

Wind impacts in apartment developments

Planning Practice Note 93

December 2021

This Practice Note provides guidance on the requirements of Clause 58.04-4 which relate to wind impacts for an apartment development of five or more storeys.

Wind impacts and apartment buildings

New apartment developments in established urban areas are typically taller than surrounding buildings. Taller buildings intensify windy conditions which can adversely affect pedestrian safety and comfort and impact the amenity of outdoor areas including the public domain and private and communal outdoor open spaces.

An area may also have naturally high wind conditions and a new apartment building may intensify wind speeds at pedestrian level.

The following aspects of a site and the design of a building should be considered in determining the likely wind impacts:

- Prevailing local wind conditions
- Exposure of the site to wind
- Proposed scale and shape of the building with relation to surrounding built form context.

Addressing wind impacts in the planning scheme

Under the requirements of Clause 58.04-4 Wind impacts, a planning permit application for an apartment building of five or more storeys must consider wind impacts and demonstrate that the proposal satisfies the following objective:

To ensure the design and layout of development does not generate unacceptable wind impacts within the site or on surrounding land.

What does the Wind Impacts standard require?

The standard requires an assessment of wind impacts and the level of wind speed to be achieved to ensure both safety and comfort for pedestrians and people using outdoor areas.



Assessment distance

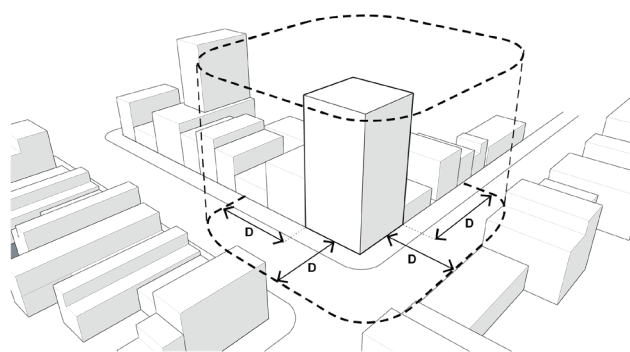
Wind impact assessments of proposed developments are required to consider impacts on all outdoor areas, including the public domain and private and communal open spaces, within a distance 'D' from the building.

The assessment distance for the building is the distance defined by the greater of either:

- half the longest width of the building or
- half the overall height of the building.

The assessment distance is measured from the external façade of the building at the ground floor.

Figure 1: Example of the application of the assessment distance in perspective view



**ASSESSMENT DISTANCE D = GREATER OF:
L/2 (HALF LONGEST WIDTH OF BUILDING) OR
H/2 (HALF OVERALL HEIGHT OF BUILDING)**

Safe and comfortable wind conditions

Safe and comfortable wind conditions are defined by thresholds to be achieved in Clause 58.04-4.

The standard seeks to achieve levels of wind speed to ensure an adequate level of public safety in proximity to the building in all outdoor areas and to ensure that comfortable wind conditions are provided in publicly accessible outdoor areas.

Safe conditions

Safe conditions are those that allow a person to safely walk and stand in gusty winds. The standard establishes a minimum level of safety for pedestrians and people using surrounding open spaces by establishing a threshold at which wind impacts become 'unsafe'.

All public land, publicly accessible areas on private land, private open space and communal open space, within the assessment distance should achieve this 'safe' wind condition.

Comfortable conditions

Comfortable wind conditions are those that allow a person to comfortably sit, stand or walk without being unduly impacted by wind. The standard seeks to ensure a maximum level of wind speed to allow comfortable conditions for sitting, standing and walking on public land, and in publicly accessible areas on private land.

Private open spaces do not require assessment against the comfortable wind criteria as a private resident can choose to retreat indoors during uncomfortable wind conditions while a pedestrian or person using a public area may not have this option.



Addressing wind impacts in an application for an apartment development of five or more storeys

A planning permit application for an apartment development of five or more storeys must consider potential wind impacts and the likely extent of wind impacts of the proposed building on outdoor areas within the assessment distance.

This consideration should draw on the site conditions described in the urban context report and any related design features should be reflected within the design response submitted with the application.

Types of wind impact assessment

An assessment from a suitably qualified wind engineer may be required to demonstrate that the wind impacts objective has been met. The assessment could take the form of a wind impact assessment.

Wind impact assessment

A wind impact assessment is a written report provided by a suitably qualified wind engineer. It should include diagrams, a statistical wind climate model of wind speed data, an assessment of wind speeds of the site for safety, and sitting, standing and walking comfort levels, identification of building design trouble spots and possible design adjustments to satisfy the requirements of Clause 58.04-4.

