

**NORTH MELBOURNE MIXED USE DEVELOPMENT
NORTH MELBOURNE**

ENVIRONMENTAL WIND ASSESSMENT

by
M. Eaddy

SUMMARY

We have assessed the likely environmental wind conditions around the proposed North Melbourne Mixed Use development, North Melbourne, detailed in the drawings dated March, 2011. The podium would have good low level shielding from direct wind flow, but the towers would be exposed to direct wind flow for the majority of wind directions. The design has incorporated a low podium with the towers well set-back from the podium edges. Therefore, little additional wind flow would be expected to be induced by the podium into the surrounding streetscapes and the additional wind flow induced towards lower levels by the exposed towers would deflect over the podium roof instead of into the surrounding streetscapes. Given this scenario it has been assessed that the environmental wind conditions in the surrounding streetscapes would be expected to be within the criterion for walking comfort.

The wind conditions within the public plaza at the north-east corner of the development site would be expected to vary between within the criterion for walking comfort at the Canning Street edge, and achieve the criterion for short term stationary activities near the entrance and proposed retail tenancy.



Revision 1

CONTENTS

SUMMARY

1.	Introduction	3
2.	Assessment Criteria	4
3.	Wind Environment and Exposure	5
4.	Wind Assessment	6
4.1	Podium	6
4.2	Towers	6
4.3	Street Level Plaza (north-east)	7
5.	Conclusions	8

1. INTRODUCTION

The North Melbourne Mixed Use Development is located on a site on the corner of MacAulay Road, Vaughan Terrace, and Canning Street, in North Melbourne. The development will consist of a 3 level podium containing commercial and residential spaces and car parking. Two residential towers, 10 and 15 levels high will be located on the east and south-west sides of the podium. The towers have good set-backs from the east and south edges of the podium and the designers have rounded the ends of the towers, which aerodynamically is a beneficial wind amelioration feature.

The location of the development and the strong wind directions are shown in Figure 1.

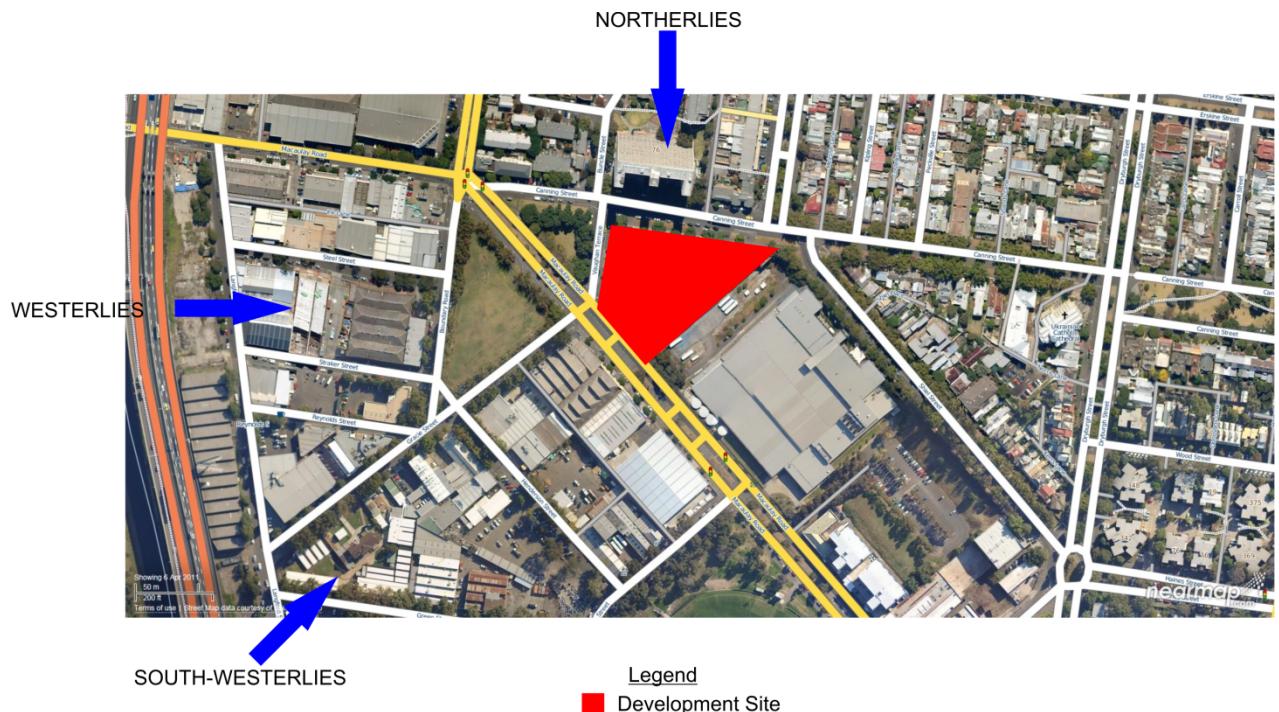


Figure 1: North Melbourne Mixed Use Development

This assessment has been based on drawings by The Buchan Group dated March, 2011,

2. ASSESSMENT CRITERIA

This desktop assessment of the environmental wind conditions will be based on the following criteria:

In main public access-ways wind conditions are considered

- (a) unacceptable if the peak gust speed during the hourly mean with a probability of exceedence of 0.1% in any 22.5° wind direction sector exceeds 23ms^{-1} (the gust wind speed at which people begin to get blown over);
- (b) generally acceptable for walking in urban and suburban areas if the peak gust speed during the hourly mean with a probability of exceedence of 0.1% in any 22.5° wind direction sector does not exceed 16 ms^{-1} (which results in half the wind pressure of a 23 ms^{-1} gust).

