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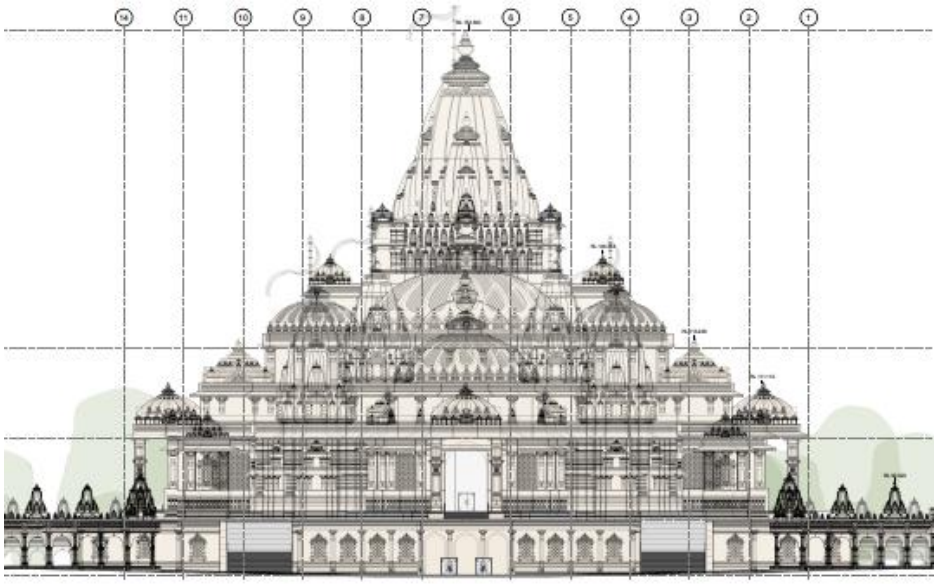

PEDESTRIAN WIND ENVIRONMENT STATEMENT

BAPS HINDU MAHA-MANDIR, CRANBOURNE SOUTH

WL480-01F02(REV2)- WS REPORT

AUGUST 25, 2026

Prepared for:

BAPS Swaminarayan Sanstha, Australia Ltd

60 Heaths Court, Mill Park VIC, 3082

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WINDTECH CONSULTANTS
www.windtechconsult.com
reception@windtechglobal.com

Sydney | Singapore | London | Melbourne | Mumbai | New York | Hong Kong | Dubai | Miami | Toronto

DOCUMENT CONTROL

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EXECUTIVE SUMMARY

This report presents an opinion on the likely impact of the BAPS Hindu Maha-Mandir development, located on 1390-1450 Western Port Highway, Cranbourne South, on the local wind environment at the critical outdoor areas within and around the subject site. The effect of wind activity has been examined for the three predominant wind directions for the region, namely the northerly, south-westerly, and westerly winds. The analysis of the wind effects relating to the proposed development have been carried out in the context of the local wind climate, building morphology and land topography.

The conclusions of this report are drawn from our extensive experience in this field and are based on an examination of the latest architectural drawings. No wind tunnel testing has been undertaken for the subject development, and hence this report addresses only the general wind effects and any localised effects that are identifiable by visual inspection of the architectural drawings provided (received 11th August 2026). Any recommendations in this report are made only in-principle and are based on our extensive experience in the study of wind environment effects.

The results of this assessment indicate that the development has incorporated several design features and wind mitigating strategies and is expected to be suitable for the intended use for the majority of the outdoor trafficable areas. However, there are some areas that are likely to be exposed to stronger winds. It is expected that the wind effects identified in the report can be ameliorated with the consideration of the following treatment strategies into the design of the development:

- The inclusion of the proposed acoustic fencing varying between 2.4m to 3.0m along the perimeter of the development site as indicated in the architectural drawings.
- The inclusion of the proposed internal perimeter walls as indicated in the architectural drawings.
- The inclusion of the proposed densely foliating vegetation in the form of trees and shrubs/hedge planting within and around the subject development site as indicated in the architectural and landscape drawings. In particular the densely foliating vegetation within the northern garden plaza, along the southern main entrance to the Grand Temple and around areas intended for short duration stationary activities such as outdoor seating.
- The densely foliating vegetation proposed along the western boundary of the site is to be of an evergreen species to ensure its effectiveness in wind mitigation throughout the year.

