

Client: Extreme Marquees

Project: Design check – 5m × 9m Function Standard Tent Structure for 80km/hr Wind

 $-4m \times 9m$ Function Standard Tent Structure for 80km/hr Wind

- 3m × 9m Function Standard Tent Structure for 80km/hr Wind

Reference: Extreme Marquees' data

Report by: KZ Checked by: EAB Date: 11/06/2015

JOB NO: D-11-263557-2



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Introduction 1

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The report examines the effect of 3s gust wind of 80 km/hr on 5m Span x 3m Bay Function Standard Tent. The relevant Australian Standards AS1170.0:2002 General principles, AS1170.1:2002 Permanent, imposed and other actions and AS1170.2:2011 Wind actions are used. The design check is in accordance with AS/NZS 1664.1:1997 Aluminum limit state design.

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2 Design Restrictions and Limitations

- 2.1 The erected structure is for temporary use only and is limited to 6 months maximum at any one site establishment.
- 2.2 It should be noted that if high gust wind speeds are anticipated or forecast in the locality of the tent, the temporary erected structure should be dismantled.
- 2.3 For forecast winds in excess of (**refer to summary**) all fabric shall be removed from the frames, and the structure should be completely dismantled.
 - (Please note that the locality squall or gust wind speed is affected by factors such as terrain exposure and site elevations.)
- 2.4 The structure may only be erected in regions with wind classifications no greater than the limits specified on the attached wind analysis.
- 2.5 The wind classifications are based upon category 2 in AS. Considerations have also been made to the regional wind terrain category, topographical location and site shielding from adjacent structures. Please note that in many instances topographical factors such as a location on the crest of a hill or on top of an escarpment may yield a higher wind speed classification than that derived for a higher wind terrain category in a level topographical region. For this reason, particular regard shall be paid to the topographical location of the structure. For localities which do not conform to the standard prescribed descriptions for wind classes as defined above, a qualified Structural Engineer may be employed to determine an appropriate wind class for that the particular site.
- 2.6 The structures in no circumstances shall ever be erected in tropical or severe tropical cyclonic condition.
- 2.7 The tent structure has not been designed to withstand snow and ice loadings such as when erected in alpine regions.
- 2.8 For the projects, where the site conditions approach the design limits, extra consideration should be given to pullout tests of the stakes and professional assessment of the appropriate wind classification for the site.
- 2.9 Wall Bracing is required at one of the end bays for 5m X 9m tent to resist against lateral movement due to wind direction2. However, for multiple tent length, each end bay and every third bay in between must be braced.

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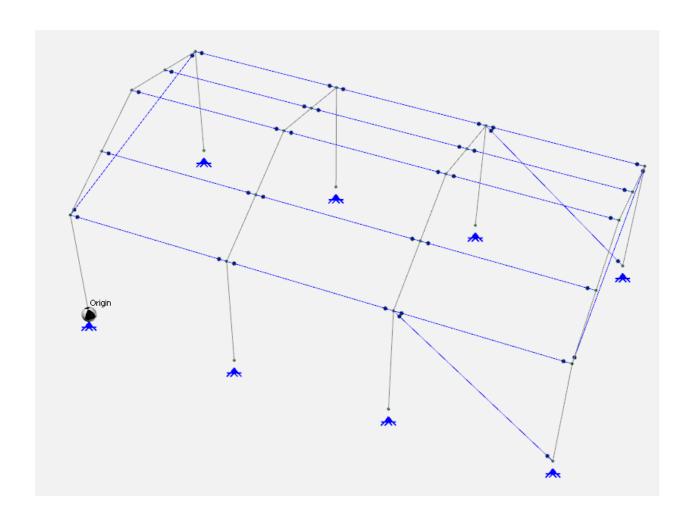


3 Specifications

3.1 General

Tent category	
Material	Aluminum 6061-T6

Size	Model
10m x 9m	Function Standard



5 | P a g e

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3.2 Aluminium Properties

Aluminium Properties		
Compressive yield strength	Fcy	241 MPa
Tensile yeild strength	Fty	241 MPa
Tensile ultimate strength	Ftu	262 MPa
Shear yield strength	Fsy	138 MPa
Bearing yeild strength	Fby	386 MPa
Bearing ultimate strength	Fbu	552 MPa
Yield stress (min{Fcy:Fty})	Fy	241 MPa
Elastic modulus	Е	70000 MPa
Shear modulus	G	26250 MPa
Value of coefficients	kt	1.00
	kc	1.00
Capacity factor (general yield)	фу	0.95
Capacity factor (ultimate)	φu	0.85
Capacity factor (bending)	φb	0.85
Capacity factor (elastic shear buckling)	φν	0.8
Capacity factor (inelastic shear buckling)	φvp	0.9

3.3 Buckling Constants

Type of member and stresses	Intercept, MPa	Slope, MPa	Intersection
Compression in columns and beam flanges	BC= 242.87	Dc= 1.43	Cc= 69.61
Compression in flat plates	Bp= 310.11	Dp= 2.06	Cp= 61.60
Compressive bending stress in solid rectangular bars	Bbr= 459.89	Dbr= 4.57	Cbr= 67.16
Compressive bending stress in round tubes	Btb= 250.32	Dtb= 14.18	Ctb= 183.52
Shear stress in flat plates	Bs= 178.29	Ds= 0.90	Cs= 81.24

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3.4 Section Properties

MEMBER(S)	Section	b	d	t	ус	Ag	Zx	Zy	Sx	Sy	lx	ly	J	rx	ry
		mm	mm	mm	mm	mm2	mm3	mm3	mm3	mm3	mm4	mm4	mm4	mm	mm
Rafter	82x48x3	48	82	3	41	744	1.63E+04	1.19E+04	2.00E+04	1.37E+04	6.69E+05	2.86E+05	6.12E+05	30.0	19.6
Upright Support	82x48x3	48	82	3	41	744	1.63E+04	1.19E+04	2.00E+04	1.37E+04	6.69E+05	2.86E+05	6.12E+05	30.0	19.6
Ridge & Eave Purlin	40x40x2	40	40	2	20	304	3.67E+03	3.67E+03	4.34E+03	4.34E+03	7.34E+04	7.34E+04	1.10E+05	15.5	15.5
Gable Beam	40x40x2	40	40	2	20	304	3.67E+03	3.67E+03	4.34E+03	4.34E+03	7.34E+04	7.34E+04	1.10E+05	15.5	15.5
Intermediate Purlin	40x40x2	40	40	2	20	304	3.67E+03	3.67E+03	4.34E+03	4.34E+03	7.34E+04	7.34E+04	1.10E+05	15.5	15.5
Brace	40x40x2	40	40	2	20	304	3.67E+03	3.67E+03	4.34E+03	4.34E+03	7.34E+04	7.34E+04	1.10E+05	15.5	15.5

4 Design Loads

4.1 Ultimate

		Distributed load (kPa)	Design load factor (-)	Factored imposed load (kPa)
Live	Q	-	1.5	-
Self weight	G	self weight	1.35, 1.2, 0.9	1.2 self weight, 0.9 self weight
3s 80km/hr gust	W	$0.245~\mathrm{C_{fig}}$	1.0	$0.245~\mathrm{C_{fig}}$

4.2 Load Combinations

4.2.1 Serviceability

 $Gravity \hspace{1cm} = \hspace{1cm} 1.0 \times G$

Wind = $1.0 \times G + 1.0 \times W$

4.2.2 Ultimate

Downward = $1.35 \times G$

 $\begin{array}{ll} = & 1.2 \times G + W_u \\ = & 1.2 \times G + W_u + W_{IS} \end{array}$

 $Upward \hspace{1.5cm} = \hspace{1.5cm} 0.9 \times G + W_u$

 $0.9 \times G + W_u \!\!+\!\! W_{IP}$

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5 Wind Analysis

Wind towards surface (+ve), away from surface (-ve)

5.1 Parameters & Coefficients ($C_{\rm fig}$)

Name	Symbol	Value	Unit	Notes	Ref.
			Input		
Importance level Annual probability of exceedance Regional gust wind speed Regional gust wind speed Wind Direction Multipliers Terrain Category Multiplier Shield Multiplier Topographic Multiplier Site Wind Speed Pitch	$\begin{array}{c} V_R \\ M_d \\ M_{Z,Cat} \\ M_S \\ M_t \\ V_{Site,\beta} \\ \alpha \end{array}$	2 < 6 months 80 22.22 1 0.91 1 1 20.22 20	Input Km/hr m/s m/s Deg	$V_{Site,\beta} = V_R * M_d * M_{z,cat} * M_S, M_t$	Table 3.1 - Table 3.2 (AS1170.0) Table 3.3 Table 3.1 (AS1170.2) Table 3.2 (AS1170.2) Table 4.1 (AS1170.2) 4.3 (AS1170.2) 4.4 (AS1170.2)
Pitch	α	0.349	rad		
Width	В	5	m		
Width Span	S_{w}	5	m		
Length	D	9	m		
Height	Z	2.95	m		
Bay Span		3	m		
Purlin Spacing		1.33	m		
Number of Intermediate Purlin		1			
	h/d	0.328			
	h/b	0.59			
		W	ind Pres	sure	
hoair	ρ	1.2	Kg/m ³		

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dynamic response factor C_{dyn} 1 0.245 Wind Pressure ρ /C_{fig} Kg/m² $\rho=0.5\rho_{air}^*(V_{des,\beta})^2*C_{fig}^*C_{dyn}$ 2.4 (AS1170.2) WIND DIRECTION 1 (Perpendicular to Length) Internal Pressure Opening Assumption With Dominant Opening (Cpi= nCpe Internal Pressure Coefficient Table 5.1 A (AS1170.2) (Without Dominant) MIN Internal Pressure Coefficient (Without Dominant) MAX Internal Pressure Coefficient Table 5.1 B (AS1170.2) (With Dominant) MIN Internal Pressure Coefficient (With Dominant) MAX 0.7 **Combination Factor** $K_{C,i}$ 1 Internal Pressure Coefficient 0.70 $C_{p,i}$ MIN Internal Pressure Coefficient 0.70 MAX External Pressure 1. Windward Wall $C_{\mathsf{P},\mathsf{e}}$ **External Pressure Coefficient** 0.7 Table 5.2 A Area Reduction Factor K_a 8.0 Table 5.4 combination factor applied to $K_{C.e}$ internal pressures local pressure factor K_{l} 1 porous cladding reduction K_p 1 factor 0.56 aerodynamic shape factor $C_{fig,e}$ Ρ kPa Wind Wall Pressure 0.14 Edge Column Force F 0.21 kN/m Intermediate Column Force 0.41 kN/m 2. Leeward Wall

