DESIGN CERTIFICATE

DESCRIPTION:
This certificate relates to the adequacy of the existing roof at the described location to support the pv-panels and to their fixings.

LOCATION:
Wardli Youth Center, 13 McKenna road, Christie Downs SA

DETAILS:
Roof:
The adequacy of the existing roof structures to carry the loads arising from the pv-installations have been assessed based on comparing the loads for which the purlins would have been designed with the loads arising from the installation of the pv-panels and have been found to be satisfactory.

Fixings:
The landscape format Longi Solar 370W panels are to be mounted on pairs of Clenergy Eco rails and secured to the purlins using Clenergy tin feet and Buildex 14-11 hex head zips.

REFERENCES:
Westside Energy General arrangement

LSEC calculations Job No 21042-3 Rev 0

STANDARDS:

AS1170.0	Structural design actions - General principles
AS1170.1	Structural design actions – Dead and imposed loads
AS1170.2	Structural design actions - Wind loads

It is certified that the described item(s) have been designed and assessed using the listed Standards, conventional engineering principles and good practice for the location and function detailed above. No physical testing of items has been undertaken.

SCJ Lovell BSc, CEng, MIStructE, NER(Structural), RPEQ 13036
Date: 24 March 2021

Lovell Structural Engineering Consultancy

ABN: 33 473 233 682

PO Box 334

Macclesfield

South Australia 5153

www.lsec.com.au

m. 0420 859 809

Lovell Structural Engineering Consultancy

PO Box 334, Macclesfield, SA 5153
w: LSEC.com.au t: 0420 859 809 ABN: 33 473 233 682

STRUCTURAL CALCULATIONS

Project: **pv-Panel installation**

Address: **Wardli Youth Center, 13 McKinna Rd, Christie Downs**

Client: **Westside Energy**

Project #: **21042-3**

Revision	Date	Description
0	24/03/21	Issued for use

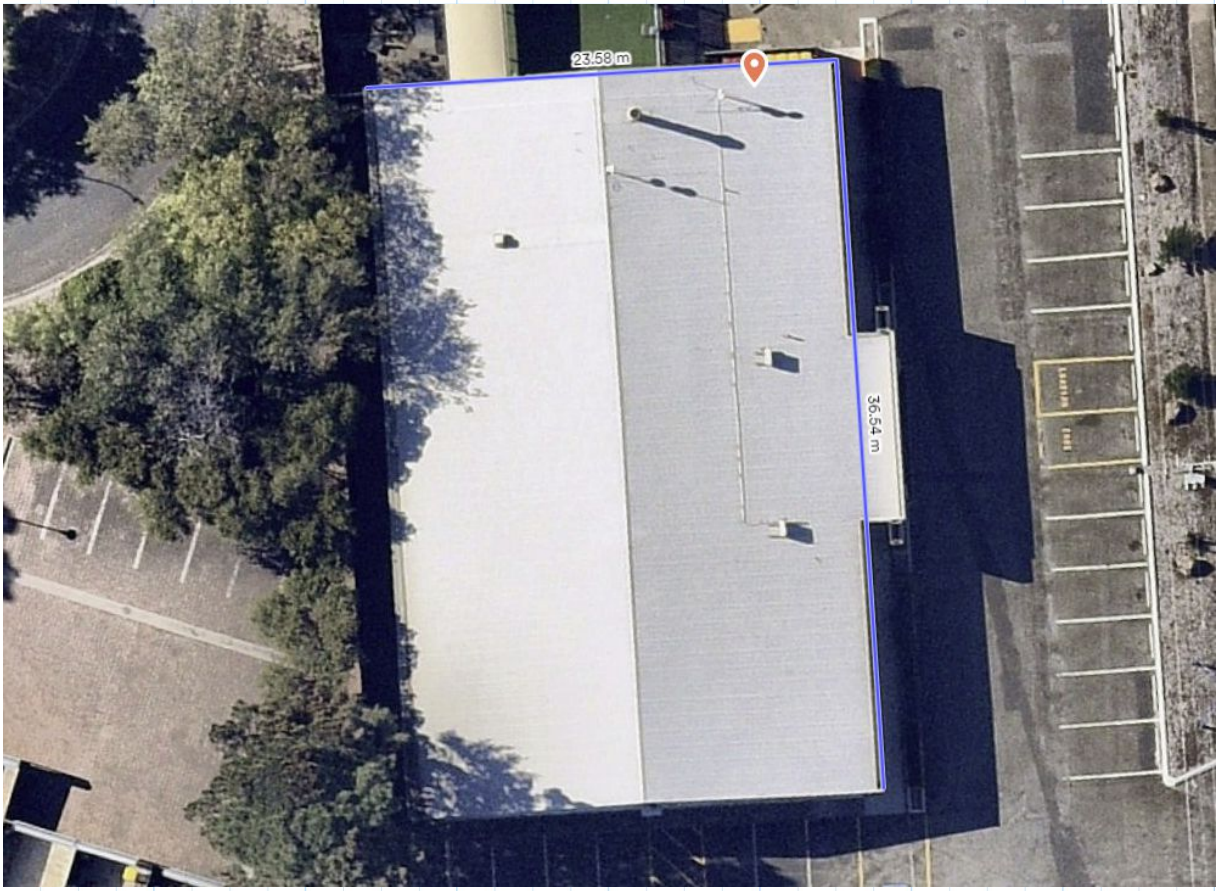
INTRODUCTION

The following structural calculations form part of the certification justifying the fixings for the pv-installation to the roof structure and the roof structure itself at the project location to withstand the applied loads and are to be read in conjunction with the certificate and with the reference drawings.

The calculation have been prepared by SCJ Lovell BSc CEng MIStructE NER RPEQ

DESCRIPTION AND DESIGN PHILOSOPHY

Overall, the building measures around 23.6 m by 36.5 m on plan with an average roof height of around 3.5 m.



Site information provided by Westside gives the 5-degree duo-pitch roof to comprise pierce corrugated sheeting and the image suggest purlins at 1200 mm spacing.

The installation comprises flush mounted pv-panels installed in landscape format on Clenergy Eco rails and fixed to the purlins using proprietary Clenergy tin feet and Buildex 14-11 hex head zips.

It is a pv-panel manufacturer's requirement that the panels are not trafficked by maintenance personnel nor that any materials are stacked on the panels; if it is necessary to undertake any maintenance work then this is conducted by removing panels to create the required access.

The panels are in small isolated groups and for the purposes of design of the fixings the wind load coefficient on the panels will be taken as 1.7. The wind load on the panel comprises the suction on the upper surface and the pressure on the lower surface however the pressure also acts on the roof sheet hence the nett effect on the roof is that due to the suction on the upper surface less the weight of the panel. For flush mounted panels the wind action on the upper surface is equivalent to that on the original roof surface hence there is no additional wind uplift on the roof.

