LOVE
DESIGN
STUDIO

August 2022

Uxbridge Road

Wind Microclimate Assessment

Contents

August 2022
PR461_V2
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Checked by: AL

Section Zero

0 Executive Summary

Executive Summary

Love Design Studio have prepared this Wind Microclimate Assessment on behalf of Infinite Partners (the applicant) as part of a planning application to the London Borough of Hillingdon (the Local Planning Authority). The scheme is considered an application of Potential Strategic Importance (PSI). It will therefore be referred to the GLA Planning Authority.

The proposal is for the demolition of ground floor entrance, parking structure, and north-east and south-west wings of the existing building, and refurbishment and extension of existing hotel to include additional accommodation at roof level and full height extension on the north elevation, together with walkways connecting to new buildings of between 6 and 8 storeys, to create additional hotel floor space and light industrial floorspace, along with ancillary facilities, parking and landscaping.

This Assessment is a qualitative assessment of the likely wind conditions around the proposed both under the proposed condition and cumulative condition assuming development in the immediate area from consented scheme(s). The report outlines the overall methodology and the use of the Lawson Comfort Criteria to assess the expected on-Site wind conditions. The assessment is based upon analysis of meteorological conditions for London Heathrow.

The meteorological data for the Site (refer to Section 4.1) indicates prevailing winds predominantly from the south-west throughout the year. Winds from other directions do occur, and are considered within the assessment; however, their impact on the overall wind microclimate conditions tend to be low, due to being relatively infrequent (compared to the prevailing directions).

67 receptors were placed at locations within and around the Proposed Development; these included spaces assumed for sitting, standing, entrance doors, places for leisure walking, business walking and roads/car parks.

The chosen receptor locations were considered based on their sensitivity and distance from the proposed development assuming pedestrian use.

All the off site receptors indicated that there is no change to the baseline assessment.

Of the 28 onsite receptors, 13 locations were deemed to require some form of mitigation measure to improve the wind microclimate conditions. 12 of the 13 experience a moderate adverse impact:

- Four at ground floor
- Four at podium level
- Four at roof level

Only one receptor experiences a major adverse impact, this receptor is located on the highest roof space at the north end of the existing building extension, so mitigation measures will be required.

Mitigation measures by way of local landscaping, raised parapets, external walkways, trees and canopies have been introduced and are likely to significantly reduce the risk of adverse impact to local conditions.

A further five receptors were considered A-E located at the next door 15-17 Uxbridge Road consented scheme for an apart-hotel. The uses around the ground at this location are changing from a derelict building site to car-park space and entrance doors.

The results of the wind assessment for the 15-17 Uxbridge Road development indicated ‘that no significant adverse effects are anticipated as a direct effect of the development scheme.’. With our proposed development in place it is assumed that the conclusions will remain the same as the intended uses will still be suitable.

With the current design there are no anticipated significant issues related to wind microclimate anticipated on site or offsite as a result of the proposed development.

Section One

1 Introduction

Introduction

This Wind Microclimate Assessment has been prepared on behalf of Infinite Partners (the applicant) as part of a planning application to the London Borough of Hillingdon (the Local Planning Authority).

This chapter presents the findings of an assessment of the potential effects of the Proposed Development on the local wind microclimate at the Site and within the surrounding area. In particular, it considers the potential effects of wind on pedestrian comfort and summarises the findings.

This report sets out the relevant planning policies; the methods used to assess the potential effects; the baseline conditions currently existing at the Site and its immediate surrounds (off-site locations); and potential impacts on the wind microclimate of the Proposed Development and the cumulative impact of the proposed development along with future consented schemes in the local area..

Where appropriate, the mitigation measures required to prevent, reduce or offset any potential effects are identified, and introduced.

Site Overview

Illustrated to the right is the proposed 1.40 acres site area for 27 Uxbridge Road. The site is bounded by Uxbridge Road to the north and Springfield Road to the west. The sites surrounding the proposal is a mixture of light industrial, residential and open spaces.

The site lies within the jurisdiction of the London Borough of Hillingdon. The scheme is considered an application of Potential Strategic Importance (PSI). It will therefore be referred to the GLA Planning Authority.

