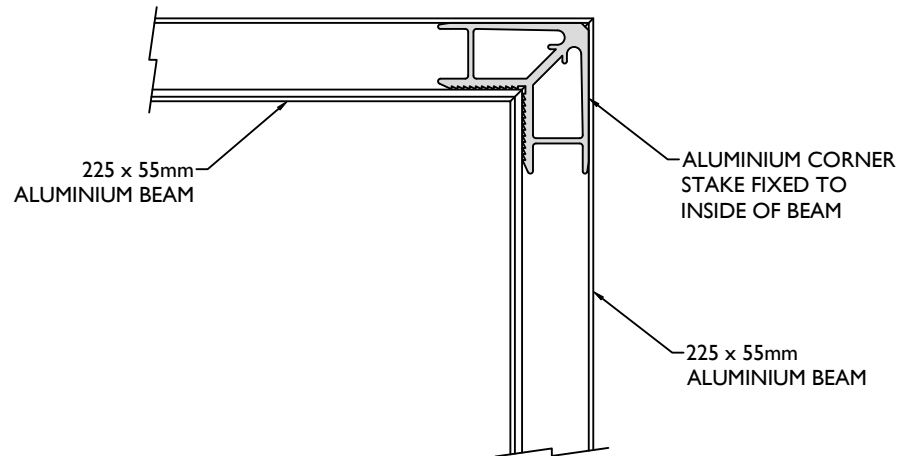
BC-BJ/STR

DATE 29.07.2020

SCALE 1:1 (A4)

DRAWN BY DDP

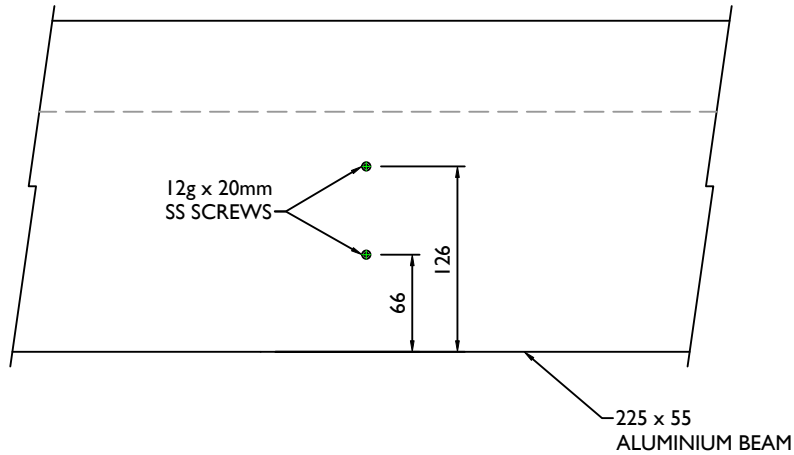
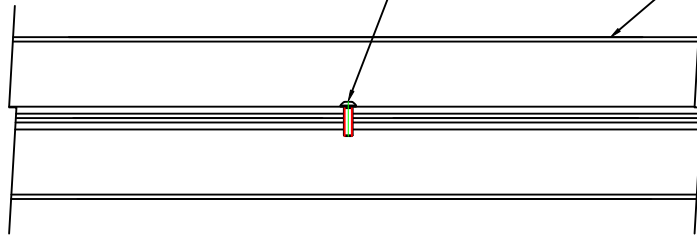
ISSUE A