The adequacy of the roof will be proven by comparing the loads for which the purlins would have been designed with the loads for which they will be subjected.

The assessment will be in accordance with:

AS1170.0	Structural design actions - General principles
AS1170.1	Structural design actions - Dead and imposed actions
AS1170.2	Structural design actions - Wind actions

REFERENCE DOCUMENTS

Westside - Wardli Youth Center, General Arrangement

Clenergy installation manual

Longi Solar 370W panel data sheet

PANEL SYSTEM

Panel dimensions	Length	$p_l := 1755\ mm$
	Width	$p_w := 1038\ mm$

Loading from pv-system

Weight of panel $G_{panel} := 19.5\ kg \cdot g = 191\ N$

Weight of frame $G_{frame} := 3\ kg \cdot g = 29\ N$

Dead load of pv-system $g_{pv} := \frac{(G_{panel} + G_{frame})}{p_l \cdot p_w} = 121\ Pa$

LOADINGS

Dead loads

Roof sheeting	$g_1 := 4.7\ kg \cdot m^{-2}$
Purlins	$g_2 := 4.5\ kg \cdot m^{-2}$
Ceiling and services - allow	$g_3 := 12\ kg \cdot m^{-2}$

Roof dead load $g_{kr} := (g_1 + g_2 + g_3) \cdot g = 0.208\ kPa$

Imposed load

General load $q_{kr} := 0.25\ kPa$

Wind loads

A wind analysis has been undertaken using CheckWind software

CHECKWIND v5.3.2 AS/NZS 1170 SITE REPORT revo

STRUCTURE:	BUILDING	LATITUDE:	-35.136098	CRITICAL DIRECTION:	West
ORIENTATION:	0°	LONGITUDE:	138.488468	Md:	1.00
WIDTH:	23.60 m	ELEVATION:	45.00 m	TC:	3.00
LENGTH:	36.50 m			Mz,cat:	0.8300
HEIGHT (h):	4.00 m	WIND REGION:	A1	Ms:	1.0
BASE RL:	0.00 m	ULTIMATE ARI:	500 YEARS	Mh:	1.0
		ULTIMATE VR:	45 m/s	Mlee:	1.0
				Mel:	1.0
				Mt:	1.0
				Vdes,θ:	37.35 m/s
				qdes,θ:	0.84 kPa

$q_{sit} := 0.84\ kPa$

Existing purlins

Pitch of roof $\phi := 5\ deg$

Purlin spacing $s_p := 1.20\ m$

Additional dead loads from pv-panels

Original design load on purlins $E_{d.ex} := \left(\frac{1.2 \cdot g_{kr}}{\cos(\alpha)} + q_{kr}\right) \cdot s_p = 0.599\ kN \cdot m^{-1}$

General load case $E_{d.1} := \frac{1.35 \cdot (g_{kr} + g_{pv})}{\cos(\alpha)} \cdot s_p = 0.533\ kN \cdot m^{-1}$

CHECK $\frac{E_{d.1}}{E_{d.ex}} = 0.889$ **< 1 :. OK**

Existing purlins OK for additional dead loads from pv panels

Fixings

For Buildex 14-11 hex head zips in 1.2 mm thick G450 purlins

Pull out capacity $N_{fix.a} := -3.87\ kN$

Capacity reduction factor $\phi := 0.7$

Aerodynamic shape factor $C_{fig} := -1.7$

Design wind pressure $p := q_{sit} \cdot C_{fig} = -1428\ Pa$

Load on panels $W := p + g_{pv} = -1307\ Pa$

For panels supported by 2 rails, load per fixing $F_{fix} := W \cdot \frac{p_l}{2} \cdot s_p = -1.376\ kN$

CHECK $\frac{F_{fix}}{\phi \cdot N_{fix.a}} = 0.508$ **< 1 :. OK**

USE 2 RAILS PER PANEL AND BUILDEX 14-11 HEX HEAD ZIPS

----- STRUCTURE DATA ----------

TYPE: BUILDING
ORIENTATION: 0.0°
ROOF: GABLE
WIDTH: 23.60 m
LENGTH: 36.50 m
ROOF SLOPE (α): 5.0°
HEIGHT (h): 4.00 m
BASE RL: 0.00 m

----- SITE DATA ----------

LOCATION

LATITUDE: -35.136098
LONGITUDE: 138.488468
ELEVATION: 45.00 m

DESIGN

REFERENCE: AS/NZS 1170
IMPORTANCE LEVEL: 2
LIFE: 50 YEARS

WIND

REGION: A1
ULTIMATE ARI: 500 YEARS

REGIONAL WIND SPEED (VR)

• Calculated as per AS/NZS 1170.2 Section 3.2.

ULTIMATE: 45 m/s
ICE: 34 m/s
SERVICEABILITY: 37 m/s

DIRECTION MULTIPLIER (Md)

• Calculated for Region A1 as per AS/NZS 1170.2 Section 3.3.

WIND	Md
N	0.90
NE	0.80
E	0.80
SE	0.80
S	0.85
SW	0.95
W	1.00
NW	0.95

TERRAIN/HEIGHT MULTIPLIER (Mz,cat)

• Calculated using averaging as per AS/NZS 1170.2 Section 4.2.3 and varies with height.

NORTH WIND: Mz,cat = 0.8300 (TC 3.00)

ZONE 1: TC 3 to 580.00 m

NORTH EAST WIND: Mz,cat = 0.8300 (TC 3.00)

ZONE 1: TC 3 to 580.00 m

EAST WIND: Mz,cat = 0.8393 (TC 2.88)

ZONE 1: TC 3 to 464.00 m
ZONE 2: TC 2.5 to 580.00 m

SOUTH EAST WIND: Mz,cat = 0.8300 (TC 3.00)

ZONE 1: TC 3 to 580.00 m

SOUTH WIND: Mz,cat = 0.8300 (TC 3.00)

ZONE 1: TC 3 to 580.00 m

SOUTH WEST WIND: Mz,cat = 0.8300 (TC 3.00)

ZONE 1: TC 3 to 580.00 m

WEST WIND: Mz,cat = 0.8300 (TC 3.00)

ZONE 1: TC 3 to 580.00 m

NORTH WEST WIND: Mz,cat = 0.8300 (TC 3.00)

ZONE 1: TC 3 to 580.00 m

SHIELDING MULTIPLIER (Ms)

• Calculated as per AS/NZS 1170.2 Section 4.3 and varies with height.

