

TECHNICAL REFERENCE INTRODUCTION

"Building products beyond the standards"

SINCE OUR BEGINNING IN 1997, WE HAVE DEVELOPED A RANGE OF WINDOW AND DOOR PRODUCTS THAT ARE INNOVATIVE, FUNCTIONAL AND STYLISH.

Wintec Systems windows and doors are an all Australian designed and manufactured product, with modern designs and quality finish at the forefront of the Wintec Systems philosophy.

Wintec Systems have products to suit all areas in Australia, consisting of: Sliding windows, Sliding doors, Awning windows, Casement windows, Double Hung windows, Louvre windows, Sliding Multitrack door, Hinged doors, Bi-fold doors, Commercial shop front system, Balustrade, Shower screens and an Aluminium cladding system.

Wintec Systems designed products are tested to Australian Standard AS2047 in NATA accredited laboratory 14093. This ensures all windows and doors comply with the Building Code of Australia.

Due to the vast difference in performance requirements in different wind zones across Australia it is imperative that the correct combination of structural members (mullions and transoms) are used

in the window construction. Along with this is the correct type and thickness of glass that must be used to withstand the relevant wind pressure.

This guide has been developed to assist with the selection of windows and doors suitable for use in all wind zones across Australia.

The guide is separated into ten specific Wind Zone chapters from N1 to N6 and C1 to C4. Each chapter is then separated into the different product types; sliding window, sliding door etc. Within each product type are four pages outlining the performance requirements and available size in four Wind Zone sub-categories.

THE FOUR SUB-CATEGORIES ARE:

1. General - non exposed
2. General - exposed
3. Corner - non exposed
4. Corner - exposed

Definitions of corner and exposed windows are shown on the following pages in publications from the Australian Window Association.

KEY MESSAGE

GUIDE TO EXTERNAL CORNER WINDOW AND DOOR PRESSURES IN HOUSING - AS 2047:2014

AS 2047 was re-published in 2014 to align wind pressures for housing, including cyclonic regions, with AS 4055 Wind Loads for Housing. One significant change is the requirement to consider higher performing windows in external corner situations.

CORNER ZONES AND WIND PRESSURE

As wind flows over, and around a building, it exerts pressure on the building itself, creating high pressure on the windward side, and low pressure (suction) on the downwind side.

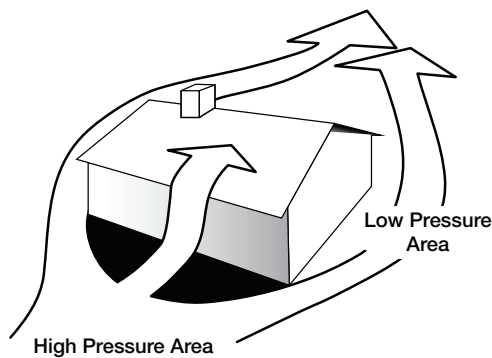


Figure 1 Airflow around a House.

These pressure differentials can be significantly higher near the corners of the building. As wind velocity increases at the leading edge, vortices are produced on the leeward side. It is therefore important that windows and doors situated near corners be capable of withstanding the higher wind loads encountered.

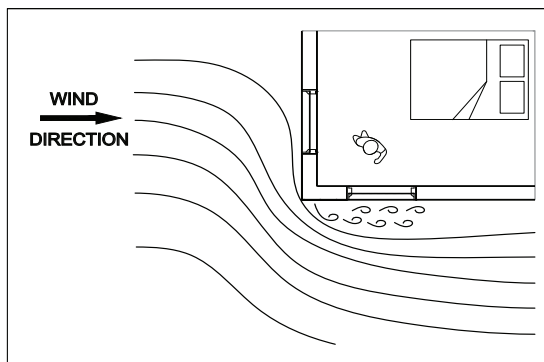


Figure 2 Airflow Around a Corner Zone.

Corner Zones, (shown in red in **Figure 3**) occur where walls intersect at an angle of less than 135 degrees (as measured from the inside of the building) .

