

ST GEORGE PRIVATE HOSPITAL

ST GEORGE PRIVATE HOSPITAL EXPANSION AT 119 - 129 PRINCES HIGHWAY
AND 2 HOGBEN STREET, KOGARAH, AND 1 SOUTH STREET, KOGARAH



SSDA PEDESTRIAN WIND ASSESSMENT

PROJECT # 2511035

27 OCTOBER 2025

SUBMITTED TO

Akalan Projects Pty Ltd

Suite 202, 84 Alexander Street
Crows Nest NSW 2065

SUBMITTED BY

RWDI Australia Pty Ltd

Suite 602, Level 6, 80 William Street,
Woolloomooloo NSW 2011, Australia
ABN 86 641 303 871

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RWDI Australia Pty Ltd operates a Quality Management System which complies with the requirements of AS/NZS ISO 9001:2015. This management system has been externally certified by SAI Global and Licence No. QEC 13457 has been issued for the following scope: The provision of consultancy services in acoustic engineering, air quality and wind engineering; and the sale, service, support and installation of acoustic monitoring and related systems and technologies.

STATEMENT OF DECLARATION

The undersigned declares that the Pedestrian Wind Assessment Report (PWA Report) has been prepared in accordance with relevant policy, guidelines, or legislative requirements. The PWA Report contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the PWA Report relates; does not contain information that is false or misleading; identifies and addresses the relevant Planning Secretary's environmental assessment requirements (SEARs) for the project; identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments to which the PWA Report relates; and contains a consolidated summary of the proposed or necessary mitigation measures.



Dr. Aman Choudhry *PhD, MIEAUST*
Leader Microclimate | APAC

EXECUTIVE SUMMARY



This Pedestrian Wind Assessment has been prepared by RWDI Australia Pty Ltd (RWDI) to accompany a detailed State Significant Development Application (SSDA) for the expansion of the St George Private Hospital.

This report has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued by DPHI on 30 June 2025 in relation to the project (SSD-86969958).

This report concludes that the Proposed Development is considered suitable for approval. Wind impacts are not expected to be significant with the current design expected to provide a suitable level of amenity for the intended use of the various outdoor space. **Hence, no additional wind mitigation measures are required.**

1. INTRODUCTION



1.1 Purpose of this Report

This Pedestrian Wind Assessment Report has been prepared on behalf of Akalan Projects Pty Ltd in support of a State Significant Development Application (SSDA) submitted to the Department of Planning, Housing and Infrastructure (DPHI) under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act 1979).

The SSDA seeks approval for the expansion of the St George Private Hospital. Specifically, the SSDA seeks consent for two components: the first being the erection of a health services facility (hospital), and the second relating to upgrades to the main hospital campus, including a new emergency department.

For reporting purposes, the site subject to the new health services facility (hospital) is referred to herein as the 'clinical tower site' and the main hospital campus is referred to as such.

This report provides an assessment of the local pedestrian wind microclimate and responds to the Secretary's Environmental Assessment Requirements (SEARs) issued by DPHI on 30 June 2025 in relation to the project (SSD-86969958) .

1.2 Site Location and Context

The sites are in the Georges River Local Government Area (LGA), within the Kogarah town centre.

The clinical tower site is adjoined to the south by an existing multi-storey health services facility, which forms part of the St George Private Hospital campus. South Street separates this facility from the main hospital campus, though a connecting sky-bridge provides pedestrian access between the buildings. Further west is the St George Public Hospital, and other surrounding development comprises a mix of commercial premises (typically at ground floor) and medium and high-density residential premises.

On the opposite (eastern) side of Princes Highway is a mix of educational premises including Moorfield Girls High School, James Cook Boys Technology High School, St George High School, and a TAFE NSW campus. Surrounding development on this side of Princes Highway primarily constitutes low density residential premises.

Kogarah Train Station is south-west of the site, approximately 500m away. There is a pedestrian bridge that extends from Hogben Street over the Princes Highway, which provides direct access to the eastern side of the highway.

The sites are approximately 1.7km from Brighton Le Sands Beach, and approximately 3.5km from Sydney Airport. Refer to Image 1 for a site context map.



