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MEMORANDUM

DATE:

2026-04-10

RWDI REFERENCE #: 2604273

TO:

Simone Gervasi

METIS

FROM:

Kevin Peddie

RWDI

Henry Kuo

RWDI

RE:

**Natural Cross Ventilation Review and Response to RFI
164-172 and 174-194 William Street, Woolloomooloo**

RWDI has been requested to review the natural cross ventilation potential associated with the proposed development located at 164-172 and 174-194 William Street in Woolloomooloo. The focus of this review is with regards to the affordable housing apartments proposed in lower levels of the William Street West Building of the development and the cross ventilation capability of these apartments.

The Design Integrity Panel suggested that further investigation should be undertaken to better understand this potential noting that the site was found, in the wind report, to be exposed to the strong westerly winds. As such, RWDI has undertaken a review of the wind exposure of the site and how the development is expected to interact with the prevailing winds for the region to generate pressure differentials at apartment opening locations for the affordable housing apartments.

Local Wind Climate and Site Exposure

The subject development site is exposed to the prevailing summer winds from the north-easterly and southerly sectors, while the west to north-westerly and southerly winds are more prevalent during the winter months, as shown in Figure 1.

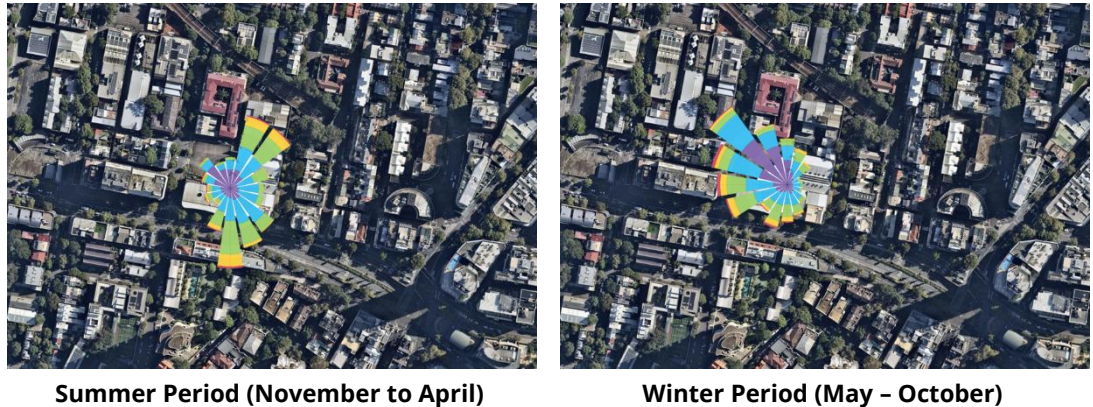


Figure 1: Seasonal Wind Climate Overlay from Sydney International Airport (1995-2025)

As can be noted in Figure 2, the sites exposure to the north-easterly summer breezes due to both urban built form and topographic effects is expected to be directed down Dowling Street and also funnelled through the gaps in the built form due to the U-shaped massing arrangement. The westerly winds will be directed by the adjacent built form along William Street with the interaction noted in the wind report. The southerly winds are generally directed along the street corridors with side-streaming effects around the built forms expected.

