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Ref: 39-22-DE-LET-A-01

16 May 2024

Attn: Nicholas Steele
Woolworths

Ramsgate Village
193-199 Rocky Point Road, 66-69 Ramsgate Ave & 2-4 Targo Road, Ramsgate, NSW 2217

In response to the comments by Georges River Council in the Urban Design Referral (Reference: PP2024/0001 dated 20 February 2024) in “Principle 3: Density”, regarding the environmental wind conditions on the top of the podium and rooftops of Buildings A, B and C, the concerns raised can be addressed by undertaking a wind tunnel study during the development application when the design has progressed closer to its final stage. During the wind tunnel study, measurements will be taken to quantify the wind conditions and, if necessary, develop mitigation strategies (e.g. local wind-break screens and landscaping around proposed sitting areas, as per Section 6.5 in MEL Report 39-22-DE-EWA-02, refer to Appendix A) to achieve the target wind criteria as per the planning authority’s requirements. Following the wind tunnel testing a report suitable for development application will be issued that will be relevant for the most recent design and incorporate the final optimised wind mitigation strategies developed during the wind tunnel testing programme.

Yours sincerely,

James Tan

M. Eaddy
MEL Consultants Pty Ltd
RPEV: PE0006965

Appendix A

RAMSGATE CENTRE
193-199 ROCKY POINT ROAD, 66-69 RAMSGATE AVE, 2-6 TARGO ROAD, RAMSGATE, NSW

ENVIRONMENTAL WIND ASSESSMENT

By

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And

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MEL CONSULTANTS

Report 39-22-DE-EWA-02

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1. INTRODUCTION

The proposed development (Ramsgate Centre) will be located on a site that is bounded by Targo Road to the north, Rocky Point Road to the East and Ramsgate Road to the south. The site location is shown in Figure 1.