1. INTRODUCTION



1.3 Site Description

1.3.1 Clinical Tower Site

The proposed new health services facility (hospital) will be located on land that is bound by three road frontages, being Princes Highway to the east (a classified road), Hogben Street to the north, and Bank Lane to the west. This site comprises eight adjoining allotments of land, known as 119 – 129 Princes Highway, Kogarah, and 2 Hogben Street, Kogarah. The site currently accommodates a hard-stand parking lot, providing approximately 76 car parking spaces and a two-storey commercial premises (subject to separate demolition), which is attached to the existing multi-storey health services facility at 2 South Street, Kogarah.

Refer to Image 2 for a site aerial excerpt.

1.3.2 Main Hospital Campus

The existing hospital is located at 1 South Street, Kogarah which is also known as 1A South Street, Kogarah. This site is bound by two road frontages, being South Street to the north and Princes Highway (a classified road) to the east.

The site accommodates the St George Private Hospital's main campus, with vehicular access provided off South Street. Refer to Image 3 for a site aerial excerpt.

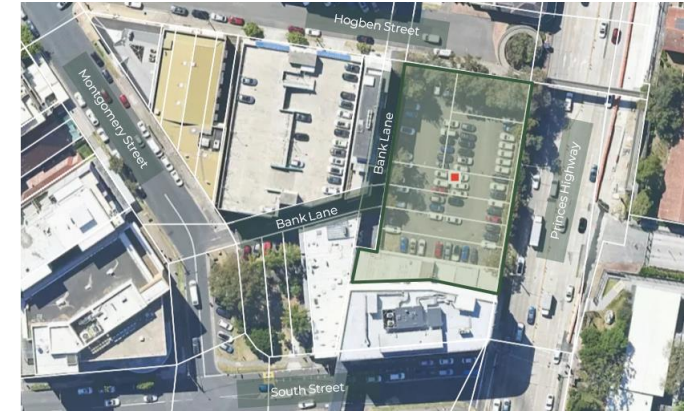


Image 2: Site Aerial Extract

Source: Metro Map, modified by Patch



Image 3: Main Hospital Site Aerial Extract

Source: Metro Map, modified by Patch

1. INTRODUCTION



1.4 Overview of Proposed Development

The SSDA seeks approval for the expansion of the St George Private Hospital. Specifically, the SSDA seeks consent for two components: the first being the erection of a health services facility (hospital), and the second relating to upgrades to the main hospital campus, including a new emergency department.

In summary, approval for the following is sought for the **clinical tower site**:

- Site preparation works and bulk earthworks, including tree clearing;
- Construction of a seven (7) storey health services facility (hospital) equating to a total GFA of 9,952sqm.
- Construction of a five (5) level basement carpark including a radiation oncology unit, providing a total of 241 parking spaces;
- Ancillary office, amenities, and loading dock provisions;
- Basement storage and a substation; and
- Landscaping works.

The Proposed Development is depicted in Image 4 below, with full architectural details provided within the EIS, of which this report also forms an Appendix.

In addition, approval for the following is sought for the **main hospital campus**:

- Construction of an emergency department at the northern end of the existing hospital, to be operated 24 hours a day, seven days a week;
- Alterations to the South Street frontage, to facilitate ambulance bays and access requirements; and
- Associated internal re-configurations.

The Proposed Development is depicted in Image 5, with full architectural details provided within the EIS, of which this report also forms an Appendix.

1. INTRODUCTION



Image 4: Proposed Render
Clinical Tower Site



1. INTRODUCTION



1.5 SEARs Relevant to this Report

This Pedestrian Wind Assessment Report has been prepared to respond to the SEARs issued for the St George Private Hospital Expansion project. The SEARs that are relevant to this Pedestrian Wind Assessment Report assessment, and where they are addressed within this report, are detailed below.

SEARS Request	Response / Location in Report
5. Environment Amenity Assess amenity impacts on the surrounding locality, including lighting impacts, solar access, visual privacy, visual amenity, view loss and view sharing, overshadowing and wind impacts. A high level of environmental amenity for any surrounding residential or other sensitive land uses must be demonstrated.	Section 5

2. METHODOLOGY



Predicting wind speeds and occurrence frequencies around a building is a complex process, encompassing an assessment of factors such as building geometry, orientation, surrounding building heights and positions, terrain upstream, and the local wind climate. RWDI has amassed extensive expertise through conducting numerous wind tunnel studies and Computational Fluid Dynamics (CFD) assessments specifically focused on pedestrian wind conditions around buildings. This wealth of experience, complemented by comprehensive literature, facilitates a reliable and efficient desktop estimation of pedestrian wind conditions for concept designs without the need for wind-tunnel testing or detailed CFD studies.