Within the site currently stands a 60's 12 storey plus plant hotel building comprising 170 keys, meeting rooms and gym.

The proposal scheme entails the demolition of ground floor entrance, parking structure, and north-east and south-west wings of the existing building, and refurbishment and extension of existing hotel to include additional accommodation at roof level and full height extension on the north elevation, together with walkways connecting to new buildings of between 6 and 8 storeys, to create additional hotel floor space and light industrial floorspace, along with ancillary facilities, parking and landscaping.

The scheme is creating an addition 265 hotel rooms.

15-17 Uxbridge Road next door is a consented scheme that comprises erection of a ground, mezzanine and 12 upper floors plus basement apart -hotel building to provide guest rooms and associated ancillary facilities, and associated landscaping/public realm works.

Section Two

2 Policy & Methodology

Policy and Guidance

National Policy

There is no National Legislation directly relating to wind microclimate issues for the Proposed Development.

National Policy and Guidance

National Planning Policy Framework (2021)

The National Planning Policy Framework was revised on 20 July 2021 and sets out the government's planning policies for England and how these are expected to be applied.

This revised Framework replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018 and updated in February 2019.

There are no national planning policies within the National Planning Policy Framework (NPPF) directly relating to wind microclimate issues, however, the NPPF emphasises the benefits of a high quality built environment, for example: "126. The creation of high quality, beautiful and sustainable buildings and places is fundamental to what the planning and development process should achieve. Good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities. Being clear about design expectations, and how these will be tested, is essential for achieving this. So too is effective engagement between applicants, communities, local planning authorities and other interests throughout the process."

Regional Policy and Guidance

The London Plan (2021)

The general objectives for the London Plan, and the process for drawing it up, altering it and replacing it, are set out in the Greater London Authority Act 1999 (as amended) and the Town and Country Planning (London Spatial Development Strategy) Regulations 2000. The London Plan has been developed in line with these requirements.

Policy D8 Public Realm

"...G ensure buildings are of a design that activates and defines the public realm, and provides natural surveillance. Consideration should also be given to the local microclimate created by buildings, and the impact of service entrances and facades on the public realm.

J ensure that appropriate shade, shelter, seating and, where possible, areas of direct sunlight are provided, with other microclimatic considerations, including temperature and wind, taken into account in order to encourage people to spend time in a place..."

Policy D9 Tall buildings

"...3) environmental impact

a) wind, daylight, sunlight penetration and temperature conditions around the building(s) and neighbourhood must be carefully considered and not compromise comfort and the enjoyment of open spaces, including water spaces, around the building..."

London Borough of Hillingdon

The Hillingdon Local Plan: Part 1: Strategic Policies was adopted in November 2012 and is the key strategic planning document for Hillingdon. It sets out a long term spatial vision and objectives for the Borough, what is planned to happen, where and how it will be achieved.

Policy DMHB 10: High Buildings and Structures

"Any proposal for a high building or structure will be required to respond to the local context and satisfy the criteria listed below...

vi) not adversely impact on the microclimate (i.e. wind conditions and natural light) of the site and that of the surrounding areas, with particular focus on maintaining useable and suitable comfort levels in public spaces;"

Local Planning Validation Checklist

Microclimate and Wind Assessment for Tall Buildings

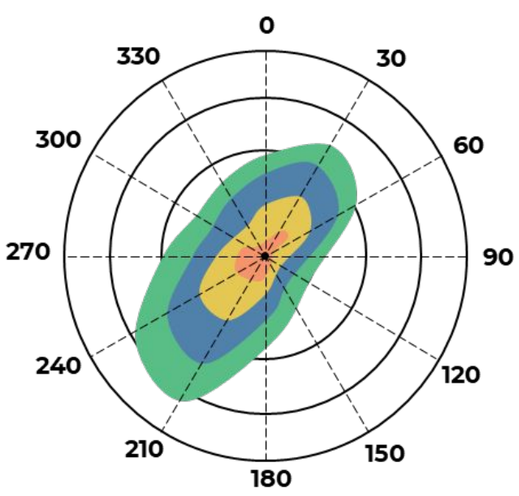
Major applications including tall buildings may require an assessment of their impacts on the surrounding environs. Tall buildings, in particular, can alter the air flow with highly disruptive consequences. Tall buildings will require an analysis of their impacts at ground level.