BC-DBL

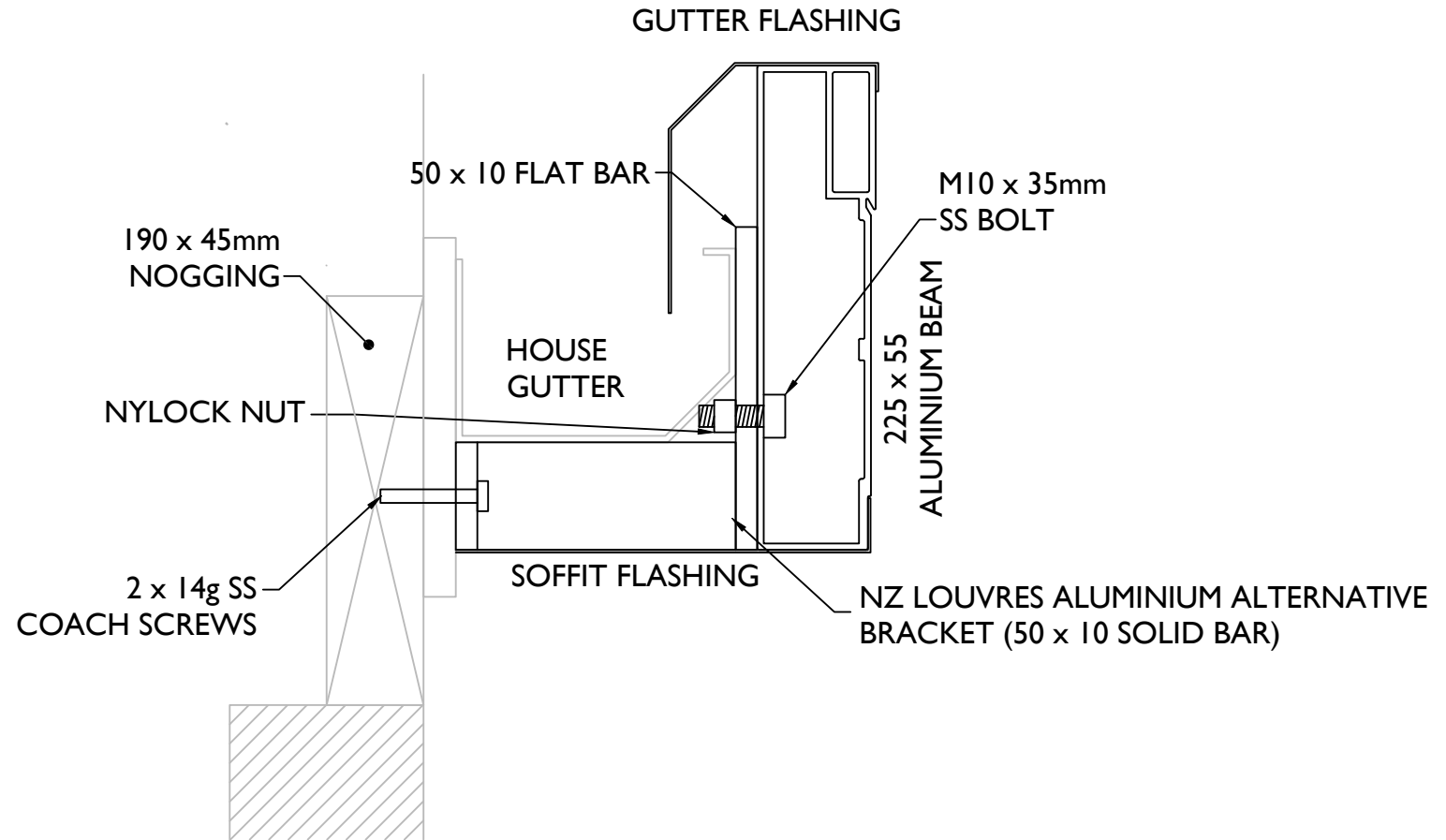
DOUBLE BEAM FIXING 2/ 12g x  
20mm HARDTEK S/DRILLERS  
@ 600mm CTRS TYPICAL.

2 x ( 225 x 55 )  
ALUMINIUM BEAM

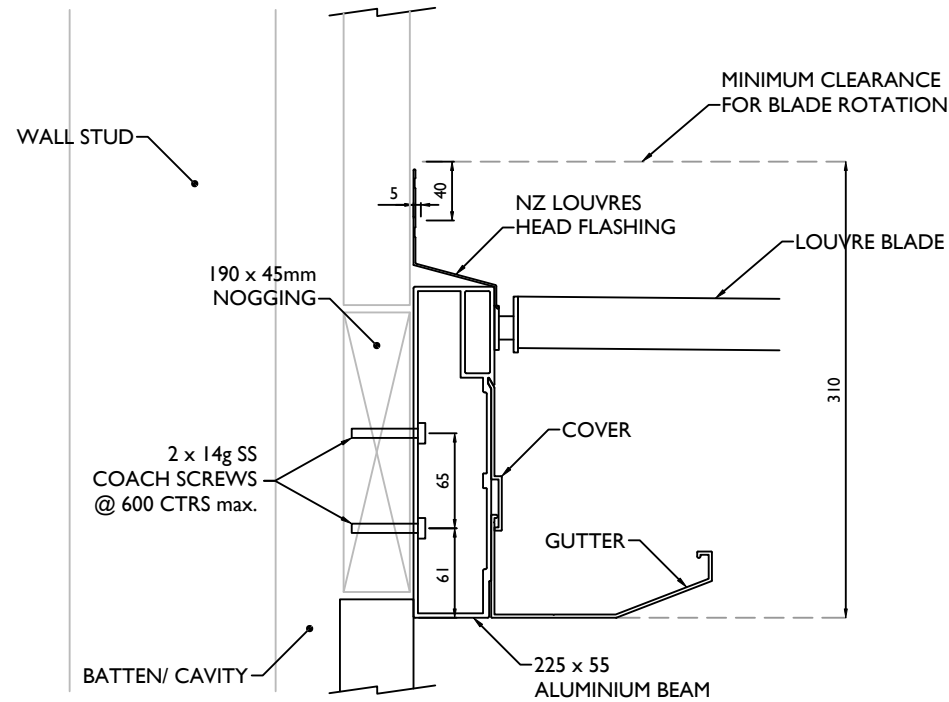




BF-ALT



BF-DF



CLIENT

DRAWING TITLE

BEAM FIXING  
DIRECT FIX

DATE 18.09.2020

SCALE 1:1 (A4)

