



Date: June 5, 2020

Reference: WE455-11F02(rev0) - WE Letter

Aenor

Level 4/15 Castlereagh St, Sydney NSW 2000

Attn: Mr Joseph Ravi

## RE: WESTERN GATEWAY SUB-PRECINCT REZONING: BLOCK A - WIND ANALYSIS

Dear Joseph,

### 1. OVERVIEW

On behalf of Atlassian this letter seeks to provide a brief response to the recent public exhibition of the draft planning controls in relation to 'Block A' at 8-10 Lee Street, Haymarket. Specifically, the letter provides a response to wind related matters raised in these submissions.

Windtech have been engaged by Atlassian to provide ongoing expert wind advice throughout the duration of the project, acknowledging that this is a critical component of the project and the broader Western Gateway Sub-Precinct. A preliminary wind assessment was undertaken to support the proposed rezoning of 'Block A', with subsequent analysis having been undertaken more recently in relation to a more detailed design outcome following the completion of a competitive design process in December 2019.

The public exhibition of the draft planning controls for the Precinct occurred between 17 October 2019 until 27 November 2019. In February 2020 the NSW Department of Planning, Infrastructure and Environment (DPIE) provided a 'Submissions Summary' in relation to the Central State Significant Precinct (CSSP).

In addition to the Submissions Summary, we note that the Central Station Project Review Panel (PRP) (consisting of key agency members) met in early December 2019 to confirm the issues raised in submissions and to provide advice and recommendations to the Project Working Group (PWG) to assist Transport for NSW (TfNSW) in preparing its response to the submissions made during public exhibition.

In relation to wind impacts, the PRP made the following recommendation:

*The panel reiterated its previous advice and the advice of the Design Review panel on the issue of wind and additionally recommended that wind impacts generated by the proposals need to be addressed at the rezoning stage through changes to the proposed building envelope massing and not through temporary or secondary/ancillary wind mitigation measures at the development application stage which are considered unacceptable.*

*It is recommended that TfNSW in its RtS demonstrate that the proposed built forms for Block A and B in the Western Gateway ensure an acceptable wind environment. In particular, sitting in public domain areas, walking throughout the sub-precinct and standing at building entrances should be prioritised.*

Atlassian and its consultant team have considered the above recommendation and undertaken further analysis to respond positively to this matter. This letter responds to the wind related feedback and should be read in conjunction with Atlassian's complete suite of Response to Submissions documentation.

This letter provides a preliminary assessment of potential wind impacts associated with the proposed Western Gateway Sub-Precinct Rezoning, and in particular the concept envelope design work which has sought to inform the draft planning controls for 'Block A' of the precinct.

Our preliminary analysis of the planning envelope indicates that it provides an acceptable wind outcome. A more detailed analysis will be provided following the rezoning and as part of a future development application, which will consider the detailed design of any proposal. Specifically, this will need to examine the types of uses proposed (i.e. directly adjacent to the upper and lower ground areas) and other areas of the public domain adjacent to the site.

## 2. OVERVIEW OF ADDITIONAL WIND INVESTIGATION OF THE 'BLOCK A' BUILDING ENVELOPE

Following the feedback from the public exhibition Windtech have undertaken a more detailed investigation into the wind environment impact of the envelope design for Block A. The modelling includes the existing surrounding buildings, as well the 'Block B' planning envelope which will be the outcome of the Western Gateway Sub-Precinct Rezoning.

### 2.1 Wind Testing methodology

The following testing methodology was adopted:

- Testing was performed at Windtech's boundary layer wind tunnel facility. The wind tunnel has a 3.0m wide working section and a fetch length of 14m, and measurements were taken from 16 wind directions at 22.5 degree increments. Testing was carried out using a 1:300 detailed scale model of the development to provide accurate modelling of the wind flow around the curved surfaces. The effects of nearby buildings and land topography have been accounted for through the use of a proximity model which represents an area with a radius of 375m.
- Peak gust and mean wind speeds were measured at selected critical outdoor trafficable locations within and around the subject development. Wind velocity coefficients representing the local wind speeds are derived from the wind tunnel and are combined with a statistical model of the regional wind climate (which accounts for the directional strength and frequency of occurrence of the prevailing regional winds) to provide the equivalent full-scale wind speeds at the site. The wind speed measurements are compared with criteria for pedestrian comfort and safety, based on Gust-Equivalent Mean (GEM) and annual maximum gust winds, respectively.

