

EXAMPLE 2: REGION B (NON-CYCLONIC)

BUILDING DESCRIPTION

- The project is a 6 m x 6 m x 3.0 m high double garage with twin roller doors, in the vicinity of a house on a 1000 m² allotment in suburban outer Brisbane, less than 100 km from the coast. The precinct is fully developed with housing and associated buildings and structures. The building will be used for the garaging of private vehicles and other domestic activities such as workshop and storage. As a domestic building, it is likely that the main roller doors of the building will be closed during high winds.
 - *The building is not a dwelling, but its use is associated with domestic purposes.*
 - *The NCC Classification of the building is 10a, which is appropriate for a non-habitable shed, garage or carport. There are no structural implications of this classification.*
 - *The building doors may be assumed closed during peak wind events. Internal pressure consistent with dwellings may be used for structural design.*

SITE FACTORS

- Check region with Council.
 - *The Council has confirmed in writing that the allotment on which the proposed garage will be built is located in Region B, as defined in AS 1170.2.*
- The consequences of structural failure are considered to be *moderate* in terms of human hazard (because the building is associated with domestic use) and *moderate* in terms of impact on the public (because the allotment is in a residential zone).
 - *Importance Level 2 is assigned – this is consistent with residential outbuildings generally. Importance Level 1 can only be justified if both hazard and impact of failure are low.*
 - *Importance Level 2 requires an annual probability of exceedance for wind events of 1:500.*
- The exact orientation of the building and roller door orientation are not design factors for an enclosed building in Region B.
 - *For Region B, a wind direction multiplier of 0.95 is applied.*
- The general terrain of the property precinct is *suburban housing* in all directions. There is no reason to believe it would be redeveloped in any direction for non-housing purposes.
 - *The terrain is Category 3 with no change anticipated. A terrain/height multiplier of 0.83 is appropriate.*
- The proposed garage is well shielded by the house and other dwellings on adjoining blocks, with typically about 10 buildings in each direction. It appears to be worthwhile to consider the effects of shielding.
 - *Evaluate shielding parameter (s) from AS/NZS 1170.2 Clause 4.3.3:*
 - *Average height of shielding buildings (h_s) is about 4 m.*
 - *Average breadth of shielding buildings (b_s) is about 9 m.*
 - *Roof height of garage being shielded (h) is 3 m.*
 - *Number of upwind shielding buildings (n_s) is about 10.*
 - *Shielding parameter $s = (3 \times (10/10 + 5))/(4 \times 9)^{0.5} = 3.0$*
 - *Look up shielding multiplier in Table 4.3, $M_s = 0.8$*
- The site and surrounding geography are essentially flat and level.
 - *There is no reason to apply a topographic factor higher than 1.0.*
- The steps in calculation of site wind speed are:
 - *Look up regional wind speed for region B and 1:500, $V_R = 57$*



- Wind directional multiplier for region B, $M_d = 0.95$
- Look up terrain/height multiplier $M_{z, cat} = 0.83$
- Look up shielding multiplier $M_s = 0.8$
- Look up topography multiplier $M_t = 1.0$
- Calculate $= V_R \times M_d \times M_{z, cat} \times M_s \times M_t$
- Value for this example, $V_{sit} = 57 \times 0.95 \times 0.83 \times 0.8 \times 1.0 = 36 \text{ m/s}$
- In this case, as the building orientation is irrelevant this is also the design wind speed V_{des}
- The calculated design wind speed is then used to calculate the design wind pressures acting on various parts of the structure in accordance with AS/NZS 1170.2 Clause 2.4.



DESIGN INFORMATION – Sheds and garages – Example 2			
Pro-forma request for design information by building certifier if design information supplied by shed supplier is inadequate			
LINE	ITEM	DESIGN VALUE	NOTES
Compliance details			
1	Shed supplier		
2	Structural designer		
3	Certifying authority		
Building details			
4	Building description	Supplied	Owner
5	Specification reference and date	Supplied	Owner
6	Owner's stated intended use	Machinery shed	Owner
7	NCC classification	10a	NCC
8	Length (m)	6.0 m	Owner's plans
9	Width (m)	6.0 m	Owner's plans
10	Height – maximum (m)	3.0 m	Owner's plans
11	Height to eave (m)	2.4 m	Owner's plans
12	Roof pitch (degrees)	20 deg	AS/NZS 1170.2, Tables 5.1A&B & 5.2A&B
13	Internal pressure coefficient	+ 0.2	AS/NZS 1170.2, Tables 5.3A, B & C
14	Average C_{pe} roof	- 0.7	AS/NZS 1170.2, Tables 5.2A, B & C
15	Average C_{pe} walls	+ 0.7, - 0.5	AS/NZS 1170.2, Table 5.6
16	Local pressure effects applied?	Yes	
Site details			
17	Site address		
18	Site plan reference and date	Supplied	Owner
19	Wind region	B	Council
20	Importance level	2	NCC Guide and Volume 1
21	Annual probability of exceedance for wind	1:500	NCC Volume 1 Table 1.2b
22	Cyclonic factor (F_C , F_D) (if applicable)	N/A	AS/NZS 1170.2 Clause 3.4
23	Regional wind speed (V_R)	57 m/s	AS/NZS 1170.2, Table 3.1
24	Wind direction multiplier	0.95	AS/NZS 1170.2, Table 3.2
25	Terrain category	3	AS/NZS 1170.2, Clause 4.2.1
26	Terrain-height multiplier	0.83	AS/NZS 1170.2, Table 4.1
27	Shielding multiplier	0.8	AS/NZS 1170.2, Clause 4.3
28	Topographic multiplier	1.07	AS/NZS 1170.2, Clause 4.4
29	Site wind speed (V_{sit})	36 m/s	AS/NZS 1170.2, Clause 2.2
30	Design wind speed (V_{des})	36 m/s	AS/NZS 1170.2, Clause 2.2



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