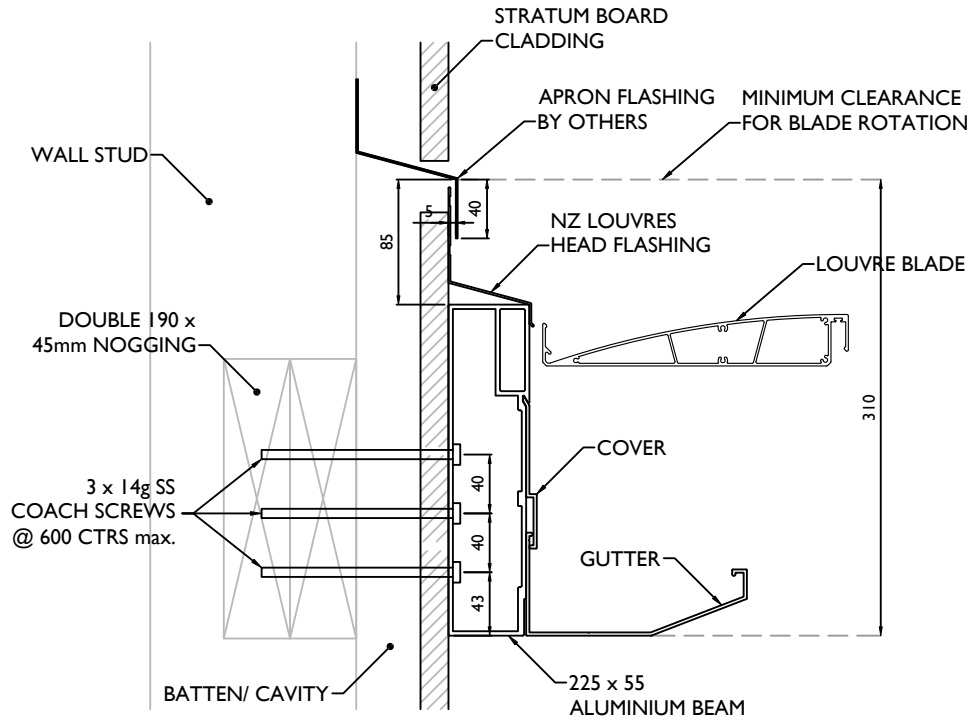
DRAWN BY DDP

DRAWING NO.

BF-DF

ISSUE A

**BF-DF/STR**



CLIENT

DRAWING TITLE

BEAM FIXING  
DIRECT FIX/STRATUM BOARD

DRAWING NO.

BF-DF/STR

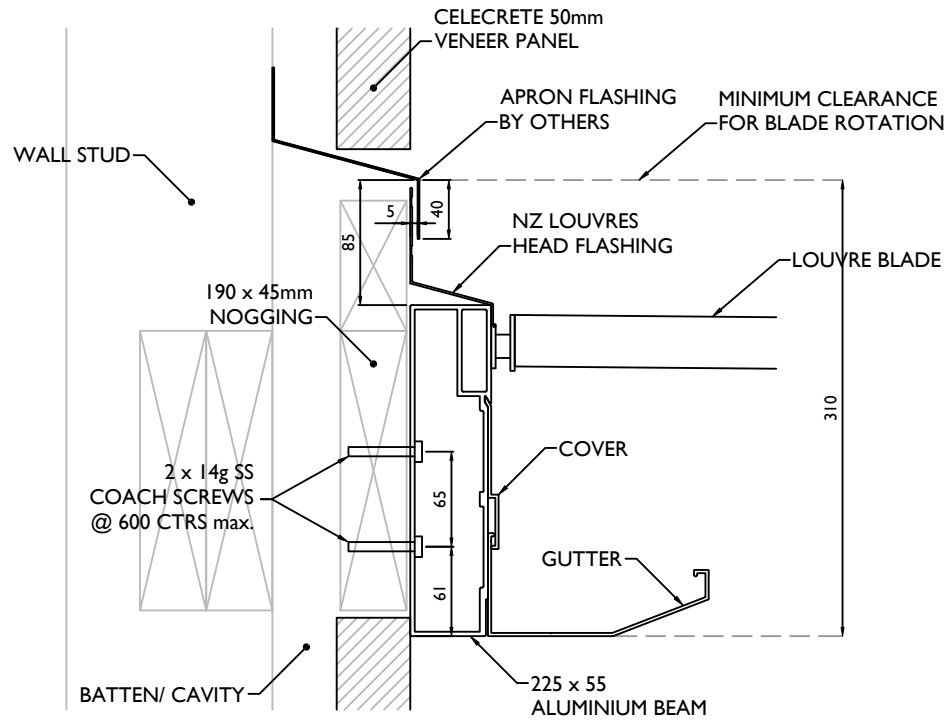
DATE 18.09.2020

SCALE 1:1 (A4)

DRAWN BY DDP

ISSUE A

**BF-DF/VN**



CLIENT

DRAWING TITLE

BEAM FIXING  
DIRECT FIX/VENEER

DRAWING NO.