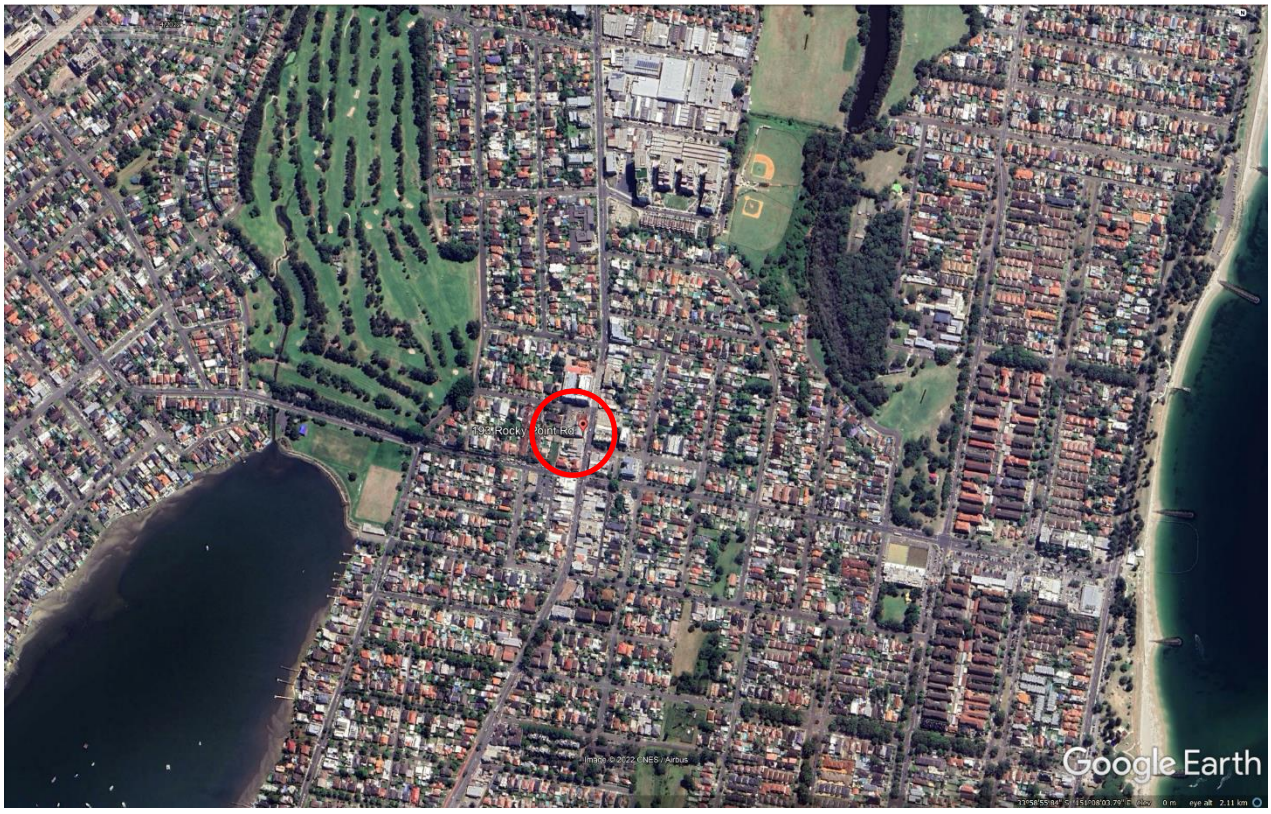

Figure 1: Location of the proposed Ramsgate Centre development (highlighted by red circle)

This assessment was commissioned by Woolworths and is based on a review of development plans by Clarke Hopkins Clarke Studio dated 1st December, 2023 and only considers current existing surrounds and under construction buildings (i.e. no proposed future buildings). This desktop environmental wind assessment is based on MEL Consultants knowledge of wind flow around buildings and structures from undertaking numerous wind tunnel model studies, no wind tunnel study has been undertaken for this study.

2. THE DEVELOPMENT

The development will comprise of 3 residential buildings (labelled Buildings A, B and C with heights of 8, 8 and 4 storeys, respectively) sitting atop a single storey podium which would be a supermarket, as shown in Figures 2 and 3. There will be a pedestrian laneway along the west side of the site. Pedestrian entrances into the building will be via the western laneway, Targo, Rocky Point and Ramsgate Roads. A communal open space has been proposed for the area between the buildings on Level 1 (Figure 3). Buildings A and B will have a 5m set back from the northern and eastern podium edges, with Buildings B and C having an approximately 3m set back from the western podium edge, creating private terraces. All 3 buildings will maintain a similar floor plan from level 1 up to the rooftop level where there would be communal open areas/terraces (Figures 4 to 7). The design of buildings A, B and C will have private terraces/balconies on all residential levels and building faces. Figure 8 shows the design perspective view of the development from Rocky Point Road.