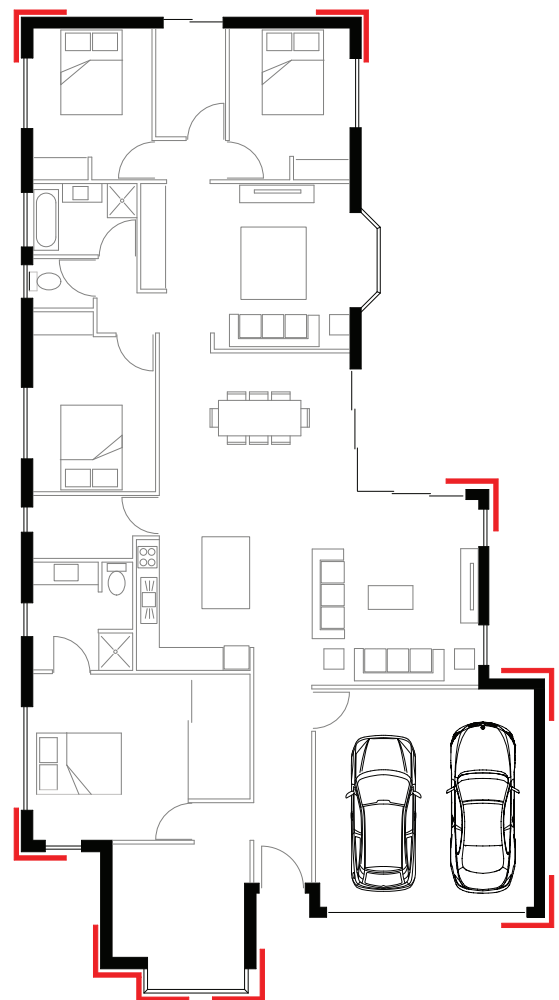


Figure 3 Corner Zones.

KEY MESSAGE

GUIDE TO EXTERNAL CORNER WINDOW AND DOOR PRESSURES IN HOUSING - AS 2047:2014

WHAT IS A CORNER WINDOW?

Corner windows and doors are defined as having 25% or more of **any** panel or pane within 1200 mm of an external corner of the building.

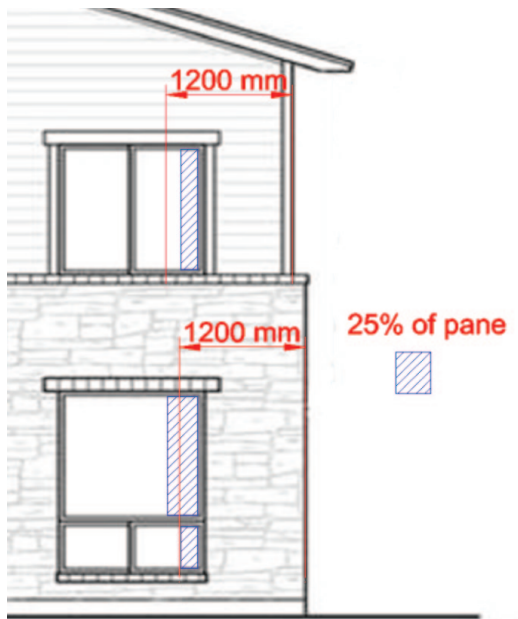


Figure 4 Corner Windows.

Both windows, as shown above in **Figure 4**, have 25% or more of a pane within the corner zone.

IMPORTANT NOTE:

The provisions in this Key Message relate to HOUSING as defined in AS 4055. The wind load requirements for residential and commercial buildings may be different and are determined by the building designer.

DISCLAIMER:

This key message has been developed to provide general guidance, awareness and education to AWA members only. It should not be viewed as a definitive guide and should be read in conjunction with AS 2047:2014 and AS 4055:2012. Whilst every effort has been made to ensure the information is accurate the AWA expressly disclaims all and any liability to any person for anything done in reliance on this publication. No responsibility is accepted by the AWA for any mistakes, errors or omissions in this publication.

SLS & ULS FOR CORNER WINDOWS

Serviceability and Ultimate Limit State pressures for houses are nominated in AS 2047 and are summarised in **Table 1**.

Table 1 Window Rating Test Pressures.