BF-DF/VN

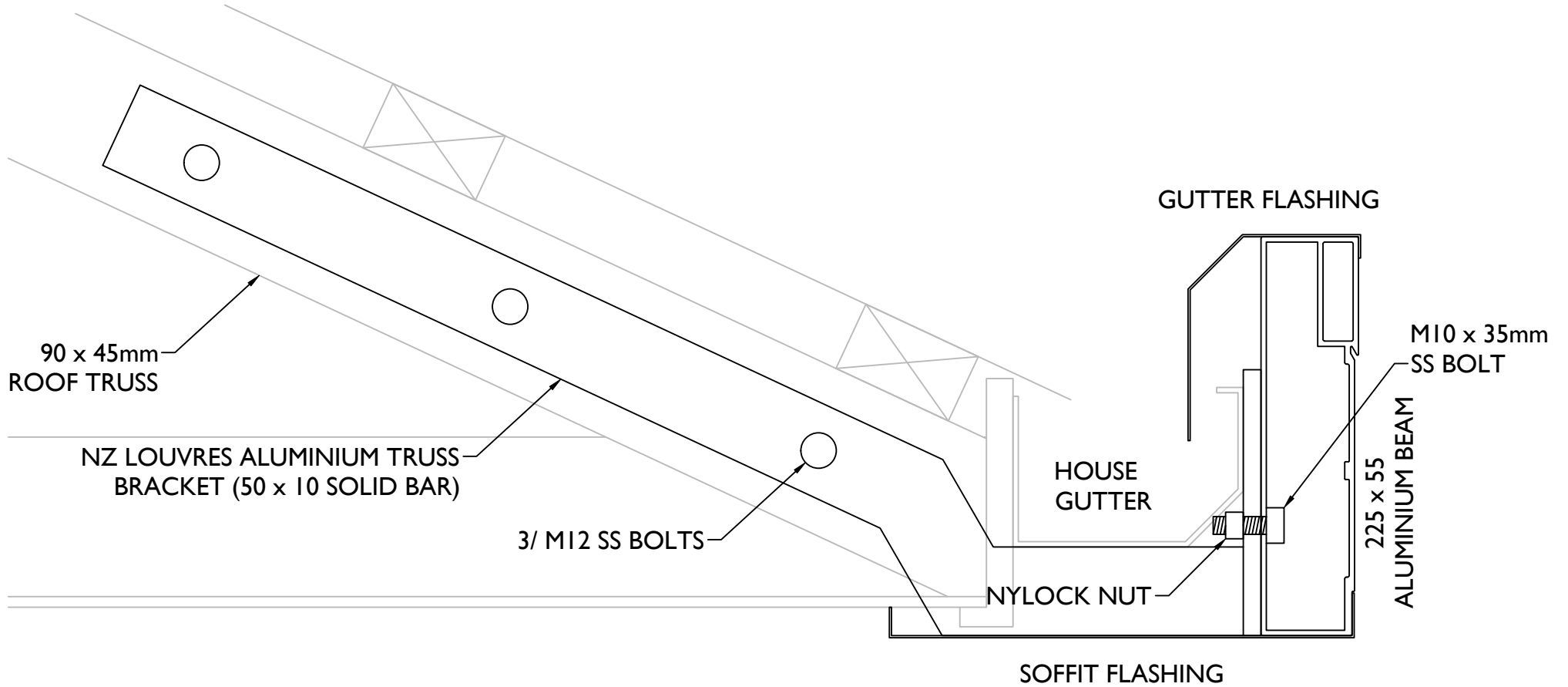
DATE 18.09.2020

SCALE 1:1 (A4)

DRAWN BY DDP

ISSUE A

BF-TB



CLIENT

DRAWING TITLE

BEAM FIXING TRUSS BRACKET

DRAWING NO.

BF-TB

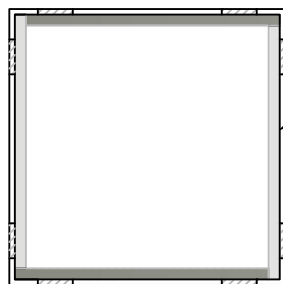
DATE 18.09.2020

SCALE 1:1 (A4)