NORTH WIND: Ms = 1.0

ID	HEIGHT	ELEVATION	SLOPE	AREA	BREADTH	LATITUDE	LONGITUDE
015	3.00 m	45.00 m	0.0000	103 m²	8.56 m	-35.135792	138.488365

NORTH EAST WIND: Ms = 1.0

ID	HEIGHT	ELEVATION	SLOPE	AREA	BREADTH	LATITUDE	LONGITUDE
005	3.00 m	46.00 m	0.0166	210 m²	9.37 m	-35.135930	138.489099

EAST WIND: Ms = 1.0

ID	HEIGHT	ELEVATION	SLOPE	AREA	BREADTH	LATITUDE	LONGITUDE
002	3.00 m	46.00 m	0.0130	339 m²	20.87 m	-35.135944	138.489290
005	3.00 m	46.00 m	0.0166	210 m²	16.78 m	-35.135930	138.489099
011	3.00 m	45.50 m	0.0076	125 m²	1.71 m	-35.136372	138.489108
012	3.00 m	46.00 m	0.0127	123 m²	9.46 m	-35.136127	138.489332
013	3.00 m	45.50 m	0.0087	114 m²	14.92 m	-35.136161	138.489095

SOUTH EAST WIND: Ms = 1.0

ID	HEIGHT	ELEVATION	SLOPE	AREA	BREADTH	LATITUDE	LONGITUDE
004	3.00 m	46.00 m	0.0127	213 m²	16.71 m	-35.136512	138.489167
011	3.00 m	45.50 m	0.0076	125 m²	14.99 m	-35.136372	138.489108

SOUTH WIND: Ms = 1.0

ID	HEIGHT	ELEVATION	SLOPE	AREA	BREADTH	LATITUDE	LONGITUDE
001	3.00 m	45.00 m	0.0000	363 m²	12.65 m	-35.136604	138.488440

SOUTH WEST WIND: Ms = 1.0

ID	HEIGHT	ELEVATION	SLOPE	AREA	BREADTH	LATITUDE	LONGITUDE
006	3.00 m	44.00 m	0.0156	192 m²	17.32 m	-35.136392	138.487863
007	3.00 m	43.50 m	0.0202	185 m²	13.65 m	-35.136392	138.487735
008	3.00 m	44.50 m	0.0094	175 m²	17.32 m	-35.136485	138.488121
009	3.00 m	44.00 m	0.0181	172 m²	17.30 m	-35.136424	138.488011

WEST WIND: Ms = 1.0

ID	HEIGHT	ELEVATION	SLOPE	AREA	BREADTH	LATITUDE	LONGITUDE
006	3.00 m	44.00 m	0.0156	192 m²	1.70 m	-35.136392	138.487863
007	3.00 m	43.50 m	0.0202	185 m²	8.09 m	-35.136392	138.487735
010	3.00 m	43.50 m	0.0189	125 m²	14.27 m	-35.135912	138.487624
014	3.00 m	43.50 m	0.0236	107 m²	7.81 m	-35.135884	138.487821

NORTH WEST WIND: Ms = 1.0

ID	HEIGHT	ELEVATION	SLOPE	AREA	BREADTH	LATITUDE	LONGITUDE
003	3.00 m	44.50 m	0.0072	271 m²	27.49 m	-35.135614	138.487985
014	3.00 m	43.50 m	0.0236	107 m²	9.79 m	-35.135884	138.487821
015	3.00 m	45.00 m	0.0000	103 m²	5.42 m	-35.135792	138.488365
016	3.00 m	44.00 m	0.0197	91 m²	13.47 m	-35.135843	138.488006

TOPOGRAPHIC MULTIPLIER (Mt)

- Calculated as per AS/NZS 1170.2 Section 4.4 and varies with height.
- Water Surface has been defined @ RL 0.00 m.

WIND	CRITICAL	TOPOGRAPHY	H	Lu	x	Mh	Mt
N	NNW	Escarpment	37.00 m	370.00 m	840.00 m	1.0	1.0
NE	NE	Escarpment	14.50 m	91.67 m	-2380.00 m	1.0	1.0
E	ENE	Flat	24.50 m	285.00 m	1940.00 m	1.0	1.0
SE	SSE	Escarpment	26.00 m	184.29 m	-1680.00 m	1.0	1.0
S	SSE	Escarpment	26.00 m	184.29 m	-1680.00 m	1.0	1.0
SW	SSW	Escarpment	37.00 m	328.57 m	-2160.00 m	1.0	1.0
W	WSW	Flat	12.00 m	260.00 m	-500.00 m	1.0	1.0
NW	NNW	Escarpment	37.00 m	370.00 m	840.00 m	1.0	1.0

----- ANALYSIS -----

LOAD CASE 01: Ultimate Wind

NORTH WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.90	0.8300	0	-	-	1.0	1.0	33.62 m/s	0.6782 kPa
3.60 m	0.90	0.8300	0	-	-	1.0	1.0	33.62 m/s	0.6782 kPa
3.20 m	0.90	0.8300	0	-	-	1.0	1.0	33.62 m/s	0.6782 kPa
2.80 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	33.52 m/s	0.6742 kPa
2.40 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	33.52 m/s	0.6742 kPa
2.00 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	33.52 m/s	0.6742 kPa
1.60 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	33.52 m/s	0.6742 kPa
1.20 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	33.52 m/s	0.6742 kPa
0.80 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	33.52 m/s	0.6742 kPa
0.40 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	33.52 m/s	0.6742 kPa
0.00 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	33.52 m/s	0.6742 kPa

NORTH EAST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.80	0.8300	0	-	-	1.0	1.0	30.00 m/s	0.5400 kPa
3.60 m	0.80	0.8300	0	-	-	1.0	1.0	30.00 m/s	0.5400 kPa
3.20 m	0.80	0.8300	0	-	-	1.0	1.0	30.00 m/s	0.5400 kPa
2.80 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	30.00 m/s	0.5400 kPa
2.40 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	30.00 m/s	0.5400 kPa
2.00 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	30.00 m/s	0.5400 kPa
1.60 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	30.00 m/s	0.5400 kPa
1.20 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	30.00 m/s	0.5400 kPa
0.80 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	30.00 m/s	0.5400 kPa
0.40 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	30.00 m/s	0.5400 kPa
0.00 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	30.00 m/s	0.5400 kPa

EAST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.80	0.8393	0	-	-	1.0	1.0	30.21 m/s	0.5476 kPa
3.60 m	0.80	0.8391	0	-	-	1.0	1.0	30.21 m/s	0.5476 kPa

