

*Opus Research Report 18-529K10.00*

**Wind Assessment:  
Mission Bay Development  
Auckland**



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# **Wind Assessment: Mission Bay Development Auckland**

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## 1 Introduction

This wind assessment describes the expected effects of a proposed development in Mission Bay in Auckland on wind conditions likely to be experienced by pedestrians and building users in its vicinity. It considers the potential effects of the development on the wind conditions on the streets and footpaths around the development, with reference to the Auckland Unitary Plan provisions regarding wind effects for consent purposes.

Our assessment of the expected wind effects of the proposed development is based on our experience in assessing wind conditions for new buildings and additions in urban areas, and the results of wind tunnel model studies carried out in situations with similar sizes and heights of buildings. No wind tunnel testing has been performed on the proposal for this assessment. All comments refer to plans and drawings supplied by the client, including most recent plans dated March 2018.

The client has advised that the desktop study is required to comply with the Auckland Unitary Plan requirement that any building over 25m needs a wind study assessment. For the proposed development, only the northwest corner building is higher than 25m. However, the client has requested a wind assessment for the full development, as he considers that it likely that the Council will enquire about the wind effects of the rest of the development. As a consequence, this wind assessment report pertains to the full development.

## 2 Description of the site, the surrounding area and the proposed development

### The site

The site of the proposed development is large and approximately square in plan, measuring roughly 80 m on each side, with a total area of 6530 square metres.

The site is bounded by Tamaki Drive on the north side of the site, Patteson Avenue on the west side, and Marau Crescent on the south side

Figure 1 shows an aerial view of the development site, showing the approximate plan shape of the proposed development.

Figure 2 shows a view of the proposed development, as viewed from the northwest.

The development site currently consists of mainly 2-storey buildings on the northern half of the site, and single storey buildings on the southern half of the site.

### **The surrounding area**

To the north of the site, there is a grassy park area with some trees. Beyond the park to the north is Mission Bay beach. The distance from the development to the beach is about 60 m.

The areas to the west, south and east of the development mainly consist of single storey and 2 storey buildings. The tallest existing building in the neighbourhood is a 4-story apartment building immediately to the southwest of the proposed development.

### **The proposed development**

The proposed development essentially consists of seven largely independent towers. The development is seen as three separate buildings when it is viewed from the north, from Tamaki Drive. It is also seen as three separate buildings when it is viewed from the south, from Marau Crescent.

The highest part of the proposed development is the North Tower which is near the northwest corner of the site, where the building is 8 stories high. The upper storey at this corner is relatively small, and it is set back from the floor below on the north and west sides. The relatively small size of this upper level, and also the setbacks on two sides, will result in this upper floor having a negligible effect on the wind conditions in the vicinity of the development.

On the west side of the site, the development is essentially 7 storeys high. The upper two storeys of this part of the development are set back from both the west side and the south end.

On the north side of the site, the development steps down by 2 storeys for the second tower along from the west side, and steps down a further storey for the third tower along from the west side (i.e. third tower along is 5 storeys high).

There is also a 6 storey tower at the centre of the site.

The 3 towers on the north side of the development along Tamaki Drive all feature curved corners on their north sides. The central tower has curved corners at all four corners.

There are substantial gaps between all the seven towers on the site.

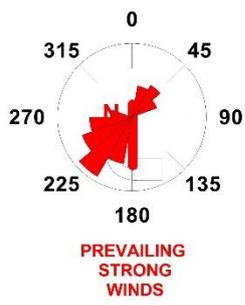


Figure 1. Aerial view of the site, indicating the approximate area of the proposed development.



Figure 2. View of the proposed development as seen from northwest.

### 3 Existing wind conditions

The location of the development near the waterfront in Mission Bay in Auckland currently experiences relatively moderate wind conditions, which are typically quite pleasant. It is likely that the wind conditions around the site are currently mainly in Category A and Category B. Refer to Appendix A for the Auckland Council descriptions of the wind conditions in these categories. There are likely to be some locations nearby where Category C wind conditions occur. We do not anticipate that Category D or Category E wind conditions currently occur in the neighbourhood.