The wind impact assessment may also indicate whether wind tunnel modelling is recommended.

Wind tunnel modelling study

A wind tunnel modelling study will utilise a scale model of the building to quantify wind impacts around a building from typically at least 16 wind directions. Wind tunnel modelling is used on larger developments where the local wind conditions, the scale and shape of the proposed building(s) and the potential wind interactions with the adjacent built form have the potential to generate unacceptable wind conditions.

Under this study, areas defined by the assessment distance must be tested for safety and acceptable comfort levels. Where unacceptable safety or comfort levels are found, design adjustments are made and retested as needed. This modelling should be conducted in accordance with the Australasian Wind Engineering Society's (AWES) 'Wind Engineering Studies of Buildings Quality Assurance Manual'.



Steps in preparing an application

There are some key steps when preparing a planning permit application for an apartment development that needs to consider wind impacts:

1. Consider if the apartment development design is likely to cause adverse wind impacts

It is preferable to ascertain early in the design process whether wind impacts are likely to be an issue for an apartment development proposal. The architect, building designer or wind engineer can all advise on whether the design is likely to cause adverse wind impacts.

In doing so it is important to reflect on the prevailing wind conditions for the site and whether the surrounding built form will provide any shielding from the wind. If the building is typically no more than twice the height of the surrounding built form it may be shielded from the wind.

Some locations, such as in the central city, have complex wind patterns and special consideration of wind impacts must be paid in these locations.

Where an application is being prepared as part of a broader precinct development, any assessment of wind impacts for an individual building should take into consideration the built form of any other previously approved buildings within the assessment distance of the subject site.

2. Seek professional advice from a wind engineer

Where wind impacts are likely to be an issue for an apartment development, a wind engineer should be engaged. The wind engineer can provide design advice on how to mitigate the impact of wind on the outdoor areas around the building, so they are safe and comfortable for pedestrians and residents.

3. Talk to the responsible authority

The permit applicant should discuss the application with the responsible authority as early as possible. This discussion may reveal further issues that need to be resolved, such as other built form controls that may need to be taken into consideration when designing the basic massing of the building.

4. Respond to the professional advice

The building design should be refined in response to the design advice provided by the wind engineer and the responsible authority.

The wind engineer may prepare a wind impact assessment advising of any design changes required to mitigate any likely adverse wind impacts. For larger projects and those in more complex wind environments, such as the central city, the wind engineer may recommend that wind tunnel modelling is undertaken instead of a wind impact assessment to assess the likely impact of the proposed building.

Finding the best building design solution to mitigate the impact of wind on surrounding outdoor areas may be an iterative process between the architect / building designer and the wind engineer. It is important to note that wind impacts should be resolved in the first instance via structural building elements rather than landscaping.

5. Prepare the application

An assessment of the likely wind conditions affecting the site should be included as part of the urban context report submitted with the planning permit application.

The wind impact assessment, or wind tunnel modelling study for larger developments, should be submitted as part of the planning permit application.

The assessment needs to verify that the wind conditions in the standard will be achieved in the outdoor areas within the assessment area for the apartment development proposal, and include calculations demonstrating the case.

The architectural and landscape drawings should be consistent with the wind mitigation measures described in the wind assessment.

Wind impact assessments and wind tunnel modelling studies should be prepared by a suitably qualified wind engineer.



Assessing an application against the Standard

The relevant local council is usually the responsible authority for determining the application and must decide if an application for an apartment building has satisfactorily demonstrated that any potential wind impacts have been identified and that the building will satisfy the requirements of Standard D32. The responsible authority may seek its own professional advice to support this process.

When considering an application some basic steps for the responsible authority to take include:

- Checking that the submitted wind assessment verifies that the building design meets the wind conditions required by the standard with regard to the outdoor areas located within the area defined by the assessment distance.
- Checking that the architectural and the landscape drawings are consistent with any wind mitigation measures recommended in the wind assessment.

Who decides if the wind impact assessment is satisfactory?

If the responsible authority determines that the submitted application does not adequately evaluate the likely wind impacts of the proposed building, it can request more information, such as a wind tunnel modelling study, under section 54 of the Planning and Environment Act 1987 prior to requiring public notice of the application.

If further information is required, the responsible authority will make a written request to the permit applicant. This correspondence should make clear the specific concerns regarding potential wind impacts on the surrounding area and what degree of assessment is required to demonstrate compliance with the standard.

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