3.20 m	0.80	0.8390	0	-	-	1.0	1.0	30.20 m/s	0.5472 kPa
2.80 m	0.80	0.8389	5	3.00 m	12.75 m	0.8509	1.0	30.00 m/s	0.5400 kPa
2.40 m	0.80	0.8387	5	3.00 m	12.75 m	0.8509	1.0	30.00 m/s	0.5400 kPa
2.00 m	0.80	0.8386	5	3.00 m	12.75 m	0.8509	1.0	30.00 m/s	0.5400 kPa
1.60 m	0.80	0.8385	5	3.00 m	12.75 m	0.8509	1.0	30.00 m/s	0.5400 kPa
1.20 m	0.80	0.8383	5	3.00 m	12.75 m	0.8509	1.0	30.00 m/s	0.5400 kPa
0.80 m	0.80	0.8382	5	3.00 m	12.75 m	0.8509	1.0	30.00 m/s	0.5400 kPa
0.40 m	0.80	0.8381	5	3.00 m	12.75 m	0.8509	1.0	30.00 m/s	0.5400 kPa
0.00 m	0.80	0.8380	5	3.00 m	12.75 m	0.8509	1.0	30.00 m/s	0.5400 kPa

SOUTH EAST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.80	0.8300	0	-	-	1.0	1.0	30.00 m/s	0.5400 kPa
3.60 m	0.80	0.8300	0	-	-	1.0	1.0	30.00 m/s	0.5400 kPa
3.20 m	0.80	0.8300	0	-	-	1.0	1.0	30.00 m/s	0.5400 kPa
2.80 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	30.00 m/s	0.5400 kPa
2.40 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	30.00 m/s	0.5400 kPa
2.00 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	30.00 m/s	0.5400 kPa
1.60 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	30.00 m/s	0.5400 kPa
1.20 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	30.00 m/s	0.5400 kPa
0.80 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	30.00 m/s	0.5400 kPa
0.40 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	30.00 m/s	0.5400 kPa
0.00 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	30.00 m/s	0.5400 kPa

SOUTH WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.85	0.8300	0	-	-	1.0	1.0	31.75 m/s	0.6048 kPa
3.60 m	0.85	0.8300	0	-	-	1.0	1.0	31.75 m/s	0.6048 kPa
3.20 m	0.85	0.8300	0	-	-	1.0	1.0	31.75 m/s	0.6048 kPa
2.80 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	30.55 m/s	0.5600 kPa
2.40 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	30.55 m/s	0.5600 kPa
2.00 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	30.55 m/s	0.5600 kPa
1.60 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	30.55 m/s	0.5600 kPa
1.20 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	30.55 m/s	0.5600 kPa
0.80 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	30.55 m/s	0.5600 kPa
0.40 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	30.55 m/s	0.5600 kPa
0.00 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	30.55 m/s	0.5600 kPa

SOUTH WEST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.95	0.8300	0	-	-	1.0	1.0	35.48 m/s	0.7553 kPa
3.60 m	0.95	0.8300	0	-	-	1.0	1.0	35.48 m/s	0.7553 kPa
3.20 m	0.95	0.8300	0	-	-	1.0	1.0	35.48 m/s	0.7553 kPa
2.80 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	30.00 m/s	0.5400 kPa
2.40 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	30.00 m/s	0.5400 kPa
2.00 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	30.00 m/s	0.5400 kPa
1.60 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	30.00 m/s	0.5400 kPa
1.20 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	30.00 m/s	0.5400 kPa
0.80 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	30.00 m/s	0.5400 kPa
0.40 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	30.00 m/s	0.5400 kPa
0.00 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	30.00 m/s	0.5400 kPa

WEST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	1.00	0.8300	0	-	-	1.0	1.0	37.35 m/s	0.8370 kPa
3.60 m	1.00	0.8300	0	-	-	1.0	1.0	37.35 m/s	0.8370 kPa
3.20 m	1.00	0.8300	0	-	-	1.0	1.0	37.35 m/s	0.8370 kPa
2.80 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	33.70 m/s	0.6814 kPa
2.40 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	33.70 m/s	0.6814 kPa
2.00 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	33.70 m/s	0.6814 kPa
1.60 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	33.70 m/s	0.6814 kPa
1.20 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	33.70 m/s	0.6814 kPa
0.80 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	33.70 m/s	0.6814 kPa
0.40 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	33.70 m/s	0.6814 kPa
0.00 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	33.70 m/s	0.6814 kPa

NORTH WEST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.95	0.8300	0	-	-	1.0	1.0	35.48 m/s	0.7553 kPa
3.60 m	0.95	0.8300	0	-	-	1.0	1.0	35.48 m/s	0.7553 kPa
3.20 m	0.95	0.8300	0	-	-	1.0	1.0	35.48 m/s	0.7553 kPa
2.80 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	30.31 m/s	0.5512 kPa
2.40 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	30.31 m/s	0.5512 kPa
2.00 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	30.31 m/s	0.5512 kPa
1.60 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	30.31 m/s	0.5512 kPa
1.20 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	30.31 m/s	0.5512 kPa
0.80 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	30.31 m/s	0.5512 kPa
0.40 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	30.31 m/s	0.5512 kPa
0.00 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	30.31 m/s	0.5512 kPa

LOAD CASE 02: Serviceability Wind

NORTH WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.90	0.8300	0	-	-	1.0	1.0	27.64 m/s	0.4584 kPa
3.60 m	0.90	0.8300	0	-	-	1.0	1.0	27.64 m/s	0.4584 kPa
3.20 m	0.90	0.8300	0	-	-	1.0	1.0	27.64 m/s	0.4584 kPa
2.80 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	27.56 m/s	0.4557 kPa
2.40 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	27.56 m/s	0.4557 kPa
2.00 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	27.56 m/s	0.4557 kPa
1.60 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	27.56 m/s	0.4557 kPa
1.20 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	27.56 m/s	0.4557 kPa
0.80 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	27.56 m/s	0.4557 kPa
0.40 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	27.56 m/s	0.4557 kPa
0.00 m	0.90	0.8300	1	3.00 m	8.56 m	0.9973	1.0	27.56 m/s	0.4557 kPa

NORTH EAST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.80	0.8300	0	-	-	1.0	1.0	24.57 m/s	0.3622 kPa
3.60 m	0.80	0.8300	0	-	-	1.0	1.0	24.57 m/s	0.3622 kPa
3.20 m	0.80	0.8300	0	-	-	1.0	1.0	24.57 m/s	0.3622 kPa
2.80 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	24.29 m/s	0.3540 kPa
2.40 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	24.29 m/s	0.3540 kPa
2.00 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	24.29 m/s	0.3540 kPa
1.60 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	24.29 m/s	0.3540 kPa
1.20 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	24.29 m/s	0.3540 kPa
0.80 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	24.29 m/s	0.3540 kPa
0.40 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	24.29 m/s	0.3540 kPa
0.00 m	0.80	0.8300	1	3.00 m	9.37 m	0.9886	1.0	24.29 m/s	0.3540 kPa