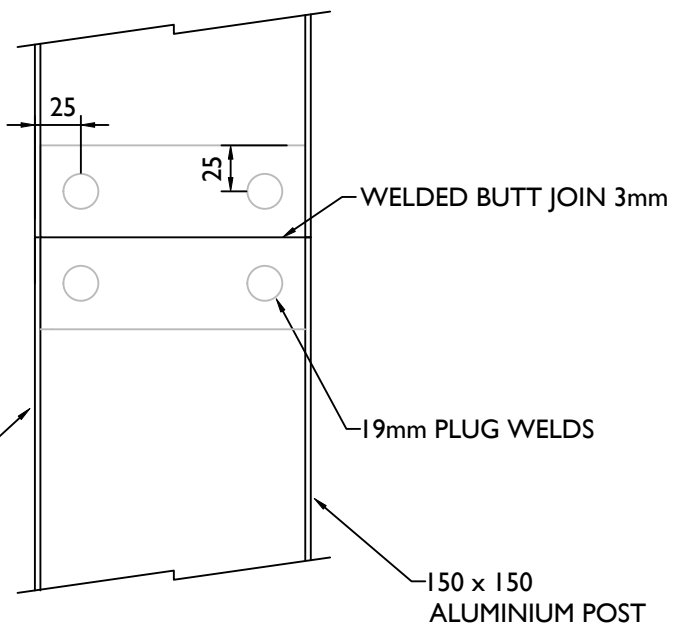
DRAWN BY DDP

ISSUE A

PC-BJEX



100mm x 6mm  
SOLID ALUMINIUM  
FLAT BAR



4 x 14g x 19mm  
SS SCREWS

WELDED BUTT JOIN 3mm

19mm PLUG WELDS

150 x 150  
ALUMINIUM POST



CLIENT

DRAWING TITLE

POST CONNECTION  
BUTT JOIN EXTENSION

DRAWING NO.

PC-BJEX

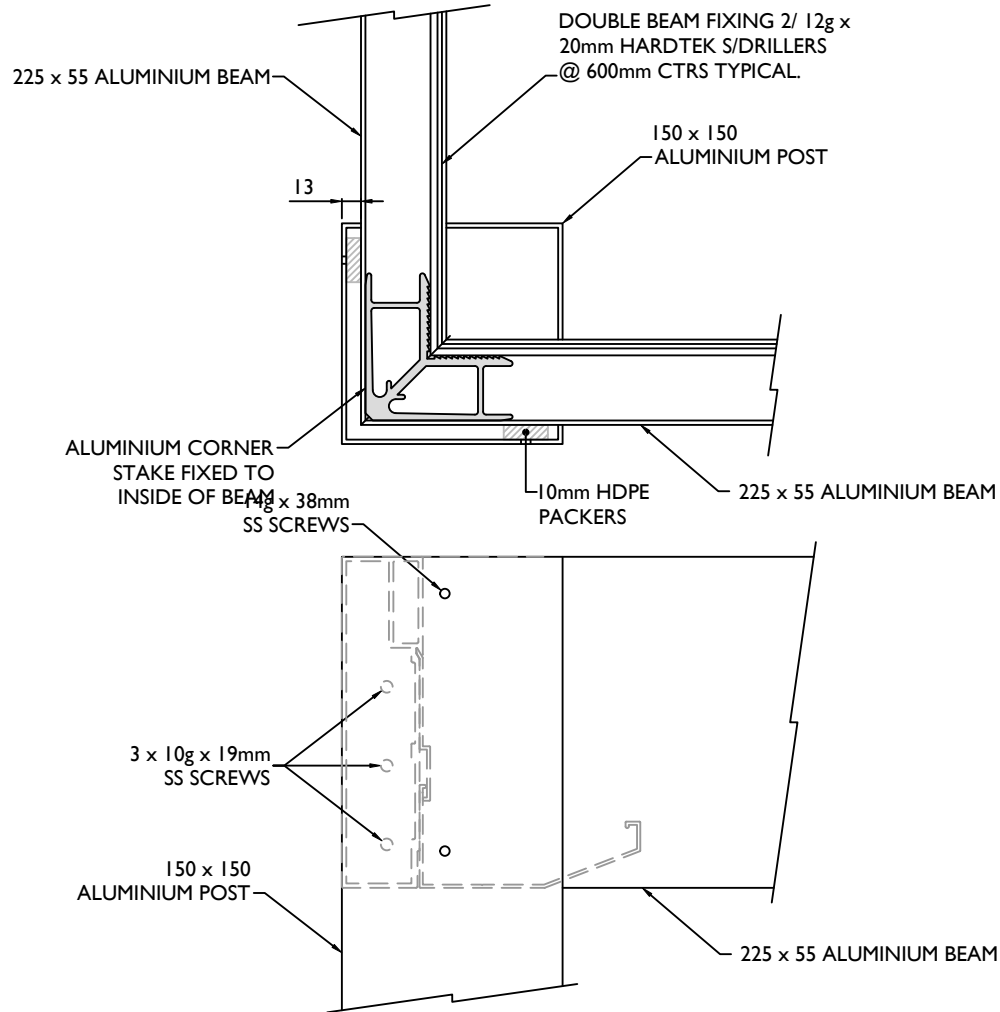
DATE 29.07.2020

SCALE 1:1 (A4)

DRAWN BY DDP

ISSUE A

PC-CNR



CLIENT

DRAWING TITLE

POST CONNECTION  
CORNER FIXING

DATE 18.09.2020

SCALE 1:1 (A4)

