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Design Review and Span Tables

For

Opening Louvered Roof System

For

CW Systems
5 Tollis Place,
SEVEN HILLS NSW 2147

Ref.: 9440-001-rep
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Status: ISSUE 2

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2. WIND LOADING SUMMARY

This design review and the span tables developed for the opening louvered roof systems for CW Systems Pty Limited has been based on non-cyclonic wind load classifications for housing in accordance with AS4055-2012.

DESIGN GUST WIND SPEED (V_h) FOR NON-CYCLONIC REGIONS A AND B

Wind class	Design gust wind speed (V_h) at height (h) m/s	
	Serviceability limit state ($V_{h,s}$)	Ultimate limit state ($V_{h,u}$)
N1	26	34
N2	26	40
N3	32	50
N4	39	61
N5	47	74
N6	55	86

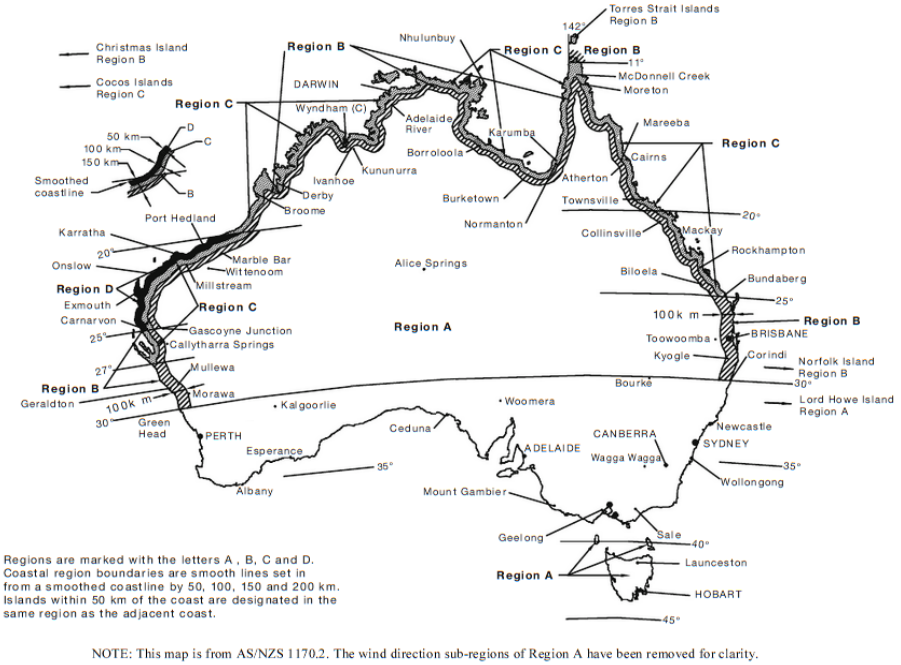
Figure 1 – Design Gust Wind Speeds from AS4055-2012.

WIND CLASSIFICATION FROM WIND REGION AND SITE CONDITIONS

Wind region	TC	Topographic class												
		T0			T1			T2			T3		T4	T5
		FS	PS	NS	FS	PS	NS	FS	PS	NS	PS	NS	NS	NS
A	3	N1	N1	N1	N1	N2	N2	N2	N2	N2	N3	N3	N3	N4
	2.5	N1	N1	N2	N1	N2	N2	N2	N3	N3	N3	N3	N4	N4
	2	N1	N2	N2	N2	N2	N3	N2	N3	N3	N3	N3	N4	N4
	1.5	N2	N2	N2	N2	N3	N3	N3	N3	N3	N3	N4	N4	N5
	1	N2	N3	N3	N2	N3	N3	N3	N3	N4	N4	N4	N4	N5
B	3	N2	N2	N3	N2	N3	N3	N3	N3	N4	N4	N4	N4	N5
	2.5	N2	N3	N3	N3	N3	N3	N3	N4	N4	N4	N4	N5	N5
	2	N2	N3	N3	N3	N3	N4	N3	N4	N4	N4	N5	N5	N6
	1.5	N3	N3	N4	N3	N4	N4	N4	N4	N4	N5	N5	N5	N6
	1	N3	N4	N4	N4	N4	N4	N4	N5	N5	N5	N5	N6	N6
C	3	C1	C1	C2	C1	C2	C2	C2	C2	C3	C3	C3	C3	C4
	2.5	C1	C2	C2	C2	C2	C2	C2	C3	C3	C3	C3	C4	NA
	2	C1	C2	C2	C2	C2	C3	C2	C3	C3	C3	C4	C4	NA
	1.5	C2	C2	C3	C2	C3	C3	C3	C3	C4	C4	C4	NA	NA
	1	C2	C3	C3	C3	C3	C3	C3	C4	C4	C4	NA	NA	NA
D	3	C2	C3	C3	C2	C3	C3	C3	C4	C4	C4	C4	NA	NA
	2.5	C2	C3	C3	C3	C3	C4	C3	C4	C4	C4	NA	NA	NA
	2	C3	C3	C4	C3	C4	C4	C4	C4	NA	NA	NA	NA	NA
	1.5	C3	C4	C4	C4	C4	NA	C4	NA	NA	NA	NA	NA	NA
	1	C3	C4	C4	C4	NA	NA	NA	NA	NA	NA	NA	NA	NA

LEGEND:
FS = Full shielding
PS = Partial shielding
NS = No shielding
N = Non-cyclonic
C = Cyclonic
N/A = Not applicable, that is, beyond the scope of this Standard (use AS/NZS 1170.2)
TC = Terrain category

Figure 2 – Wind Region Classification from AS4055-2012.