EAST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.80	0.8393	0	-	-	1.0	1.0	24.84 m/s	0.3702 kPa
3.60 m	0.80	0.8391	0	-	-	1.0	1.0	24.84 m/s	0.3702 kPa
3.20 m	0.80	0.8390	0	-	-	1.0	1.0	24.83 m/s	0.3699 kPa
2.80 m	0.80	0.8389	5	3.00 m	12.75 m	0.8509	1.0	21.13 m/s	0.2679 kPa
2.40 m	0.80	0.8387	5	3.00 m	12.75 m	0.8509	1.0	21.12 m/s	0.2676 kPa
2.00 m	0.80	0.8386	5	3.00 m	12.75 m	0.8509	1.0	21.12 m/s	0.2676 kPa
1.60 m	0.80	0.8385	5	3.00 m	12.75 m	0.8509	1.0	21.12 m/s	0.2676 kPa
1.20 m	0.80	0.8383	5	3.00 m	12.75 m	0.8509	1.0	21.11 m/s	0.2674 kPa
0.80 m	0.80	0.8382	5	3.00 m	12.75 m	0.8509	1.0	21.11 m/s	0.2674 kPa
0.40 m	0.80	0.8381	5	3.00 m	12.75 m	0.8509	1.0	21.11 m/s	0.2674 kPa
0.00 m	0.80	0.8380	5	3.00 m	12.75 m	0.8509	1.0	21.11 m/s	0.2674 kPa

SOUTH EAST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.80	0.8300	0	-	-	1.0	1.0	24.57 m/s	0.3622 kPa
3.60 m	0.80	0.8300	0	-	-	1.0	1.0	24.57 m/s	0.3622 kPa
3.20 m	0.80	0.8300	0	-	-	1.0	1.0	24.57 m/s	0.3622 kPa
2.80 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	21.95 m/s	0.2891 kPa
2.40 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	21.95 m/s	0.2891 kPa
2.00 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	21.95 m/s	0.2891 kPa
1.60 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	21.95 m/s	0.2891 kPa
1.20 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	21.95 m/s	0.2891 kPa
0.80 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	21.95 m/s	0.2891 kPa
0.40 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	21.95 m/s	0.2891 kPa
0.00 m	0.80	0.8300	2	3.00 m	15.85 m	0.8934	1.0	21.95 m/s	0.2891 kPa

SOUTH WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.85	0.8300	0	-	-	1.0	1.0	26.10 m/s	0.4087 kPa
3.60 m	0.85	0.8300	0	-	-	1.0	1.0	26.10 m/s	0.4087 kPa
3.20 m	0.85	0.8300	0	-	-	1.0	1.0	26.10 m/s	0.4087 kPa
2.80 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	25.12 m/s	0.3786 kPa
2.40 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	25.12 m/s	0.3786 kPa
2.00 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	25.12 m/s	0.3786 kPa
1.60 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	25.12 m/s	0.3786 kPa
1.20 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	25.12 m/s	0.3786 kPa
0.80 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	25.12 m/s	0.3786 kPa
0.40 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	25.12 m/s	0.3786 kPa
0.00 m	0.85	0.8300	1	3.00 m	12.65 m	0.9623	1.0	25.12 m/s	0.3786 kPa

SOUTH WEST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.95	0.8300	0	-	-	1.0	1.0	29.17 m/s	0.5105 kPa
3.60 m	0.95	0.8300	0	-	-	1.0	1.0	29.17 m/s	0.5105 kPa
3.20 m	0.95	0.8300	0	-	-	1.0	1.0	29.17 m/s	0.5105 kPa
2.80 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	24.58 m/s	0.3625 kPa
2.40 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	24.58 m/s	0.3625 kPa
2.00 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	24.58 m/s	0.3625 kPa
1.60 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	24.58 m/s	0.3625 kPa
1.20 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	24.58 m/s	0.3625 kPa
0.80 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	24.58 m/s	0.3625 kPa
0.40 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	24.58 m/s	0.3625 kPa
0.00 m	0.95	0.8300	4	3.00 m	16.40 m	0.8426	1.0	24.58 m/s	0.3625 kPa

WEST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	1.00	0.8300	0	-	-	1.0	1.0	30.71 m/s	0.5659 kPa
3.60 m	1.00	0.8300	0	-	-	1.0	1.0	30.71 m/s	0.5659 kPa
3.20 m	1.00	0.8300	0	-	-	1.0	1.0	30.71 m/s	0.5659 kPa
2.80 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	27.71 m/s	0.4607 kPa
2.40 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	27.71 m/s	0.4607 kPa
2.00 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	27.71 m/s	0.4607 kPa
1.60 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	27.71 m/s	0.4607 kPa
1.20 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	27.71 m/s	0.4607 kPa
0.80 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	27.71 m/s	0.4607 kPa
0.40 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	27.71 m/s	0.4607 kPa
0.00 m	1.00	0.8300	4	3.00 m	7.97 m	0.9023	1.0	27.71 m/s	0.4607 kPa

NORTH WEST WIND

RL	Md	Mz,cat	ns	hs	bs	Ms	Mt	Vsit,β	qz
4.00 m	0.95	0.8300	0	-	-	1.0	1.0	29.17 m/s	0.5105 kPa
3.60 m	0.95	0.8300	0	-	-	1.0	1.0	29.17 m/s	0.5105 kPa
3.20 m	0.95	0.8300	0	-	-	1.0	1.0	29.17 m/s	0.5105 kPa
2.80 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	24.92 m/s	0.3726 kPa
2.40 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	24.92 m/s	0.3726 kPa
2.00 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	24.92 m/s	0.3726 kPa
1.60 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	24.92 m/s	0.3726 kPa
1.20 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	24.92 m/s	0.3726 kPa
0.80 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	24.92 m/s	0.3726 kPa
0.40 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	24.92 m/s	0.3726 kPa
0.00 m	0.95	0.8300	4	3.00 m	14.04 m	0.8541	1.0	24.92 m/s	0.3726 kPa

----- EXTERNAL PRESSURES -----

LOAD CASE 01: Ultimate Wind

NORTH FACE

WALLS

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
Windward	All	1.0	0.7	0.53 kPa	0.53 kPa / 0.53 kPa
Leeward	All	1.0	-0.3907	-0.30 kPa	-0.30 kPa / -0.30 kPa
Side	0.00 m to 4.00 m	1.0	-0.65	-0.49 kPa	-0.49 kPa / -0.49 kPa
	4.00 m to 8.00 m	1.0	-0.5	-0.38 kPa	-0.38 kPa / -0.38 kPa
	8.00 m to 12.00 m	1.0	-0.3	-0.23 kPa	-0.23 kPa / -0.23 kPa
	12.00 m to 36.50 m	1.0	-0.2	-0.15 kPa	-0.15 kPa / -0.15 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
All Slopes	0.00 m to 4.00 m	1.0	-0.9000 / -0.4000	-0.68 kPa / -0.30 kPa	-0.68 kPa / -0.30 kPa
	4.00 m to 8.00 m	1.0	-0.5000 / 0.0000	-0.38 kPa / 0.00 kPa	-0.38 kPa / 0.00 kPa
	8.00 m to 12.00 m	1.0	-0.3000 / 0.1000	-0.23 kPa / 0.08 kPa	-0.23 kPa / 0.08 kPa
	12.00 m to 36.50 m	1.0	-0.2000 / 0.2000	-0.15 kPa / 0.15 kPa	-0.15 kPa / 0.15 kPa