With the inclusion of the abovementioned recommendations in the final design, it is expected that wind conditions for the various trafficable outdoor areas within and around the development will be suitable for their intended uses, and that the wind speeds will satisfy the applicable criteria for pedestrian comfort and safety.

The pedestrian thoroughfares on the Level 1 (podium level) of Building 1 Grand Temple may be susceptible to stronger wind conditions and wind tunnel testing is recommended be undertaken at a detailed design stage to verify the wind conditions and subsequently optimise the potential wind mitigation strategies if required.

CONTENTS

1 INTRODUCTION

An opinion on the likely impact of the proposed design on the local wind environment affecting pedestrians within the critical outdoor areas within and around the subject development is presented in this report. The analysis of wind effects relating to the proposed development has been carried out in the context of the predominant wind directions for the region, building morphology of the development and nearby buildings, and local land topography. The conclusions of this report are drawn from our extensive experience in the field of wind engineering and studies of wind environment effects.

No wind tunnel testing has been undertaken for this assessment. Hence this report addresses only the general wind effects and any localised effects that are identifiable by visual inspection, and any recommendations in this report are made only in-principle.

A list of the architectural drawings referenced for this assessment is provided in the table below.

Table 1: List of Architectural Drawing Referenced

Drawing/file name	Revision Number	Date Received
EXISTING SITE PLAN	C	11/08/26
PROPOSED SITE PLAN	C	11/08/26
PROPOSED SITE PLAN – GROUND FLOOR	C	11/08/26
PROPOSED SITE PLAN – LEVEL 1	C	11/08/26
SITE PLAN – PROPOSED NATIVE VEGETATION RETAINED	C	11/08/26
SITE PLAN – PROPOSED NATIVE VEGETATION REMOVED	C	11/08/26
SITE ELEVATIONS	C	11/08/26
SITE SECTIONS	C	11/08/26
SITE SECTIONS CONTINUED	C	11/08/26

2 DESCRIPTION OF DEVELOPMENT AND SURROUNDINGS

The site is bounded by Dandenong-Hastings Road to the west, Homewood Road to the north, and private residential property along the remaining boundaries. Surrounding the site are primarily private residential lots comprised of large swathes of open bushland and residential housing.

A survey of the land topography indicates a gradual descent in elevation towards the south of the site. An aerial image of the subject site and the local surroundings is shown in Figure 1, with the frequency and magnitude of the prevailing winds is superimposed for each wind direction.

The existing site consists of a former equestrian site that is currently vacated and will be redeveloped into five buildings; comprised of the five buildings summarised as follows:.

- Building 1 Grand Temple (Maha-Mandiram) is located to the south of the site and has an overall height of approximately 64m above the local ground level.
- Building 2 Religious Services Complex (Satsang Sankulam) is located to the east of the site and has an overall height of approximately 18m above the local ground level.
- Building 3 Security Building 1(Suraksha Kaksha) is located to the north-east of the site and has an overall height of approximately 9m above the local ground level.
- Building 4 Security Building 2 (Suraksha Kaksha) is located to the north-west of the site and has an overall height of approximately 9m above the local ground level.
- Building 5 Welcome Centre, Hindu Kitchen & Souvenir Shop (Mukh Mandapam, Padmak Mandapam & Aksharpith) is located to the east of the site and has an overall height of approximately 19m above the local ground level

The critical outdoor trafficable areas associated with the proposed development, which are the focus of this assessment with regards to wind effects, are listed as follows:

- Ground Level outdoor trafficable areas.
- The outdoor pedestrian thoroughfare into the Prayer & Riturals Hall on Level 1 of Building 1 Grand Temple (Maha-Mandiram).