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External Pressure Coefficient	$C_{P,e}$	-0.4			Table 5.2 B
Area Reduction Factor	Ka	0.8			Table 5.4
combination factor applied to internal pressures	$K_{C,e}$	1			
local pressure factor	K_{l}	1			
porous cladding reduction factor	K_p	1			
aerodynamic shape factor	$C_{\text{fig,e}}$	-0.32			
Lee Wall Pressure	Р	-0.08	kPa		
Edge Column Force	F	-0.12	kN/m		
Intermediate Column Force	, F	-0.12	kN/m		
miomiodiato Columni Color	·	V			
3. Side Wall					Table 5.2 C
Area Reduction Factor	K_a	0.8			Table 5.4
combination factor applied to internal pressures	$K_{\text{C,e}}$	1			
local pressure factor	K_{l}	1			
porous cladding reduction factor	K_p	1			
External Pressure Coefficient	$C_{P,e}$	-0.65		0 to 1h	
External Pressure Coefficient	$C_{\text{P,e}}$	-0.5		1h to 2h	
External Pressure Coefficient	$C_{\text{P,e}}$	-0.3		2h to 3h	
External Pressure Coefficient	$C_{\text{P,e}}$	-0.2		>3h	
aerodynamic shape factor	$C_{\text{fig,e}}$	-0.52		0 to 1h	
aerodynamic shape factor	$C_{\text{fig,e}}$	-0.4		1h to 2h	
aerodynamic shape factor	$C_{\text{fig,e}}$	-0.24		2h to 3h	
aerodynamic shape factor	$C_{\text{fig,e}}$	-0.16		>3h	
Side Wall Pressure	Р	-0.13	kPa	0 to 1h	
Side Wall Pressure	Р	-0.10	kPa	1h to 2h	
Side Wall Pressure	Р	-0.06	kPa	2h to 3h	
Side Wall Pressure	Р	-0.04	kPa	>3h	
4. Roof Up Wind Slop				α >10°	
Area Reduction Factor	K_a	0.8			Table 5.3 B
combination factor applied to internal pressures	$K_{C,e}$	1			
local pressure factor	K_{l}	1			

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porous cladding reduction	K_p	1	
factor External Pressure Coefficient	,		
MIN	$C_{P,e}$	-0.46	
External Pressure Coefficient MAX	$C_{\text{P},\text{e}}$	-0.06	
aerodynamic shape factor MIN	$C_{fig,e}$	-0.37	
aerodynamic shape factor MAX	$C_{\text{fig,e}}$	-0.05	
Pressure MIN	Р	-0.09	kPa
Pressure MAX	Р	-0.01	kPa
	_		
Edge Rafter Force MIN	F F	-0.14 -0.02	kN/m kN/m
Edge Rafter Force Max Intermediate Rafter Force MIN	F	-0.02 -0.27	kN/m
Intermediate Rafter Force	F	-0.04	kN/m
MAX	'	0.04	KIVIII
5. Roof Down Wind Slop			
Area Reduction Factor	K_{a}	0.8	
combination factor applied to internal pressures	$K_{\text{C,e}}$	1	
local pressure factor	Kı	1	
porous cladding reduction factor	K_{p}	1	
External Pressure Coefficient	$C_{P,e}$	-0.6	
aerodynamic shape factor	$C_{\text{fig,e}} \\$	-0.48	
Pressure MIN	Р	-0.12	kPa
Pressure MAX	Р	-0.12	kPa
EL D'G E MIN	_	0.40	1.517
Edge Rafter Force MIN	F _	-0.18	kN/m
Edge Rafter Force MAX	F	-0.18	kN/m
Intermediate Rafter Force MIN	F	-0.35	kN/m
Intermediate Rafter Force MAX	F	-0.35	kN/m
		IND DIRECT	

Opening Assumption WIND DIRECTION 2 (Parallel to Length) Internal Pressure Opening Assumption With Dominant Opening (Cpi= nCpe

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Internal Pressure Coefficient		-0.1			Table 5.1 A (AS
(Without Dominant) MIN					742.0 0.7 71 (710
Internal Pressure Coefficient (Without Dominant) MAX					
Internal Pressure Coefficient (With Dominant) MIN					Table 5.1 B (AS
Internal Pressure Coefficient (With Dominant) MAX					
N		0.7		Cpi⊨ N*Cpe	
Combination Factor	$K_{C,i}$	1			
Internal Pressure Coefficient MIN	$C_{p,i}$	0.70			
Internal Pressure Coefficient MAX	$C_{p,i}$	0.70			
		Ex	ternal Pre	ssure	
4 Minching Mall					
Windward Wall External Pressure Coefficient	0	0.7			Table 5.2
	$C_{P,e}$				
Area Reduction Factor	Ka	8.0			Table 5.4
combination factor applied to internal pressures	$K_{C,e}$	1			
local pressure factor	K_{l}	1			
porous cladding reduction factor	K_p	1			
aerodynamic shape factor	$C_{\text{fig,e}}$	0.56			
Wind Wall Pressure	Р	0.14	kPa		
Edge Column Force	F	0.34	kN/m		
Intermediate Column Force	F	0.69	kN/m		
2. Leeward Wall					
External Pressure Coefficient	$C_{P,e}$	-0.4			Table 5.2
Area Reduction Factor	K_a	0.8			Table 5.4
combination factor applied to internal pressures	$K_{\text{C,e}}$	1			
local pressure factor	Kı	1			
porous cladding reduction factor	K_p	1			
aerodynamic shape factor	$C_{\text{fig,e}}$	-0.32			
					1

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Edge Column Force	F	-0.20	kN/m		
Intermediate Column Force	F	-0.39	kN/m		
3. Side Wall					Table 5.2 C
Area Reduction Factor	Ka	0.8			Table 5.4
combination factor applied to internal pressures	$K_{C,e}$	1			
local pressure factor	K_{l}	1			
porous cladding reduction factor	K_p	1			
External Pressure Coefficient	C_P,e	-0.65		0 to 1h	
External Pressure Coefficient	C_P,e	-0.5		1h to 2h	
External Pressure Coefficient	C_P,e	-0.3		2h to 3h	
External Pressure Coefficient	$C_{\text{P,e}}$	-0.2		>3h	
aerodynamic shape factor	$C_{fig,e}$	-0.52		0 to 1h	
aerodynamic shape factor	C _{fig,e}	-0.4		1h to 2h	
adioaynamio diapo ladioi	Olig,e	0.1		III to ZII	
Side Wall Pressure	P	-0.13	kPa	0 to 1h	
Olde Wall Flessare	•	0.10	KI G	0 10 111	
Side Wall Pressure	Р	-0.10	kPa	1h to 2h	
Side Wall Pressure	P	-0.16	kPa	2h to 3h	
Side Wall Pressure	Р	-0.04	kPa	>3h	
Glad Wall I Toobald	•	0.04	М 4	2617	
4. Roof				α <10°	
Area Reduction Factor	K_a	0.8		α<10	Table 5.3 A
combination factor applied to internal pressures	K _{C,e}	1			74510 0.071
local pressure factor	K _I	1			
porous cladding reduction	Κ _p	1			
factor External Pressure Coefficient	C_P,e	-0.9		0 to 0.5h	
MIN External Pressure Coefficient MIN	$C_{P,e}$	-0.9		0.5 to 1h	
External Pressure Coefficient MIN	$C_{P,e}$	-0.50		1h to 2h	
	_			0h to 0h	
External Pressure Coefficient MIN	$C_{P,e}$	-0.30	l l	2h to 3h	

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External Pressure Coefficient MAX	$C_{\text{P,e}}$	-0.4		0 to 0.5h
External Pressure Coefficient MAX	$C_{P,e}$	-0.4		0.5 to 1h
External Pressure Coefficient	$C_{P,e}$	0		1h to 2h
External Pressure Coefficient MAX	$C_{P,e}$	0.1		2h to 3h
External Pressure Coefficient	$C_{P,e}$	0.2		>3h
MAX	,-			
aerodynamic shape factor	$C_{fig,e}$	-0.72		0 to 0.5h
aerodynamic shape factor	$C_{fig,e}$	-0.72		0.5 to 1h
aerodynamic shape factor	$C_{\text{fig,e}}$	-0.4		1h to 2h
aerodynamic shape factor	$C_{fig,e}$	-0.24		2h to 3h
aerodynamic shape factor	$C_{fig,e}$	-0.16		>3h
MIN	3,-			
aerodynamic shape factor	$C_{fig,e}$	-0.32		0 to 0.5h
aerodynamic shape factor	$C_{\text{fig,e}}$	-0.32		0.5 to 1h
aerodynamic shape factor	$C_{\text{fig,e}}$	0		1h to 2h
aerodynamic shape factor	$C_{\text{fig,e}}$	0.08		2h to 3h
aerodynamic shape factor	$C_{\text{fig,e}}$	0.16		>3h
Pressure MIN	Р	-0.18	kPa	0 to 0.5h
Pressure MIN	P	-0.18	kPa	0.5 to 1h
Pressure MIN	Р	-0.10	kPa	1h to 2h
Pressure MIN	Р	-0.06	kPa	2h to 3h
Pressure MIN	Р	-0.04	kPa	>3h
Pressure MAX	Р	-0.08	kPa	0 to 0.5h
Pressure MAX	Р	-0.08	kPa	0.5 to 1h
Pressure MAX	P	0.00	kPa	1h to 2h
Pressure MAX	P	0.02	kPa	2h to 3h
Pressure MAX	P	0.04	kPa	>3h
Edge Purlin Force MIN	F	-0.12	kN/m	0 to 0.5h
Edge Purlin Force MIN	F	-0.12	kN/m	0.5 to 1h
Edge Purlin Force MIN	F	-0.07	kN/m	1h to 2h
Edge Purlin Force MIN	F	-0.04	kN/m	2h to 3h
Edge Purlin Force MIN	F	-0.03	kN/m	>3h