EAST FACE

WALLS

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
Windward	All	1.0	0.7	0.38 kPa	0.38 kPa / 0.38 kPa
Leeward	All	1.0	-0.5	-0.27 kPa	-0.27 kPa / -0.27 kPa
Side	0.00 m to 4.00 m	1.0	-0.65	-0.36 kPa	-0.36 kPa / -0.36 kPa
	4.00 m to 8.00 m	1.0	-0.5	-0.27 kPa	-0.27 kPa / -0.27 kPa
	8.00 m to 12.00 m	1.0	-0.3	-0.16 kPa	-0.16 kPa / -0.16 kPa
	12.00 m to 23.60 m	1.0	-0.2	-0.11 kPa	-0.11 kPa / -0.11 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
All Slopes	0.00 m to 4.00 m	1.0	-0.9000 / -0.4000	-0.49 kPa / -0.22 kPa	-0.49 kPa / -0.22 kPa
	4.00 m to 8.00 m	1.0	-0.5000 / 0.0000	-0.27 kPa / 0.00 kPa	-0.27 kPa / 0.00 kPa
	8.00 m to 12.00 m	1.0	-0.3000 / 0.1000	-0.16 kPa / 0.05 kPa	-0.16 kPa / 0.05 kPa
	12.00 m to 23.60 m	1.0	-0.2000 / 0.2000	-0.11 kPa / 0.11 kPa	-0.11 kPa / 0.11 kPa

SOUTH FACE

WALLS

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
Windward	All	1.0	0.7	0.53 kPa	0.53 kPa / 0.53 kPa
Leeward	All	1.0	-0.3907	-0.30 kPa	-0.30 kPa / -0.30 kPa
Side	0.00 m to 4.00 m	1.0	-0.65	-0.49 kPa	-0.49 kPa / -0.49 kPa
	4.00 m to 8.00 m	1.0	-0.5	-0.38 kPa	-0.38 kPa / -0.38 kPa
	8.00 m to 12.00 m	1.0	-0.3	-0.23 kPa	-0.23 kPa / -0.23 kPa
	12.00 m to 36.50 m	1.0	-0.2	-0.15 kPa	-0.15 kPa / -0.15 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
All Slopes	0.00 m to 4.00 m	1.0	-0.9000 / -0.4000	-0.68 kPa / -0.30 kPa	-0.68 kPa / -0.30 kPa
	4.00 m to 8.00 m	1.0	-0.5000 / 0.0000	-0.38 kPa / 0.00 kPa	-0.38 kPa / 0.00 kPa
	8.00 m to 12.00 m	1.0	-0.3000 / 0.1000	-0.23 kPa / 0.08 kPa	-0.23 kPa / 0.08 kPa
	12.00 m to 36.50 m	1.0	-0.2000 / 0.2000	-0.15 kPa / 0.15 kPa	-0.15 kPa / 0.15 kPa

WEST FACE

WALLS

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
Windward	All	1.0	0.7	0.59 kPa	0.59 kPa / 0.59 kPa
Leeward	All	1.0	-0.5	-0.42 kPa	-0.42 kPa / -0.42 kPa
Side	0.00 m to 4.00 m	1.0	-0.65	-0.54 kPa	-0.54 kPa / -0.54 kPa
	4.00 m to 8.00 m	1.0	-0.5	-0.42 kPa	-0.42 kPa / -0.42 kPa
	8.00 m to 12.00 m	1.0	-0.3	-0.25 kPa	-0.25 kPa / -0.25 kPa
	12.00 m to 23.60 m	1.0	-0.2	-0.17 kPa	-0.17 kPa / -0.17 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
All Slopes	0.00 m to 4.00 m	1.0	-0.9000 / -0.4000	-0.75 kPa / -0.33 kPa	-0.75 kPa / -0.33 kPa
	4.00 m to 8.00 m	1.0	-0.5000 / 0.0000	-0.42 kPa / 0.00 kPa	-0.42 kPa / 0.00 kPa
	8.00 m to 12.00 m	1.0	-0.3000 / 0.1000	-0.25 kPa / 0.08 kPa	-0.25 kPa / 0.08 kPa
	12.00 m to 23.60 m	1.0	-0.2000 / 0.2000	-0.17 kPa / 0.17 kPa	-0.17 kPa / 0.17 kPa

LOAD CASE 02: Serviceability Wind

NORTH FACE

WALLS

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet

Windward	All	1.0	0.7	0.36 kPa	0.36 kPa / 0.36 kPa
Leeward	All	1.0	-0.3907	-0.20 kPa	-0.20 kPa / -0.20 kPa
Side	0.00 m to 4.00 m	1.0	-0.65	-0.33 kPa	-0.33 kPa / -0.33 kPa
	4.00 m to 8.00 m	1.0	-0.5	-0.26 kPa	-0.26 kPa / -0.26 kPa
	8.00 m to 12.00 m	1.0	-0.3	-0.15 kPa	-0.15 kPa / -0.15 kPa
	12.00 m to 36.50 m	1.0	-0.2	-0.10 kPa	-0.10 kPa / -0.10 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
All Slopes	0.00 m to 4.00 m	1.0	-0.9000 / -0.4000	-0.46 kPa / -0.20 kPa	-0.46 kPa / -0.20 kPa
	4.00 m to 8.00 m	1.0	-0.5000 / 0.0000	-0.26 kPa / 0.00 kPa	-0.26 kPa / 0.00 kPa
	8.00 m to 12.00 m	1.0	-0.3000 / 0.1000	-0.15 kPa / 0.05 kPa	-0.15 kPa / 0.05 kPa
	12.00 m to 36.50 m	1.0	-0.2000 / 0.2000	-0.10 kPa / 0.10 kPa	-0.10 kPa / 0.10 kPa