Meteorological Data

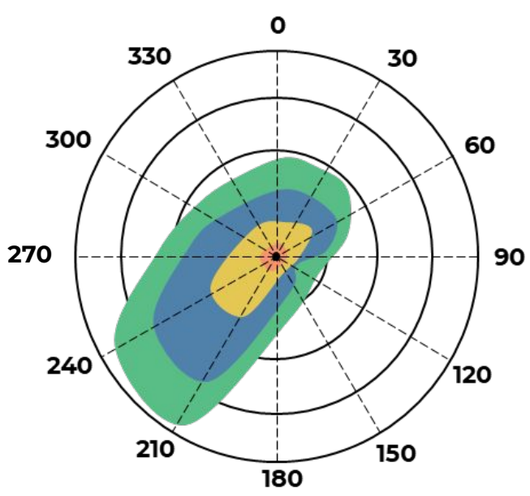
Meteorological data for London derived from the meteorological stations at Heathrow Airport. The assessment focuses on winter, representing a ‘worst-case’ season.

The images below indicates the distribution of wind frequency and directionality for each season.

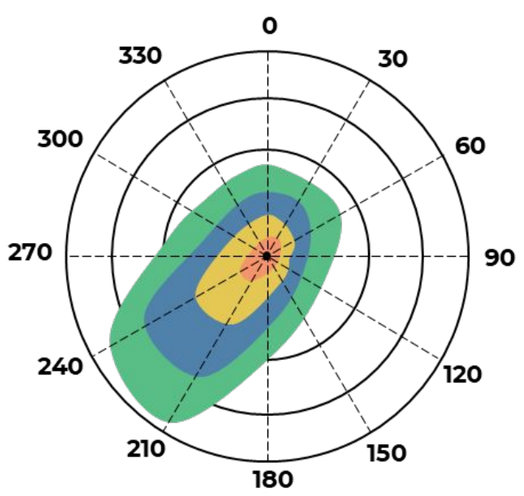
The meteorological data indicate that the prevailing wind direction throughout the year is from the southwest(i.e. 210 to 240 degrees on the compass); there is also a secondary peak north-easterly winds. The combination of meteorological data, site altitude and velocity ratios permit the percentage of time that wind speeds are exceeded across the site. The locations can then be assessed using the Lawson Comfort Criteria, as per overleaf.



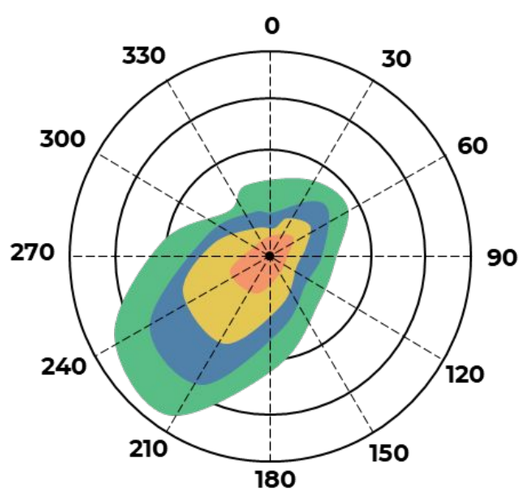
Spring



Summer



Autumn



Winter

London Heathrow Airport

Methodology

The Lawson Comfort Criteria reflect the fact the sedentary activity, such as sitting, requires a low wind speed whereas for more transient activity (such as walking) pedestrians would tolerate stronger winds.

If the wind conditions exceed the threshold then the conditions are deemed to be unacceptable for the stated activity. If the wind conditions are below the threshold then they are described as tolerable (or acceptable) for the stated activity. For example, if the wind speed exceeds Beaufort Force 4 (B4) for more than 4% of the time then the conditions would be unacceptable for leisure walking, as per tables to the right..

The probability of exceedance at a given location (for comparison against the Lawson Criteria) is calculated as follows. For each measurement location:

LDS measure the local wind speed for each wind angle using CFD simulation.