Note that this approach delivers a preliminary assessment of potential wind conditions around the site. It offers a conceptual framework for wind control measures aimed at enhancing wind comfort, if and where necessary. To further validate and refine the predicted conditions discussed in this report or to fine-tune the suggested wind control measures, physical scale model tests in a boundary layer wind tunnel or CFD simulations will be required. These detailed studies offer a quantitative validation and enable a more detailed assessment, ensuring the accuracy and effectiveness of proposed wind control strategies.

Therefore, RWDI's assessment is based on the following:

- A review of the regional long-term meteorological data;
- Drawings and information received by RWDI in September 2025.
- Wind-tunnel studies, CFD simulations, and desktop assessments undertaken by the microclimate team for projects in the region;
- RWDI's engineering judgement, experience, and expert knowledge of wind flows around buildings^{1, 2}; and,
- Assessment against a suitable criteria for pedestrian wind comfort and safety.

Note that other microclimate issues such as those relating to cladding and structural wind loads, door operability, building air quality, noise, vibration, etc. are not part of the scope of this assessment.

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1. H. Wu and F. Kriksic (2012). "Designing for Pedestrian Comfort in Response to Local Climate", *Journal of Wind Engineering and Industrial Aerodynamics*, vol.104-106, pp.397-407.
 2. C.J. Williams, H. Wu, W.F. Waechter and H.A. Baker (1999), "Experience with Remedial Solutions to Control Pedestrian Wind Problems", 10th International Conference on Wind Engineering, Copenhagen, Denmark.

3. METEOROLOGICAL DATA



Meteorological data recorded at Sydney International Airport from 1995 to 2022 were used as a reference for wind conditions in the area. The distributions of wind frequency and directionality for the summer (November through April) and winter (May through October) seasons are shown in Image 6. The records indicate that winds from the northeast and the southern sectors are predominant during the summer season. Wind from the west and northwest directions are predominant in the winter season and can have an impact on the perceived outdoor thermal comfort of a space. Strong winds with a mean speed exceeding 30 km/h, as measured at the airport at a height of 10 meters, occur more frequently in summer than in winter. During both seasons, strong winds predominantly originate from the south while winds from the northeast are common in summer and winds from west to northwest are common in winter. These winds can potentially be the source of uncomfortable / unsafe wind conditions, depending on the site exposure or development design.