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Edge Purlin Force MAX	F	-0.05	kN/m	0 to 0.5h
Edge Purlin Force MAX	F	-0.05	kN/m	0.5 to 1h
Edge Purlin Force MAX	F	0.00	kN/m	1h to 2h
Edge Purlin Force MAX	F	0.01	kN/m	2h to 3h
Edge Purlin Force MAX	F	0.03	kN/m	>3h
Intermediate Purlin Force MIN	F	-0.23	kN/m	0 to 0.5h
Intermediate Purlin Force MIN	F	-0.23	kN/m	0.5 to 1h
Intermediate Purlin Force MIN	F	-0.13	kN/m	1h to 2h
Intermediate Purlin Force MIN	F	-0.08	kN/m	2h to 3h
Intermediate Purlin Force MIN	F	-0.05	kN/m	>3h
Intermediate Purlin Force MAX	F	-0.10	kN/m	0 to 0.5h
Intermediate Purlin Force MAX	F	-0.10	kN/m	0.5 to 1h
Intermediate Purlin Force MAX	F	0.00	kN/m	1h to 2h
Intermediate Purlin Force MAX	F	0.03	kN/m	2h to 3h
Intermediate Purlin Force MAX	F	0.05	kN/m	>3h

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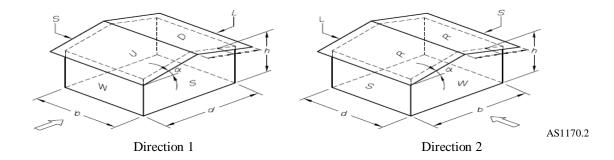


5.2 Pressure (P)

$$\begin{split} &C_{\mathrm{fig,i}} = C_{\mathrm{p.i.}} \, k_{c, \mathrm{i}} \\ &C_{\mathrm{fig,e}} = C_{\mathrm{p.e.}} \, k_a \, k_{c, e} \, k_l \, k_p \end{split} \label{eq:cfig_ig}$$

5.2.1 Pressure summary

WIND EX	(TERNAL PRESSURI	E	Dire	ction1		D	irectio	n2			
W	/indward (kPa)		0	.14			0.14				
L	eeward (kPa)		-0	-0.08 -0.08							
	Length	(m)	(m)	(Kpa)			(Kpa)				
6.1	0 - 1h	0	2.95	-0.13			-0.13				
Sidewall (m)	1h - 2h	2.95	5.9	-0.10		-0.10					
(,	2h - 3h	5.9	8.85	-0.06	-0.06						
	>3h	8.85	-	-0.04							
			Min (Kpa)	Мах (Кра)	Length	(m)	(m)	Min (Kpa)	Max (Kpa)		
	Upwind Slope -0.09		-0.01	0-0.5h	0.00	1.48	-0.18	-0.08			
Roof	Downwind Slop	ре	-0.12	-0.12	0.5h- 1h	1.48	2.95	-0.18	-0.08		
					1h-2h	2.95	5.90	-0.10	0.00		
					2h-3h	5.90	8.85	-0.06	0.02		
					>3h	8.85	ı	-0.04	0.04		
		·	Min (kPa)	Max (kPa)	Min (kPa)			Max (kPa)			
Wind Int	ternal Pressure (kPa)		Proportion of Cpe	Proportion of Cpe	Proportion of Cpe			•	rtion of pe		



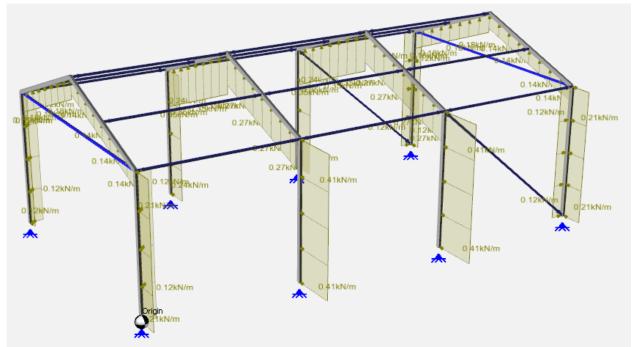
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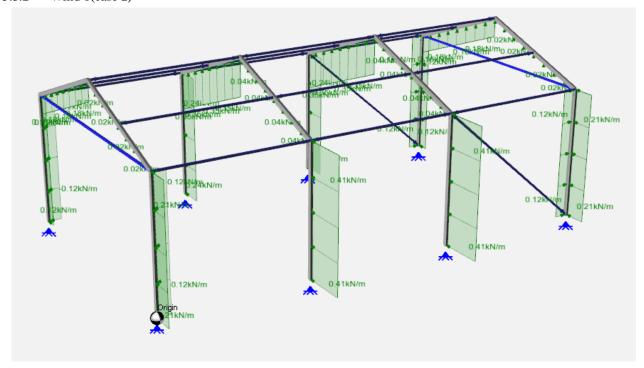


5.3 Wind Load Diagrams

5.3.1 Wind 1(case 1)



5.3.2 Wind 1(case 2)

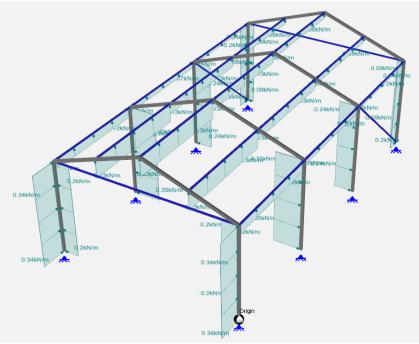


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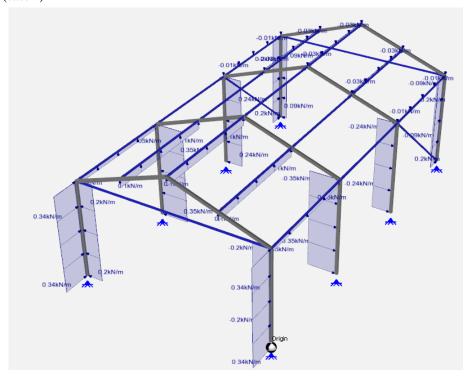
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5.3.3 Wind 2(Case1)



Wind 2(case 2) 5.3.4

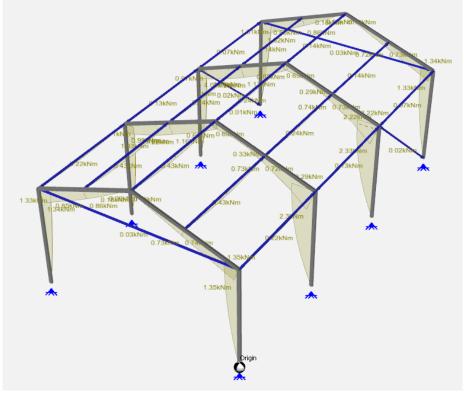


After 3D model analysis, each member is checked based on adverse load combination. In this regard the maximum bending moment, shear and axial force due to adverse load combinations for each member are presented as below:

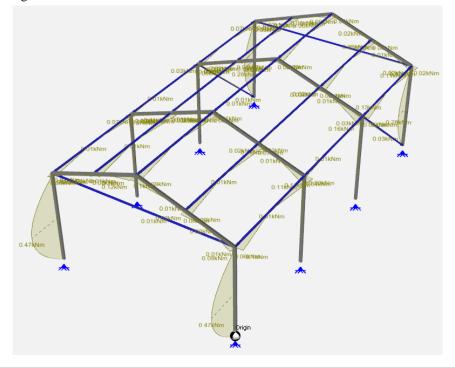
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5.3.5 Max Bending Moment due to critical load combination in major axis



5.3.6 Max Bending Moment in minor axis due to critical load combination

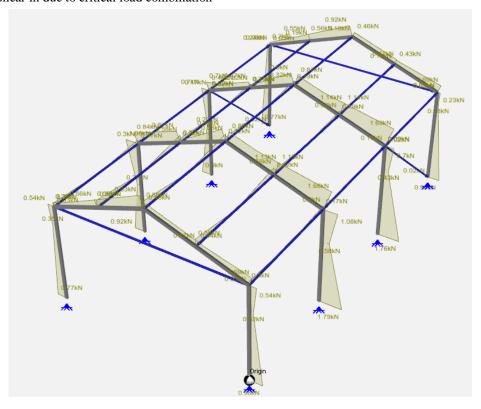


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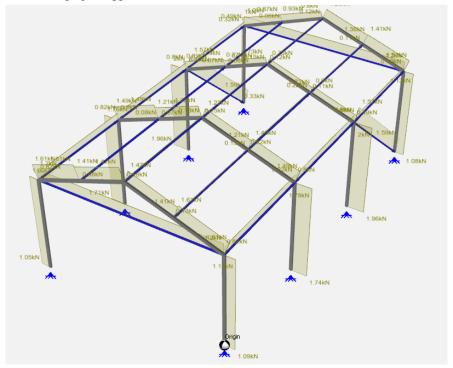
Web: https://cseds.com.au/



5.3.7 Max Shear in due to critical load combination



5.3.8 Max Axial force in upright support and roof beam due to critical load combination



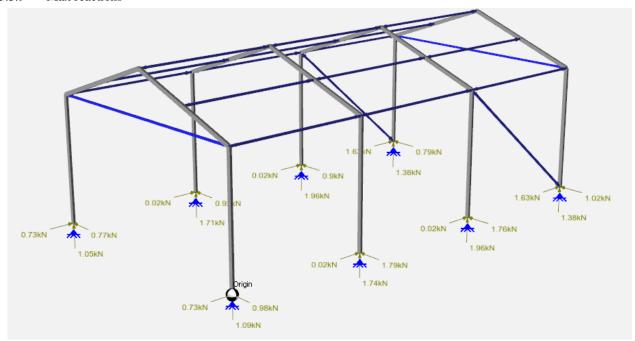
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5.3.9 Max reactions



Max Reaction $N^* = 2 kN$

5.3.10 Summary Table:

MEMBER(S)	Section	b	d	t	Р	Mx	Му
		mm	mm	mm	kN	kN.m	kN.m
Rafter	82x48x3	48	82	3	1.49	2.3	0.16
Upright Support	82x48x3	48	82	3	2	2.22	0.05
Ridge & Eave Purlin	40x40x2	40	40	2	0.82	0.43	0.1
Gable Beam	40x40x2	40	40	2	1.2	0.03	0.02
Intermediate Purlin	40x40x2	40	40	2	0.13	0.43	0.1
Brace	40x40x2	40	40	2	1.6	0.13	0.02

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Checking Members Based on AS1664.1 ALUMINIUM LSD