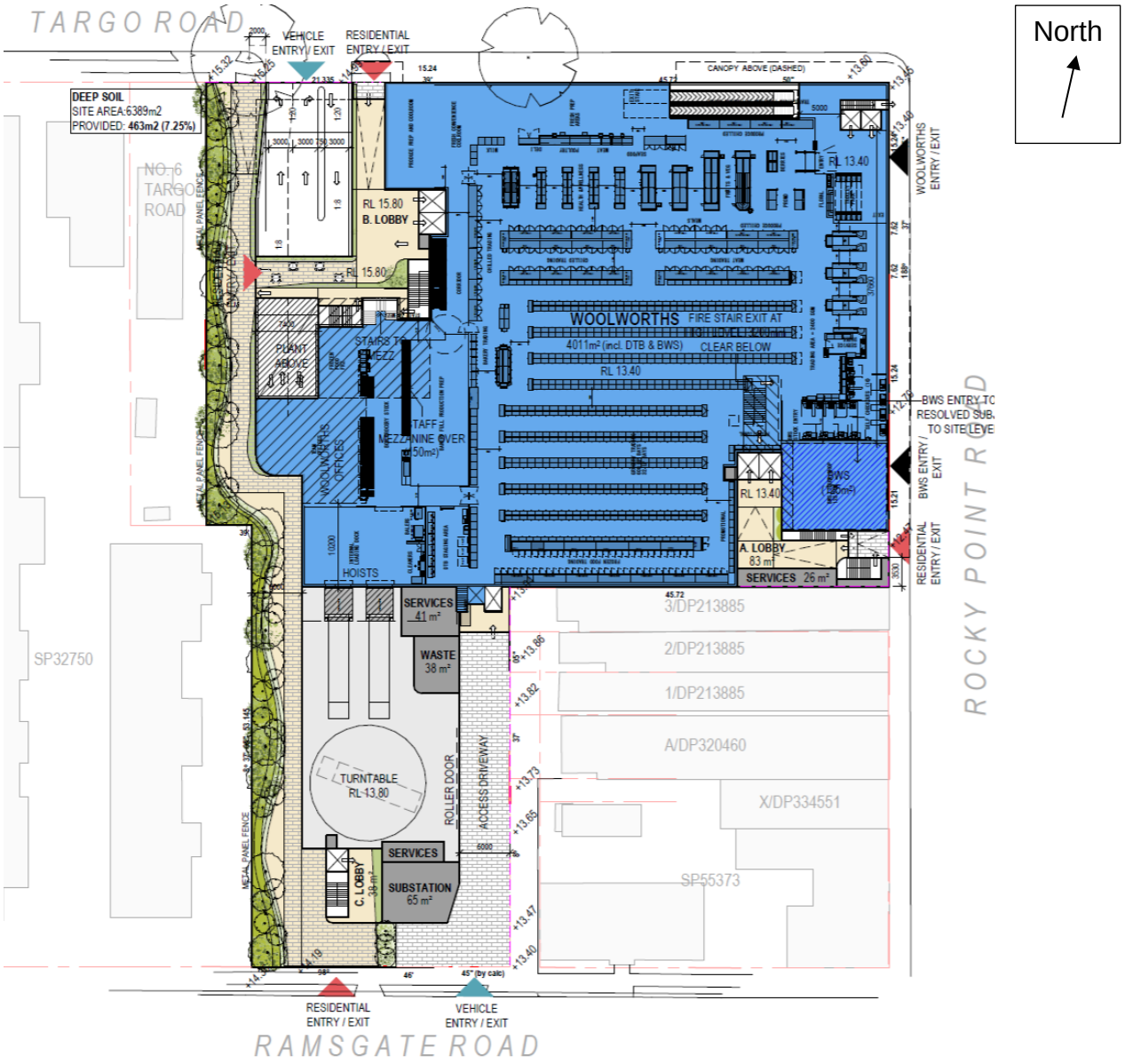

Figure 2: Ground floor plan of the development.

Figure 3: Level 1 floor plan of the route development.

Figure 4: Level 4 floor plan of the development.

Figure 5: Typical levels 5 and 6 floor plans of the development.

Figure 6: Level 7 floor plan of the development.

Figure 7: Rooftop plan of the development.

Figure 8: Rocky Point Road perspective design view.

3. WIND ENVIRONMENT AND EXPOSURE

The strongest and most frequent winds for Ramsgate with respect to the pedestrian level environmental wind conditions come from the northeast, south, and west sectors. The north and east sector winds are relatively light and infrequent. The wind climate for the Sydney airport and associated pedestrian wind comfort criteria are shown in Figure 9. The closer these criteria lines are to the centre of the figure indicates the strong and frequent wind directions.