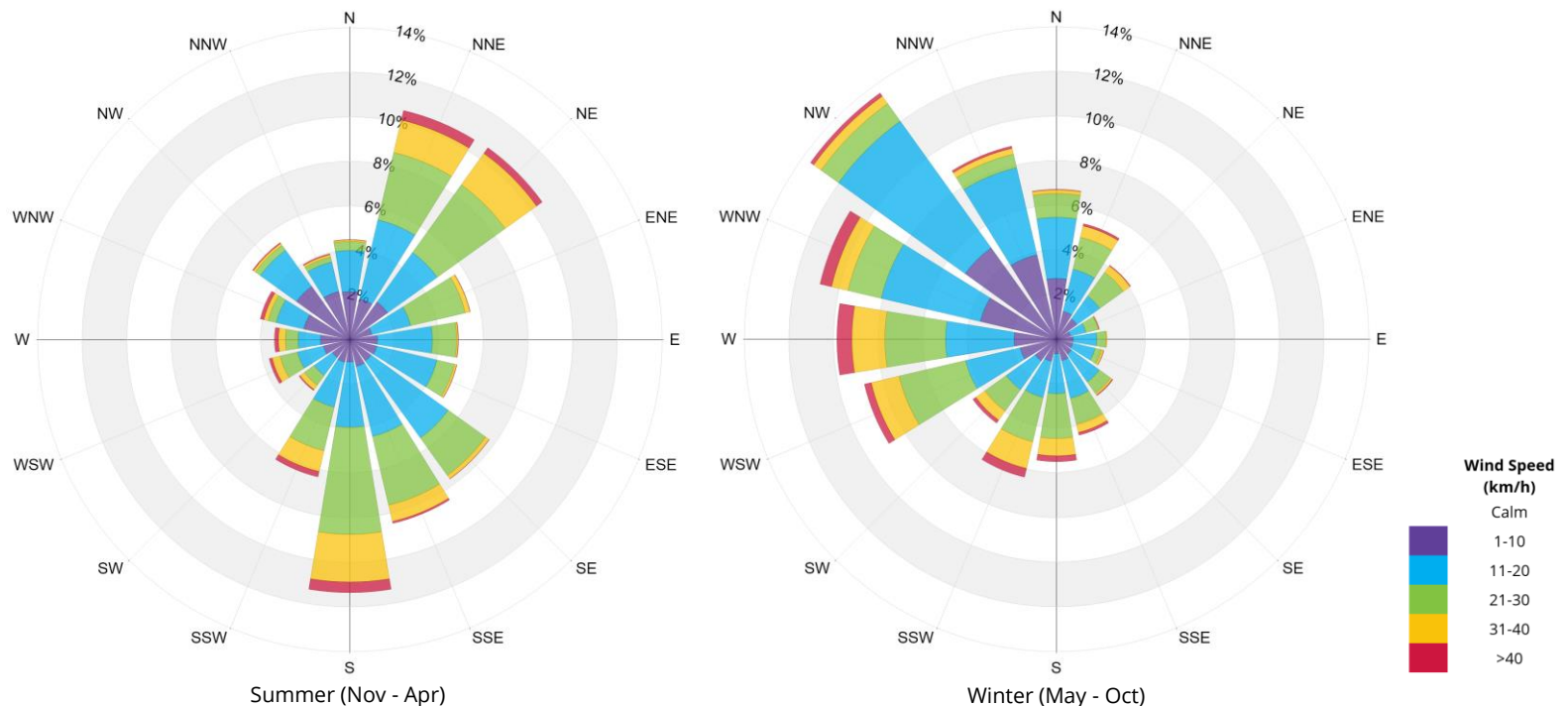


Image 6: Directional Distribution of Winds Approaching Sydney International Airport
Recorded from 1995-2022

4. PEDESTRIAN WIND CRITERIA



4.1 Pedestrian Safety Criterion

Pedestrian wind safety is associated with excessive gusts that can adversely affect a person's balance and footing. The *Australasian Wind Engineering Society Guidelines for Pedestrian Wind Effects Criteria* (2024) recommends assessing wind safety using a threshold of 3-second gusts exceeding 83 km/h for more than 0.1% (or 9 hours) per year. Wind conditions surpassing this limit are considered severe and likely to impact pedestrian stability. This has been assessed qualitatively in the current report.

4.2 Pedestrian Comfort Criteria

Pedestrian wind comfort is assessed using the criteria developed by Soligo et al.^{1,2} which are illustrated in Image 7. These criteria, established at RWDI through extensive research and consulting since 1974, are based on gust-equivalent mean wind speeds. Wind comfort levels are categorised according to the typical/intended pedestrian activity such that higher the activity level, higher the wind speed tolerable while engaged in the activity. Wind conditions are assessed at a typical pedestrian chest height and are considered suitable for the intended use of the space if the associated winds for the category are expected for at least 80% of the time. Wind control measures are

recommended for areas where the occurrence frequencies of wind speeds are expected to exceed the threshold values for specific pedestrian activities.

It should be noted that these criteria for wind forces represent average wind tolerance and can be subjective with regional differences in wind climate and thermal conditions as well as variations in age, health, clothing, etc. also impacting and individual's perception of the wind climate. For a full assessment of comfort, a thermal comfort study is required.

Sitting ≤ 10 km/h			Calm or light breezes desired for outdoor seating areas where one can read a paper without having it blown away
Standing ≤ 14 km/h			Gentle breezes suitable for main building entrances, bus stops and locations where pedestrians may linger such as communal terraces
Strolling ≤ 17 km/h			Moderate winds that would be appropriate for strolling along a downtown street, plaza or park and where the objective is not to linger
Walking ≤ 20 km/h			High Winds that can be tolerated if one's objective is to walk, run or cycle without lingering - Also suitable for certain sporting activities
Uncomfortable > 20 km/h			None of comfort categories above are met - Represents conditions that might be dangerous to the elderly and children and are of a considerable discomfort to others

Image 7: RWDI Pedestrian Wind Comfort Criteria

1. M.J. Soligo, P.A. Irwin, and C.J. Williams (1993). "Pedestrian Comfort Including Wind and Thermal Effects," Third Asia-Pacific Symposium on Wind Engineering, Hong Kong.
2. M.J. Soligo, P.A. Irwin, C.J. Williams, and G.D. Schuyler (1998). "A Comprehensive Assessment of Pedestrian Comfort Including Thermal Effects," Journal of Wind Engineering and Industrial Aerodynamics, vol. 77&78, pp. 753-766.