Strong winds in Auckland City mainly occur for winds blowing from the south, southwest, west and north east wind directions. For the development site, there are no other buildings to the north, northeast or northwest to provide shelter to the site.

We anticipate that the effect of this lack of shelter from other buildings for the development for winds blowing from the north is that the wind speeds in the vicinity of the site are increased by about 10% compared to winds blowing from the south, due to this relative lack of shelter.

We note that the development site is provided with some shelter by the large trees in the park to the north of the site. These sheltering trees counteract the increased wind speeds caused by the adjacent seashore to some extent.

## 4 Effects of the proposed development on local wind conditions

The proposed development is eight stories high at its highest part, at the northwest corner of the development. It is therefore about twice the height of the current tallest building in the neighbourhood, which is four stories high. The current buildings on the site are typically only one and two storeys high.

Due to the greater height of the proposed development, we expect that there will be some increase in wind speeds in the streets and on the footpaths around the development.

We do not expect that the increases in the resulting wind speeds will be excessive. There are a number of features of the design of the proposed development which will offset the increases in wind speeds caused by the increased height and bulk of the development. These design features include:

- Only a very small part of the development exceeds the 25 m height which introduces the requirement for a wind assessment.
- The buildings steps down in height away from the highest part of the development which is at the northwest corner.
- There are some significant setbacks of the upper floors away from the site boundaries, which assist to reduce the wind effects which can otherwise be caused by vertical building walls.
- There are seven separate buildings on the site, all situated on a single storey ground floor podium.
- The podium assists to reduce wind speeds in the adjacent footpaths.
- The separate buildings allow winds to substantially pass through the development, in contrast to the considerably higher wind speeds which would occur if the development consisted of a single large building.
- There is substantial curvature on the corners of the development on the north side corners. These curves assist to reduce downwash, and hence reduce the increase in wind speeds on the adjacent footpaths.
- Overall the development includes a range of design features which act together to reduce the adverse wind conditions which could be expected to occur due to a large new development on a waterfront site.

If we were to suggest a potential design feature which could have some further beneficial effect on the local wind environment, it would be that a permanent verandah over the adjacent footpaths could be built, in place of the lines of red umbrellas which are shown in the architect's concept picture shown in Figure 2. The additional beneficial effect on wind conditions of such a verandah would be relatively small. The main benefit of such a verandah is typically to keep a footpath dry during rain.

We estimate that the current wind conditions in the vicinity of the site are likely to reach Category C in some locations. It is probable that no Category D or Category C wind conditions occur currently.

We believe that it is likely that the wind conditions in the vicinity of the proposed development are also unlikely to exceed Category C. We therefore expect that the proposed development will comply with the requirements of the Auckland Unitary Plan wind rules.

## 5 Concluding Comments

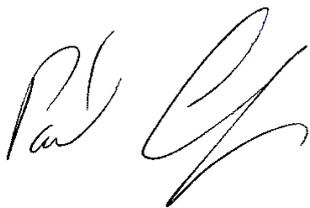
The proposed development is likely to cause some increase in wind speeds around it, as it is substantially taller than any other buildings in the neighbourhood.

The development includes a range a design features which combine to reduce the adverse wind effects which can be caused by a new tall building in a neighbourhood of lowrise buildings.

We believe that there are likely to be some existing occurrences of Category C wind conditions in the vicinity of the site. It is our opinion that the highest wind speeds around the new development will continue to be in Category C. We believe that no occurrences of Category D or Category E wind conditions are likely to be created by the proposed development.

We therefore believe that the proposed development will comply with the aims of the Auckland Unitary Plan with regard to wind effects in the adjacent streets.

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**Reviewed by:**



**Peter Cenek**  
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## 6 Appendix A: Auckland Unitary Plan - Wind

The section of the Auckland Unitary Plan which discusses the wind rules which apply for the development site is listed below, as advised by the client contact.

### H11.6.7. Wind

Purpose: mitigate the adverse wind effects generated by tall buildings.

