

# **OUTER CIRCLE PRECINCT, ALPHINGTON**

## **DESKTOP ENVIRONMENTAL WIND ASSESSMENT**

**by**  
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## 1. INTRODUCTION

The proposed Boiler House Precinct in Alphington lies on the south-western extremity of the former Alphington paper mill site. The Boiler House precinct buildings (7A) lie immediately south of the Outer Circle and Wetlap buildings (6 and 5). Figure 1 shows the location of the development site within the masterplan context.



**Figure 1: Location of the Boiler House precinct (7A) within the masterplan context of the Alphington Paper Mill site.**

This assessment will consider the wind effects in the ground level pedestrian realm surrounding the Boiler House buildings as well on private balconies on these buildings.. The assessment will consider the Caydon building, buildings along Heidelberg Road, Artisan East and West buildings, Wetlap buildings as well as the Outer Circle and Paper Trail buildings.

This desktop environmental wind assessment will be based on the town planning drawings by JCB Architects dated 30<sup>th</sup> September, 2020. This desktop environmental wind assessment has been prepared based on MEL Consultants extensive knowledge of wind flow around buildings and structures from undertaking numerous wind tunnel model studies to quantify the environmental wind conditions around buildings and structures in suburban and urban areas.

## 2. THE DEVELOPMENT

The development will comprise two buildings; Boiler House east and Boiler House west. The west building will be taller, at 5 levels (with the south-west elevation up to 6 levels), and include rooftop terraces and communal spaces, while the east building will be 3 levels in height and retain some of the original building's features, such as the original chimney stack.

There will be new streets constructed to the north and south of the precinct. Between the two buildings will be an access way (Boiler Lane), with additional access ways to the north (Joel Terrace) and south (Ledger Walk). Access to each of the sites will be via these access ways. There will be individual apartment access off Chandler Highway to the western Level 1 apartments via the individual terraces.

The layout of the proposed development is shown in Figure 2.



**Figure 2: Plan view of the proposed Boiler House buildings.**

### 3. 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  $22.5^\circ$  wind direction sector exceeds  $23\text{ms}^{-1}$  (the gust wind speed at which people begin to get blown over);
- (b) generally acceptable for walking in waterfront locations if the peak gust speed during the hourly mean with a probability of exceedence of 0.1% in any  $22.5^\circ$  wind direction sector does not exceed  $20\text{ ms}^{-1}$  (which results in 83% of the wind pressure of a  $23\text{ ms}^{-1}$  gust).
- (c) 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  $22.5^\circ$  wind direction sector does not exceed  $16\text{ ms}^{-1}$  (which results in half the wind pressure of a  $23\text{ ms}^{-1}$  gust).

For more recreational activities wind conditions are considered

- (d) 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  $22.5^\circ$  wind direction sector does not exceed  $13\text{ ms}^{-1}$ ;
- (e) 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  $22.5^\circ$  wind direction sector does not exceed  $10\text{ ms}^{-1}$ .

The probability of exceedence of 0.1% relates approximately to the annual maximum mean wind speed occurrence for each wind direction sector. The above criteria relate to the wind conditions in the outdoor streetscapes surrounding a development.

## 4. WIND ENVIRONMENT AND EXPOSURE

The strongest and most frequent winds in the Melbourne Region come from the north and west sectors with secondary strong winds coming from the south sector; east sector winds are relatively light and infrequent.

The Boiler House precinct will have good shielding for north wind sector directions provided by all the buildings to its north. To the south the vegetation along the river will provide shielding to the lower levels as would any future buildings in the Riverfront precinct. Most of the direct wind exposure will be incident from the west sector. The Boiler House west building will provide shielding to the west wind sectors for the full height of the Boiler House east building, but will itself be exposed to the west wind directions and will be likely to induce additional wind flow to lower levels along Chandler Highway.



**Figure 2: View of the Paper Mill site (06/09/2020 : Metromap).**

## 5. WIND ASSESSMENT

### 5.1 Pedestrian Realm

The Boiler House west building presents a broad face to the strong west sector wind directions and as such would be expected to induce additional wind flow to pedestrian level. In conjunction with the buildings of the Village, Artisan West and Outer Circle precincts the wind flow would be expected to flow south along Chandler Highway and into the new streets to the north and south of the Boiler House buildings. However, with the progressive decrease in height of buildings as one proceeds south along Chandler Highway, the wind conditions would be expected to achieve the walking comfort criterion for all wind directions. The north-west and south-west corners of the site would be expected to experience the highest wind conditions, but both areas would be expected to meet the walking criterion.