### 2.2 Wind speed criteria

For the purposes of the additional wind analysis, the measured wind conditions for the various critical outdoor trafficable areas around the subject development are compared against the criteria presented in the Sydney Development Control Plan 2012 - Central Sydney Planning Review Amendment, which supersedes the criteria detailed in the City of Sydney Development Control Plan 2012 (SDCP2012).

For pedestrian comfort, the Sydney DCP 2012 requires that the hourly mean wind speed, or Gust-Equivalent Mean (GEM) wind speed (whichever is greater for each wind direction), must not exceed 8m/s for walking, 6m/s for standing, and 4m/s for sitting. These are based on a 5% probability of exceedance. This recent amendment is consistent with the recommendations from field studies undertaken by Rofail (2007).

For pedestrian safety, the Sydney DCP 2012 defines a safety limit criterion of 24m/s, based on an annual maximum 0.5 second gust wind speed, which applies to all areas. Furthermore, in accordance with the provisions of the Sydney DCP 2012, the existing conditions for the pedestrian footpaths around the site are also measured and analysed as baseline case as part of this study to determine the impact of the subject development.

## 2.3 Existing Wind Conditions

The Figures 1a and 1b below, provide an overview of the existing wind conditions in proximity to Block A.

It is important to note that the current level of wind comfort for the Public Square to the north of the site is appropriate for walking at this point in time and are not suited for standing or stationary activities.