(1) A new building exceeding 25m in height must not cause:

PC 4 (See  
modifications)

- (a) the mean wind speed around it to exceed the category for the intended use of the area as set out in Table H11.6.7.1 and Figure H11.6.7.1 below;
- (b) the average annual maximum peak 3-second gust to exceed the dangerous level of 25m per second; and
- (c) an existing wind speed which exceeds the controls of Standard H11.6.7(1)(a) or Standard H11.6.7(1)(b) above to increase.

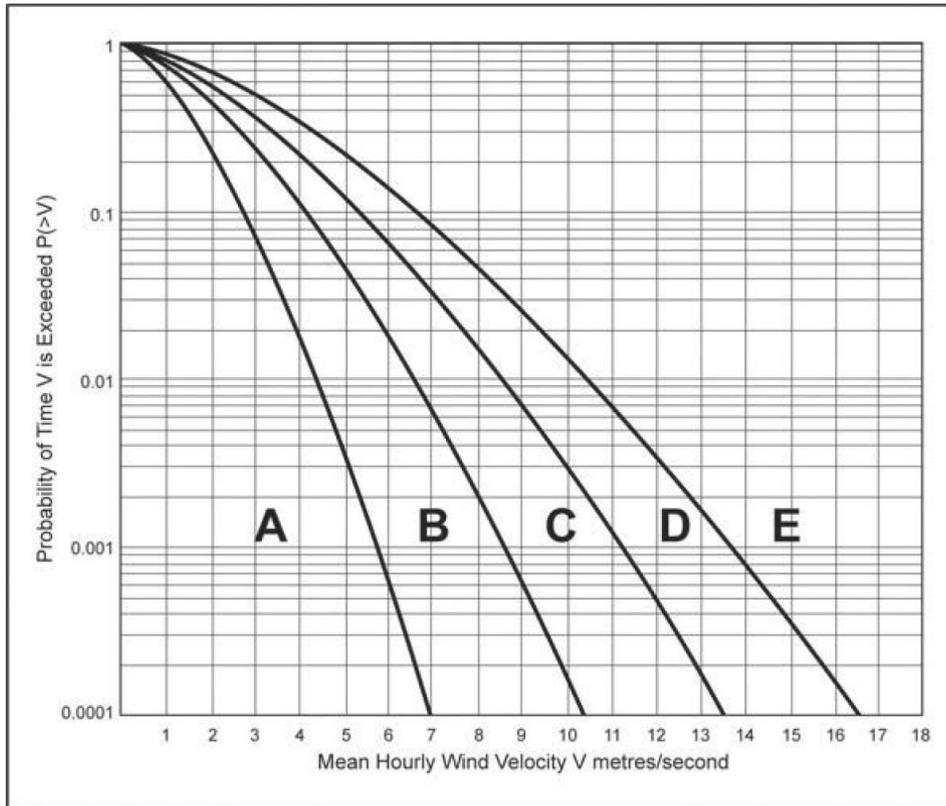
(2) A report and certification from a suitably qualified and experienced person, showing that the building complies with Standard H11.6.7(1) above, will demonstrate compliance with this standard.

(3) If the information in Standard H11.6.7(2) above is not provided, or if such information is provided but does not predict compliance with the rule, a further wind report including the results of a wind tunnel test or appropriate alternative test procedure is required to demonstrate compliance with this standard.

**Table H11.6.7.1 Categories**

(B1)	Category A	Areas of pedestrian use or adjacent dwellings containing significant formal elements and features intended to encourage longer term recreational or relaxation use i.e. public open space and adjacent outdoor living space
(B2)	Category B	Areas of pedestrian use or adjacent dwellings containing minor elements and features intended to encourage short term recreation or relaxation, including adjacent private residential properties
(B3)	Category C	Areas of formed footpath or open space pedestrian linkages, used primarily for pedestrian transit and devoid of significant or repeated recreational or relaxational features, such as footpaths not covered in categories A or B above
(B4)	Category D	Areas of road, carriage way, or vehicular routes, used primarily for vehicular transit and open storage, such as roads generally where devoid of any features or form which would include the spaces in categories A - C above.
(B5)	Category E	Category E represents conditions which are dangerous to the elderly and infants and of considerable cumulative discomfort to others, including residents in adjacent sites. Category E

Figure H9.6.9.1 Wind environment control





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