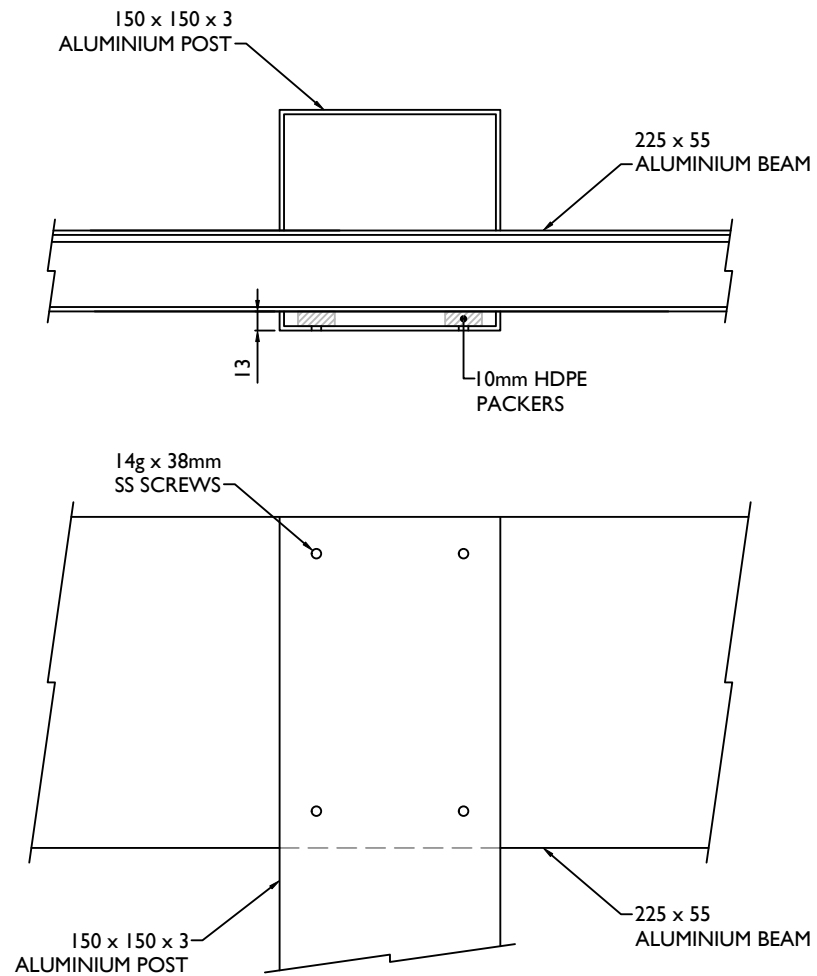
DRAWN BY DDP

DRAWING NO.