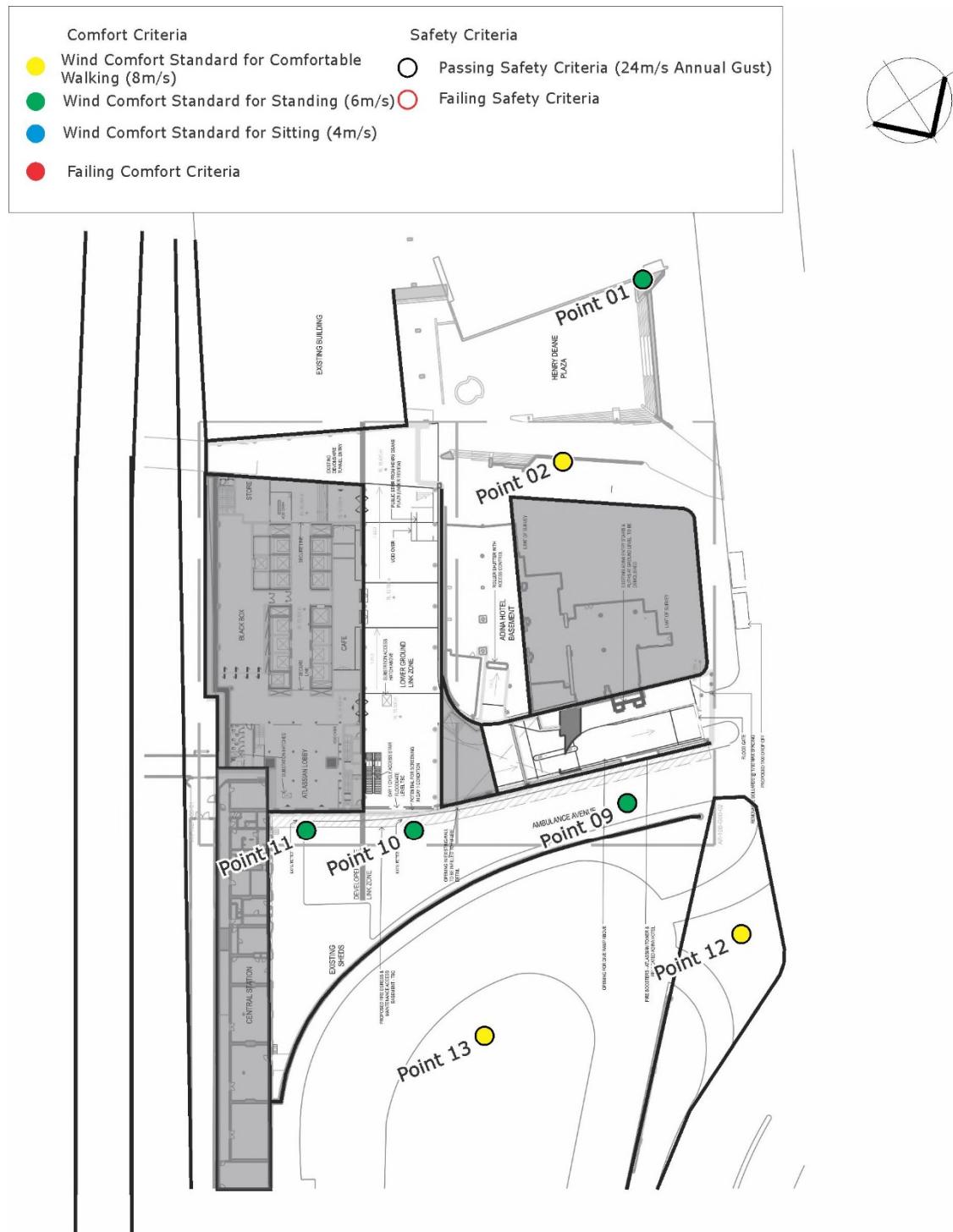


Figure 1a: Wind Tunnel Results – Existing Site Conditions – Lower Ground Floor Plan

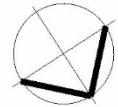
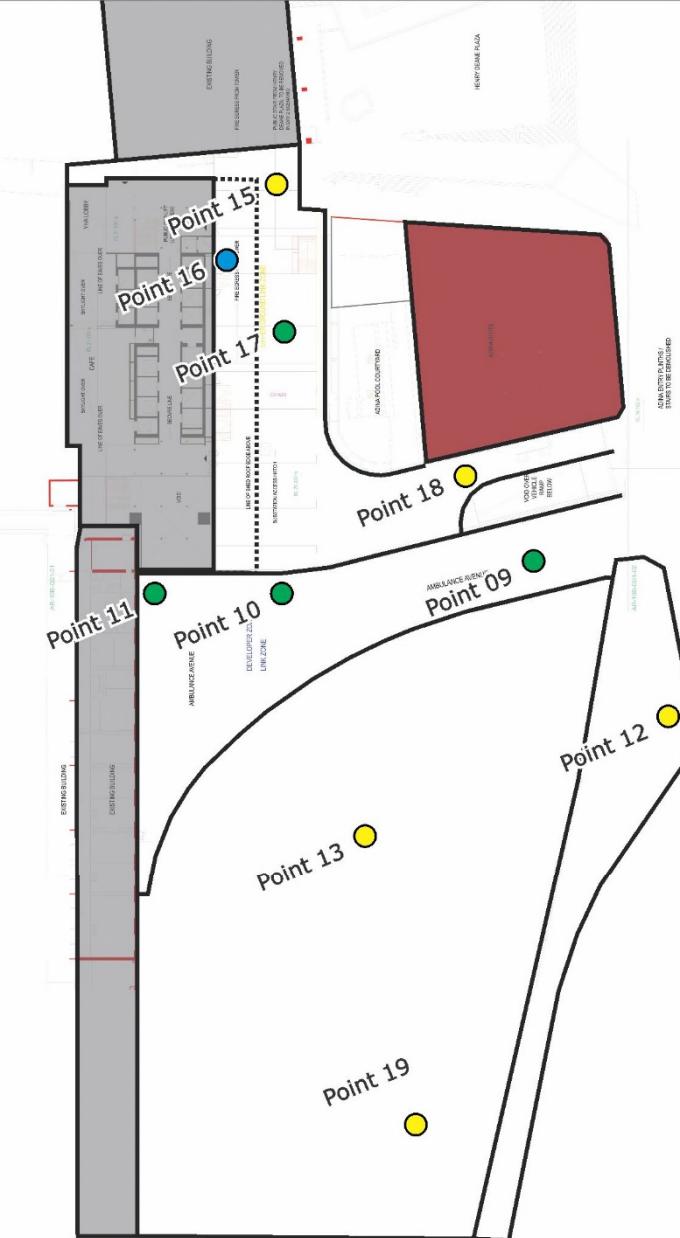
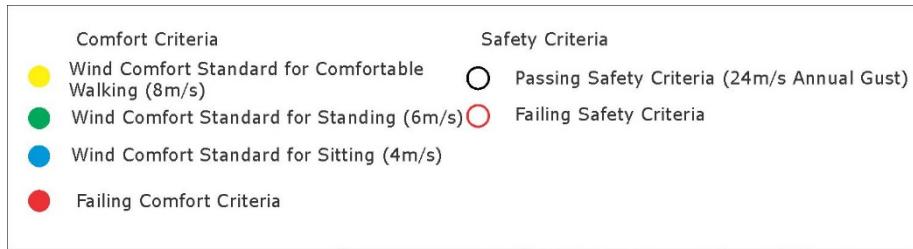