Unright Supports

6.1 Upright Supports NAME	SYMBOL (Upright		VALUE	UNIT	NOTES	REF
82x48x3	Support)					
Alloy and temper	6061-T6					AS1664.1
Tanaian	F_tu	=	262	MPa	Ultimate	T3.3(A)
Tension	F_{ty}	=	241	MPa	Yield	
Compression	F_{cy}	=	241	MPa		
Shear	F_su	=	165	MPa	Ultimate	
Sileai	F_{sy}	=	138	MPa	Yield	
Bearing	F_bu	=	551	MPa	Ultimate	
bearing	F_{by}	=	386	MPa	Yield	
Modulus of elasticity	Е	=	70000	MPa	Compressive	
	k_{t}	=	1.0			To 4(D)
	k_c	=	1.0			T3.4(B)
FEM ANALYSIS RESULTS						
TEMPTON REGISTRE						
Axial force	Р	=	1.79	kN	compression	
In plane moment	M_x	=	1.87	kNm		
Out of plane moment	M_{y}	=	0.49	kNm		
DESIGN STRESSES						
Gross cross section area	A_g	=	744	mm^2		
In-plane elastic section modulus	Z_{x}	=	16318.439	mm^3		
Out-of-plane elastic section mod.	Z_{y}	=	11937	mm^3		
Stress from axial force	f _a	=	P/A _g			
		=	2.41	MPa	compression	
Stress from in-plane bending	f_{bx}	=	M_x/Z_x		_	
Oteran francis to to t	•	=	114.59	MPa	compression	
Stress from out-of-plane bending	f_{by}	=	M _y /Z _y 41.05	MPa	compression	
00110000000				-	,	
COMPRESSION 2.4.9 Compression in column	e avial areas so	otion				
3.4.8 Compression in column1. General	s, axiai, gross se	UTION				3.4.8.1

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1					I	1 1
Unsupported length of			2600			
member	L	=_	2600	mm _		
Effective length factor	k	=	1			
Radius of gyration about buckling axis	r	=	19.62	mm		
Slenderness ratio	kL/r	=	132.50			
Slenderness parameter	λ	=	2.47			
	D_c^*	=	90.3			
	S_1^*	=	0.33			
	S_2^*	=	1.23			
	ϕ_{cc}	=	0.926			
Factored limit state stress	φF _L	=	36.46	MPa		
2. Sections not subject to torsion	al or torsiona	al-flexura	al buckling			3.4.8.2
Largest slenderness ratio for flexural buckling	kL/r	=	132.50			
3.4.10 Uniform compression in c flat plates 1. Uniform compression in comp	onents of co		_			 3.4.10.1
plates with both edges supported	<i>J</i> k₁	=	0.35			T3.3(D)
Max. distance between toes	K ₁	_	0.55			13.5(D)
of fillets of supporting elements for plate	b'	=	42			
·	t	=	3	mm		
Slenderness	b/t	=	14			
Limit 1	S_1	=	12.34			
Limit 2	S_2	=	32.87		S1 < b/t < S2	
Factored limit state stress	φF∟	=	224.30	MPa		
Most adverse compressive limit state stress	Fa	=	36.46	MPa		
Most adverse compressive capacity factor	f _a /F _a	=	0.07		PASS	
BENDING IN DI ANE						
BENDING - IN-PLANE 3.4.15 Compression in beams, etubes, box sections	extreme fibre,	gross s	ection recta	angular		
Unbraced length for bending	L_b	=	2600	mm		

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Second moment of area	I_{y}	=	2.86E+05	mm ⁴		
(weak axis)	•			mm ³		
Torsion modulus	J Z	=	6.12E+05	mm mm³		
Elastic section modulus Slenderness	Z S	=	11937 148.30	шш		
Limit 1	S S₁	=	0.39			
					04 - 0 - 00	
Limit 2	S_2	=	1695.86		S1 < S < S2	
Factored limit state stress	φF_{L}	=	202.45	MPa		3.4.15(2)
3.4.17 Compression in compone compression), gross section - fla						
compression, gross section me	k ₁	=	0.5	ou		T3.3(D)
	k ₂	=	2.04			T3.3(D)
Max. distance between toes	N2	_	2.07			10.0(D)
of fillets of supporting elements for plate	b'	=	42	mm		
	t	=	3	mm		
Slenderness	b/t	=	14			
Limit 1	S_1	=	12.34			
Limit 2	S_2	=	46.95		S1 < S < S2	
Factored limit state stress	ϕF_L	=	224.30	MPa		
Most adverse in-plane bending limit state stress	F _{bx}	=	202.45	MPa		
Most adverse in-plane bending capacity factor	f_{bx}/F_{bx}	=	0.57		PASS	
BENDING - OUT-OF-						
PLANE	are the same	for our	t of plana ha	ndina		
NOTE: Limit state stresses, ϕF_L (doubly symmetric section)	are the same	ior out	-ог-ріапе ве	naing		
Factored limit state stress	ϕF_{L}	=	202.45	MPa		
Most adverse out-of-plane bending limit state stress	F _{by}	=	202.45	MPa		
Most adverse out-of-plane	-					
bending capacity factor	f _{by} /F _{by}	=	0.20		PASS	
COMBINED ACTIONS						
4.1.1 Combined compression ar	nd bending					4.1.1(2)
					1	_ . . (∠)

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	Fa	=	36.46	MPa		3.4.8
	F_{ao}	=	224.30	MPa		3.4.10
	F_bx	=	224.30	MPa		3.4.17
	F_{by}	=	202.45	MPa		3.4.17
	f_a/F_a	=	0.066		Which is <0.15	
Check:	$f_a/F_a + f_{bx}/F_{bx} +$	f _{by} /F _{by}	≤ 1.0			4.1.1
i.e.	0.83	≤	1.0		PASS	

6.2 Rafter

NAME	SYMBOL		VALUE	UNIT	NOTES	REF
82x48x3	(Rafter)					
Alloy and temper	6061-T6					AS1664.1
	F_tu	=	262	MPa	Ultimate	T3.3(A)
Tension	F _{tv}	=	241	MPa	Yield	
Compression	F _{cy}	=	241	MPa		
	F _{su}	=	165	MPa	Ultimate	
Shear	F_{sy}	=	138	MPa	Yield	
	F_bu	=	551	MPa	Ultimate	
Bearing	F_{by}	=	386	MPa	Yield	
Modulus of elasticity	E	=	70000	MPa	Compressive	
	k_{t}	=	1.0			TO 4(D)
	k_c	=	1.0			T3.4(B)
FEM ANALYSIS RESULTS						
Axial force	Р	=	1.63	kN	compression	
In plane moment	M_{x}	=	1.85	kNm		
Out of plane moment	M_{y}	=	0.58	kNm		
DESIGN STRESSES						
Gross cross section area	A_g	=	744	mm^2		
In-plane elastic section modulus	Z_{x}	=	16318.439	mm^3		
Out-of-plane elastic section mod.	Z_{y}	=	11937	mm^3		
Stress from axial force	fa	=	P/A_g			
		=	2.19	MPa	compression	

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Stress from in-plane bending Stress from out-of-plane bending	f _{bx}	= = =	M_x/Z_x 113.37 M_y/Z_y 48.59	MPa MPa	compression compression	
COMPRESSION						
3.4.8 Compression in columns, a	axial, gross	s sectio	on			
1. General						3.4.8.1
Unsupported length of member	L	=	5000	mm		
Effective length factor	k	=	1			
Radius of gyration about buckling axis	r	=	19.62	mm		
Slenderness ratio	kL/r	=	254.80			
Slenderness parameter	λ	=	4.759			
	D_c^*	=	90.3			
	S_1^*	=	0.33			
	S_2^*	=	1.23			
	ϕ_{cc}	=	0.950			
Factored limit state stress	фҒ∟	=	10.11	MPa		
2. Sections not subject to torsion	nal or torsic	onal-fle	exural bucki	ling		3.4.8.2
Largest slenderness ratio for flexural buckling	kL/r	=	254.80			
3.4.10 Uniform compression in c	component	s of cc	olumns, gro	ss section		
flat plates1. Uniform compression in comp plates with both edges supported		columi	ns, gross se	ection - flat		3.4.10.1
, c	k ₁	=	0.35			T3.3(D
Max. distance between toes of fillets of supporting elements	b'	=	42			
for plate			•			
Slenderness	t b/t	=	3 14	mm		
Limit 1	b/t S₁	=	14 12.34			
Limit 2	S_1	=	32.87		S1 < b/t < S2	
Little 4	O 2	_	02.01		01 \ 5/1 \ 02	
				MD-		
Factored limit state stress	ϕF_{L}	=	224.30	MPa		

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Most adverse compressive capacity factor	f _a /F _a	=	0.22		PASS	
BENDING - IN-PLANE						
3.4.15 Compression in beams, exrectangular tubes, box sections	dreme fibr	e, gr	oss section			
Unbraced length for bending	L_b	=	1770	mm		
Second moment of area (weak axis)	I_y	=	2.86E+05	mm ⁴		
Torsion modulus	J	=	6.12E+05	mm^3		
Elastic section modulus	Z	=	11937	mm^3		
Slenderness	S	=	100.96			
Limit 1	S_1	=	0.39			
Limit 2	S_2	=	1695.86		S1 < S < S2	
Factored limit state stress	φF _L	=	207.34	MPa		3.4.15(2)
3.4.17 Compression in componer uniform compression), gross sect supported						
	k_1	=	0.5			T3.3(D)
	k_2	=	2.04			T3.3(D)
Max. distance between toes of fillets of supporting elements for plate	b'	=	42	mm		
•	t	=	3	mm		
Slenderness	b/t	=	14			
Limit 1	S_1	=	12.34			
Limit 2	S_2	=	46.95		S1 < S < S2	
			224.30	MPa		
Factored limit state stress	φF _L	=	224.30	IVIFA		
Factored limit state stress Most adverse in-plane bending limit state stress	φF _L	=	207.34	MPa		
Most adverse in-plane bending limit state stress Most adverse in-plane bending	•				PASS	
Most adverse in-plane bending	F _{bx}	=	207.34	MPa	PASS	

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Most adverse out-of-plane bending limit state stress	F _{by}	=	207.34	MPa		
Most adverse out-of-plane bending capacity factor	f_{by}/F_{by}	=	0.23		PASS	
COMBINED ACTIONS						
4.1.1 Combined compression an	d bending					4.1.1(2)
	Fa	=	10.11	MPa		3.4.8
	F_{ao}	=	224.30	MPa		3.4.10
	F_{bx}	=	224.30	MPa		3.4.17
	F_by	=	207.34	MPa		3.4.17
	f _a /F _a	=	0.217		Which is <0.15	
Check:	$f_a/F_a + f_{bx}/$	F _{bx} +f	$F_{by}/F_{by} \le 1.0$	כ		(3)
i.e.	1.00	≤	1.0		PASS	