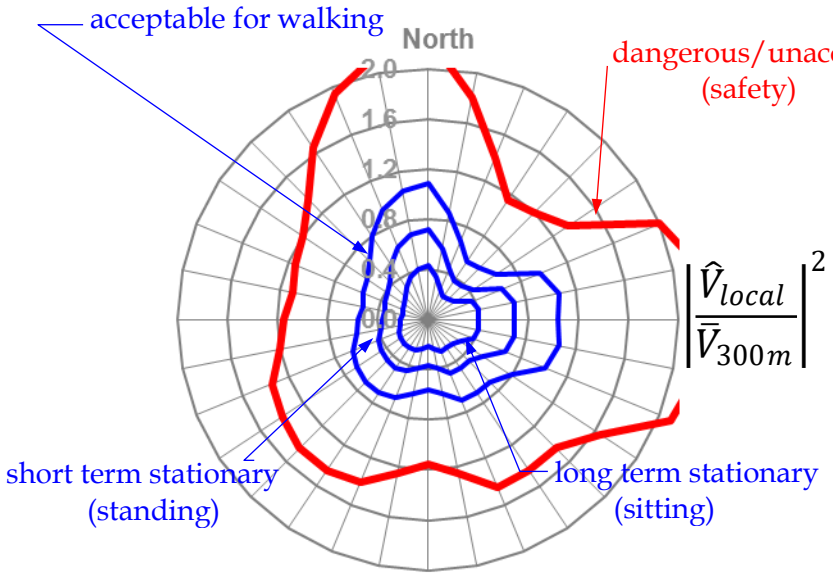

Figure 9: Ramsgate wind climate based on Sydney airport data and associated pedestrian wind comfort criteria

The existing 4-5 storey apartment buildings immediately to the north and east (along Dillon Street) will provide some shielding from these wind directions. There are typically low level (1-2 level) residential and commercial establishments that surround the site for the remaining wind directions and therefore the site will have exposure to most wind directions. In the far field to the east and southwest lies Botany Bay with typical suburban housing for all other wind directions (with the exception of the golf course to the northwest).

4. ASSESSMENT CRITERIA

To assess whether the predicted wind conditions are likely to be acceptable or not, some forms of criteria are required. For the purposes of the wind assessment of the development and given the absence of any specifically defined wind criteria in the Georges River Council DCP the wind criteria, for safety and comfort, will be adopted from the Sydney Design Control Plan, and has defined wind comfort standards for the assessment of the wind conditions in Sydney City. The definition of the standards is as follows:

Wind Safety Standard is an annual hourly maximum peak 0.5 second gust wind speed measured between 6am and 10pm Eastern Standard Time of 24 meters per second.

Wind Comfort Standard is an hourly mean wind speed for each wind direction, with probability of exceedance less than 5% per annum (averaged over all wind directions) measured between 6am and 10pm Eastern Standard Time (equivalent to 292 hours per annum), of equal to or less than:

- 4 metres/second for sitting areas
- 6 metres/second for standing areas
- 8 metres/second for walking areas

Mean wind speed means the maximum of:

- Hourly mean wind speed, or
- Gust equivalent mean wind speed (gust wind speed divided by 1.85)

It is noted that the above Safety standard is assessed for each wind direction while the above Comfort standards are pass/fail criteria as they only assess the summation of probabilities of exceedance across all wind directions to determine whether a location passes or fails the threshold criterion. i.e. the criteria assess the average wind conditions.

5. RECOMMENDED WIND COMFORT CRITERIA

The following wind comfort criteria are recommended:

Streetscapes	Walking
Building and Tenancy Entrances	Standing
Outdoor Communal/Private Terraces	Walking

The wind conditions on outdoor terraces have been recommended to satisfy the walking criterion as these spaces could be considered elective when external conditions would be perceived as acceptable for the desired activity. Users of these terraces will need to be educated on the wind effects and loose objects should not be left on an unattended terrace.

6. WIND ASSESSMENT

6.1 Targo Road

The north faces of buildings A and B will be set back from the northern podium edge by 5m, and have some shielding provided by the 4 to 5 storey apartment building across the road as well as having their narrow faces oriented towards north. Therefore, for the north wind directions there would be little additional wind flow induced to ground level. For winds incident from the stronger northeast and west wind directions onto the broader faces of buildings A and B, respectively, wind flow would be deflected into the adjacent sites and into Targo Road. Winds incident from the south sector would be deflected off the northern corners of buildings A and B towards the north side of Targo Road, increasing the wind conditions there.

Wind conditions would be elevated compared to existing conditions but would still be expected to achieve the walking comfort criterion in the streetscapes of Targo Road. The wind conditions outside the residential entrance near the northwest corner of the site would be expected to achieve the standing comfort criterion as it benefits from being a recessed entry.

6.2 Rocky Point Road

Winds incident from the strong northeast wind directions would be incident upon the corners of buildings A and B which would tend to flow around the buildings rather than be induced directly down to ground level. However as wind flows approach more perpendicular to the east face there would be progressively more downwash induced to lower levels. The 5m setback of building A from the eastern edge of the podium would limit the amount of downwash into Rocky Point Road.

