



Date: March 29, 2019

Reference: WC853-06F01(rev1)- WE Letter

Iglu 209 Pty Ltd

Level 4, 58 York Street,
Sydney, NSW 2000

**RE: 80-88 REGENT STREET, REDFERN
PEDESTRIAN WIND ENVIRONMENT LETTER FOR REVIEW OF
DEPARTMENT OF PLANNING AND CITY OF SYDNEY COMMENTS**

Dear Mr Cheshire,

This letter is in relation to the development at 80-88 Regent Street, Redfern, and the various items raised by the NSW Department of Planning and Environment and City of Sydney Council, which have been consolidated by Ethos Urban. Wind tunnel testing of the wind conditions within and around the site was performed in August 2018, with the methodology, results and recommendations presented in the Pedestrian Wind Environment report issued by Windtech on 23 August 2018 (Doc. Ref.: WC853-04F02(rev1)- WE Report). Note that in-principle treatment recommendations are common practice.

Windtech have been operating for just under 30 years providing advanced wind engineering services, primarily in the study of wind effects on large structures, façade cladding as well as environmental wind effects. Since its establishment, Windtech has provided wind engineering and related high technology services for over 2,500 major building projects including Iglu Redfern 1, and the Urba and Diecota buildings within the street block. Windtech's extensive experience in this field enables the development of reliable wind mitigation strategies based on the original wind tunnel testing.

The items raised by the NSW Department of Planning and Environment and the City of Sydney Council are as follows:

1 Department of Planning and Environment:

1.1 Additional information is required responding to the issues raised by the City of Sydney.

This is addressed in Section 2 of this letter.

1.2 Further investigation is required into design features to mitigate wind impacts, including wind model testing to confirm their effectiveness.

The treatment recommendations presented in the Pedestrian Wind Environment Report (WC853-04F02(rev1)- WE Report) are in principle and based on Windtech's experience with previous projects. We expect that with the inclusion of the suggested in-principle treatments the adverse wind conditions can be mitigated to an acceptable level.

1.3 Provide a quantifiable comparison between the wind impacts of the proposed design and a design compliant with the required height and setbacks. Include justification and/or wind mitigation measures to address any impacts beyond a compliant development.

The wind impacts of the proposed design have been tested and compared against the existing wind conditions by wind tunnel testing both scenarios, as outlined in the Pedestrian Wind Environment Report (WC853-04F02(rev1)- WE Report). This is in addition to comparing against the wind comfort and safety criteria. This ensures that the development minimises any adverse wind impacts it may cause.

1.4 A detailed landscaped plan is required. The plan is to be consistent with the measures contained within the Wind report and include a schedule of planting with appropriate plantar depths

Windtech has reviewed the amended design drawing set prepared by Bates Smart, received 18 January 2019 (Doc. Ref.:190118_Iglu_80-88 Regent Street_Drawingset) and the landscape drawings prepared by 360 Degrees, received 18 January 2019 (Doc. Ref.: Appendix J_Landscape Design Report and Plans). Based on the design drawings received, Windtech is satisfied that the landscape design presented meets the requirements of the treatment recommendation, given its densely foliating state in winter for westerly wind mitigation. This has been outlined in the Letter for Pedestrian Wind Environment Mitigation, issued 23 January, 2019 (Doc. Ref.:WC853-05F01(rev0)- WE Letter).

2 City of Sydney Council:

- 2.1 As per the previous submission, the Windtech Report notes that there are issues with the recently approved IGLU development (level 1 courtyard). Refer to page 20 of Appendix Y "The north side of the adjoining Level 1 courtyard located on 60-78 Regent Street is exposed to wind conditions which exceed the comfort criteria due to the west and south-west wind directions. The prevailing westerly winds are seen to funnel between the neighbouring developments to the west which are down washing into the courtyard area".**

This item is in relation to the comfort exceedance at Point 13 of the Pedestrian Wind Environment Report (WC853-04F02(rev1)- WE Report). Due to this exceedance, appropriate in-principle treatment recommendations have been made to address this through the use of planting, as outlined in the report in the form of landscaping, and confirmed in the Letter for Pedestrian Wind Environment Mitigation (Doc. Ref.:WC853-05F01(rev0)- WE Letter).