6.3 Gable Pole

NAME	SYMBOL		VALUE	UNIT	NOTES	REF
82x48x3	(Gable pole)					
Alloy and temper	6061-T6					AS1664.1
	F_tu	=	262	MPa	Ultimate	T3.3(A)
Tension	F _{ty}	=	241	MPa	Yield	10.0(/1)
Compression	F _{cy}	=	241	МРа	7.0.0	
	F _{su}	=	165	MPa	Ultimate	
Shear	F _{sy}	=	138	MPa	Yield	
	F_bu	=	551	MPa	Ultimate	
Bearing	F_by	=	386	MPa	Yield	
Modulus of elasticity	Е	=	70000	MPa	Compressive	
	k_{t}	=	1.0			 .(5)
	k_c	=	1.0			T3.4(B)
FEM ANALYSIS RESULTS						
Axial force	Р	=	1.17	kN	compression	
In plane moment	M_{x}	=	0.96	kNm		
Out of plane moment	M_{y}	=	1.03	kNm		

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DESIGN STRESSES						
Gross cross section area	A_{g}	=	744	mm ²		
In-plane elastic section	· ·					
modulus	Z_{x}	=	16318.439	mm ³		
Out-of-plane elastic section	Z_{v}	=	11937	mm^3		
mod. Stress from axial force	f _a	=	P/A _a			
Stress from axial force	¹a	_	1.57	MPa	compression	
Stress from in-plane bending	f_{bx}	=	M_x/Z_x	WII G	Compression	
ри осо и от то риски	- DX	=	58.83	MPa	compression	
Stress from out-of-plane	f_{by}	=	M_y/Z_y		,	
bending		=	86.29	MPa	compression	
COMPRESSION						
3.4.8 Compression in columns, a.	xial, gross	section	on			0.404
1. General						3.4.8.1
Unsupported length of	L	_	4420	mm		
member	L	=	4420	mm		
Effective length factor	k	=	1			
Radius of gyration about buckling axis	r	=	19.62	mm		
Slenderness ratio	kL/r	=	225.25			
Slenderness parameter	λ	=	4.21			
	D _c *	=	90.3			
	S ₁ *	=	0.33			
	S_2^*	=	1.23			
	ϕ_{cc}	=	0.950			
Factored limit state stress	ϕF_{L}	=	12.94	MPa		
2. Sections not subject to torsiona	al or torsio	nal-fle	exural bucklin	na		3.4.8.2
Largest slenderness ratio for				3		5. 1.5.2
flexural buckling	kL/r	=	225.25			
3.4.10 Uniform compression in coflat plates	omponents	s of co	lumns, gross	s section -		
1. Uniform compression in compo plates with both edges supported		columi	ns, gross sec	tion - flat		3.4.10.1
	k_1	=	0.35			T3.3(D)
Max. distance between toes of	•					' '

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Slenderness Limit 1	t b/t S₁	= =	3 14 12.34	mm		
Limit 2	S ₂	=	32.87		S1 < b/t < S2	
Factored limit state stress	φF _L	=	224.30	MPa		
Most adverse compressive limit state stress	Fa	=	12.94	MPa		
Most adverse compressive capacity factor	f_a/F_a	=	0.12		PASS	
BENDING - IN-PLANE						
3.4.15 Compression in beams, e. tubes, box sections	xtreme fibr	e, gro	ss section re	ctangular		
Unbraced length for bending	L _b	=	2600	mm		
Second moment of area (weak axis)	I_y	=	286488	mm ⁴		
Torsion modulus	J	=	611517.34	mm^3		
Elastic section modulus	Z	=	11937	mm^3		
Slenderness	S	=	148.30			
Limit 1	S_1	=	0.39			
Limit 2	S_2	=	1695.86		S1 < S < S2	
Factored limit state stress	φF _L	=	202.45	MPa		3.4.15(2)
3.4.17 Compression in componer uniform compression), gross sec supported						
	\mathbf{k}_1	=	0.5			T3.3(D)
	k_2	=	2.04			T3.3(D)
Max. distance between toes of fillets of supporting elements for plate	b'	=	42	mm		
	t	=	3	mm		
Slenderness	b/t	=	14			
Limit 1	S_1	=	12.34			
Limit 2	S_2	=	46.95		S1 < S < S2	
Factored limit state stress	φF _L	=	224.30	MPa		

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					_	
Most adverse in-plane bending limit state stress	F_{bx}	=	202.45	MPa		
Most adverse in-plane bending capacity factor	f_{bx}/F_{bx}	=	0.29		PASS	
BENDING - OUT-OF-PLANE						
NOTE: Limit state stresses, ϕF_L (doubly symmetric section)	are the san	ne for d	out-of-plane	e bending		
Factored limit state stress	φF _L	=	202.45	MPa		
Most adverse out-of-plane bending limit state stress	F_{by}	=	202.45	MPa		
Most adverse out-of-plane bending capacity factor	f_{by}/F_{by}	=	0.43		PASS	
COMBINED ACTIONS						
4.1.1 Combined compression ar	nd bending					4.1.1(2)
	F_a	=	12.94	MPa		3.4.8
	F_{ao}	=	224.30	MPa		3.4.10
	F_{bx}	=	224.30	MPa		3.4.17
	F_by	=	202.45	MPa		3.4.17
	f_a/F_a	=	0.122		Which is <0.15	
Check:	$f_a/F_a + f_{bx}/F$	$\frac{1}{1}$ bx + f_{bx}	$/F_{bv} \leq 1.0$			4.1.1
i.e.	0.84				PASS	(3)

6.4 Ridge & Eave Purlin

NAME	SYMBOL		VALUE	UNIT	NOTES	REF
40x40x2	(Ridge & Eave Purlin)					
Alloy and temper	6061-T6					AS1664.
Tanaian	F_tu	=	262	MPa	Ultimate	T3.3(A)
Tension	F_{ty}	=	241	MPa	Yield	
Compression	F_cy	=	241	MPa		
Chass	F_su	=	165	MPa	Ultimate	
Shear	F_{sy}	=	138	MPa	Yield	
Dooring	F_bu	=	551	MPa	Ultimate	
Bearing	F_{by}	=	386	MPa	Yield	

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Modulus of elasticity	E	=	70000	MPa	Compressive	
	_		. 5555	&		
	\mathbf{k}_{t}	=	1.0			T3.4(B)
	k _c	=	1.0			(_/
FEM ANALYSIS RESULTS						
Axial force	Р	=	0.82	kN	compression	
In plane moment	M_x	=	0.15	kNm		
Out of plane moment	M_{y}	=	0.39	kNm		
DESIGN STRESSES						
Gross cross section area	A_g	=	304	mm ²		
In-plane elastic section modulus	Z_{x}	=	3668.266 7	mm^3		
Out-of-plane elastic section mod.	Z_{y}	=	3668.266 7	mm^3		
Stress from axial force	fa	=	P/A _g			
		=	2.70	MPa	compression	
Stress from in-plane bending	f_{bx}	=	M_x/Z_x			
bending		=	40.89	MPa	compression	
Stress from out-of-plane	\mathbf{f}_{by}	=	M_y/Z_y			
bending		=	106.32	MPa	compression	
COMPRESSION						
3.4.8 Compression in columns, a1. General	axial, gross se	ction				3.4.8.1
Unsupported length of member	L	=	3000	mm		
Effective length factor	k	= [1]		
Radius of gyration about buckling axis	r	=	15.53	mm		
Slenderness ratio	kL/r	=	193.11			
Slenderness parameter	λ	=	3.61			
	D_c^*	=	90.3			
	S ₁ *	=	0.33			
	S ₂ *	=	1.23			
	фсс	=	0.950			
Factored limit state stress	φF _L	=	17.60	MPa		

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2. Sections not subject to torsion	iai oi torsioriai	-пехига	Duckiing			3.4.8.2
Largest slenderness ratio for flexural buckling	kL/r	=	193.11			
3.4.10 Uniform compression in oplates	components of	column	s, gross sec	tion - flat		
1. Uniform compression in comp plates with both edges supporte		ımns, gı	ross section	- flat		3.4.10.1
places mar sour eages supporte	k ₁	=	0.35			T3.3(D)
Max. distance between toes of fillets of supporting elements for plate	b'	=	36			
	t	=	2	mm		
Slenderness	b/t	=	18			
Limit 1	S ₁	=	12.34		04 . h// . 00	
Limit 2	S_2	=	32.87		S1 < b/t < S2	
Factored limit state stress	фҒ∟	=	213.07	MPa		
Most adverse compressive limit state stress	Fa	=	17.60	MPa		
Most adverse compressive capacity factor	f _a /F _a	=	0.15		PASS	
BENDING - IN-PLANE						
3.4.15 Compression in beams, etubes, box sections	extreme fibre, (gross se	ection rectan	gular		
Unbraced length for bending	L_b	=	3000	mm		
Second moment of area (weak axis)	I_y	=	73365.33 3	mm ⁴		
Torsion modulus	J	=	109744	mm^3		
Elastic section modulus	Z	=	3668.266	mm^3		
Slenderness	S	=	7 245.29			
Limit 1	S ₁	=	0.39			
Limit 2	S_2	=	1695.86		S1 < S < S2	
Factored limit state stress	φF _L	=	194.46	MPa		3.4.15(2