NOTE: This map is from AS/NZS 1170.2. The wind direction sub-regions of Region A have been removed for clarity.

Figure 3 – Wind Region Map from AS4055-2012.

3. ROOF CONFIGURATIONS

The following roof configurations have been considered as canopies attached to buildings.

1. Canopy attached to one wall of a residential building, as sketched below. The net wind pressure coefficients are Cpn = +1.2, -1.5

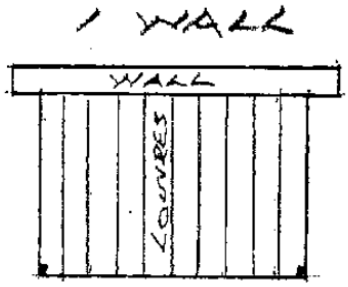


Figure 4 – Louvered canopy attached to one wall.

2. Canopy attached to two or 3 walls of a residential building, as sketched below. The net wind pressure coefficients are Cpn = +0.85, -1.6.

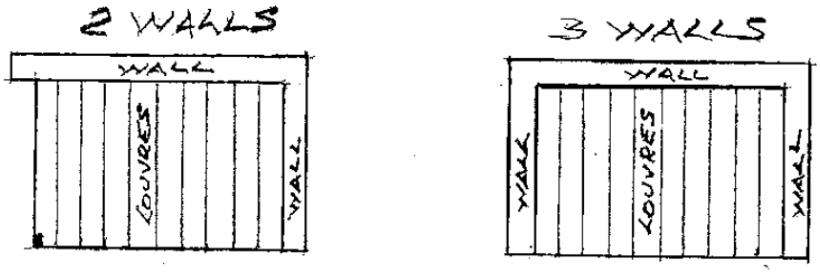


Figure 5 – Louvered canopy attached to two or three walls.

3. Free standing canopy with 4 posts, as sketched below. The net wind pressure coefficients are Cpn = +0.4, -0.4 where there are no obstructions below, and Cpn = +0.4, -1.0 where there are obstructions blocking the wind flow below.

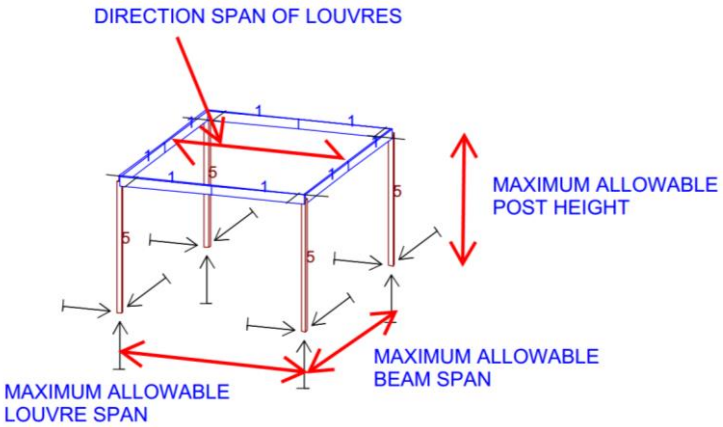
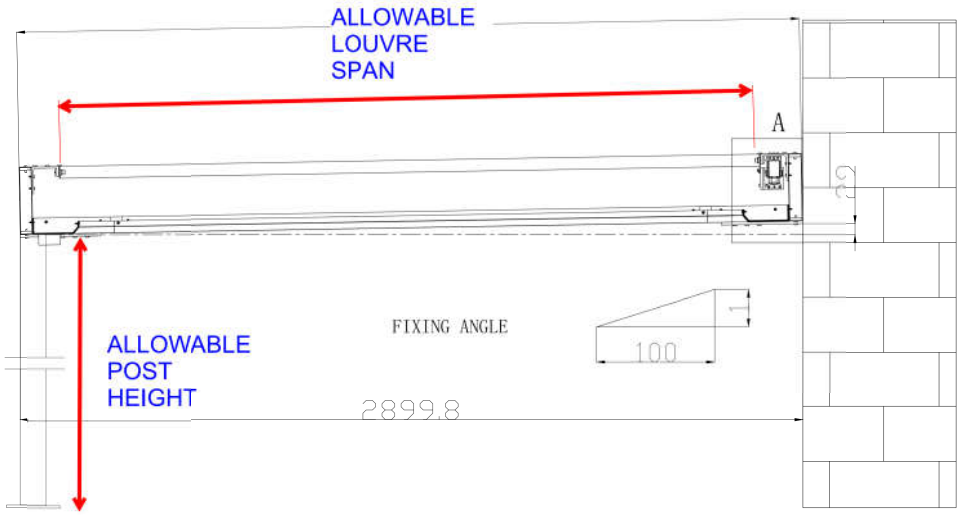
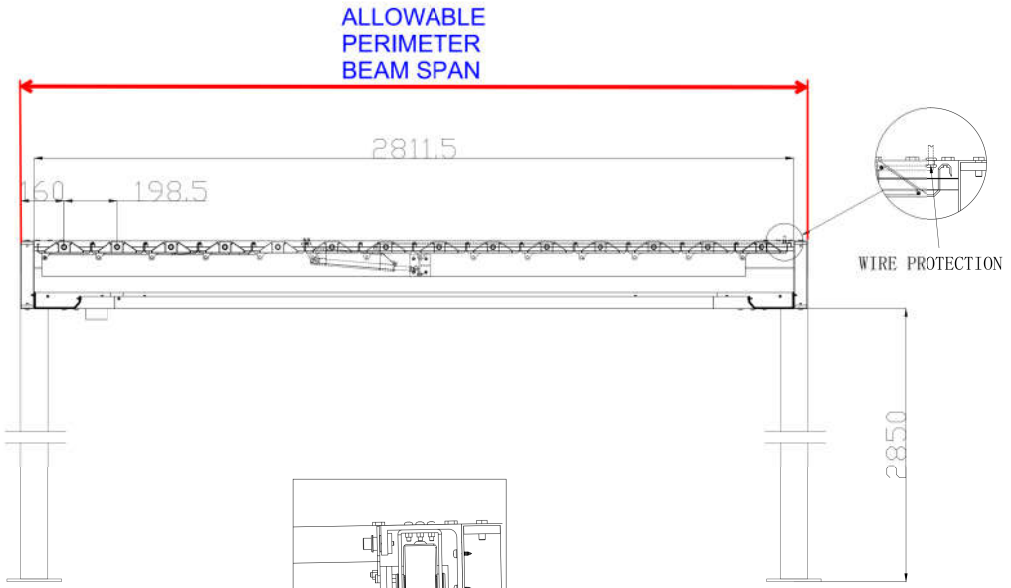
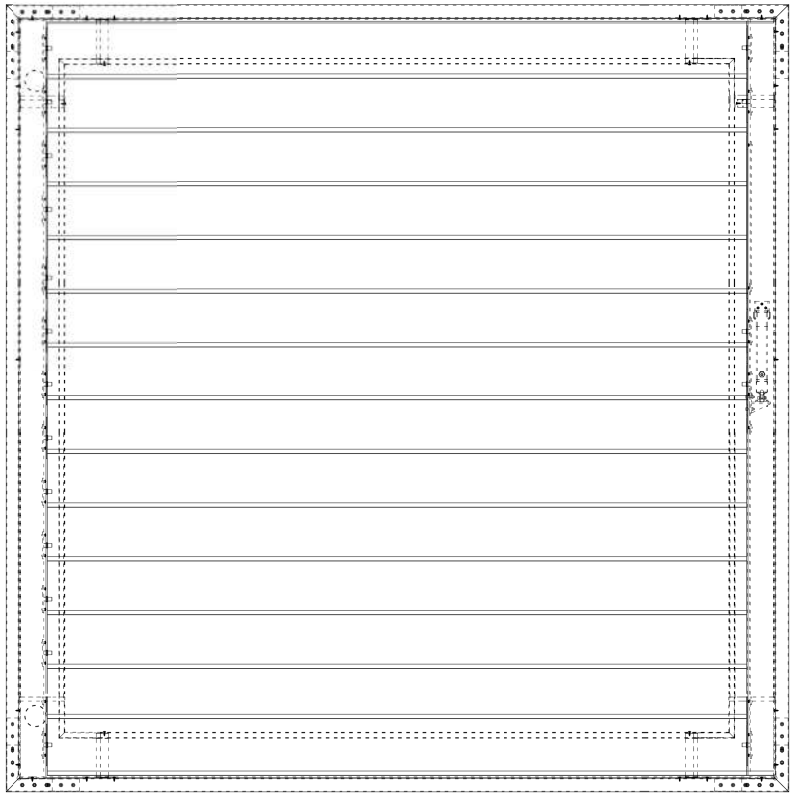