EAST FACE

WALLS

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
Windward	All	1.0	0.7	0.26 kPa	0.26 kPa / 0.26 kPa
Leeward	All	1.0	-0.5	-0.19 kPa	-0.19 kPa / -0.19 kPa
Side	0.00 m to 4.00 m	1.0	-0.65	-0.24 kPa	-0.24 kPa / -0.24 kPa
	4.00 m to 8.00 m	1.0	-0.5	-0.19 kPa	-0.19 kPa / -0.19 kPa
	8.00 m to 12.00 m	1.0	-0.3	-0.11 kPa	-0.11 kPa / -0.11 kPa
	12.00 m to 23.60 m	1.0	-0.2	-0.07 kPa	-0.07 kPa / -0.07 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
All Slopes	0.00 m to 4.00 m	1.0	-0.9000 / -0.4000	-0.33 kPa / -0.15 kPa	-0.33 kPa / -0.15 kPa
	4.00 m to 8.00 m	1.0	-0.5000 / 0.0000	-0.19 kPa / 0.00 kPa	-0.19 kPa / 0.00 kPa
	8.00 m to 12.00 m	1.0	-0.3000 / 0.1000	-0.11 kPa / 0.04 kPa	-0.11 kPa / 0.04 kPa
	12.00 m to 23.60 m	1.0	-0.2000 / 0.2000	-0.07 kPa / 0.07 kPa	-0.07 kPa / 0.07 kPa

SOUTH FACE

WALLS

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
Windward	All	1.0	0.7	0.36 kPa	0.36 kPa / 0.36 kPa
Leeward	All	1.0	-0.3907	-0.20 kPa	-0.20 kPa / -0.20 kPa
Side	0.00 m to 4.00 m	1.0	-0.65	-0.33 kPa	-0.33 kPa / -0.33 kPa
	4.00 m to 8.00 m	1.0	-0.5	-0.26 kPa	-0.26 kPa / -0.26 kPa
	8.00 m to 12.00 m	1.0	-0.3	-0.15 kPa	-0.15 kPa / -0.15 kPa
	12.00 m to 36.50 m	1.0	-0.2	-0.10 kPa	-0.10 kPa / -0.10 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
All Slopes	0.00 m to 4.00 m	1.0	-0.9000 / -0.4000	-0.46 kPa / -0.20 kPa	-0.46 kPa / -0.20 kPa
	4.00 m to 8.00 m	1.0	-0.5000 / 0.0000	-0.26 kPa / 0.00 kPa	-0.26 kPa / 0.00 kPa
	8.00 m to 12.00 m	1.0	-0.3000 / 0.1000	-0.15 kPa / 0.05 kPa	-0.15 kPa / 0.05 kPa
	12.00 m to 36.50 m	1.0	-0.2000 / 0.2000	-0.10 kPa / 0.10 kPa	-0.10 kPa / 0.10 kPa

WEST FACE

WALLS

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
Windward	All	1.0	0.7	0.40 kPa	0.40 kPa / 0.40 kPa
Leeward	All	1.0	-0.5	-0.28 kPa	-0.28 kPa / -0.28 kPa
Side	0.00 m to 4.00 m	1.0	-0.65	-0.37 kPa	-0.37 kPa / -0.37 kPa
	4.00 m to 8.00 m	1.0	-0.5	-0.28 kPa	-0.28 kPa / -0.28 kPa
	8.00 m to 12.00 m	1.0	-0.3	-0.17 kPa	-0.17 kPa / -0.17 kPa
	12.00 m to 23.60 m	1.0	-0.2	-0.11 kPa	-0.11 kPa / -0.11 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	Ka	Cp,e	pe	pnet
All Slopes	0.00 m to 4.00 m	1.0	-0.9000 / -0.4000	-0.51 kPa / -0.23 kPa	-0.51 kPa / -0.23 kPa
	4.00 m to 8.00 m	1.0	-0.5000 / 0.0000	-0.28 kPa / 0.00 kPa	-0.28 kPa / 0.00 kPa
	8.00 m to 12.00 m	1.0	-0.3000 / 0.1000	-0.17 kPa / 0.06 kPa	-0.17 kPa / 0.06 kPa
	12.00 m to 23.60 m	1.0	-0.2000 / 0.2000	-0.11 kPa / 0.11 kPa	-0.11 kPa / 0.11 kPa

----- LOCAL PRESSURES -----

LOAD CASE 01: Ultimate Wind

NORTH FACE

WALLS

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kl	Cfig,e	pe	pnet
Windward	All	WA1	4.00 m²	1.5	1.0500	0.79 kPa	0.79 kPa
Side	0.00 m to 4.00 m	SA1	16.00 m²	1.5	-0.9750	-0.74 kPa	-0.74 kPa
	0.00 m to 2.00 m	SA2	4.00 m²	2.0	-1.3000	-0.98 kPa	-0.98 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kr	Kl	Cfig,e	pe	pnet

Upwind Edges	0.00 m to 4.00 m	RA1	16.00 m²	1.0000	1.5	-1.3500	-1.02 kPa	-1.02 kPa
	0.00 m to 2.00 m	RA2	4.00 m²	1.0000	2.0	-1.8000	-1.36 kPa	-1.36 kPa
Upwind Corners	0.00 m to 4.00 m	RC1	4.00 m²	1.0000	3.0	-2.7000	-2.04 kPa	-2.04 kPa

EAST FACE

WALLS

SURFACE	DISTANCE FROM EDGE	REF	AREA		Kl	Cfig,e	pe	pnet
Windward	All	WA1	4.00 m²		1.5	1.0500	0.57 kPa	0.57 kPa
Side	0.00 m to 4.00 m	SA1	16.00 m²		1.5	-0.9750	-0.53 kPa	-0.53 kPa
	0.00 m to 2.00 m	SA2	4.00 m²		2.0	-1.3000	-0.71 kPa	-0.71 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kr	Kl	Cfig,e	pe	pnet
Upwind Edges	0.00 m to 4.00 m	RA1	16.00 m²	1.0000	1.5	-1.3500	-0.74 kPa	-0.74 kPa
	0.00 m to 2.00 m	RA2	4.00 m²	1.0000	2.0	-1.8000	-0.99 kPa	-0.99 kPa
Upwind Corners	0.00 m to 4.00 m	RC1	4.00 m²	1.0000	3.0	-2.7000	-1.48 kPa	-1.48 kPa

SOUTH FACE

WALLS

SURFACE	DISTANCE FROM EDGE	REF	AREA		Kl	Cfig,e	pe	pnet
Windward	All	WA1	4.00 m²		1.5	1.0500	0.79 kPa	0.79 kPa
Side	0.00 m to 4.00 m	SA1	16.00 m²		1.5	-0.9750	-0.74 kPa	-0.74 kPa
	0.00 m to 2.00 m	SA2	4.00 m²		2.0	-1.3000	-0.98 kPa	-0.98 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kr	Kl	Cfig,e	pe	pnet
Upwind Edges	0.00 m to 4.00 m	RA1	16.00 m²	1.0000	1.5	-1.3500	-1.02 kPa	-1.02 kPa
	0.00 m to 2.00 m	RA2	4.00 m²	1.0000	2.0	-1.8000	-1.36 kPa	-1.36 kPa
Upwind Corners	0.00 m to 4.00 m	RC1	4.00 m²	1.0000	3.0	-2.7000	-2.04 kPa	-2.04 kPa