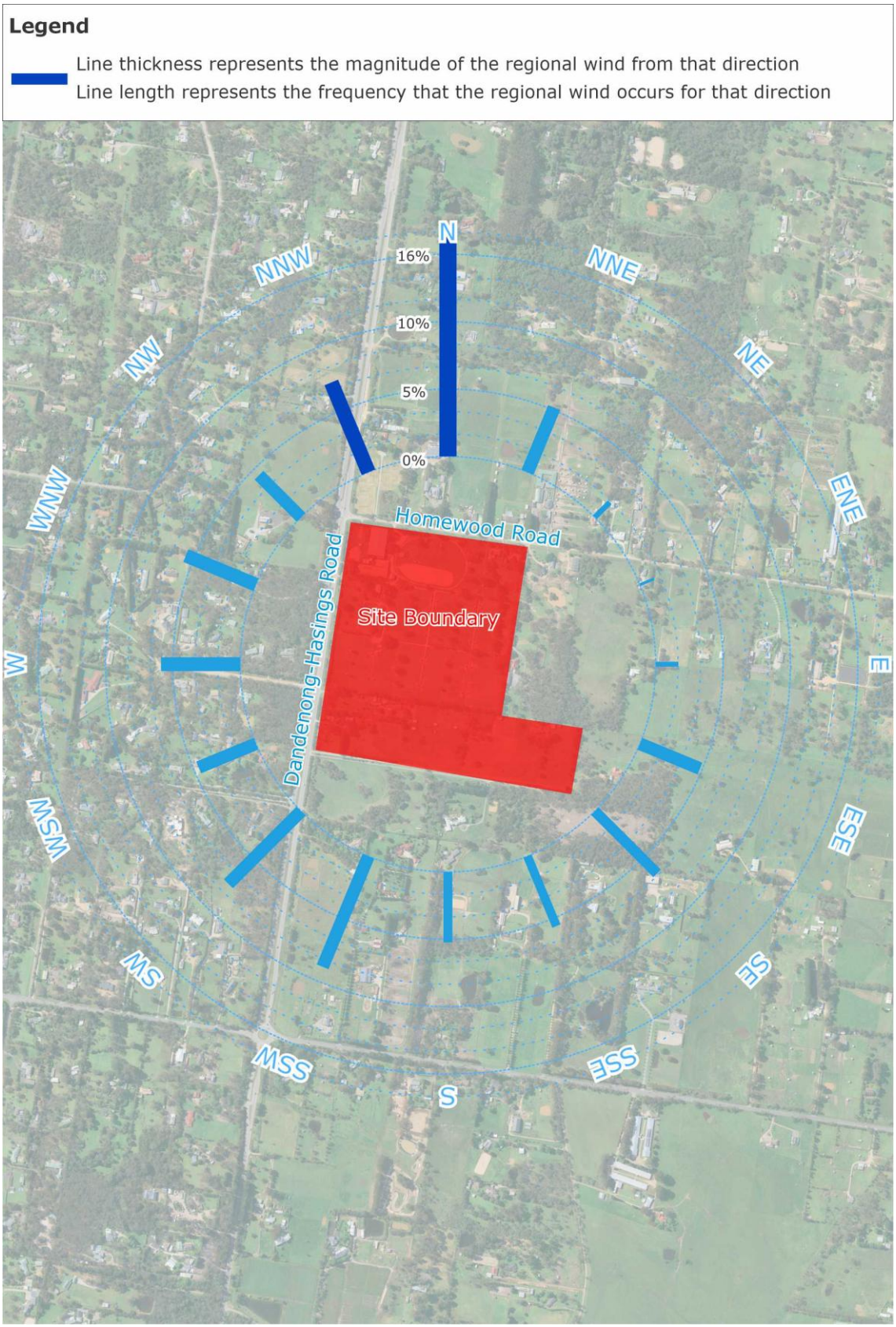

Figure 1: Aerial Image of the Site Location and Prevailing Wind Directions

3 REGIONAL WIND

The Cranbourne region is governed by three principal wind directions that can potentially affect the subject development. These winds prevail from the north, south-westerly, and west. These wind directions were determined from an analysis undertaken by Windtech Consultants of recorded directional wind speeds obtained from the meteorological station located at Moorabbin Airport by the Bureau of Meteorology (recorded from 1993 