For more recreational activities wind conditions are considered

- (c) generally acceptable for stationary short exposure activities (window shopping, standing or sitting in plazas) if the peak gust speed during the hourly mean with a probability of exceedence of 0.1% in any 22.5° wind direction sector does not exceed 13 ms^{-1} ;
- (d) generally acceptable for stationary long exposure activities (outdoor restaurants, theatres) if the peak gust speed during the hourly mean with a probability of exceedence of 0.1% in any 22.5° wind direction sector does not exceed 10 ms^{-1} .

The probability of exceedence of 0.1% relates approximately to the annual maximum mean wind speed occurrence for each wind direction sector.

3. WIND ENVIRONMENT AND EXPOSURE

The approach wind flow for the North Melbourne Mixed Use development would be over low multi-level residential and commercial buildings with the exception of the north wind direction. For the north wind direction there will be good shielding from the existing 20 level residential tower on the north side of Canning Street for the western half of the development site.

The podium would have reasonable low level shielding from the surrounding buildings and the tall trees of the park to the west. The upper levels of the podium, particularly with the falling ground level to the west, may be exposed to some direct wind flow. The towers, with the exception of the north wind directions, would have exposure to direct wind flow for all wind directions.

4. WIND ASSESSMENT

4.1 Podium

As discussed in Section 3, the podium would have good shielding from the surrounding buildings for the majority of its height, with only the upper levels being exposed to direct wind flow. However, the relatively low podium would not be expected to induce significant amount of additional wind flow towards ground level and wind conditions along Canning Street, Vaughan Terrace, and MacAulay Road would be expected to be maintained within the criterion for walking comfort.

4.2 Towers

As discussed, the towers would be exposed to direct wind flow from the majority of wind directions, with the north wind direction being shielded by the existing residential tower on the north side of Canning Street.

The 10 level residential tower on the eastern side of the podium is set-back from the east edge of the podium by approximately 10m and well set-back for all other directions. The east tower would be completely shielded from direct wind flow by the south-west tower. The exposure to the remaining wind directions would cause additional wind flow towards lower levels. However, due to the good set-backs of the tower from the edges of the podium the additional wind flow would be deflected over the roof of the podium above pedestrian height.

The 15 level residential tower on the south-west side of the podium is, again, well set-back from the podium edges with the smallest set-back of approximately 7m from the east podium edge. As discussed the tower will be exposed to direct wind flow, particularly from the strong wind directions, and would induce additional wind flow towards lower levels. The large set-backs of the tower from the podium edges would allow the additional wind flow to be deflected over the roof of the podium instead of into the surrounding streetscapes.

Based on the above scenarios the wind conditions in the surrounding streetscapes would not be significantly influenced by the towers and, as assessed in Section 4.1, the wind conditions in these streetscapes would be expected to be within the criterion for walking comfort.

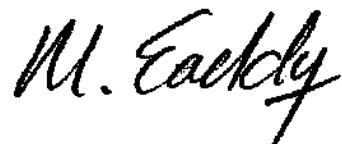
4.3 Street Level Plaza (north-east)

The proposed design includes a street level public plaza at the north-east corner of the site that would forms the entrance into the lift lobby and a retail tenancy. The plaza would be shielded from the most of the strong wind directions, with the only exposure to ground level wind flow for the northerly wind directions along Melrose and Canning Streets. The Plaza would not be expected to be affected by wind flow induced towards lower levels by the towers due to the tower set-backs and podium. Therefore, the wind conditions at the Canning Street edge of the Plaza would be expected to be within the criterion for walking comfort, and improve to achieve the criterion for short term stationary activities further into the Plaza space near the entrance and proposed retail tenancy. However, if it was proposed to have seated outdoor retail areas within the Plaza then these areas would require wind screens to achieve the recommended criterion for long term stationary activities.

5. CONCLUSIONS

We have assessed the likely environmental wind conditions around the proposed North Melbourne Mixed Use development, North Melbourne, detailed in the drawings dated March, 2011. The podium would have good low level shielding from direct wind flow, but the towers would be exposed to direct wind flow for the majority of wind directions. The design has incorporated a low podium with the towers well set-back from the podium edges. Therefore, little additional wind flow would be expected to be induced by the podium into the surrounding streetscapes and the additional wind flow induced towards lower levels by the exposed towers would be deflected over the podium roof instead of into the surrounding streetscapes. Given this scenario it has been assessed that the environmental wind conditions in the surrounding streetscapes would be expected to be within the criterion for walking comfort.

The wind conditions within the public plaza at the north-east corner of the development site would be expected to vary between within the criterion for walking comfort at the Canning Street edge, and achieve the criterion for short term stationary activities near the entrance and proposed retail tenancy.



M. Eaddy

June 2011