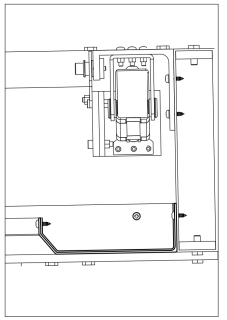
Figure 6 – Free standing louvred canopy on 4 posts.

4. DETAILED DRAWINGS OF ROOF CONFIGURATIONS









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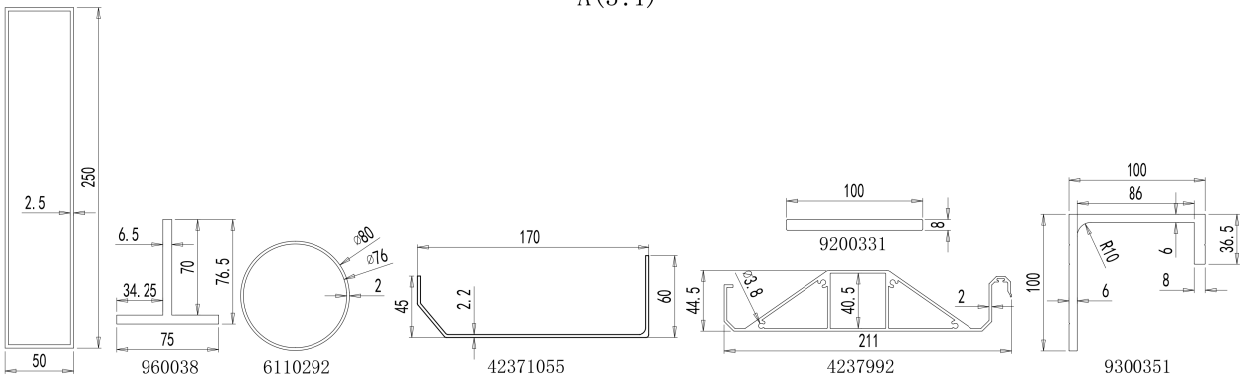
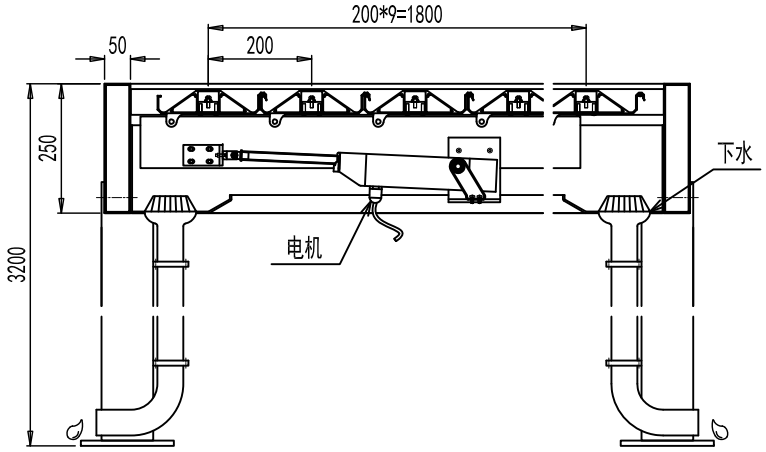
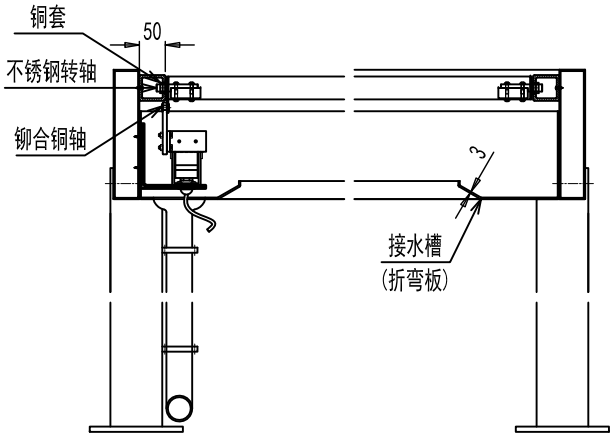
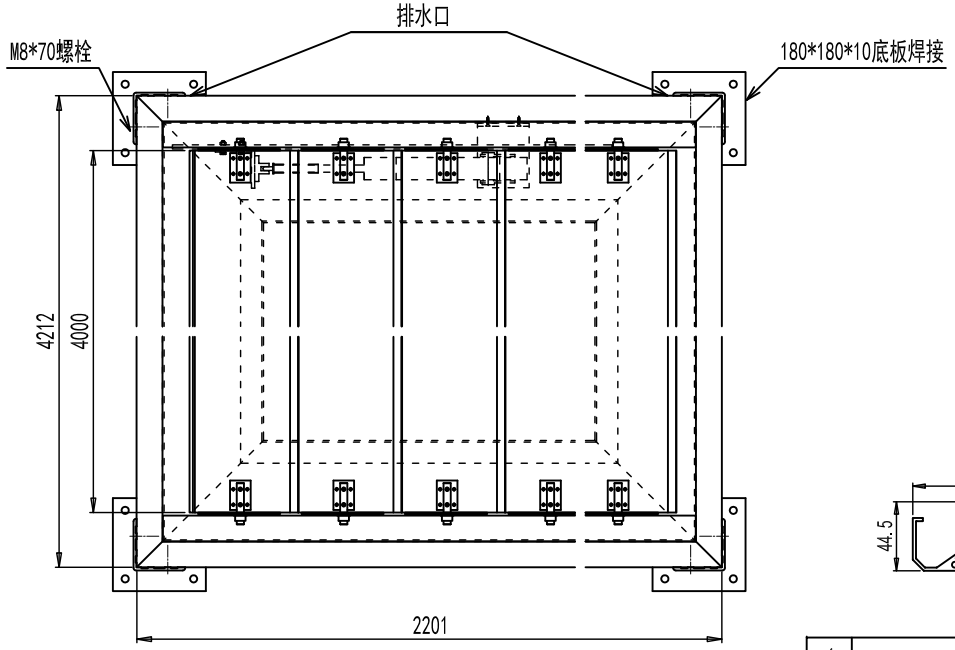
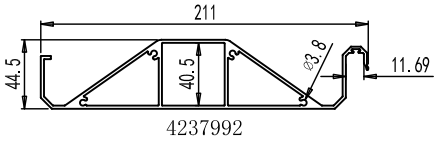


4				审核		投影		名称: 防水百叶
3				校对		单位	mm	
2				设计		数量	-	编号: 20160803
1				制图	程果	材料	AL6063	
==	YF-1600	新 图	16.08.26	佛山市南海永丰铝材有限公司				
No	变更号	记 事 栏	日 期	Tel:0757-85565511 Fax:0757-85520011				









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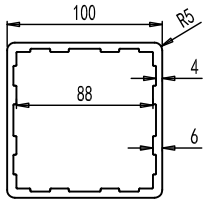

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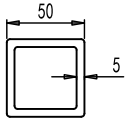

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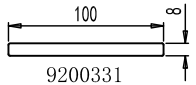

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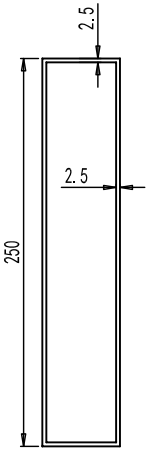

注：以实际加工为准。

4				审核		投影		名称: 防水百叶
3				校对		单位	mm	
2				设计		数量	–	编号: XX
1				制图	梁润清	材料	AL6063	
==	YF-1600	新　图	16.04.12	佛山市南海永丰铝材有限公司				
No	变更号	记　事　栏	日　期	Tel:0757-85565511　Fax:0757-85520011				