to 2020). The data has been corrected to represent winds over standard open terrain at a height of 10m above ground level. The results of this analysis are presented in Figure 2 in the form of a directional plot of the annual and 5% exceedance mean winds for the region. The frequency of occurrence of these winds is also shown in Figure 2.

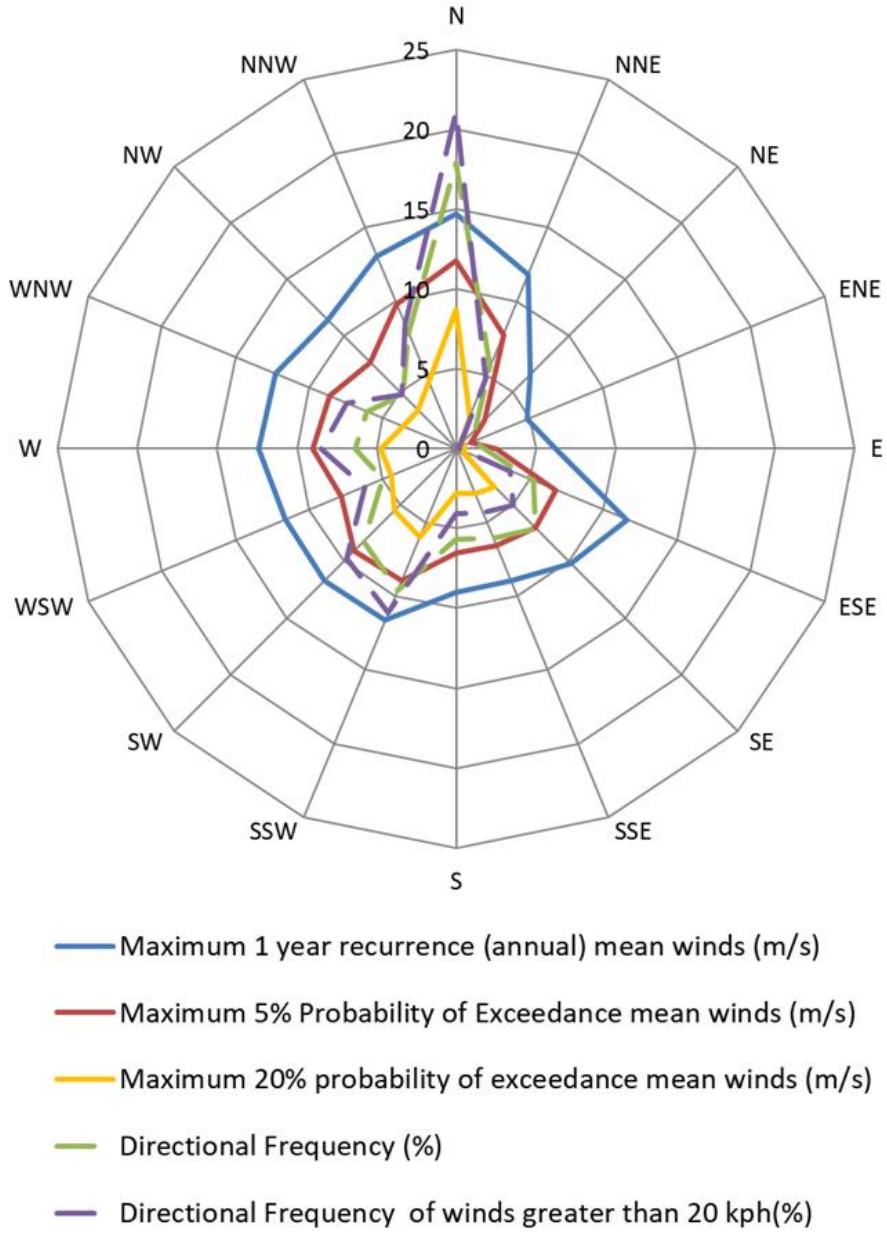

Figure 2: Directional Annual and 5% Exceedance Hourly Mean Wind Speeds (referenced to 10m height in standard open terrain), and Frequencies of Occurrence, for the Cranbourne Region