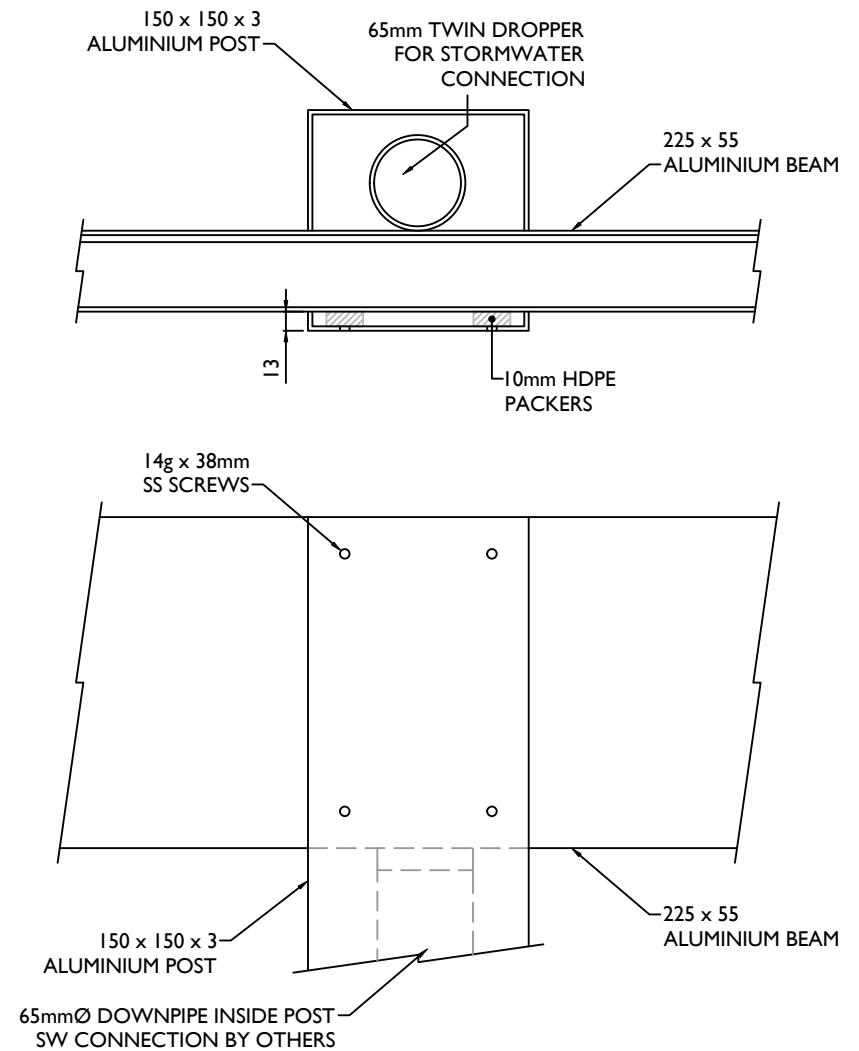
PC-CNR

ISSUE A

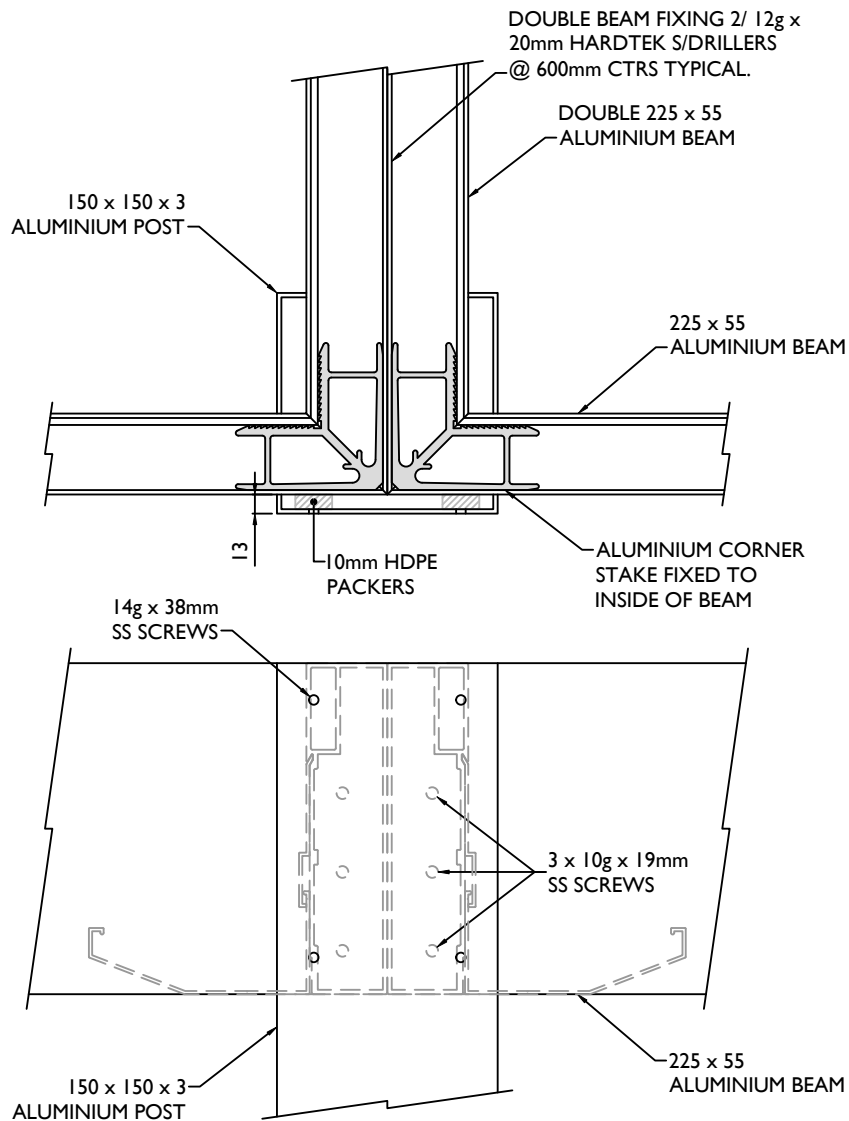
PC-SDF



PC-SDF







CLIENT

DRAWING TITLE

POST CONNECTION  
SIDE FIX DOUBLE BEAMS

DRAWING NO.