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Max. distance between toes of fillets of supporting elements for plate $ t = 2 $		k ₁	=	0.5			T3.3(D)
toes of fillets of supporting elements for plate $t = 2 \text{ mm}$ $Slenderness $		k_2	=	2.04			T3.3(D)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	toes of fillets of supporting	b'	=	36	mm		
Limit 1 $S_1 = 12.34$ $S_2 = 46.95$ $S1 < S < S2$ Factored limit state stress $\phi F_L = 213.07$ MPa Most adverse in-plane bending limit state stress $\phi F_{bx} = 194.46$ MPa Most adverse in-plane bending capacity factor $f_{bx}/F_{bx} = 0.21$ PASS BENDING - OUT-OF-PLANE NOTE: Limit state stresses, ϕF_L are the same for out-of-plane bending (doubly symmetric section) Factored limit state stress $\phi F_L = 194.46$ MPa Most adverse out-of-plane bending limit state stress $\phi F_L = 194.46$ MPa Most adverse out-of-plane bending limit state stress Most adverse out-of-plane bending capacity factor $\phi F_L = 194.46$ MPa Most adverse out-of-plane bending apacity factor $\phi F_L = 194.46$ MPa Most adverse out-of-plane bending apacity factor $\phi F_L = 194.46$ MPa Fa = 17.60 MPa Fa = 213.07 MPa Fa = 194.46 MPa Most adverse out-of-plane bending34.17 Fa = 194.46 MPa Which is <0.154.1.1 (3)	•	t	=	2	mm		
Limit 2 $S_2 = 46.95$ $S1 < S < S2$ Factored limit state stress $\phi F_L = 213.07$ MPa Most adverse in-plane bending limit state stress Most adverse in-plane bending limit state stress Most adverse in-plane bending capacity factor $f_{bx}/F_{bx} = 0.21$ PASS BENDING - OUT-OF-PLANE NOTE: Limit state stresses, ϕF_L are the same for out-of-plane bending (doubly symmetric section) Factored limit state stress $\phi F_L = 194.46$ MPa Most adverse out-of-plane bending limit state stress Most adverse out-of-plane bending capacity factor $f_{by}/F_{by} = 0.55$ PASS COMBINED ACTIONS 4.1.1 Combined compression and bending $F_a = 17.60 \text{MPa} \\ F_{50} = 213.07 \text{MPa} \\ F_{50} = 213.07 \text{MPa} \\ F_{by} = 194.46 \text{MPa}$ 3.4.10 $F_a = 17.60 \text{MPa} \\ F_{50} = 213.07 \text{MPa} \\ F_{50} = 194.46 \text{MPa}$ 3.4.17 $F_b = 194.46 \text{MPa} \\ F_{50} = 213.07 \text{MPa} \\ F_{50} = 194.46 \text{MPa}$ 3.4.17 $F_b = 194.46 \text{MPa} \\ F_{50} = 213.07 \text{MPa} \\ F_{50} = 213.0$	Slenderness	b/t	=	18			
Factored limit state stress ϕF_L = 213.07 MPa Most adverse in-plane bending limit state stress Most adverse in-plane bending capacity factor f_{bb}/F_{bx} = 0.21 PASS BENDING - OUT-OF-PLANE NOTE: Limit state stresses, ϕF_L are the same for out-of-plane bending (doubly symmetric section) Factored limit state stress ϕF_L = 194.46 MPa Most adverse out-of-plane bending limit state stress f_{by} = 194.46 MPa Most adverse out-of-plane bending limit state stress f_{by} = 0.55 PASS COMBINED ACTIONS 4.1.1 Combined compression and bending $F_a = 17.60 \text{MPa} \\ F_{ao} = 213.07 \text{MPa} \\ F_{by} = 194.46 \text{MPa}$ 34.10 $F_a = 17.60 \text{MPa} \\ F_{ab} = 213.07 \text{MPa} \\ F_{by} = 194.46 \text{MPa}$ 34.17 $F_{by} = 194.46 \text{MPa}$ Check: $f_a/F_a + f_{by}/F_{bx} + f_{by}/F_{by} \le 1.0$ Which is <0.154.1.1 (3)	Limit 1	S_1	=	12.34			
Most adverse in-plane bending limit state stress $F_{bx} = 194.46 \text{MPa}$ Most adverse in-plane bending capacity factor $F_{bx} = 0.21 \text{PASS}$ $F_{bx} = 194.46 \text{MPa}$ $F_{a} = 17.60 \text{MPa}$ $F_{a} = 17.60 \text{MPa}$ $F_{a} = 213.07 \text{MPa}$ $F_{bx} = 213.07 \text{MPa}$ $F_{by} = 194.46 \text{MPa}$ $F_{by} = 194.46 \text{MPa}$ $F_{a} = 0.31.07 \text{MPa}$ $F_{bx} = 213.07 \text{MPa}$ $F_{by} = 194.46 \text{MPa}$ $F_{bx} = 213.07 \text{MPa}$ $F_{bx} = 213.07 \text{MPa}$ $F_{bx} = 194.46 \text{MPa}$ $F_{bx} = 213.07 \text{MPa}$ F	Limit 2	S_2	=	46.95		S1 < S < S2	
bending limit state stress Fbx = 194.46 MPa Most adverse in-plane bending capacity factor PASS BENDING - OUT-OF-PLANE NOTE: Limit state stresses, ϕF_L are the same for out-of-plane bending (doubly symmetric section) Factored limit state stress $\phi F_L = 194.46 $ MPa Most adverse out-of-plane bending limit state stress $\phi F_L = 194.46 $ MPa Most adverse out-of-plane bending limit state stress $\phi F_L = 194.46 $ MPa Most adverse out-of-plane bending $\phi F_L = 194.46 $ MPa Most adverse out-of-plane bending $\phi F_L = 194.46 $ MPa Most adverse out-of-plane bending $\phi F_L = 194.46 $ MPa Most adverse out-of-plane bending $\phi F_L = 194.46 $ MPa $\phi F_L =$	Factored limit state stress	φF _L	=	213.07	MPa		
bending capacity factor I_{bb}/F_{bx} $=$ 0.21 PASS BENDING - OUT-OF- PLANE NOTE: Limit state stresses, ϕF_L are the same for out-of-plane bending (doubly symmetric section) Factored limit state stress ϕF_L $=$ 194.46 MPa Most adverse out-of-plane bending limit state stress Most adverse out-of-plane bending limit state stress Most adverse out-of-plane bending capacity factor F _{by} /F _{by} $=$ 0.55 PASS COMBINED ACTIONS 4.1.1 Combined compression and bending F _a $=$ 17.60 MPa F _{bx} $=$ 213.07 MPa F _{bx} $=$ 213.07 MPa F _{bx} $=$ 213.07 MPa F _{by} $=$ 194.46 MPa Check: $f_a/F_a + f_{by}/F_{bx} + f_{by}/F_{by} \le 1.0$ Which is <0.15 Check: $f_a/F_a + f_{by}/F_{bx} + f_{by}/F_{by} \le 1.0$		F_{bx}	=	194.46	MPa		
PLANE NOTE: Limit state stresses, ϕF_L are the same for out-of-plane bending (doubly symmetric section) Factored limit state stress $\phi F_L = 194.46 MPa$ Most adverse out-of-plane bending limit state stress Most adverse out-of-plane bending capacity factor $f_{by}/F_{by} = 0.55$ PASS COMBINED ACTIONS 4.1.1 Combined compression and bending $F_a = 17.60 MPa$ $F_{ao} = 213.07 MPa$ $F_{bx} = 213.07 MPa$ $F_{by} = 194.46 MPa$ 3.4.10 $F_b = 194.46 MPa$ 3.4.10 $F_b = 213.07 MPa$ $F_b = 213.07 MP$		f_{bx}/F_{bx}	=	0.21		PASS	
NOTE: Limit state stresses, ϕF_L are the same for out-of-plane bending (doubly symmetric section) Factored limit state stress $\phi F_L = 194.46 MPa$ Most adverse out-of-plane bending limit state stress Most adverse out-of-plane bending capacity factor $f_{by}/F_{by} = 0.55$ PASS COMBINED ACTIONS 4.1.1 Combined compression and bending $F_a = 17.60 MPa$ $F_{ao} = 213.07 MPa$ $F_{bx} = 213.07 MPa$ $F_{bx} = 213.07 MPa$ $F_{by} = 194.46 MPa$ $F_{by} = 194.46 MPa$ Which is <0.15 Check: $f_a/F_a + f_{bx}/F_{bx} + f_{by}/F_{by} \le 1.0$							
Most adverse out-of-plane bending limit state stress Most adverse out-of-plane bending capacity factor $\mathbf{f_{by}/F_{by}} = 0.55$ PASS COMBINED ACTIONS 4.1.1 Combined compression and bending $\mathbf{F_{a}} = 17.60 \text{MPa}$ $\mathbf{F_{ao}} = 213.07 \text{MPa}$ $\mathbf{F_{bx}} = 213.07 \text{MPa}$ $\mathbf{F_{bx}} = 213.07 \text{MPa}$ $\mathbf{F_{by}} = 194.46 \text{MPa}$ $\mathbf{MPa} = 0.34.10 \dots 3.4.10 \dots 3.4.17 \dots $		L are the same	for out-o	f-plane ben	ding		
bending limit state stress Most adverse out-of-plane bending capacity factor $\mathbf{f_{by}/F_{by}} = 0.55$ PASS COMBINED ACTIONS $4.1.1 \ Combined \ compression \ and \ bending}$ $\mathbf{F_a} = 17.60 \text{MPa}$ $\mathbf{F_{ao}} = 213.07 \text{MPa}$ $\mathbf{F_{bx}} = 213.07 \text{MPa}$ $\mathbf{F_{by}} = 194.46 \text{MPa}$ $\mathbf{f_{a}/F_{a}} = 0.153$ Check: $\mathbf{f_{a}/F_{a}} + \mathbf{f_{bx}/F_{bx}} + \mathbf{f_{by}/F_{by}} \leq 1.0$ Which is <0.15 4.1.1 (3)	Factored limit state stress	$\phi F_{ t L}$	=	194.46	MPa		
bending capacity factor $I_{by}/F_{by} = 0.55$ PASS COMBINED ACTIONS 4.1.1 Combined compression and bending $F_{a} = 17.60 \text{MPa} \\ F_{ao} = 213.07 \text{MPa} \\ F_{bx} = 213.07 \text{MPa} \\ F_{by} = 194.46 \text{MPa}$ 3.4.17 $f_{a}/F_{a} = 0.153 \text{Which is < 0.15}$ Check: $f_{a}/F_{a} + f_{bx}/F_{bx} + f_{by}/F_{by} \le 1.0$		F _{by}	=	194.46	MPa		
### 4.1.1 Combined compression and bending Fa = 17.60 MPa 3.4.8 Fao = 213.07 MPa 3.4.10 Fbx = 213.07 MPa 3.4.17 Fby = 194.46 MPa 3.4.17 $f_a/F_a = 0.153$ Which is <0.15 Check: $f_a/F_a + f_{bx}/F_{bx} + f_{by}/F_{by} \le 1.0$ Which is <0.15 4.1.1 (3)		f_{by}/F_{by}	=	0.55		PASS	
$F_{a} = 17.60 \text{MPa}$ $F_{ao} = 213.07 \text{MPa}$ $F_{bx} = 213.07 \text{MPa}$ $F_{by} = 194.46 \text{MPa}$ $\frac{1}{3}.4.17$ $\frac{1}{4}.1.1(2)$ $$	COMBINED ACTIONS						
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	4.1.1 Combined compression a	and bending					4.1.1(2)
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		Fa	=	17.60	MPa		3.4.8
$F_{bx} = 213.07$ MPa 3.4.17 $F_{by} = 194.46$ MPa Which is <0.15 Check: $f_a/F_a + f_{bx}/F_{bx} + f_{by}/F_{by} \le 1.0$ Which is <0.15 4.1.1							
$F_{by} = 194.46$ MPa 3.4.17 $f_a/F_a = 0.153$ Which is <0.15 4.1.1 (3)							
Check: $f_a/F_a + f_{bx}/F_{bx} + f_{by}/F_{by} \le 1.0$ 4.1.1							3.4.17
Check. $I_a/F_a + I_{bx}/F_{bx} + I_{by}/F_{by} \le 1.0$ (3)		f _a /F _a	=	0.153		Which is <0.15	
	Check: f	$_{a}/F_{a} + f_{bx}/F_{bx} + f_{b}$	_{ov} /F _{bv} ≤	1.0			
LG: U.31 \ LU FA.11	i.e.	0.91	, s, ≤	1.0		PASS	(3)