The reference height that is used sa the top of the sky is greater than 100m above the ground, and the outer boundary is sufficiently far upwind so as not to be directly influenced by the modelled surrounding buildings.

LDS then multiply the factored wind speed ratio for each angle by the corresponding parameter scale factor. For each angle, the probability of exceedance is calculated for each threshold in the criteria (using the parameters for each season for comfort, and using the annual parameters for the safety threshold) using the following formula:

$$F(x) = p \times e^{-(\frac{x}{c})^k}$$

and summed across all angles to arrive at the total probability of exceedance for that season (typically winter to represent a worst-case situation).

(Parameters c and k are the scale and shape factors respectively for use in calculating a Weibull probability distribution. Parameter p is the probability that wind will approach from a given direction. These parameters are used in combination with the measured local wind speeds from a CFD simulation to determine the probability of exceeding a given wind speed at a given measurement location during a given season.)

Description	Lawson Criteria Threshold	Activities that are Acceptable
Sitting	**1% > B3**	Pedestrians sitting for a longtime and wind velocity in the vicinity of entrance doors.
Entrance Doors	**6% > B3**	Standing or sitting for a short time.
Standing	**6% > B3**	
Leisure Walking	**4% > B4**	Pedestrian walking / strolling / sightseeing.
Business Walking	**2% > B5**	People at work (e.g. maintenance)
Roads & Car Parks	**6% > B5**	Fast pedestrian walking e.g. walking to a destination / cycling.

Beaufort Force	Average Wind Speed (m/s)	Description
0	**<1**	**Calm**
1	**1-2**	**Light air**
2	**2-3**	**Light breeze**
3	**4-5**	**Gentle breeze**
4	**6-8**	**Moderate breeze**
5	**9-11**	**Fresh breeze**
6	**11-14**	**Strong breeze**
7	**14-17**	**Near gale**
8	**17-21**	**Gale**
9	**21-24**	**Strong gale**
10	**25-28**	**Storm**
11	**29-32**	**Violent storm**
12	**33+**	**Hurricane**

Methodology

Following the classification of effects, a statement of significance is then made as to whether effects are considered to be significant or not significant. Major, Moderate, Minor Beneficial and Negligible are considered to be not significant, while Major, Moderate and Minor Adverse are considered to be significant and will require mitigation.

This report contains images of the 3D CFD model used in the analysis (see Appendices).

Whether a condition is significant or not depends on whether the condition requires mitigation. The tables below and to the right include a column that defines if mitigation measures are necessary.

The significance of on-site measurement locations are defined by comparing the wind comfort/safety levels with the intended pedestrian activity at each location.