- 2.2 As the prevailing conditions are similar, if not exactly the same, for the proposed adjoining courtyard on the subject site, it is unacceptable for the Department to support a development which results in similarly poor amenity for users of this courtyard.**

This item is in relation to the conditions at Points 11, 12 and 13 of the Pedestrian Wind Environment Report (WC853-04F02(rev1)- WE Report). Wind tunnel testing has demonstrated that Points 11 and 12, located on the southern side of the Level 1 courtyard pass both the target comfort (short duration stationary activities) and safety criteria, and therefore no mitigation measure are necessary to meet this criteria. It has therefore been demonstrated through quantitative wind tunnel testing that the winds affecting Point 13 does not result in similarly poor amenity for users of the southern side courtyard.

- 2.3 It is recommended that alternatives are considered which mitigate the wind impacts, and that re-testing via wind tunnel is undertaken using the "sitting" 4m/s comfort criteria.**

Regarding wind criteria, Windtech generally assigns a standing criterion to communal terraces in most cases for the following reasons:

- In the event of a strong wind event, occupants are unlikely to use that space for long durations (BBQ's, events, etc.)
- The most common use of the space would be for short duration stationary activities and thoroughfare, which is unlike a fine dining establishment or outdoor theatre, where

outdoor seating for a long duration is necessary for the intended use (generally sitting criteria applied).

- "Sitting" is generally used to describe areas where long duration stay is expected (generally more than 1 hour), based on published data, and not necessarily whether or not a seat has been provided.
- "Standing" is generally used to describe areas where short duration stay is expected (generally less than 1 hour), based on published data. The City of Sydney criteria has been based on the same published data.

No further wind tunnel testing is required to reanalyse the conditions of points that have already been tested for another criterion. Note that using a stricter criterion is likely to lead to additional treatment measures being recommended to meet the more stringent requirements.

2.4 It is unclear whether "stagnates" means that the comfort criteria is achieved. Again, further testing is required to demonstrate adequate comfort conditions for users of the outdoor courtyard. For the avoidance of doubt, wind tunnel testing using the "sitting" 4m/s comfort criteria should be undertaken.

This item is in relation to the conditions between Points 11 and 12 of the Pedestrian Wind Environment Report (WC853-04F02(rev1)- WE Report). These two critical locations have been tested to quantify the effect of the downwashed winds from the tower above, and to assess whether or not this would cause an adverse wind effect. The area between these two points, based on Windtech's extensive experience in this field, has been assessed to be a "stagnation region", which refers to an area where there is little to zero wind velocity (by definition), and therefore is expected to achieve suitable wind conditions. This is due to the design of the building form and how it interacts with the prevailing winds.

2.5 The wind report recommends "densely foliating evergreen trees capable of growing up to 2-4m in height with interlocking canopies along the centre line of the level 1 courtyard".

Yes. Please refer to Section 1.4 of this letter.

2.6 The landscape plans and architect plan layouts for Level 1 do not match Windtech's recommendation.

Please refer to Section 1.4 of this letter.

2.7 As previously advised, the amelioration treatments should be tested via wind model testing to confirm their efficacy. The Department should not support the development unless it can be satisfied that the amelioration treatments achieve the stated effect.

The in-principle treatments outlined in the Pedestrian Wind Environment Report (WC853-04F02(rev1)- WE Report) have been recommended based on the testing results, and past experience in mitigating similar wind conditions. It is expected that with the implementation of the treatments recommended in the report, the wind conditions within and around the development are expected to be suitable for their intended uses. Further treatment optimisation can be performed at a more detailed design stage.

2.8 In the absence of applicable wind controls for the RWA, and in light of existing unacceptable wind impacts in the local context directly caused by the absence of appropriate RWA controls for wind impacts, it is appropriate for the DCP controls to guide the assessment of the SSD.

The criteria used for the study have been outlined in the Pedestrian Wind Environment Report (WC853-04F02(rev1)- WE Report). The published environmental criteria and research that these controls have been based on are outlined in Appendix A of the report.

2.9 Wind impacts at the south east corner have not been satisfactorily resolved. The Redfern Waterloo Urban Design Principles (UDP) recommends a setback of 4m to Marian Street above podium height. The application proposes 1.3m.

The in-principle treatment strategies outlined in the Pedestrian Wind Environment Report (WC853-04F02(rev1)- WE Report) (continuous full-width awning) for the adverse wind impacts at the south-east corner are expected to mitigate the wind effects in this area.

2.10 Until the revised awning treatment is tested to confirm acceptable comfort levels, this remains a determinative issue, as any changes to the setbacks result in extensive changes to the built form.

Please refer to Section 2.9 of this letter.

Regards,



Henry Kuo
Supervising Engineer
Windtech Consultants