In the area along Chandler Highway between Joel Terrace and Ledger Walk the wind conditions would be expected to increase compared to the existing conditions but would still be within the walking comfort criterion. It is noted that individual apartment entries are evident on the west face, off Chandler Highway, via the Level 1 terraces. It would be advised to ensure any openings to these private apartment are adequately designed to avoid damage and/or personal injury during strong wind events.

The remaining apartment entries lie on the other faces of the building(s), which avoids any exposure to strong wind directions, or are protected by adjacent buildings or existing vegetation, the latter which relates to the situation for the southern face of the Boiler House west building).

As a result of the direct shielding provided by the buildings to the north the wind conditions in the pedestrian areas for these wind directions would be expected to be within the walking comfort criterion. Furthermore the wind conditions along the Boiler Lane would be expected to be well within the walking comfort criterion and likely meet the stationary activities criteria.

The wind conditions for east sector winds would be expected to be well within the walking comfort criterion at all locations around the precinct, and would likely achieve the stationary activities criteria for a number of wind directions. For south sector wind directions the wind conditions would be generally within the walking comfort criterion, however as the directions tend more south-westerly, there would be expected to be additional wind flow induced towards ground level that would flow into Ledger Walk and Joel Terrace. The wind conditions for these wind directions would be expected to be within the walking comfort criterion at the north-west and south-west ends of the site. The conditions at the south-west end of the site would also benefit from the extensive vegetation that runs along the river and would provide some amelioration benefit to the winds from the south-west.

## 5.2 Terraces

Outdoor private terraces at either these north-west or south-west corners would be exposed to strong accelerating wind flows around the corners from Chandler Highway into Mills Boulevard and the new street to the south and would be expected to experience wind conditions above the walking comfort criterion. Increasing the balustrade heights and privacy screens between adjacent terraces (to 1.8m or higher) would be expected to improve the local conditions at these corner terraces. Any winter gardens would avoid these effects with all openings fully closed.

Terraces and wintergardens on the west face of the buildings would experience direct wind flow from the west sector. It would be advised to ensure any openings onto terraces or wintergarden openings facing these directions are adequately designed to avoid damage and/or personal injury during strong wind events. The wind conditions on the terraces facing Chandler Highway would be expected to be within the walking comfort criterion, with those away from the north-west and south-west corners expected to achieve the stationary activities criteria for a number of wind directions.

Terraces on the east face, adjacent to the Paper Trail would be expected to have wind conditions well within the walking comfort criterion and would be likely to achieve the stationary activities criterion for most wind directions.

The higher level terraces on Level 4 would also experience acceleration of wind flow around the north-west and south-west corners resulting in wind conditions on or possibly above the walking criterion. The wind conditions for the terraces in-board from the building corners would be expected to be within the walking comfort criterion and likely achieve the criteria for stationary activities for a number of wind directions.

The wind conditions on the small inset terraces (away from the building corners) at all building levels would be expected to achieve the criterion for walking, with the east facing terraces expected to have better conditions than the west facing terraces.

The rooftop terraces and communal spaces would benefit from being on the eastern side of the Boiler House west building and thus be shielded from direct wind flow from the west wind directions. The terrace at the south-western corner of the building could be exposed to wind flow from the south-west and would benefit from taller balustrades on the southern side, which have returns along a proportion of the east side. These terraces also benefit from the good shielding provided by the buildings to the north. As such the wind conditions on the terraces would be expected to be within the walking comfort criterion for all wind directions, with conditions for most wind directions also achieving the stationary activities criteria.

## 6. CONCLUSIONS

We have assessed the environmental wind conditions surrounding the Boiler House precinct (east and west buildings) detailed in drawings supplied by JCB Architects dated 30<sup>th</sup> September, 2020. It would be expected that additional wind flow would be induced to pedestrian levels, particularly for the strong west sector wind directions but wind conditions would be expected to meet the walking comfort criterion for all wind directions.

Comments have also been provided on the expected wind conditions on the private terraces and outdoor communal spaces of both buildings.



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