WEST FACE

WALLS

SURFACE	DISTANCE FROM EDGE	REF	AREA		Kl	Cfig,e	pe	pnet
Windward	All	WA1	4.00 m²		1.5	1.0500	0.88 kPa	0.88 kPa
Side	0.00 m to 4.00 m	SA1	16.00 m²		1.5	-0.9750	-0.82 kPa	-0.82 kPa
	0.00 m to 2.00 m	SA2	4.00 m²		2.0	-1.3000	-1.09 kPa	-1.09 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kr	Kl	Cfig,e	pe	pnet
Upwind Edges	0.00 m to 4.00 m	RA1	16.00 m²	1.0000	1.5	-1.3500	-1.13 kPa	-1.13 kPa
	0.00 m to 2.00 m	RA2	4.00 m²	1.0000	2.0	-1.8000	-1.51 kPa	-1.51 kPa
Upwind Corners	0.00 m to 4.00 m	RC1	4.00 m²	1.0000	3.0	-2.7000	-2.26 kPa	-2.26 kPa

LOAD CASE 02: Serviceability Wind

NORTH FACE

WALLS

SURFACE	DISTANCE FROM EDGE	REF	AREA		Kl	Cfig,e	pe	pnet
Windward	All	WA1	4.00 m²		1.5	1.0500	0.54 kPa	0.54 kPa
Side	0.00 m to 4.00 m	SA1	16.00 m²		1.5	-0.9750	-0.50 kPa	-0.50 kPa
	0.00 m to 2.00 m	SA2	4.00 m²		2.0	-1.3000	-0.66 kPa	-0.66 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kr	Kl	Cfig,e	pe	pnet
Upwind Edges	0.00 m to 4.00 m	RA1	16.00 m²	1.0000	1.5	-1.3500	-0.69 kPa	-0.69 kPa
	0.00 m to 2.00 m	RA2	4.00 m²	1.0000	2.0	-1.8000	-0.92 kPa	-0.92 kPa
Upwind Corners	0.00 m to 4.00 m	RC1	4.00 m²	1.0000	3.0	-2.7000	-1.38 kPa	-1.38 kPa

EAST FACE

WALLS

SURFACE	DISTANCE FROM EDGE	REF	AREA		Kl	Cfig,e	pe	pnet
Windward	All	WA1	4.00 m²		1.5	1.0500	0.39 kPa	0.39 kPa
Side	0.00 m to 4.00 m	SA1	16.00 m²		1.5	-0.9750	-0.36 kPa	-0.36 kPa
	0.00 m to 2.00 m	SA2	4.00 m²		2.0	-1.3000	-0.48 kPa	-0.48 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kr	Kl	Cfig,e	pe	pnet
Upwind Edges	0.00 m to 4.00 m	RA1	16.00 m²	1.0000	1.5	-1.3500	-0.50 kPa	-0.50 kPa
	0.00 m to 2.00 m	RA2	4.00 m²	1.0000	2.0	-1.8000	-0.67 kPa	-0.67 kPa
Upwind Corners	0.00 m to 4.00 m	RC1	4.00 m²	1.0000	3.0	-2.7000	-1.00 kPa	-1.00 kPa

SOUTH FACE

WALLS

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kl	Cfig,e	pe	pnet
Windward	All	WA1	4.00 m²	1.5	1.0500	0.54 kPa	0.54 kPa
Side	0.00 m to 4.00 m	SA1	16.00 m²	1.5	-0.9750	-0.50 kPa	-0.50 kPa
	0.00 m to 2.00 m	SA2	4.00 m²	2.0	-1.3000	-0.66 kPa	-0.66 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kr	Kl	Cfig,e	pe	pnet
Upwind Edges	0.00 m to 4.00 m	RA1	16.00 m²	1.0000	1.5	-1.3500	-0.69 kPa	-0.69 kPa
	0.00 m to 2.00 m	RA2	4.00 m²	1.0000	2.0	-1.8000	-0.92 kPa	-0.92 kPa
Upwind Corners	0.00 m to 4.00 m	RC1	4.00 m²	1.0000	3.0	-2.7000	-1.38 kPa	-1.38 kPa

WEST FACE

WALLS

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kl	Cfig,e	pe	pnet
Windward	All	WA1	4.00 m²	1.5	1.0500	0.59 kPa	0.59 kPa
Side	0.00 m to 4.00 m	SA1	16.00 m²	1.5	-0.9750	-0.55 kPa	-0.55 kPa
	0.00 m to 2.00 m	SA2	4.00 m²	2.0	-1.3000	-0.74 kPa	-0.74 kPa

ROOF

SURFACE	DISTANCE FROM EDGE	REF	AREA	Kr	Kl	Cfig,e	pe	pnet
Upwind Edges	0.00 m to 4.00 m	RA1	16.00 m²	1.0000	1.5	-1.3500	-0.76 kPa	-0.76 kPa
	0.00 m to 2.00 m	RA2	4.00 m²	1.0000	2.0	-1.8000	-1.02 kPa	-1.02 kPa
Upwind Corners	0.00 m to 4.00 m	RC1	4.00 m²	1.0000	3.0	-2.7000	-1.53 kPa	-1.53 kPa

----- REFERENCES -----

[1] American Association of State Highway and Transportation Officials (AASHTO) 2019, 'LRFD LTS-1 LRFD Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals'.

[2] American Society of Civil Engineers (ASCE) 2014, 'ASCE/SEI 7-10 Minimum Design Loads and Associated Criteria for Buildings and Other Structures'.

[3] American Society of Civil Engineers (ASCE) 2017, 'ASCE/SEI 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other Structures'.

[4] Australasian Wind Engineering Society (AWES) 2012, 'Wind Loadings Handbook for Australia and New Zealand Background to AS/NZS 1170.2 Wind Actions'.

[5] Bureau of Indian Standards 2015, 'IS 875 (Part 3): 2015 Design Loads (Other than Earthquake) for Buildings and Structures - Code of Practice Part 3 Wind Loads (Third Revision)'.

[6] Standards Australia/Standards New Zealand 2007, 'AS/NZS 1170.3:2003 Structural design actions Part 3: Snow and ice actions'.

[7] Standards Australia/Standards New Zealand 2009, 'AS/NZS 1170.1:2002 Structural design actions Part 1: Permanent, imposed and other actions'.

[8] Standards Australia/Standards New Zealand 2011, 'AS/NZS 1170.0:2002 Structural design actions Part 0: General principles'.

[9] Standards Australia/Standards New Zealand 2017, 'AS/NZS 1170.2:2011 Structural design actions Part 2: Wind actions'.

[10] Telecommunications Industry Association 2014, 'TIA-222-G-2 Structural Standard for Antenna Supporting Structures and Antennas'.

[11] Telecommunications Industry Association 2019, 'TIA-222-H-1 Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures'.