The wind conditions along Rocky Point Road would also be influenced by wind flow deflected around the northeast and southeast corners of building A for some northerly and southerly wind directions, respectively. As discussed above, the neighbouring 4 to 5 storey apartment buildings to the north would provide some shielding from those wind directions.

However, the exposure of building A's south face would be expected to deflect some additional wind flow around the southeast corner of the building and into Rocky Point Road.

Based on the above, there would still be additional wind flow induced into Rocky Point Road and the wind conditions in the streetscape would be expected to increase relative to the existing conditions. Wind conditions would be expected to achieve the walking comfort criterion. The wind conditions outside the building entrances near the southeast corner of the supermarket would be expected to achieve the standing comfort criterion as it benefits from being located away from building corners. However, the wind conditions outside the supermarket entrance located near the northeast corner of the building would be expected to only achieve the walking comfort criterion as wind flow would be accelerating towards this northeast site corner. A recessed entry or re-location further south would improve the wind conditions at this entry.

6.3 Ramsgate Road

Building C presents its narrow face to the south sector wind directions and as such there would be expected to be minimal downwash induced to ground level from these wind directions. Winds incident from the northeast and northwest would have some wind deflected off the southern corners and flow towards the southern side of Ramsgate Road elevating the wind conditions in this area. The effects of buildings A and B on the wind conditions in Ramsgate Road would not be expected to be significant.

Wind conditions would be expected to achieve the walking comfort criterion in the streetscapes of Ramsgate Road. The wind conditions outside the residential entrance into building C would be expected to achieve the standing comfort criterion.

6.4 Laneway and adjacent properties on the west side of the Development site

The laneway located along the west side of the Development site would be influenced by downwash off the broad west faces of Buildings B and C for the westerly wind directions. Although the setback of the towers above would go some way to mitigating these

downwash effects, given the exposure of the Development site and the heights of Buildings B (8 storey) and C (4 storey), there would be additional wind flow induced into the laneway off the west face of Building B for the westerly wind directions.

Wind conditions would be expected to achieve the walking comfort criterion in the laneway along the west side of the Development site.

The wind conditions outside the residential entrance into building B would be expected to achieve the standing comfort criterion. Given that there are two entries (i.e. north and west) into building B, wind flow would be drawn through (i.e. increasing wind conditions) the lobby when both entry doors are opened simultaneously due to a pressure difference between the building faces.

The wind conditions in the streetscapes and outdoor areas of the adjacent properties to the west of the development would mainly be influenced by wind flow deflected around the northwest corner of building B for some northerly wind directions, and also by downwash off the west face of building B. Building C would be 4 storeys tall and would provide some shielding to building B from some south sector winds. Building C would also have little significant impact on the wind conditions in the adjacent buildings.

As discussed above, the 4 to 5 storey apartment buildings directly to the north would provide some shielding from those wind directions but given the exposure of building B to the west sector winds, there would be some additional downwash off the west face into the properties directly adjacent to the west. The wind conditions here would be expected to be elevated compared to the existing conditions but still achieve the walking comfort criterion.

6.5 Level 1 Communal open space

The wind conditions within the communal open space on level 1 would be impacted by the pressure driven wind flows funnelling between the buildings. Therefore, the wind conditions in the communal open space on level 1 would be expected to achieve the walking comfort criterion, and would also be subject to gusty and turbulent wind flows in

the wakes of the towers and within the vicinity of the building corners for the stronger northeast, west and south sector wind directions for which conditions could begin to approach the safety limit.

The addition of local wind-break screens and landscaping around proposed sitting areas would be expected to improve the wind conditions at those locations. It would be recommended that wind tunnel model measurements be undertaken to quantify the wind conditions in the communal open space on level 1 and, if necessary, develop mitigation strategies (e.g. local wind-break screens) to achieve the criterion for the proposed activation and ensure conditions would meet the safety criterion.