5. LOUVRE BLADE SPAN TABLES FOR 1 WALL CONFIGURATION

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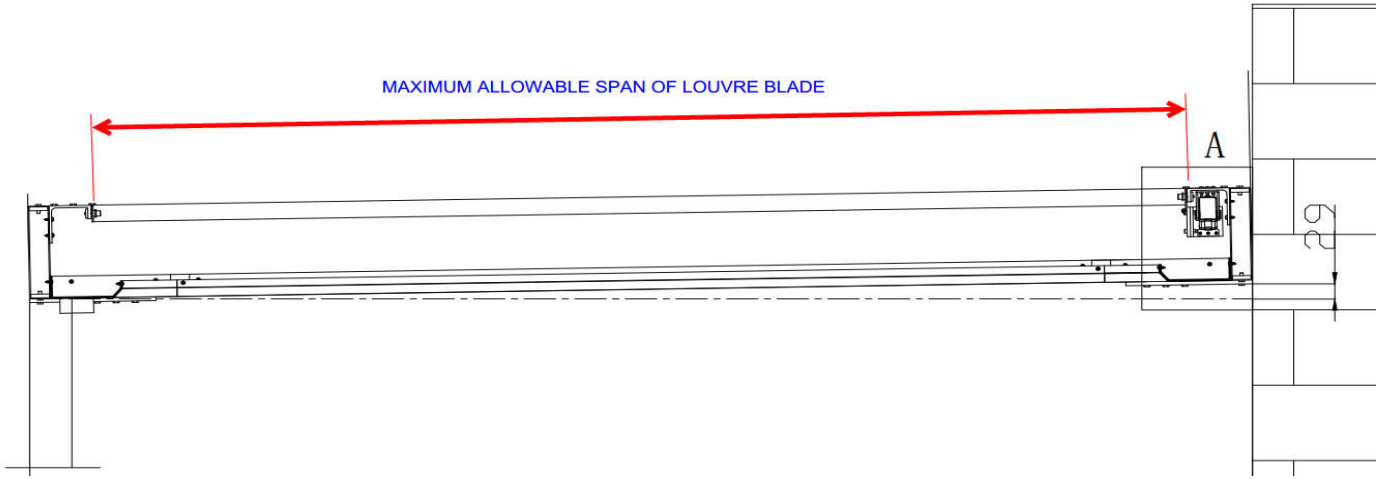
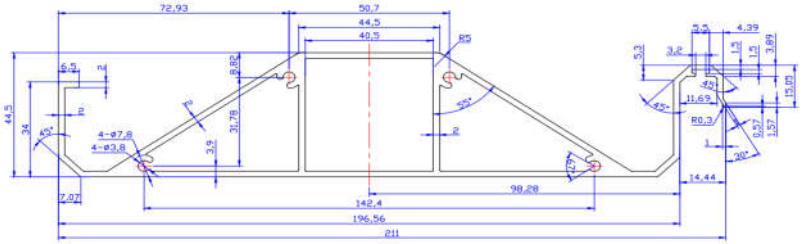
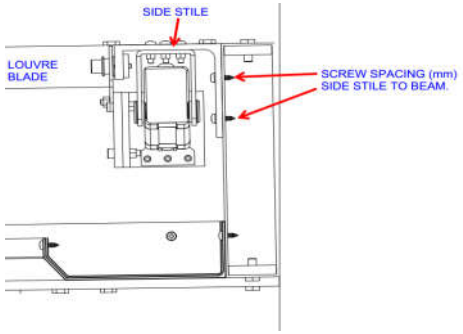
Louvre Span Table - 1 Wall (Cpn = +1.2,-1.5)

Wind Class	Ultimate Limit State (m/s)	Serviceability Limit State (m/s)	Wu (kPa)	Ws (kPa)	Maximum Allowable Span (mm)	Screw spacing (mm) Side Stile to Beam
N1	34	26	0.69	0.41	**5000**	100
N2	40	26	0.96	0.41	**4800**	100
N3	50	32	1.50	0.61	**4500**	75
N4	61	39	2.23	0.91	**3700**	75
N5	74	47	3.29	1.33	**3000**	50
N6	86	55	4.44	1.82	**2500**	50