Window Rating	Serviceability Limit State (SLS) Pressure, Pa		Ultimate Limit State (ULS) Pressure, Pa	
	General	Corner	General	Corner
N1	400	600	600	900
N2	400	600	900	1300
N3	600	800	1400	2000
N4	800	1200	2000	3000
N5	1200	1800	3000	4500
N6	1600	2500	4000	6000
C1	600	800	1800	2700
C2	800	1200	2700	4000
C3	1200	1800	4000	4900
C4	1600	2500	5300	8000

KEY MESSAGE

GUIDE TO EXPOSED SITES FOR HOUSING

AS 2047:2014

AS 2047 was re-published in 2014 and updated to ensure alignment with AS 4055 Wind Loads for Housing. One significant difference with this change is the requirement to consider windows with higher water penetration resistance for exposed locations.

DEFINITION OF EXPOSED SITE

AS 2047:2014 Clause 1.3.7 defines an exposed site as a site where one or more of the following AS 4055 site conditions are met:

a) Terrain category TC2 or less.

The site of a house is given a Terrain Category TC1 to TC3 which takes into account the number of obstructions within a radius of 500 metres, such as trees and houses, which can substantially reduce wind speed.

A site is considered as exposed when located in open terrain with few or no permanent obstructions including

Figure 1 Enclosed Water Surfaces. Includes rivers, canals, lakes and enclosed bays, extending more than 200m



Figure 2 Open Water & Oceans.



Figure 3 Farmland and Flat Plains.



b) Topographic class T3 or greater.

A house site located on a hill, ridge or escarpment experiences different average wind speeds depending on the height and steepness of the incline and whether the house is located near the base, middle or top.

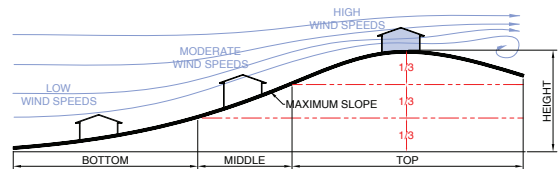


Figure 4 Topographic Class Diagram

Topographic Class T3 and higher applies when the site is located on the top third of a hill or escarpment that

- has a maximum slope greater than 1:3 or 18.4° (and includes the over the top zone which extends 4 times the height of an escarpment).
- is between 10m and 30m high with a maximum slope greater than 1:5 or 11.3°.
- is greater than 30m high with a maximum slope greater than 1:7.5 or 7.6°.

Table 1 Topographic Class Definitions

Maximum Slope	Top Third Zone (height in metres)			Over the Top Zone
	< 10m	<30m	>30m	
>1:7.5 (7.6°)	T2	T2	T3	T1
>1:5 (11.3°)	T2	T3	T4	T2
>1:3 (18.4°)	T3	T4	T5	T3

KEY MESSAGE

GUIDE TO EXPOSED SITES FOR HOUSING

AS 2047:2014

c) No Shielding

Shielding affects wind speed. It is also dependant on the number and size of obstructions, but is a more local effect than is considered when assessing the terrain category.

No shielding shall apply where there are no permanent obstructions (which are of a similar size to the house) to impede wind speed or where there are less than 2.5 obstructions per hectare, such as the row of houses or single houses abutting open parklands, open water or airfields.

If the window is protected from driving rain by elements of the building such as a wide veranda, a lower level of water penetration resistance may be specified in the design as part of an alternative solution.



Figure 5 Exposed House.

Site Classification must be conducted by a suitably qualified person in accordance with the methodologies outlined in AS 4055:2012. Nomination of window ratings or design wind pressures for each window and door assembly should be provided by the purchaser or building designer and include exposure classification.

IMPORTANT NOTE:

The provisions shown in this Key Message relate to HOUSING as defined in AS 4055. The water penetration requirements for residential and commercial buildings are different and are required to perform to a minimum of 30% of the positive Serviceability as nominated by the building designer.

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WHAT ARE THE NEW REQUIREMENTS?

Clause 2.3.1.6 of AS2047

If a building is in an exposed site and is likely to be subjected to driving rain, the exposed level of water penetration resistance should be specified in the design.

The exposed levels of water penetration resistance are further defined in **Table 2**.

Table 2 Water Penetration Resistance Test Pressures

Rating	Non-exposed (Pa)	Exposed (Pa)
N1, N2	150	200
N3, C1	150	300
N4, C2	200	300
N5, C3	300	450
N6, C4	450	600