6.6 Private Terraces

Several large private terraces are shown in the proposed development plans for buildings A and B at Level 1 and these would likely experience downwash effects due to the face of the towers above, especially at the building corners. The west facing terraces on level 1 would be expected to experience strong downwash off the broad west face of building B for west sector winds. Similarly for the east facing terraces on building A, there would likely be downwash effects from the broad east face of the building.

The design of buildings A, B and C will have private terraces/balconies on all building faces and typical residential levels. These private terraces would generally be influenced by direct wind flow incident to the face and flow acceleration effects around the corners.

Based on the above, and a 1.1m high porous balustrade (assumed to be approximately 80% porous as indicated in Figure 8), the wind conditions on all private terraces would be expected to satisfy the walking comfort and safety criteria for terraces located away from building corners, with corner terraces expected to have higher wind conditions possibly over the walking comfort and approaching the safety criterion. The use of a solid taller balustrade would be expected to improve the wind conditions on these terraces.

It would be recommended that users be educated on the wind impacts on terraces and that any objects to be left permanently on the terraces would be tethered/ fixed securely to

the terraces and the fixing/ tethers inspected regularly for damage/ corrosion. Any loose items should not be left on the terraces when unattended.

6.7 Rooftop communal area/terrace

All 3 buildings (i.e. A, B and C) will have a rooftop communal area that is generally setback from the edges of the building. These terraces will have a porous perimeter balustrade (assumed to be approximately 80% porous) and would generally be influenced by direct wind flow and would be in the wake of recirculating and reattaching flow which will be perceived as turbulent and gusty. The plant room and core of the building located on these terraces would provide some shielding from direct wind flow from these wind directions.

Given the exposure of the development, the wind conditions on these rooftop communal areas would be expected to achieve the walking comfort criterion for all wind directions. The use of a solid taller perimeter balustrade, perimeter landscaping, planter boxes and trees, would be expected to improve the wind conditions on these terraces to potential achieve the stationary criteria at the proposed sitting areas.

6.8 Natural cross ventilation in apartments

Natural cross ventilation in apartments can be achieved by having at least two openings (e.g. windows) located in different pressure regions. This allows the movement of sufficient volumes of fresh air though an apartment to create a comfortable indoor environment while reducing the need for mechanical ventilation and air conditioning.

The dotted blue lines shown in Figures 3 to 6 indicate the proposed air movement path for natural cross ventilation through the apartments. These air movement paths would be expected to be effective as they are across two different aspects of an apartment, allowing air to be drawn through the apartment by nature of a positive net pressure difference across the indicated building faces.

7. CONCLUSIONS

We have assessed the likely environmental wind conditions in the streetscapes surrounding the proposed Ramsgate Centre Development, detailed in architectural drawings issued by Clarke Hopkins Clarke Studio dated 1st December, 2023.

It has been assessed that the proposed development would have wind conditions in the surrounding streetscapes that would satisfy the walking comfort criterion or better. The wind conditions outside all building entrance into the development would be expected to achieve the standing comfort criterion except the entrance at the northeast corner of the supermarket, along Rocky Point Road, which would be expected to only satisfy the walking comfort criterion.

The wind conditions in the communal open space on level 1 would be expected to achieve the walking comfort criterion, and would also be subject to gusty and turbulent wind flows in the wakes of the towers and within the vicinity of the building corners for the stronger northeast, west and south sector wind directions for which conditions could begin to approach the safety limit.

The wind conditions on all private terraces would be expected to satisfy the walking comfort and safety criteria for terraces located away from building corners, with corner terraces expected to have higher wind conditions possibly over the walking comfort and approaching the safety criterion.

The wind conditions on the rooftop communal areas of buildings A, B and C would be expected to achieve the walking comfort and likely the standing/sitting comfort criteria.

The wind conditions on the communal and private terraces, and in the streetscapes surrounding the proposed development would be expected to satisfy the pedestrian safety criterion.

It would be recommended that wind tunnel model measurements be undertaken to quantify the wind conditions in the communal open space on level 1 and, if necessary, develop mitigation strategies (e.g. local wind-break screens) to achieve the criterion for the proposed activation and ensure conditions would meet the safety criterion.

Prepared by

J. Tan

Approved by

J. Kostas
MEL Consultants Pty Ltd
8th December, 2023