5. RESULTS AND DISCUSSION



5.1 General Wind Flow around Buildings

In the discussion of wind conditions on and around the Proposed Development, reference may be made to the following generalised wind flows (see Image 8). If these building / wind combinations occur for prevailing winds, there is a greater potential for increased wind activity and uncomfortable or potentially unsafe conditions. Design details such as setting back a tower from the edges of a podium for a prevailing wind direction, deep canopies close to ground level, wind screens / tall trees with dense landscaping, etc. can help reduce high wind activity. The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.

Conversely, in areas where higher wind velocities are desired, design measures can be implemented to enhance wind flow. For instance, channels aligned with prevailing wind directions can be integrated into the design to promote increased wind infiltration in regions prone to stagnant conditions. Such measures are particularly beneficial in areas with generally milder climates and high humidity levels, such as those closer to the equator.

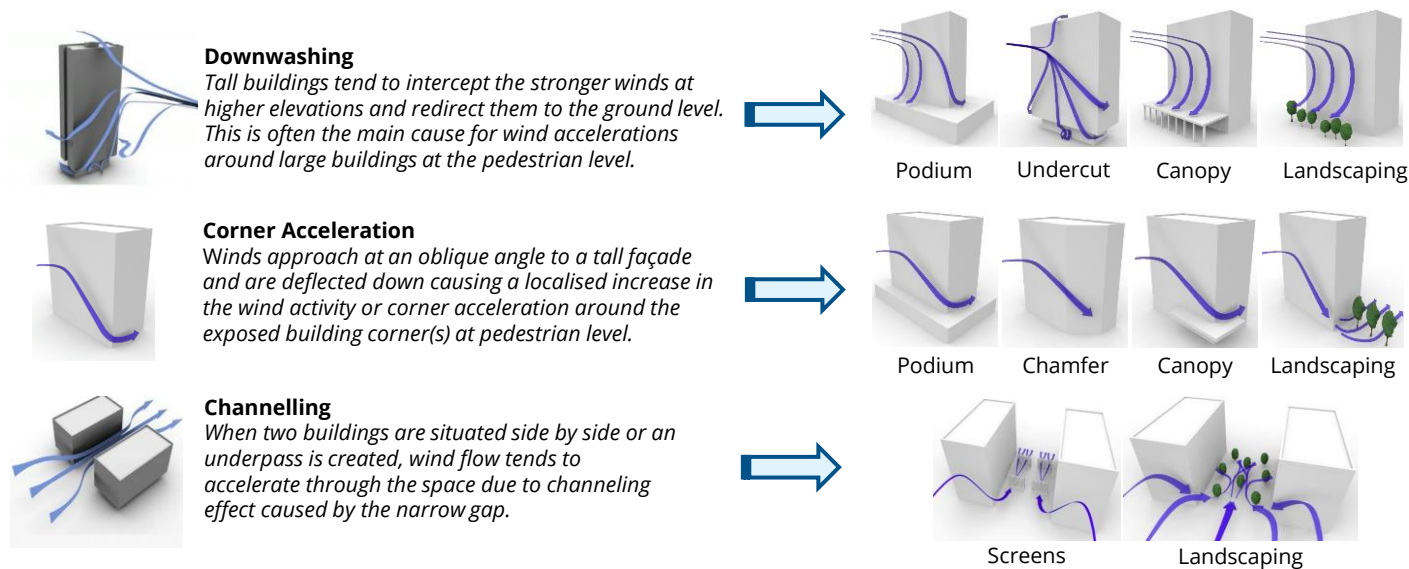


Image 8: General Wind Flow around Buildings with Examples of Common Wind Measures

5. RESULTS AND DISCUSSION



5.2 Site Exposure and Existing Site Conditions

The exposure of the site to regional prevailing winds is illustrated in Image 9 and discussed below:

1. The upwind terrain to the northeast of the site consists of low to mid-rise structures which are expected to buffer the surface-level winds approaching the site.
2. To the south, low-rise buildings and dense landscape allow some shelter from southerly prevailing winds. However, the alignment of Princes Highway with these winds can allow winds to channel through the street corridor.
3. The mix of low- to mid-rise terrain to the west and northwest of the site is expected to provide significant shielding from the winter winds from these directions. Relative alignment of Hogben and South Street can, however, allow some channelling through the street corridor.