Louvre Blade Cross Sectional Dimensions



Louvre Blade End Connections

6. LOUVRE BLADE SPAN TABLES FOR 2 OR 3 WALL CONFIGURATION

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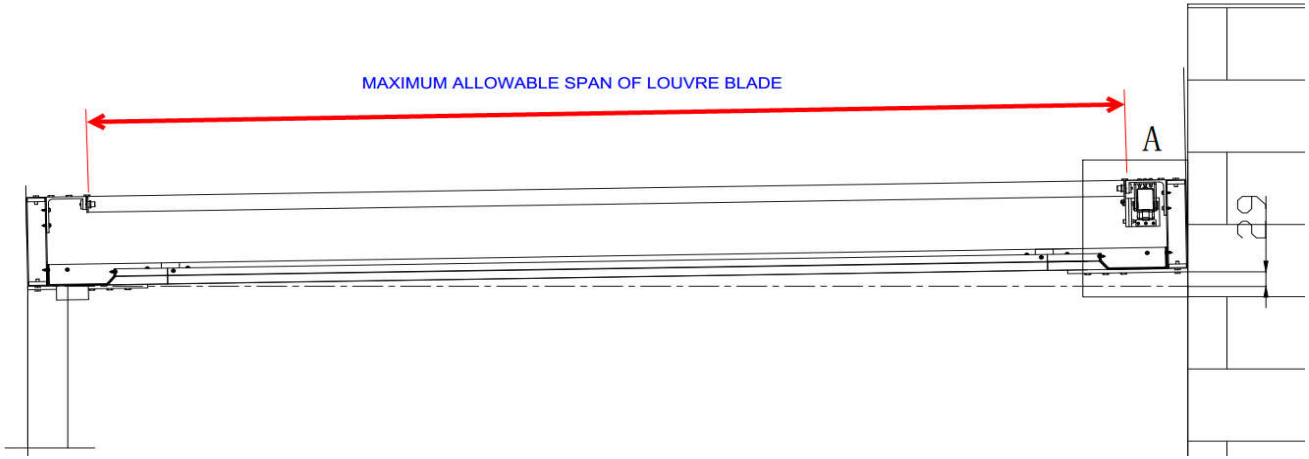
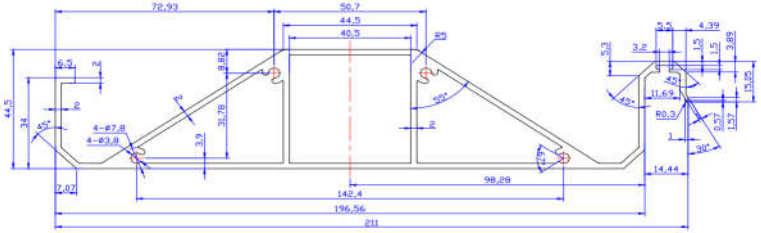
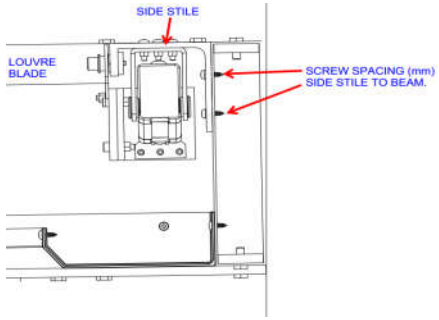
Louvre Span Table - 2 or 3 Walls (Cpn = +0.85,-1.6)

Wind Class	Ultimate Limit State (m/s)	Serviceability Limit State (m/s)	Wu (kPa)	Ws (kPa)	Maximum Allowable Span (mm)	Screw spacing (mm) Side Stile to Beam
N1	34	26	0.69	0.41	**5000**	100
N2	40	26	0.96	0.41	**5000**	100
N3	50	32	1.50	0.61	**4300**	75
N4	61	39	2.23	0.91	**3500**	75
N5	74	47	3.29	1.33	**2900**	50
N6	86	55	4.44	1.82	**2500**	50





Louvre Blade Cross Sectional Dimensions



Louvre Blade End Connections

7. EDGE BEAM SPAN TABLES FOR 1 WALL CONFIGURATION

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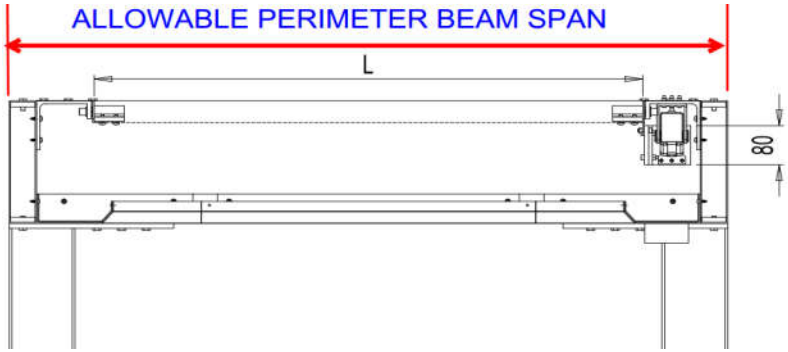
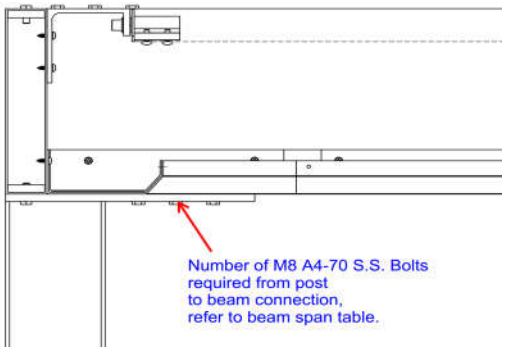
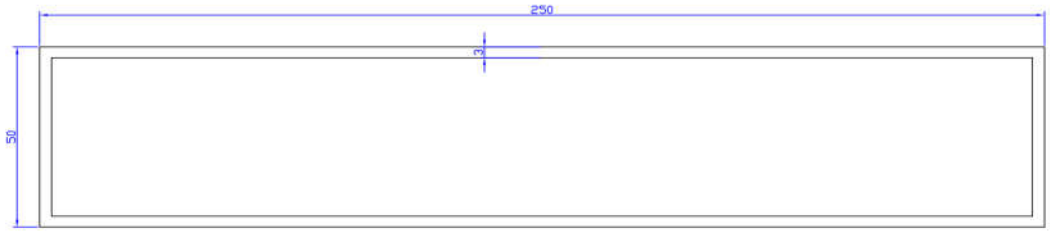
250x50x3.0 RHS Perimter Beam Span Table - 1 Wall (Cpn = +1.2,-1.5)