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6.5 Gable Beam

NAME	SYMBOL		VALUE	UNIT	NOTES	REF
40x40x2	(Gable Beam)					
Alloy and temper	6061-T6					AS1664.1
Tension	F_tu	=	262	MPa	Ultimate	T3.3(A)
	F_{ty}	=	241	MPa	Yield	
Compression	F_{cy}	=	241	MPa		
Shear	F_{su}	=	165	MPa	Ultimate	
	F_{sy}	=	138	MPa	Yield	
Bearing	F_bu	=	551	MPa	Ultimate	
Doaning	F_by	=	386	MPa	Yield	
Modulus of elasticity	Е	=	70000	MPa	Compressive	
	k_{t}	=	1.0			
	k _c	=	1.0			T3.4(B)
FEM ANALYSIS RESULTS						
Axial force	Р	=	0.44	kN	compression	
In plane moment	M_x	=	0.03	kNm		
Out of plane moment	M_{y}	=	0.18	kNm		
DESIGN STRESSES						
Gross cross section area	A_{g}	=	304	mm^2		
In-plane elastic section modulus	Z _x	=	3668.2667	mm^3		
Out-of-plane elastic section mod.	Z_{y}	=	3668.2667	mm^3		
Stress from axial force	f _a	=	P/A _g 1.45	MPa	compression	
Stress from in-plane bending	f_{bx}	=	M_x/Z_x	&	compression.	
		=	8.18	MPa	compression	
Stress from out-of-plane	\mathbf{f}_{by}	=	M_y/Z_y			
bending		=	49.07	MPa	compression	
COMPRESSION						
3.4.8 Compression in columns,1. General	axial, gross s	ectio	n			3.4.8.1
Unsupported length of	L	=	5000	mm		

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member					1	
Effective length factor	k	= [1			
Radius of gyration about buckling axis	r	=	15.53	mm		
Slenderness ratio	kL/r	=	321.86			
Slenderness parameter	λ	=	6.01			
	D_c^*	=	90.3			
	S ₁ *	=	0.33			
	S_2^*	=	1.23			
	ϕ_{cc}	=	0.950			
Factored limit state stress	φF _L	=	6.34	MPa		
2. Sections not subject to torsion	nal or torsio	nal-flex	kural bucklin	g		3.4.8.2
Largest slenderness ratio for flexural buckling	kL/r	=	321.86			
3.4.10 Uniform compression in a flat plates	components	of coll	umns, gross	section -		
1. Uniform compression in comp plates with both edges supporte		olumn	s, gross sec	tion - flat		3.4.10.1
	\mathbf{k}_1	=	0.35			T3.3(D)
Max. distance between toes of fillets of supporting elements for plate	b'	=	36			
·	t	=	2	mm		
Slenderness	b/t	=	18			
Limit 1	S_1	=	12.34			
Limit 2	S_2	=	32.87		S1 < b/t < S2	
Factored limit state stress	φF _L	=	213.07	MPa		
Most adverse compressive limit state stress	Fa	=	6.34	MPa		
Most adverse compressive capacity factor	f _a /F _a	=	0.23		PASS	
BENDING - IN-PLANE						
3.4.15 Compression in beams, etubes, box sections	extreme fibre	e, gros	s section re	ctangular		
Unbraced length for bending	L _b	=	5000	mm		
Second moment of area (weak axis)	I _y	=	73365.333	mm ⁴		

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Torsion modulus	J	=	109744	mm^3		
Elastic section modulus	Z	=	3668.2667	mm^3		
Slenderness	S	=	408.81			
Limit 1	S_1	=	0.39			
Limit 2	S_2	=	1695.86		S1 < S < S2	
Factored limit state stress	φF _L	=	184.01	MPa		3.4.15(2)
3.4.17 Compression in componuniform compression), gross sesupported						
	k_1	=	0.5			T3.3(D)
	k_2	=	2.04			T3.3(D)
Max. distance between toes	-					
of fillets of supporting elements for plate	b'	=	36	mm		
	t	=	2	mm		
Slenderness	b/t	=	18			
Limit 1	S_1	=	12.34			
Limit 2	S_2	=	46.95		S1 < S < S2	
Factored limit state stress	φF _L	=	213.07	MPa		
Most adverse in-plane bending limit state stress	F _{bx}	=	184.01	MPa		
Most adverse in-plane bending capacity factor	f_{bx}/F_{bx}	=	0.04		PASS	
BENDING - OUT-OF-PLANE						
NOTE: Limit state stresses, ϕF_t (doubly symmetric section)	are the sam	e for (out-of-plane l	pending		
Factored limit state stress	фГ∟	=	184.01	MPa		
Most adverse out-of-plane bending limit state stress	F _{by}	=	184.01	MPa		
Most adverse out-of-plane bending capacity factor	f_{by}/F_{by}	=	0.27		PASS	
COMBINED ACTIONS						
4.1.1 Combined compression a	nd bendina					4.1.1(2)

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	F_a	=	6.34	MPa		3.4.8
	F_{ao}	=	213.07	MPa		3.4.10
	F_bx	=	213.07	MPa		3.4.17
	F_by	=	184.01	MPa		3.4.17
	f_a/F_a	=	0.228		Which is <0.15	
Check:	$f_a/F_a + f_{bx}/F_b$	$_{\rm bx}$ + $f_{\rm by}/I$	$F_{by} \leq 1.0$			4.1.1
i.e.	0.54	≤	1.0		PASS	

6.6 Intermediate Purlin

NAME	SYMBOL		VALUE	UNIT	NOTES	REF
40x40x2	(Intermediate Purlin)					
Alloy and temper	6061-T6					AS1664.
Tension	F_tu	=	262	MPa	Ultimate	T3.3(A)
rension	F_ty	=	241	MPa	Yield	
Compression	F_{cy}	=	241	MPa		
Shear	F_{su}	=	165	MPa	Ultimate	
Sileai	F_{sy}	=	138	MPa	Yield	
Bearing	F_bu	=	551	MPa	Ultimate	
bearing	F_{by}	=	386	MPa	Yield	
Modulus of elasticity	Е	=	70000	MPa	Compressive	
	k_{t}	=	1.0			T2 4/D)
	k _c	=	1.0			T3.4(B)
FEM ANALYSIS RESULTS						
Axial force	Р	=	0.49	kN	compression	
In plane moment	M_x	=	0.31	kNm		
Out of plane moment	M_{y}	=	0.3	kNm		
DESIGN STRESSES						
Gross cross section area	A_g	=	304	mm^2		
In-plane elastic section modulus	Z_{x}	=	3668.266 7	mm^3		
Out-of-plane elastic section mod.	Z_{y}	=	3668.266 7	mm^3		
Stress from axial force	f_a	=	P/A _g			

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Other and fundamental and the second		=	1.61	MPa	compression	
Stress from in-plane bending	f_{bx}	=	M_x/Z_x			
Sorialing		=	84.51	MPa	compression	
Stress from out-of-plane	f_{by}	=	M_y/Z_y			
bending		=	81.78	MPa	compression	
COMPRESSION						
3.4.8 Compression in columns,1. General	axial, gross se	ection				3.4.8.
Unsupported length of member	L	=	3000	mm		
Effective length factor	k	= [1			
Radius of gyration about buckling axis	r	=	15.53	mm		
Slenderness ratio	kL/r	=	193.11			
Slenderness parameter	λ	=	3.61			
	D _c *	=	90.3			
	S ₁ *	=	0.33			
	S_2^*	=	1.23			
	ϕ_{cc}	=	0.950			
Factored limit state stress	φF _L	=	17.60	MPa		
2. Sections not subject to torsion	nal or torsiona	l-flexural	buckling			3.4.8.2
2. Sections not subject to torsion Largest slenderness ratio for flexural buckling	nal or torsiona kL/r	l-flexural =	buckling 193.11			3.4.8.2
Largest slenderness ratio	kL/r	=	193.11	ction - flat		3.4.8.2
Largest slenderness ratio for flexural buckling 3.4.10 Uniform compression in a	kL/r components o	= f column	193.11 s, gross se			3.4.8.2 3.4.10.
Largest slenderness ratio for flexural buckling 3.4.10 Uniform compression in a plates 1. Uniform compression in compression	kL/r components o conents of colled	= f column	193.11 s, gross seconoss section			3.4.10. ⁻
Largest slenderness ratio for flexural buckling 3.4.10 Uniform compression in a plates 1. Uniform compression in compression	kL/r components o	= f column: umns, gr	193.11 s, gross se			3.4.10.
Largest slenderness ratio for flexural buckling 3.4.10 Uniform compression in a plates 1. Uniform compression in complates with both edges supported	kL/r components o conents of colled	= f column: umns, gr	193.11 s, gross seconoss section			3.4.10.
Largest slenderness ratio for flexural buckling 3.4.10 Uniform compression in a plates 1. Uniform compression in complates with both edges supported Max. distance between toes of fillets of supporting elements for plate	kL/r components of conents of colo d k ₁ b' t	= f column: umns, gn =	193.11 s, gross section 0.35 36 2			3.4.10.
Largest slenderness ratio for flexural buckling 3.4.10 Uniform compression in a plates 1. Uniform compression in complates with both edges supported. Max. distance between toes of fillets of supporting elements for plate Slenderness	kL/r components of conents of colo d k ₁ b' t b/t	= f columns umns, gr = = = =	193.11 s, gross section 0.35 36 2 18	- flat		3.4.10.
Largest slenderness ratio for flexural buckling 3.4.10 Uniform compression in a plates 1. Uniform compression in complates with both edges supported Max. distance between toes of fillets of supporting elements for plate Slenderness Limit 1	kL/r components of conents of collect k ₁ b' t b/t S ₁	= f columna umns, gr = = =	193.11 s, gross section 0.35 36 2 18 12.34	- flat		3.4.10.
Largest slenderness ratio for flexural buckling 3.4.10 Uniform compression in a plates 1. Uniform compression in complates with both edges supported. Max. distance between toes of fillets of supporting elements for plate Slenderness	kL/r components of conents of colo d k ₁ b' t b/t	= f columns umns, gr = = = =	193.11 s, gross section 0.35 36 2 18	- flat	S1 < b/t < S2	