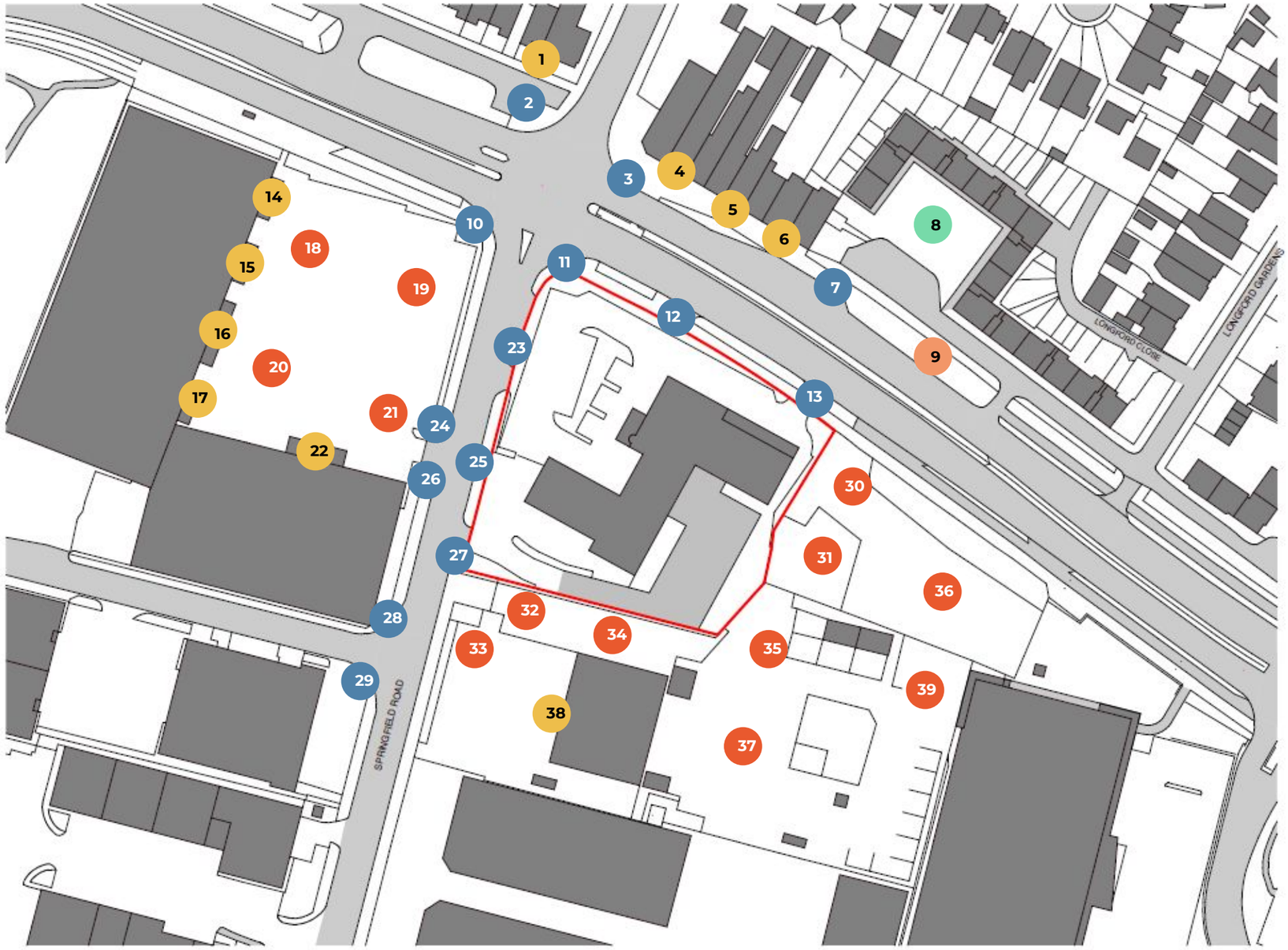
The significance of off-site measurement locations are defined not only by comparing the wind comfort levels with the intended pedestrian activity, but also by comparing the conditions to those experienced prior to the introduction of the proposed development (baseline).

On-site Receptors		**Mitigation**
Significance	**Trigger**	**Required?**
Major Adverse	Conditions are ‘unsafe’	**Yes**
Moderate Adverse	Conditions are ‘unsuitable’ (in terms of comfort) for the intended pedestrian use.	**Yes**
Negligible	Conditions are ‘suitable’ for the intended pedestrian use.	**No**
Moderate Beneficial	Conditions are calmer than required for the intended pedestrian use (by at least one comfort category).	**No**

Off-site Receptors		**Mitigation**
Significance	**Trigger**	**Required?**
Major Adverse	Conditions that were ‘safe’ in the baseline scenario become ‘unsafe’ as a result of the Proposed Development. OR Conditions that were ‘suitable’ in terms of comfort in the baseline scenario become ‘unsuitable’ as a result of the Proposed Development. OR Conditions that were ‘unsafe’ in the baseline scenario are made worse as a result of the Proposed Development.	**Yes**
Moderate Adverse	Conditions that were ‘suitable’ in terms of comfort in the baseline scenario are made windier (by at least one comfort category) as a result of the Proposed Development, but remain ‘suitable’ for the intended pedestrian activity.	**No**
Negligible	Conditions remain the same as in the baseline scenario.	**No**
Major Beneficial	Conditions that were ‘unsafe’ in the baseline scenario become ‘safe’ as a result of the Proposed Development.	
Moderate Beneficial	Conditions that were ‘unsuitable’ in terms of comfort in the baseline scenario become ‘suitable’ as a result of the Proposed Development. OR Conditions that were ‘unsafe’ in the baseline scenario are made better as a result of the Proposed Development (but not so as to make them ‘safe’).	**No**