Wind Class	Ultimate Limit State (m/s)	Serviceability Limit State (m/s)	Wu (kPa)	Ws (kPa)	Supported Louvre Span (mm)	Maximum Allowable Span (mm)	Number of Fasteners from Beam to Post	Supported Louvre Span (mm)	Maximum Allowable Span (mm)	Number of Fasteners from Beam to Post	Supported Louvre Span (mm)	Maximum Allowable Span (mm)	Number of Fasteners from Beam to Post
N1	34	26	0.69	0.41	5000	4800	3	4500	**5000**	3	3500	**5600**	3
N2	40	26	0.96	0.41	4800	4300	3	4000	**4800**	3	3000	**5300**	3
N3	50	32	1.50	0.61	4500	3600	4	3500	**4200**	4	2500	**4900**	3
N4	61	39	2.23	0.91	3700	3300	4	3000	**3600**	4	2000	**4500**	3
N5	74	47	3.29	1.33	3000	3000	5	2500	**3300**	4	1500	**4200**	3
N6	86	55	4.44	1.82	2500	2800	5	2000	**3100**	4	1000	**4000**	3





Perimeter Beam End Connections



Perimeter Beam Cross Sectional Dimensions

8. EDGE BEAM SPAN TABLES FOR 2 OR 3 WALL CONFIGURATION

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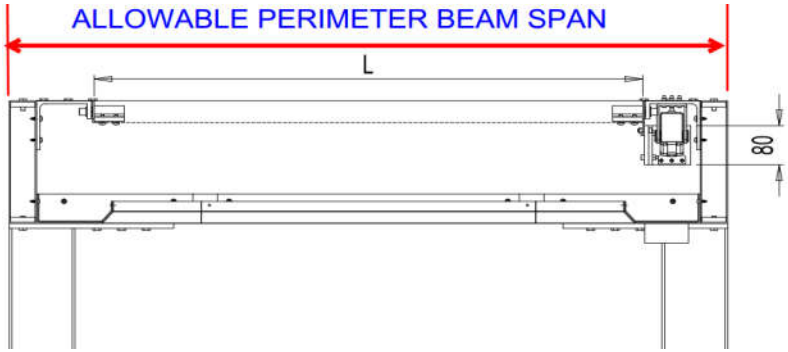
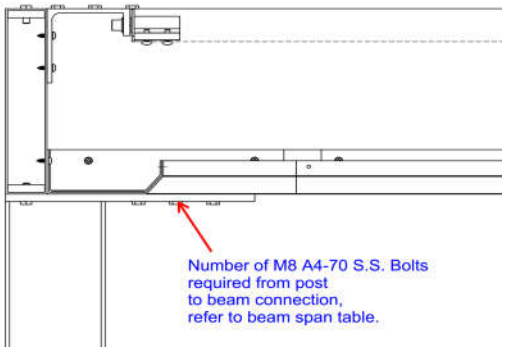
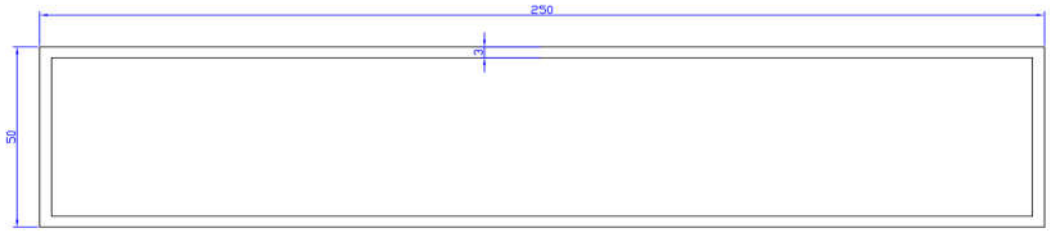
250x50x3.0 RHS Perimter Beam Span Table - 2 or 3 Walls (Cpn = +0.85,-1.6)

Wind Class	Ultimate Limit State (m/s)	Serviceability Limit State (m/s)	Wu (kPa)	Ws (kPa)	Supported Louvre Span (mm)	Maximum Allowable Span (mm)	Number of Fasteners from Beam to Post	Supported Louvre Span (mm)	Maximum Allowable Span (mm)	Number of Fasteners from Beam to Post	Supported Louvre Span (mm)	Maximum Allowable Span (mm)	Number of Fasteners from Beam to Post
N1	34	26	0.69	0.41	5000	5000	3	4500	**5400**	3	3500	6000	2
N2	40	26	0.96	0.41	5000	4300	3	4000	**4800**	3	3000	5500	3
N3	50	32	1.50	0.61	4300	3600	4	3500	**4000**	4	2500	4800	3
N4	61	39	2.23	0.91	3500	3300	4	3000	**3500**	4	2000	4300	3
N5	74	47	3.29	1.33	2900	3000	5	2500	**3200**	5	1500	4100	4
N6	86	55	4.44	1.82	2500	2700	5	2000	**3000**	5	1000	4000	4





Perimeter Beam End Connections



Perimeter Beam Cross Sectional Dimensions

9. POST SPAN TABLES FOR 1 WALL CONFIGURATION

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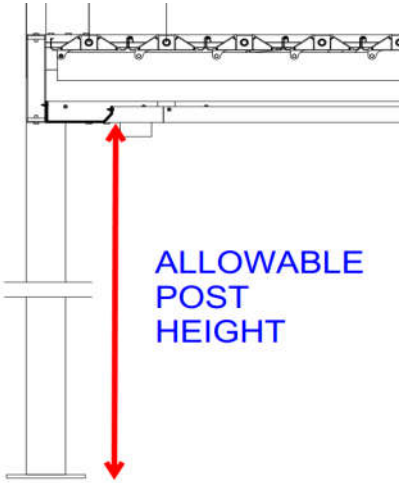
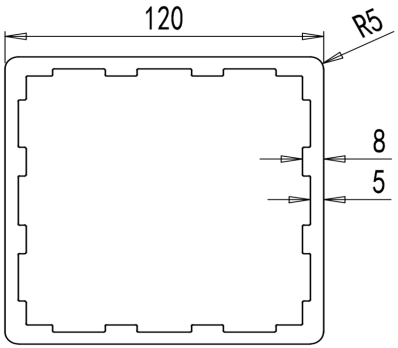
120x120x5.0 SHS Post Span Table - 1 Wall (Cpn = +1.2,-1.5)