4 WIND EFFECTS ON PEOPLE

The acceptability of wind in any area is dependent upon its use. For example, people walking, or window-shopping will tolerate higher wind speeds than those seated at an outdoor restaurant. Various other researchers, such as A.G. Davenport, T.V. Lawson, W.H. Melbourne, and A.D. Penwarden, have published criteria for pedestrian comfort for pedestrians in outdoor spaces for various types of activities. Some Councils and Local Government Authorities have adopted elements of some of these into their planning control requirements.

For example, A.D. Penwarden (1973) developed a modified version of the Beaufort scale which describes the effects of various wind intensities on people. Table 2 presents the modified Beaufort scale. Note that the effects listed in this table refers to wind conditions occurring frequently over the averaging time (a probability of occurrence exceeding 5%). Higher ranges of wind speeds can be tolerated for rarer events.

Table 2: Summary of Wind Effects on People (A.D. Penwarden, 1973)

Type of Winds	Beaufort Number	Mean Wind Speed (m/s)	Effects
Calm	0	Less than 0.3	Negligible.
Calm, light air	1	0.3 – 1.6	No noticeable wind.
Light breeze	2	1.6 – 3.4	Wind felt on face.
Gentle breeze	3	3.4 – 5.5	Hair is disturbed, clothing flaps, newspapers difficult to read.
Moderate breeze	4	5.5 – 8.0	Raises dust, dry soil and loose paper, hair disarranged.
Fresh breeze	5	8.0 – 10.8	Force of wind felt on body, danger of stumbling
Strong breeze	6	10.8 – 13.9	Umbrellas used with difficulty, hair blown straight, difficult to walk steadily, wind noise on ears unpleasant.
Near gale	7	13.9 – 17.2	Inconvenience felt when walking.
Gale	8	17.2 – 20.8	Generally impedes progress, difficulty balancing in gusts.
Strong gale	9	Greater than 20.8	People blown over.

It should be noted that wind speeds affecting this particular development can only be accurately quantified with a wind tunnel study. This assessment addresses only the general wind effects and any localised effects that are identifiable by visual inspection and the acceptability of the conditions for outdoor areas are determined based on their intended use. Any recommendations in this report are made only in-principle and are based on our extensive experience in the study of wind environment effects.

5 RESULTS AND DISCUSSION

The expected wind conditions affecting the development are discussed in the following sub-sections of this report for the various outdoor areas within and around the subject development. The interaction between the wind and the building morphology in the area is considered and important features taken into account including the distances between the surrounding buildings and the proposed building form, as well as the surrounding landform. Note that only the potentially critical wind effects are discussed in this report. A glossary of the different wind effects described in this report included in Appendix A.

For this assessment, the wind speed criteria for pedestrian comfort that are considered are listed as follows:

- Walking Criterion (8m/s with a 5% probability of exceedance)
  for general circulation and pedestrian thoroughfares, e.g. footpaths, private balconies/terraces, through-site links etc.

- Standing (Short Exposure) Criterion (6m/s with a 5% probability of exceedance)
  for stationary activities generally less than an hour, e.g. waiting areas, communal terraces, main entries, café seating etc.

- Sitting (Long Exposure) (4m/s with a 5% probability of exceedance)
  for stationary activities longer than an hour, e.g. outdoor cinemas, outdoor fine dining etc.

