



RWDI Australia Pty Ltd (RWDI)
Suite 602, Level 6, 80 William Street
Woolloomooloo NSW 2011

Tel: +61 2 9437 4611
ABN: 86 641 303 871

11 September 2024

Attn: Aoife Mac Sharry
Project Manager
James Kirkpatrick Group Ltd
Level 17, 48 Emily Place,
Auckland 1010, NZ

**Re: Response Letter to Auckland Council Comments
538 Karangahape Road, Auckland
RWDI Reference No. 2405832**

Dear Aoife,

This letter is in response to the RFI from Auckland Council (received by RWDI on 9 September 2024), seeking additional information on the Computational Fluid Dynamics (CFD) study undertaken for the proposed 538 Karangahape Road development located in Auckland. (Ref: 20240729 RWDI 2405832 REP WindDesignReview 538KarangahapeRoad).

Council Comment 1

I note that the Wind report states the following regarding gusts: "Wind safety issues, which relate to transient, higher-speed gusts, are discussed qualitatively, based on the CFD predictions and our extensive wind-tunnel experience for similar projects. In order to quantify the transient behaviour of wind and refine any conceptual mitigation measures, a more detailed assessment would be required using either boundary-layer wind tunnel or more detailed transient computational modelling"..... "The wind field was assumed to be steady in time and, as such, the transient effects of strong wind gusts and vortex shedding was not included directly"..... "Gusts are an important part of the overall wind microclimate that can impact safety, and these have not been considered in the current assessment". I note that H8.6.28.(1)(b) states that "the height of any part of the building must not cause.... the average annual maximum peak 3 second gust to exceed the dangerous level of 25m per second". Please confirm if this has been assessed? If so, could it please be clearly indicated in the report whether this standard is complied with.

RWDI Response to Comment 1

The CFD study was undertaken as a parametric evaluation of various design options to assess the wind effects and comfort conditions on the surrounding trafficable areas with respect to the Auckland Unitary Plan (AUP) standards for wind comfort, and as such, this was the focus of the assessment (i.e. the average winds). The gust (i.e. peak winds) response is typically evaluated through wind tunnel testing. Notwithstanding the above, based on our review of the CFD results and past experience with projects of a similar scale and height in Auckland, we believe that the results indicate that the development is not expected to result in the average annual maximum peak 3-second gust around the building exceeding the dangerous level of 25m/s. As discussed, we understand that a consent condition is proposed as part of the consent application that requires further testing to confirm that this standard is met at a more detailed design stage, which we would also recommend. We can quantify the gust and verify that all conditions in Standard H8.6.28 via a



wind tunnel assessment, and can recommend and incorporate any further design changes into the testing to ensure compliance (for example, awnings, façade fins etc.).

Council Comment 2

Image 6a shows Category C-D and E, circled below. These areas appear to be on the footpath, and Category D and E do not include footpaths, which if located on the footpath would represent an infringement of H8.6.28.(1)(a). Please confirm where exactly the C-D and E categories shown below are located (i.e. on footpaths or in carriageways). It may be useful to have an aerial photo overlay and confirmation from the wind specialists.



RWDI Response to Comment 2

Along Karangahape Road, the results are influenced by the modelling simplifications. The neighbouring site was modelled without the inclusion of the awning along the footpath, and the building massing was simplified. As a result, it is anticipated that wind conditions would be calmer than indicated in from the simulations. The area to the north of the building is therefore likely to be lower than that shown.

For the on-site wind conditions along Abbey Street, please refer to the overlay below, which shows the expected wind speeds (in m/s) along the footpath. Notably, most areas where Category D conditions are expected align with the car park access to the neighbouring property. Given that the driveway area is primarily used for ‘business walking’ (i.e., Category D), where people are likely moving from point A to point B without lingering, the current wind conditions are consistent with this type of usage and compliant with the relevant standard.



Council Comment 3

Please confirm if Standard H8.6.28.(1)(c) is complied with. In other words, where an existing wind speed exceeds the controls that the building does not result in these increasing further.