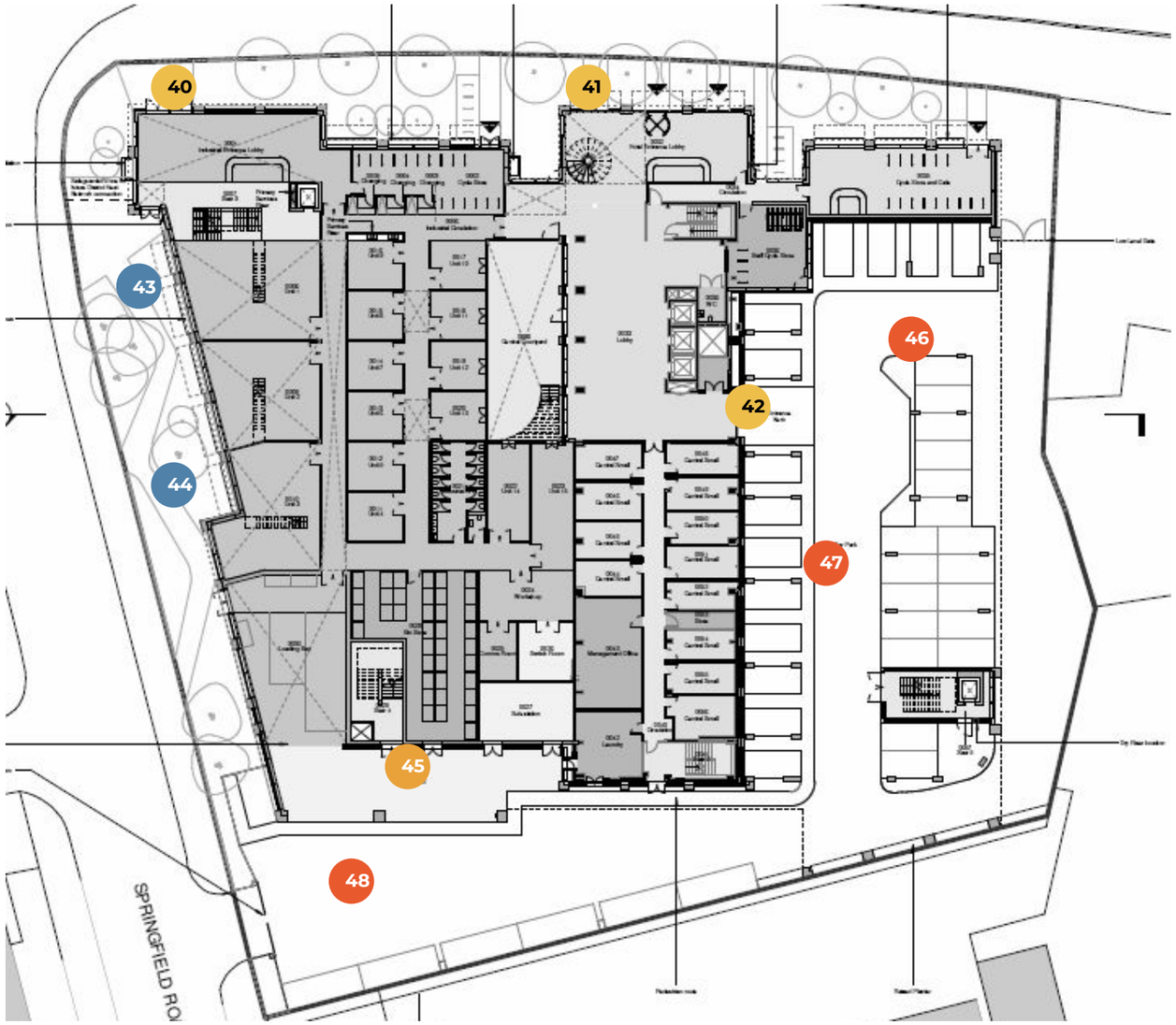
Section Three

3 Assessment



Sitting
Entrance Doors
Standing
Leisure Walking
Business Walking
Roads & Car Parks