Wind Class	Ultimate Limit State (m/s)	Serviceability Limit State (m/s)	Wu (kPa)	Ws (kPa)	Supported Beam Span (mm)	Maximum Allowable Post Height (mm)
N1	34	26	0.69	0.41	4800	6000
N2	40	26	0.96	0.41	4300	5000
N3	50	32	1.50	0.61	3600	4600
N4	61	39	2.23	0.91	3300	4100
N5	74	47	3.29	1.33	3000	3500
N6	86	55	4.44	1.82	2800	3000





Post Cross Sectional Dimensions

10. POST SPAN TABLES FOR 2 OR 3 WALL CONFIGURATION

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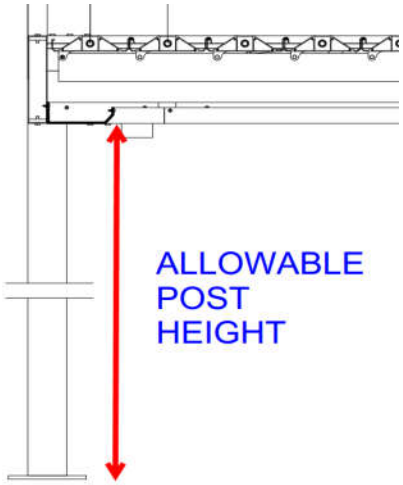
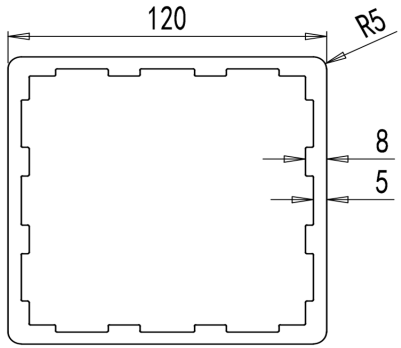
www.eclipseconsulting.com.au

120x120x5.0 SHS Post Span Table - 2 or 3 Walls (Cpn = +0.85,-1.6)

Wind Class	Ultimate Limit State (m/s)	Serviceability Limit State (m/s)	Wu (kPa)	Ws (kPa)	Supported Beam Span (mm)	Maximum Allowable Post Height (mm)
N1	34	26	0.69	0.41	5000	6000
N2	40	26	0.96	0.41	4300	5000
N3	50	32	1.50	0.61	3600	4500
N4	61	39	2.23	0.91	3300	4000
N5	74	47	3.29	1.33	3000	3400
N6	86	55	4.44	1.82	2700	3000

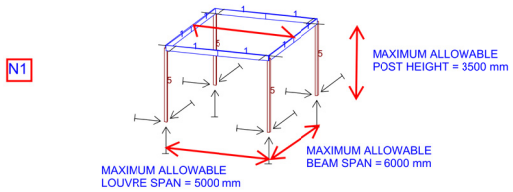


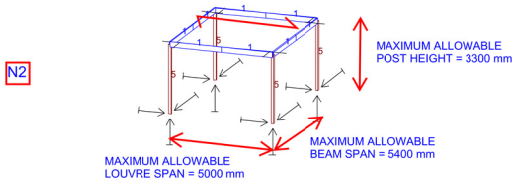


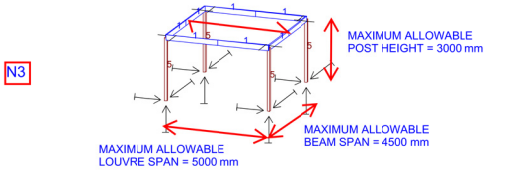
Post Cross Sectional Dimensions

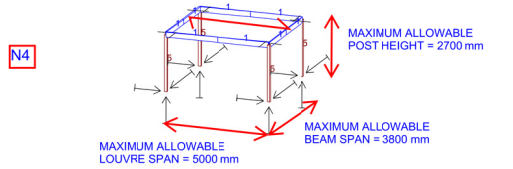
11. SPAN TABLES FOR FREE STANDING 4 POST ROOF CONFIGURATION

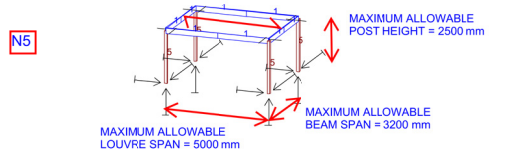
SPAN TABLES FOR:
4 POSTS - NOT BLOCKED UNDER
Cpn = + 0.4 , - 0.4

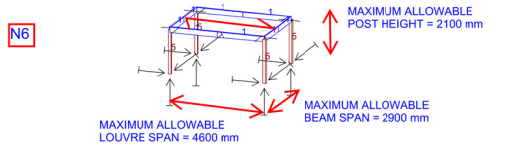












SPAN TABLE FOR:
4 POSTS - BLOCKED UNDER
Cpn = + 0.4 , - 1.0

Sections:
1 250x50x3.0RHS
5 120X120X5.0SHS Y