RWDI Response to Comment 3

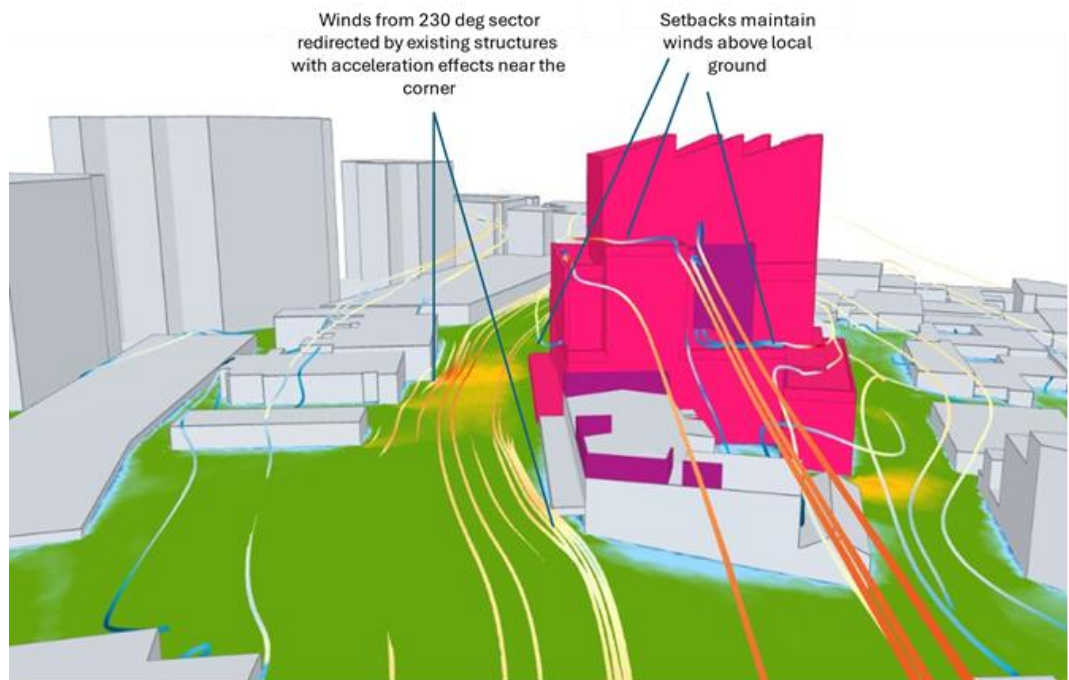
The existing site conditions were not assessed as part of these studies. However, as indicated by the wording of Standard H8.6.28(1)(c), this applies only to existing areas that exceed the controls outlined in Standard H8.6.28(1)(a) and Standard H8.6.28(1)(b). It is not expected that the existing site will exceed these controls. Therefore, compliance with Standard H8.6.28(1)(c) is achieved for Abbey Street. For the neighbouring building across Karangahape road, please refer to RWDI Response to Comment 4 below.

Council Comment 4

The report states that “High winds that are likely to exceed comfort criteria (CAT E) are expected near the neighboring building across the street during summers. It is important to note that this is likely an existing site condition and is not influenced by the proposed building”. In my view the report does not make a definitive conclusion that this is an existing situation, therefore, there appears to be uncertainty around this point. Please clarify if this is an existing situation and that it is not affected by the proposed building.

RWDI Response to Comment 4

Our conclusion was based on the results of the CFD simulations and as illustrated below with streamlines, ground-level winds are typically redirected towards Karangahape Road by the existing neighbouring buildings upstream. The setbacks included in the design of the proposed building help maintain wind flows above local ground levels. Hence, based on our assessment, we can confirm that the proposed building is not expected to impact wind conditions around the existing neighbouring building across Karangahape Road. Also, as mentioned earlier in RWDI Response to Comment 1, the conditions near the neighbouring building across Karangahape Road are likely a conservative estimate due to modelling simplifications.



Council Comment 5

Please indicate the rationale for not considering how climate change would affect the wind conditions. Latest research by NIWA indicates Auckland is tracking on a high emissions scenario. Therefore, please indicate the likelihood of wind being affected by climate change and what this means for the assessment and effects, considering the building is going to be around for a good few decades, these effects could potentially change based on climate change.

RWDI Response to Comment 5

As discussed, we are unaware of any requirements to evaluate the effect of climate change on pedestrian level winds and is not something we have been queried on previously.

Our previous experience involved undertaking climate change analysis studies for extreme winds intended for structural/cladding design in tropical regions of Australia to assess the design in the long term, and we found it matched closely with the latest Australian/NZ wind code. The code has a provision for a climate change factor for the building structure (see figure below), which for NZ has a multiplier of 1.0.

However, to clarify, these multipliers are only applicable for the design for the life of the structures, and therefore are not applicable for the shorter return period impacts affecting pedestrians which could differ to those outlined in the table below.



3.4 Climate change multiplier (M_c)

The climate change multiplier (M_c) shall be as given in [Table 3.3](#).

Table 3.3 — Climate change multiplier (M_c)

Region	M_c
A (0 to 5)	1.0
B1	1.0
B2	1.05
C	1.05
D	1.05
NZ (1 to 4)	1.0

NOTE The climate change multiplier allows for possible changes in climate affecting extreme winds during the life of structures designed by this Standard. Values of M_c may be adjusted in future amendments, depending on observed or predicted trends.

We do not believe that these considerations are within the current planning controls, and therefore this is not typically reviewed as part of individual development applications.

Please do not hesitate to contact us if you have any further questions.

RWDI

Aman Choudhry, *Ph.D., MIEAust*
Leader Microclimate APAC

Henry Kuo, *BE(Aero), DipPM, MIEAust*
Project Manager