The existing site is currently vacant and is used as a carpark facility. Given the wind exposure at the project site and surrounding context, the wind impact is anticipated to be small. Hence, the overall wind environment around the site is expected to be comfortable for sitting to standing use with areas along the Princes Highway and Hogben Street footpaths likely to be comfortable for standing to strolling comfort levels throughout the year. High winds exceeding the comfort or safety limits are not expected within and around the existing site areas.



Image 9: Exposure of Site to Regional Prevailing Winds
Top: Summer | Bottom: Winter

5. RESULTS AND DISCUSSION



5.3 Proposed Site Conditions

5.3.1 Clinical Tower Site

The Proposed Development comprises a 7-storey building that is not likely to significantly impact the local wind microclimate. The interaction of regional prevailing winds with the development is indicated in Images 10. Key elements are discussed below:

- The primary entry lobby, located at the northwest corner of the development, is recessed and is also expected to benefit from the dense surrounding landscaping, resulting in comfortable conditions suitable for sitting to standing use around the space. The other entrances, located along Bank Lane, are in sheltered areas and are expected to be comfortable for sitting use.
- The outdoor cafeteria seating spaces along Bank Lane are expected to be comfortable for passive use throughout the year due to positioning in well-sheltered areas and the surrounding landscape.
- Wind conditions within and around the site, including the street frontages, are expected to remain similar to the existing site and suitable for standing to strolling use throughout the year. Minor increase in winds can occur near the corner of South Street and Princes Highway due to increase in northeast sector winds redirected by the Proposed Development. However, overall wind conditions are expected to remain comfortable for intended use of the footpaths. Similarly, winds from the south are also expected to increase the along Princes Highway footpaths with minor wind

acceleration at the corner of Hogben Street and Princes Highway. However, overall wind environment is expected to be calm and comfortable for standing to strolling use due to existing vegetation, the proposed awning along road, and the spiral walkway at the intersection of the roads.

- The **Level 2** outdoor communal area will be generally shielded from the prevailing winds by both the Proposed Development and the neighbouring building to the west of the site. Wind conditions are expected to be favourable for passive sitting use within the space throughout the year.

The overall wind environment within and around the site is expected to be calm and comfortable with wind speeds expected to remain well-within the comfort and safety limits. Additionally, the proposed and surrounding vegetation are anticipated to enhance wind conditions by providing an additional buffer. **As a result, no further mitigation measures are required.**

5.3.2 Main Hospital Campus

RWDI has reviewed the renovation plans for the Emergency Department expansion at the main hospital campus, based on drawings received in September 2025. As the renovations are limited to internal areas of the Emergency Department, the overall wind environment at the drop-off areas of the main hospital campus is expected to remain unchanged, with conditions anticipated to be similar to that of the existing site.

CLINICAL TOWER SITE – GROUND PLANE



General Wind Effects

- Corner Acceleration
- Streaming Wind Flows
Tend to pick up speed if left uninterrupted