Note that the above wind comfort levels are derived from the Lawson (1975) criteria. Although this assessment is qualitative in nature, the abovementioned criteria for pedestrian comfort are considered when assessing the wind environment impacts. However, all areas are also assessed with consideration to a pedestrian safety criterion of 23m/s for the annual maximum gust.

5.1 Ground Level Areas

The subject development site benefits from some shielding provided by the surrounding existing densely foliating street trees along the Dandenong-Hastings Road and Homewood Road frontages of the site. Similarly, the existing densely foliating street trees on the neighbouring properties along the eastern and southern boundaries of the site can also provide some shielding.

A review of the architectural drawings also indicates that a series of acoustic fencing varying between 2.4 to 3.0m are proposed along the perimeter edge of the development site which are expected to be effective in wind mitigation to the direct wind effects from the prevailing northerly, westerly and south-westerly winds. Furthermore, the proposed buildings and internal perimeter walls as indicated in the architectural drawings are also expected to be effective in further enhancing the local wind conditions. Significant densely foliating vegetation in the form of trees and shrubs are proposed throughout the development site that can also provide effective wind amelioration and improve the local wind amenity. Hence, they are recommended to be retained in the final design of the development; in particular the densely foliating vegetation within the northern garden plaza, along the southern main entrance to the Grand Temple and around areas intended for short duration stationary activities such as outdoor seating. Note that the densely foliating vegetation proposed along the western boundary of the site is to be of an evergreen species to ensure its effectiveness in wind mitigation throughout the year.

Hence, it is expected that the wind conditions within the various outdoor trafficable areas within the development site to be suitable for its intended uses with the inclusion of the proposed landscape scheme, acoustic and perimeter fencing as indicated in the architectural drawings.

5.2 Level 1 on Building 1 Grand Temple (Maha-Mandiram).

The proposed pedestrian throughfare along the perimeter of the Building 1 Grand Temple benefits from shielding provided by the building-form of the Building 1 Grand Temple and the proposed densely foliating trees surrounding the Building 1 Grand Temple as indicated in the architectural drawings. The pedestrian thoroughfares in particular the eastern and western corner areas however may be susceptible to stronger wind conditions due to potential accelerating flows around the Building 1 Grand Temple from the prevailing northerly and south-westerly directions. Wind tunnel testing is recommended to be undertaken at a detailed design stage to quantitatively assess the wind conditions, and subsequently optimise potential wind mitigation strategies if required.

6 REFERENCES

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APPENDIX A WIND EFFECTS GLOSSARY

A.1 Downwash and Upwash Effects

The downwash wind effect occurs when wind is deflected down the windward face of a building, causing accelerated winds at pedestrian level. This can lead to other adverse effects as corner acceleration as the wind attempts to flow around the building, as seen in Figure A.1.

This can also lead to recirculating flow in the presence of a shorter upstream building, causing local ground level winds to move back into the prevailing wind.

The upwash effect occurs near upper level edge of a building form as the wind flows over the top of the building. This has the potential to cause acceleration of winds near the leading edge, as well as potentially reattaching onto the roof area. This effect causes wind issues particularly near the leading edges of tall building and on the rooftop areas if there is sufficient depth along the wind direction. Upwash is more apparent in taller towers and podia.

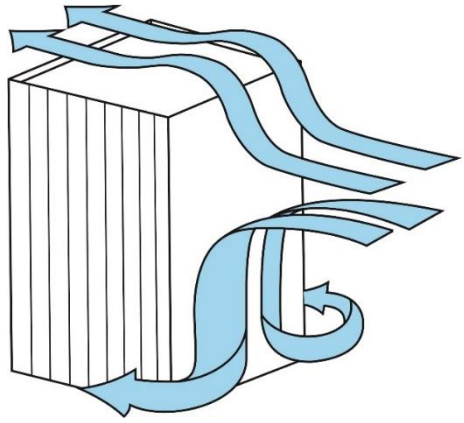

Figure A.1: Downwash Leading to Corner Wind Effect, and Upwash Effects

A.2 Funnelling/Venturi Effect

Funnelling occurs when the wind interacts with two or more buildings which are located adjacent to each other, which results in a bottleneck, as shown in Figure A.2. This causes the wind to be accelerated through the gap between the buildings, resulting in adverse wind conditions and pedestrian discomfort within the constricted space. Funnelling effects are common along pedestrian links and thoroughfares generally located between neighbouring buildings that have moderate gaps between them.