Figure 1b: Wind Tunnel Results – Existing Site Conditions – Upper Ground Floor Plan

## 2.4 Wind Conditions with the effect of the 'Block A' Envelope

As can be seen from Figures 2a and 2b below, wind comfort within the central part of the Public Square to the north of the site has been enhanced with the effect of the 'Block A' Envelope. Other areas, that are predominantly for pedestrian circulation satisfy the comfortable walking criterion. The area under the existing canopy remains within the standing criterion.

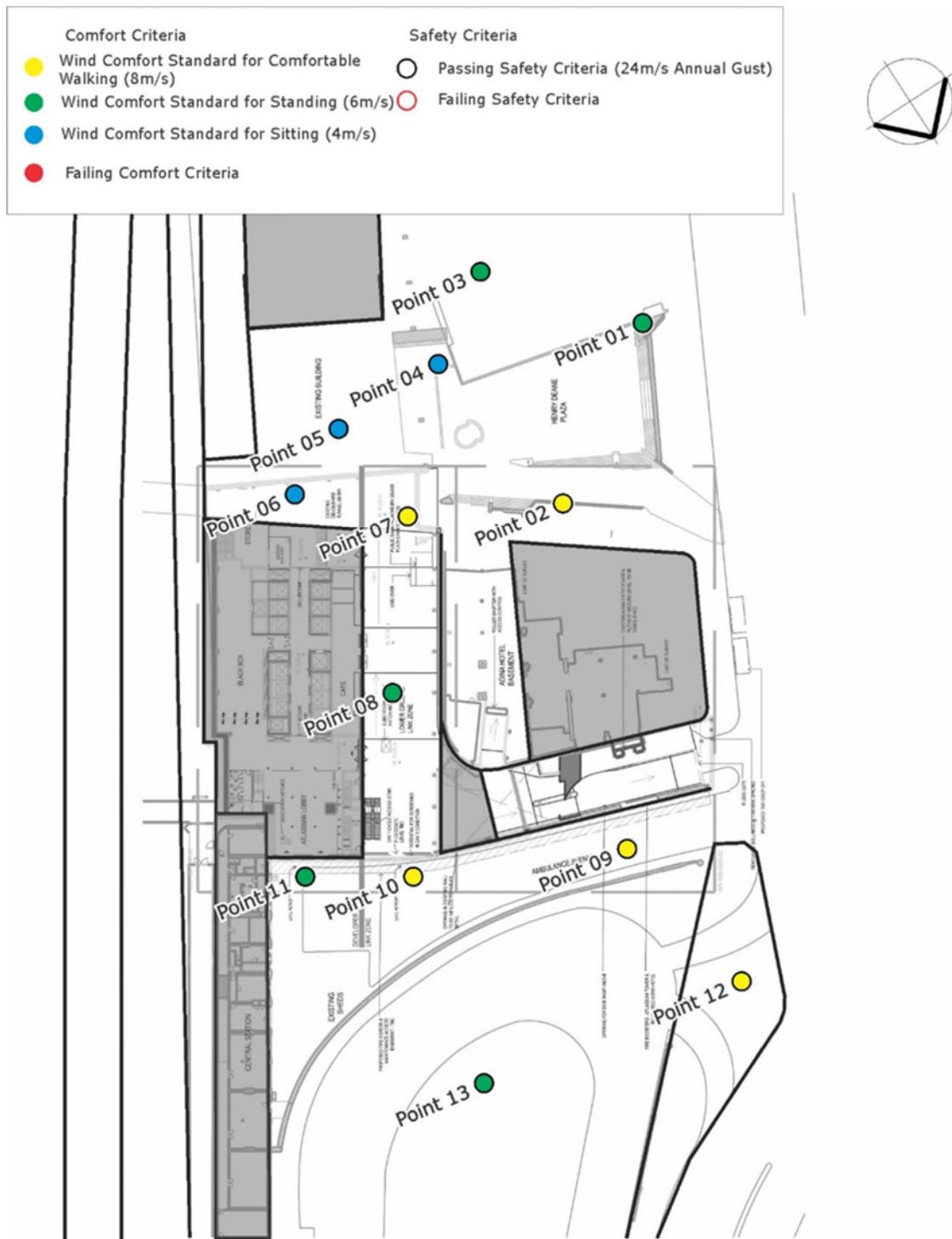


Figure 2a: Wind Tunnel Results – Lower Ground Floor Plan

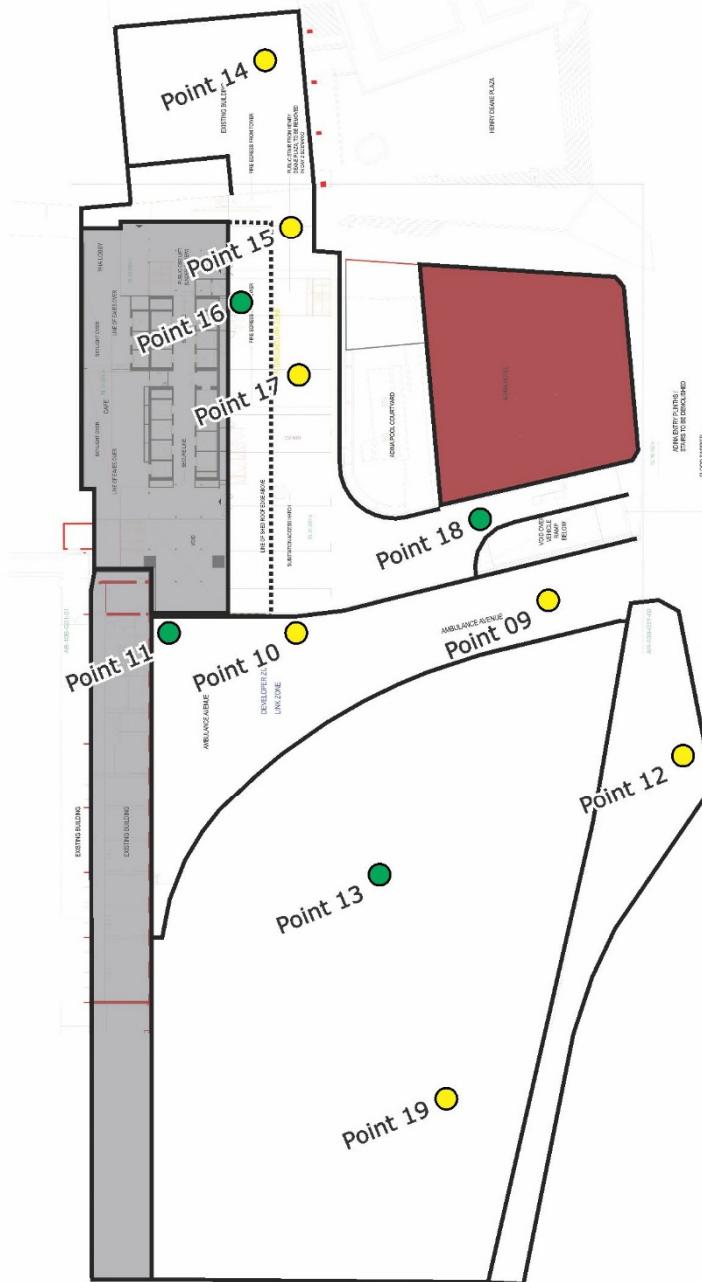
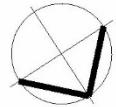
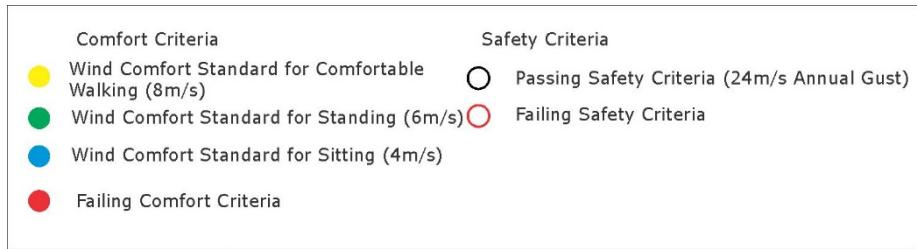