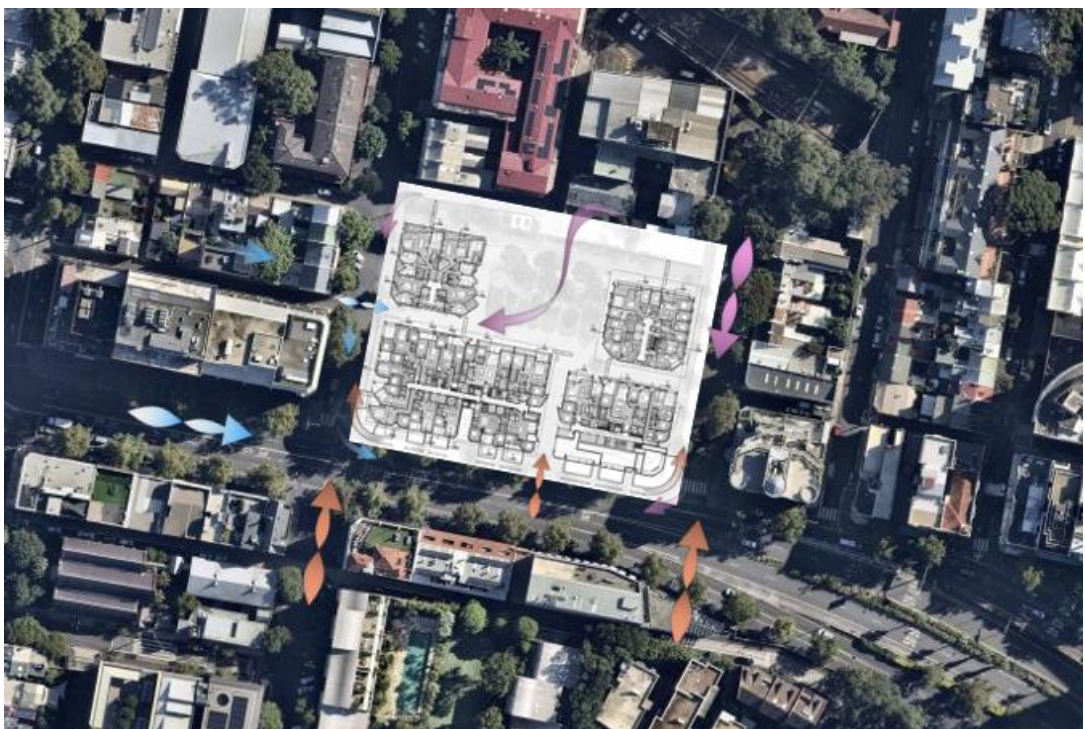


Figure 2: Expected Wind Flow Patterns Around the Site

Natural Cross Ventilation Review

The subject development site is exposed to the prevailing summer winds from the north-easterly and southerly sectors, while the west to north-westerly and southerly winds are more prevalent during the winter months. Consideration has been made for the prevailing winds and the expected pressure differential created for selected apartments. It is worth noting that pressure differential for single aspect apartments can be created where there is sufficient façade articulation, however the wind also needs to be approaching at an angle to the façade. When the façade is directly facing the prevailing winds, this generally results in similar pressures experienced at the opening location due to stagnation.

For the north-easterly winds which generally occur during the summer months, the U-shaped massing form is expected to cause the central area to experience high positive pressurisation, before funnelling between the built forms. This acceleration between the built form will result in a reduced pressure being created (Venturi Effect). By angling the façade of the northern central apartment, highlighted in blue in Figure 3, it is expected that positive pressurisation be experienced for the angled north-eastern façade of the apartment, while lower pressure is expected between the buildings, which is enhanced by the façade angled towards the north-west, away from this flow effect.



Figure 3: Expected Wind Flow During North-Easterly Winds for Natural Ventilation

The north-westerly winds were noted to be quite strong as referenced by the panel from the wind report, this is due to the site exposure but also likely the interaction with the adjacent built forms. It is expected and noted in Figure 4, that the north-westerly winds will cause a pressure differential at the opening locations for the western central apartment, highlighted in orange. The redirection

of the north-westerly winds from 150 William Street is expected to be directed towards the balcony area of the western façade before moving south towards William Street. This flow pattern, in-conjunction with the recessed balcony, angled fins and recess on the southern aspect of the apartment is expected to create a pressure differential between the openings of this apartment. A similar effect in reverse is expected for the southerly winds, although to be lesser strength due to the street alignment.



Figure 4: Expected Wind Flow During North-Westerly and Southerly Winds for Natural Ventilation

Detailed modelling can be undertaken as the design progresses to verify the natural ventilation performance of these apartments in accordance with AS1668.4 (which has been included in the upcoming NCC2025). This will help to confirm opening locations and sizes to ensure suitable levels of natural ventilation for the occupants is provided.