PC-SDF/DBL

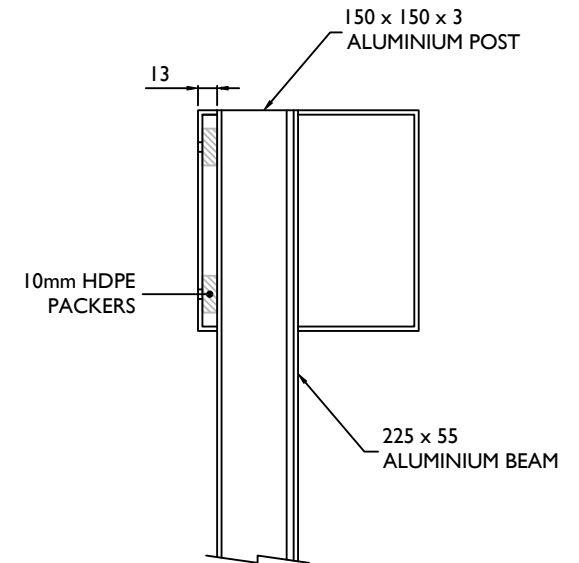
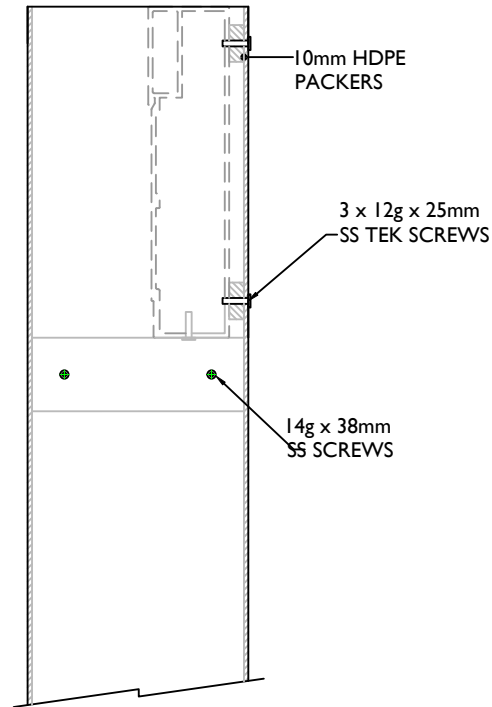
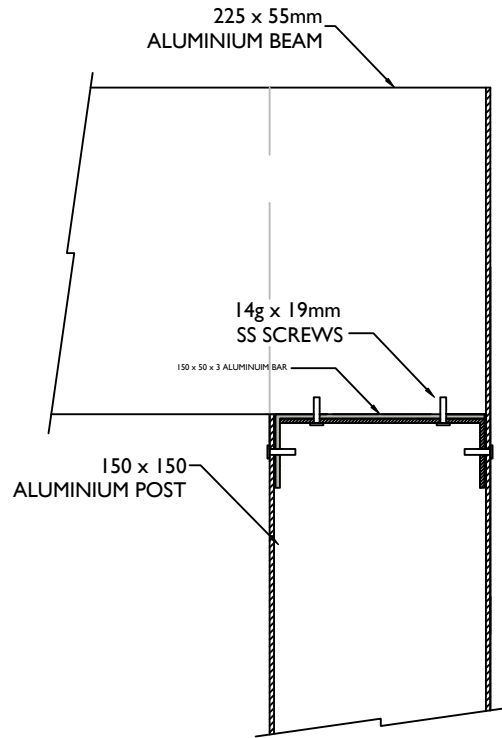
DATE 18.09.2020

SCALE 1:1 (A4)

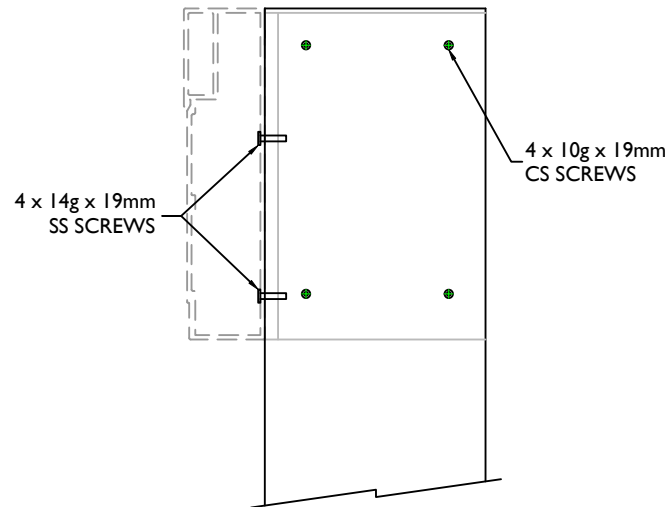
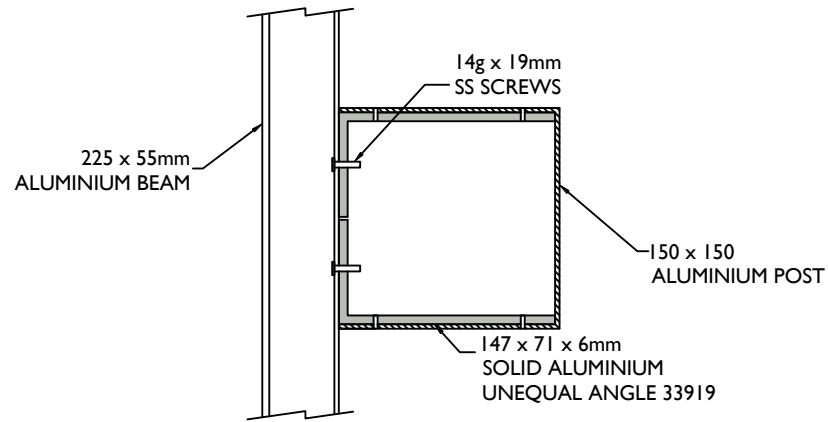
DRAWN BY DDP

ISSUE A

PC-SDF/END



PC-SDF/EXT



CLIENT

DRAWING TITLE

POST CONNECTION  
SIDE FIX ETERNAL

DRAWING NO.

PC-SDF/EXT

DATE 18.09.2020

SCALE 1:1 (A4)

DRAWN BY DDP

ISSUE A