Wind Flow Patterns

- Southerly Winds
- Northeasterly Winds

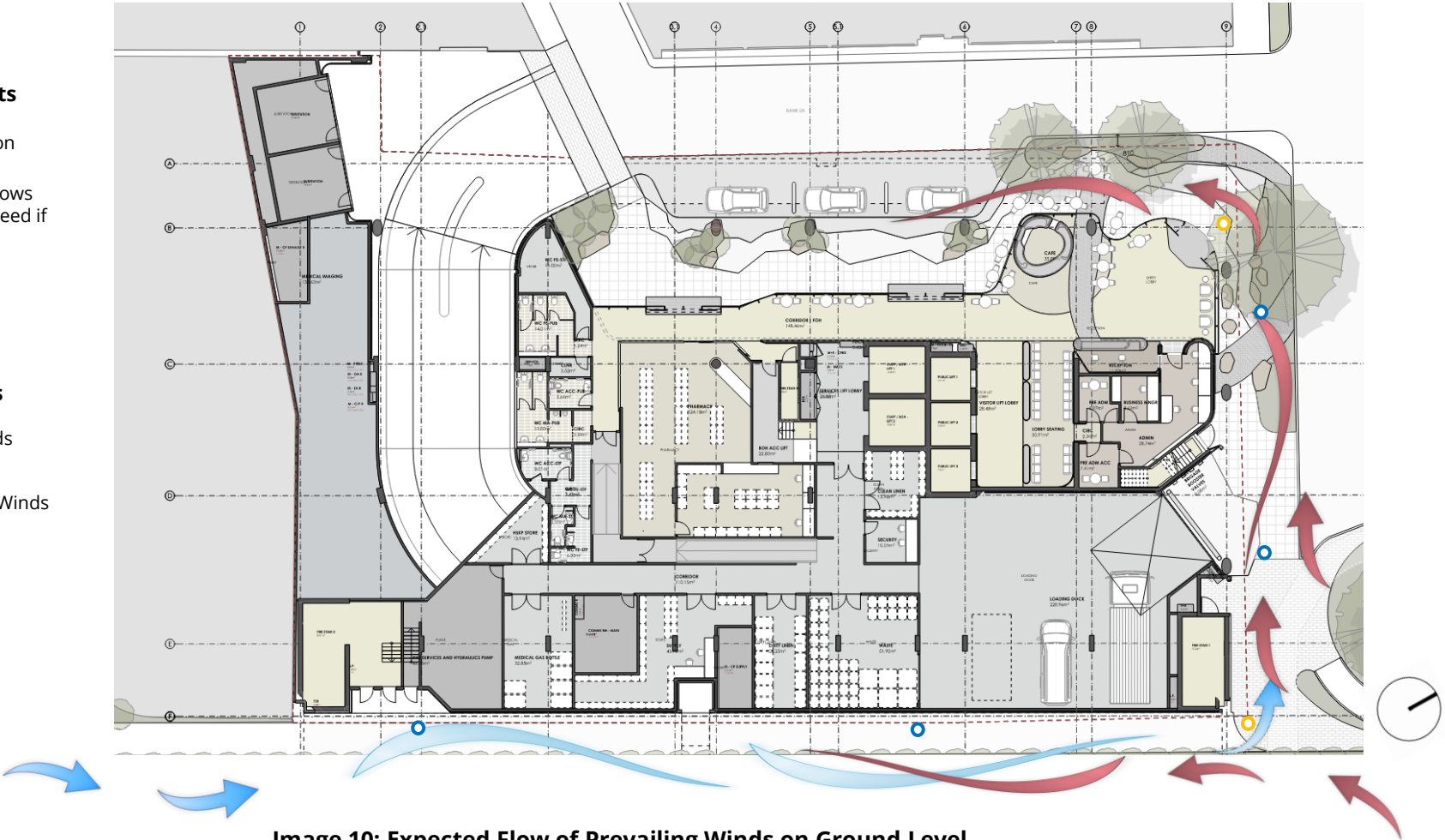


Image 10: Expected Flow of Prevailing Winds on Ground Level

6. SUMMARY



Wind conditions within and around the proposed St George Private Hospital development located in Kogarah, NSW are discussed in this report. The qualitative assessment is based on the review of local wind climate and the current design of the Proposed Development. The impact of the surrounding buildings and the local land topography has also been considered. The assessment is based on RWDI's experience with wind tunnel testing and CFD analysis of similar buildings within the region.

Conceptual wind interactions around the Proposed Development are discussed in the report for the prevailing wind directions to identify key wind sensitive areas. The assessment indicates that wind conditions around the development site benefit from its surrounding context which comprises of low to mid-rise buildings conditions and existing dense trees and vegetation. The overall building design includes elements that also reduce wind impacts such as strategic positioning of outdoor seating areas and communal terraces, recessed entrances, and inclusion of vegetation near corners. Hence, no areas are expected to exceed the safety and comfort limits. Overall, the conditions are expected to be maintained and suitable for the intended use of various spaces within and around the site. As a result, **no additional wind mitigation measures are required.**

7. APPLICABILITY OF ASSESSMENT



The assessment discussed in this report pertains to the Proposed Development in accordance with the drawings and information received in September 2025. In the event of any significant changes to the design, construction or operation of the building or addition of surroundings in the future, RWDI could provide an assessment of their impact on the wind conditions discussed in this report. It is the responsibility of others to contact RWDI to initiate this process.

Statement of Limitations

This report entitled '*St George Private Hospital Pedestrian Wind Assessment*', dated 27 October 2025, was prepared by RWDI Australia Pty Ltd ("RWDI"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be

retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilise the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provide.