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Most adverse compressive limit state stress	F_a	=	17.60	MPa		
Most adverse compressive capacity factor	f _a /F _a	=	0.09		PASS	
DENDING IN DIANE						
BENDING - IN-PLANE	outromo fibro	arooo oo	otion rooton	audor		
3.4.15 Compression in beams, tubes, box sections	extreme libre, g	gross se	ection rectan	guiar		
Unbraced length for bending	L_b	=	3000	mm		
Second moment of area (weak axis)	I_y	=	73365.33 3	mm ⁴		
Torsion modulus	J	=	109744	mm^3		
Elastic section modulus	Z	=	3668.266 7	mm^3		
Slenderness	S	=	245.29			
Limit 1	S_1	=	0.39			
Limit 2	S_2	=	1695.86		S1 < S < S2	
Factored limit state stress	φF_{L}	=	194.46	MPa		3.4.15(2
3.4.17 Compression in compon compression), gross section - fi	lat plates with b		es supporte			
	k ₁	=	0.5			T3.3(D
	k_2	=	2.04			T3.3(D
Max. distance between toes of fillets of supporting elements for plate	b'	=	36	mm		
	t	=	2	mm		
Slenderness	b/t	=	18			
Limit 1	S_1	=	12.34			
Limit 2	S_2	=	46.95		S1 < S < S2	
Factored limit state stress	фҒ∟	=	213.07	MPa		
					1	
Most adverse in-plane bending limit state stress	F_{bx}	=	194.46	MPa		
	F_bx $f_bx\!/F_bx$	=	194.46 0.43	MPa	PASS	

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NOTE: Limit state stresses, φ (doubly symmetric section)	F_{L} are the same t	or out-c	of-plane ber	nding		
Factored limit state stress	φF _L	=	194.46	MPa		
Most adverse out-of-plane bending limit state stress	F _{by}	=	194.46	MPa		
Most adverse out-of-plane bending capacity factor	f_{by}/F_{by}	=	0.42		PASS	
COMBINED ACTIONS						
4.1.1 Combined compression	and bending					4.1.1(2)
	F_a	=	17.60	MPa		3.4.8
	F_{ao}	=	213.07	MPa		3.4.10
	F_bx	=	213.07	MPa		3.4.17
	F_by	=	194.46	MPa		3.4.17
	f_a/F_a	=	0.092		Which is <0.15	
Check:	$f_a/F_a + f_{bx}/F_{bx} + f_{bx}$	$_{\text{by}}/F_{\text{by}} \leq$	1.0			4.1.1
i.e.	0.95	≤	1.0		PASS	

6.7 Cross Brace

NAME	SYMBOL		VALUE	UNIT	NOTES	REF
40x40x2	(Brace)					A C 1 C C A 1
Alloy and temper	6061-T6					AS1664.1
Tanaisa	F_tu	=	262	MPa	Ultimate	T3.3(A)
Tension	F_{ty}	=	241	MPa	Yield	
Compression	F_{cy}	=	241	MPa		
Shear	F_{su}	=	165	MPa	Ultimate	
Sileai	F_{sy}	=	138	MPa	Yield	
Pooring	F_bu	=	551	MPa	Ultimate	
Bearing	F_{by}	=	386	MPa	Yield	
Modulus of elasticity	Е	=	70000	MPa	Compressive	
	\mathbf{k}_{t}	=	1.0			TO 4(D)
	k_c	=	1.0			T3.4(B)
FEM ANALYSIS RESULTS						

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Axial force	Р	=	1.78	kN	compression	
In plane moment	M_{x}	=	0.06	kNm		
Out of plane moment	M_{y}	=	0.06	kNm		
DESIGN STRESSES						
Gross cross section area	A_g	=	304	mm^2		
In-plane elastic section modulus	Z_{x}	=	3668.2667	mm^3		
Out-of-plane elastic section mod.	Z_{y}	=	3668.2667	mm^3		
Stress from axial force	fa	=	P/A_g			
		=	5.86	MPa	compression	
Stress from in-plane bending	f_{bx}	=	M_x/Z_x			
		=	16.36	MPa	compression	
Stress from out-of-plane bending	f_{by}	=	M_y/Z_y		,	
bending		=	16.36	MPa	compression	
COMPRESSION						
3.4.8 Compression in columns, a	axial gross	s sect	ion			
1. General						3.4.8.1
Unsupported length of member	L	=	4000	mm		
Effective length factor	k	=	1			
Radius of gyration about buckling axis	r	=	15.53	mm		
Slenderness ratio	kL/r	=	257.48			
Slenderness parameter	λ	=	4.81			
	D_c^*	=	90.3			
	S_1^*	=	0.33			
	S_2^*	=	1.23			
	фсс	=	0.950			
Factored limit state stress	φF_{L}	=	9.90	MPa		
2. Sections not subject to torsion	al or torsio	onal-fi	lexural buckli	ng		3.4.8.2
Largest slenderness ratio for flexural buckling	kL/r	=	257.48			
3.4.10 Uniform compression in c - flat plates	omponent	s of c	olumns, gros	s section		
1. Uniform compression in comp plates with both edges supported		colum	nns, gross se	ction - flat		3.4.10.1

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	\mathbf{k}_1	=	0.35			T3.3(D)
Max. distance between toes of fillets of supporting elements for plate	b'	=	36			
Tot plate	t	=	2	mm		
Slenderness	b/t	=	18	111111		
Limit 1	S ₁	=	12.34			
Limit 2	S ₂	=	32.87		S1 < b/t < S2	
Factored limit state stress	φF _L	=	213.07	MPa		
Most adverse compressive limit state stress	Fa	=	9.90	MPa	1	
Most adverse compressive capacity factor	f_a/F_a	=	0.59		PASS	
BENDING - IN-PLANE						
	drama fib	ro or	ooo oodion			
3.4.15 Compression in beams, ex rectangular tubes, box sections	areme no	re, gr	oss section			
Unbraced length for bending	L_b	=	4000	mm		
Second moment of area (weak axis)	I_y	=	73365.333	mm ⁴		
Torsion modulus	J	=	109744	mm^3		
Elastic section modulus	Z	=	3668.2667	mm^3		
Slenderness	S	=	327.05			
Limit 1	S_1	=	0.39			
Limit 2	S_2	=	1695.86		S1 < S < S2	
Factored limit state stress	φF _L	=	188.90	MPa		3.4.15(2)
3.4.17 Compression in componer uniform compression), gross sect supported						
	\mathbf{k}_1	=	0.5			T3.3(D)
	k ₂	=	2.04			T3.3(D)
Max. distance between toes of	4		-			
fillets of supporting elements for plate	b'	=	36	mm		
	t	=	2	mm		
Slenderness	b/t	=	18			
Limit 1	S_1	=	12.34			

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Factored limit state stress	фҒ∟	=	213.07	MPa		
Most adverse in-plane bending limit state stress	F_{bx}	=	188.90	MPa		
Most adverse in-plane bending capacity factor	f_{bx}/F_{bx}	=	0.09		PASS	
BENDING - OUT-OF-PLANE						
NOTE: Limit state stresses, ϕF_L and (doubly symmetric section)	are the sar	ne for	out-of-plan	e bending		
Factored limit state stress	φF _L	=	188.90	MPa		
Most adverse out-of-plane bending limit state stress	F _{by}	=	188.90	MPa		
Most adverse out-of-plane bending capacity factor	f _{by} /F _{by}	=	0.09		PASS	
COMBINED ACTIONS						
4.1.1 Combined compression an	d bending					4.1.1(2)
	F_a	=	9.90	MPa		3.4.8
	F_{ao}	=	213.07	MPa		3.4.10
	F_bx	=	213.07	MPa		3.4.17
	F_by	=	188.90	MPa		3.4.17
	f _a /F _a	=	0.591		Which is <0.15	
Check:	$f_a/F_a + f_{bx}/$	F _{bx} + f	$f_{by}/F_{by} \le 1.0$)		4.1.1
i.e.	0.76	≤	1.0		PASS	(6)

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7 Summary

7.1 Conclusions

- a. The 5m Span x 3m Bay Function Standard Tent structure as specified has been analyzed with a conclusion that it has the capacity to withstand wind speeds up to and including **80km/hr**.
- b. For forecast winds in excess of **80km/hr** all fabric shall be removed from the frames, and the structure should be completely dismantled.
- c. Wall Bracing is required at one of the end bays for 5m X 9m tent to resist against lateral movement due to wind direction2. However, for multiple tent length, each end bay and every third bay in between must be braced. (Refer to detail drawing)
- d. For uplift due to 80km/hr, 3 kN (300Kg) holding down weight/per leg is required.
- e. The bearing pressure of soil should be clarified and checked by an engineer prior to any construction for considering foundation and base plate.
- f. Required weight per leg for smaller tents:

Span Width	Required Weight Per Leg					
	(kN)	(Kg)				
5	3	300				
4	2.75	275				
3	2	200				

Yours faithfully,

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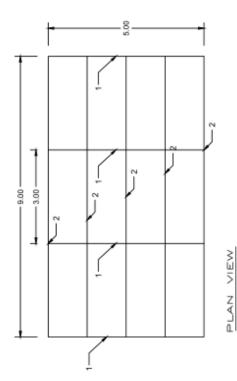
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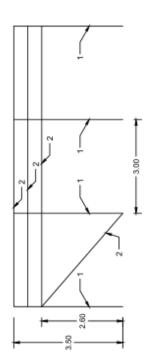
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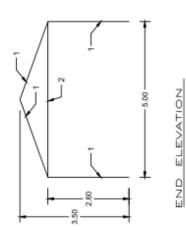
8 Appendix A – 5m x 9m Function Standard Tent:



DULE	82X48X3	40X40X2
ALUMINUM PROFILE SCHEDULE	RAFTER, UPRIGHT SUPPORT	EAVE, RIDGE & INTERMEDIATE PURLIN GABLE BEAM, CROSS BRACE
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SIDE ELEVATION