Figure 2b: Wind Tunnel Results – Upper Ground Floor Plan

### 3. ANALYSIS FROM ADDITIONAL WIND INVESTIGATION OF THE 'BLOCK A' BUILDING ENVELOPE

The additional wind analysis undertaken by Windtech confirms that:

- The draft planning controls and building envelope for Block A (as exhibited), when considered in the context of the rest of the Western Gateway Sub-Precinct, is capable of satisfying the relevant wind criteria when measured from a variety of study point locations within the public domain.
- Accordingly, in our expert opinion, the proposed building envelope massing doesn't require any amendments and creates a strong framework for any future development application. The aerodynamic and curved form of the tower and large separation above the podium has contributed to the improved wind conditions in the Public Square to the north of the site.
- Additional wind testing will need to be undertaken once there is greater clarity and resolution on the types of uses proposed adjacent to the Block A Building, noting that the lower and upper ground areas will be subject to a significant quantum of pedestrian movement (as opposed to large areas of outdoor dining). If these spaces are to be used for sitting, Windtech will need to work closely with the Atlassian team prior to the DA submission.
- Notwithstanding, our view is that there will not need to be any major reliance on mitigation measures within the public domain itself, but rather some bespoke design initiatives that can be integrated into the overall building design.
- Windtech are currently working very closely with the competition winning architects to ensure that the building design and public domain areas are fully resolved from a wind perspective, and to ensure that the building entrances, interfaces with the upper and lower ground areas, and connections to other public spaces is of utmost importance.

### 4. CONCLUSIONS

The additional wind-tunnel testing and analysis completed since public exhibition of the Western Gateway sub-precinct rezoning proposal indicates that the building envelope for Block A results in an acceptable wind outcome.

In terms of next steps, Windtech will be preparing a detailed Wind Effects Report to accompany a future development application for Block A. In accordance with the relevant City of Sydney guidelines, this will:

- Be based on wind tunnel testing, which compares and analyses the current wind conditions and the wind conditions created by the proposed building;
- Report the impacts of wind on the pedestrian environment at the footpath level within the site and the public domain;
- Provide design solutions to minimise the impact of wind on the public and private domain; and
- Demonstrate that the proposed building and solutions are consistent with the provisions of this DCP.

If you have any queries, please do not hesitate to contact me.

Kind regards,



Windtech Consultants Pty Ltd

Tony Rofail  
*Director*

## REFERENCES

- Rofail, A.W., 2007, "Comparison of Wind Environment Criteria against Field Observations". 12th International Conference of Wind Engineering, Cairns, Australia.
- City of Sydney (2016), Central Sydney Planning Strategy 2016-2036.