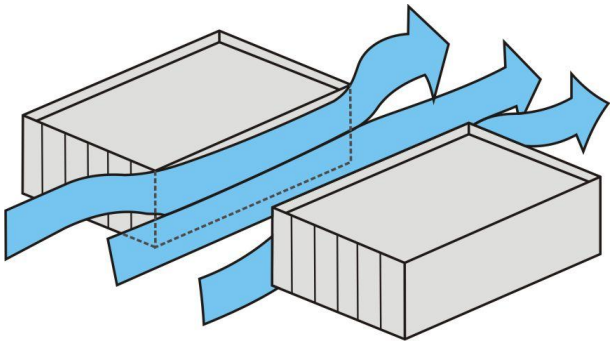

Figure A.2: Funnelling/Venturi Wind Effect

A.3 Gap Effect

The gap effect occurs in small openings in the façade that are open to wind on opposite faces, as seen in Figure A.3. This can involve a combination of funnelling and downwash effects. Presenting a small gap in the façade on the windward aspect as the easiest means through which the wind can flow through can result in wind acceleration through this gap. The pressure difference between the windward façade and the leeward façade also tends to exacerbate the wind flow through this gap.

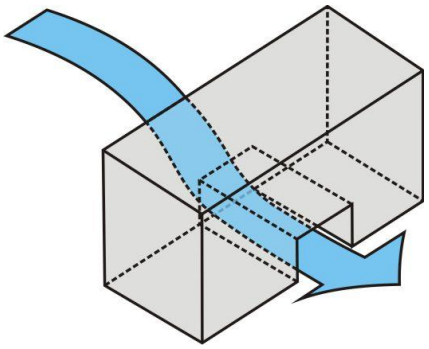

Figure A.3: Gap Wind Effect

A.4 Sidestream and Corner Effects

The sidestream effect is due to a gradual accumulation of wind shearing along the building façade that eventuates in an acceleration corner effect. The flow is parallel to the façade and can be exacerbated by downwash effects as well, or due to corner effect winds reattaching on the façade.

This is shown in Figure A.4. The corner refers to the acceleration of wind at the exterior vertical edge of a building, caused by the interaction of a large building massing with the incident wind, with the flow at the corner being accelerated due to high pressure differentials sets up between the windward façade and the orthogonal aspects. It can be further exacerbated by downwash effects that build up as the flow shears down the façade.

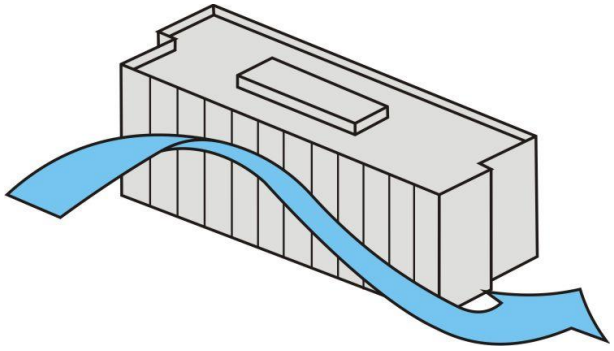

Figure A.4: Sidestream and Corner Wind Effect

A.5 Stagnation

Stagnation in a region refers to an area where the wind velocity is significantly reduced due to the effect of the flow being impeded by the bluff body. For a particular prevailing wind direction, this is typically located near the middle of the windward face of the building form or over a short distance in front of the windward face of a screen or fence. Concave building shapes tend to create an area of stagnation within the cavity, and wind speeds are generally low in these areas.