Receptor Locations: Off-site Receptors

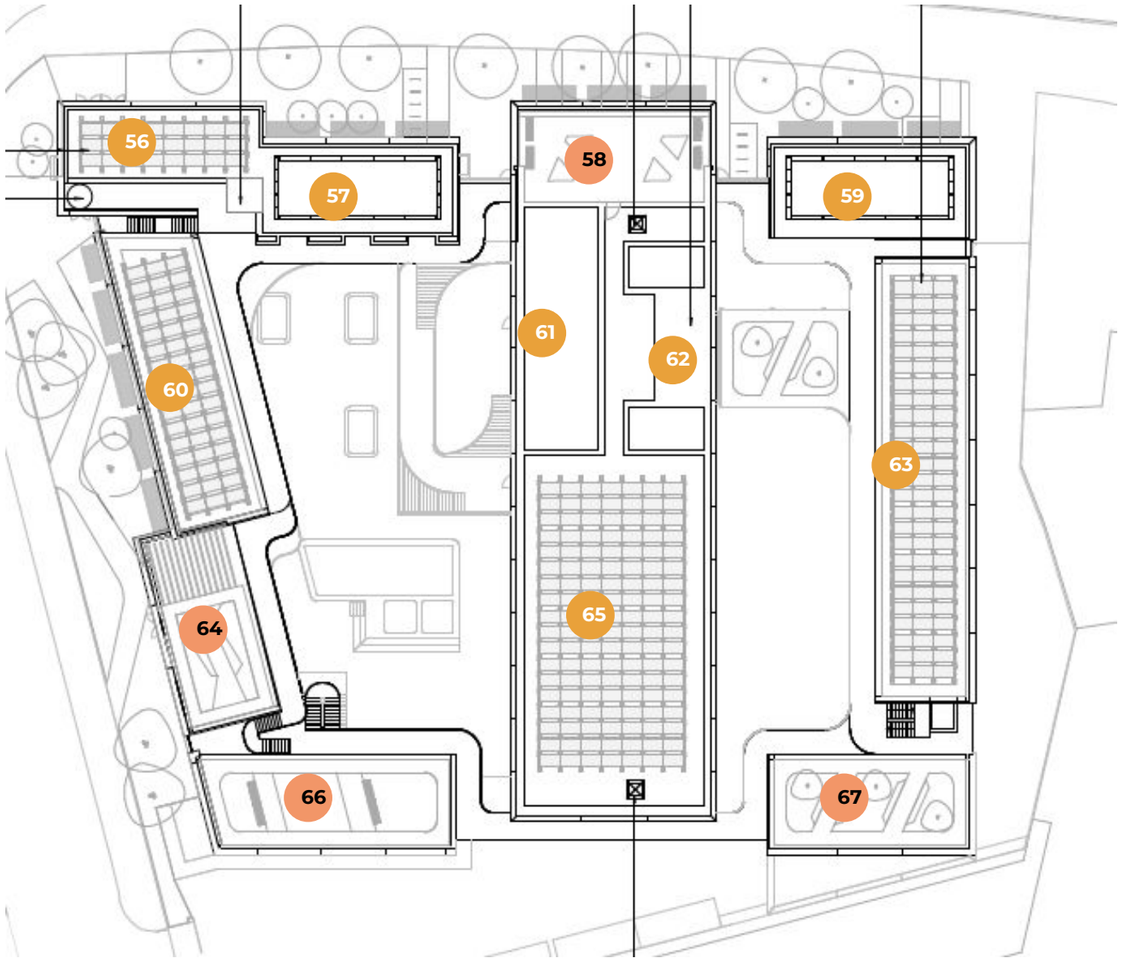


Sitting
Entrance Doors
Standing
Leisure Walking
Business Walking
Roads & Car Parks

Receptor Locations: Proposed GF Plan

Sitting
Entrance Doors
Standing
Leisure Walking
Business Walking
Roads & Car Parks

Receptor Locations: Podium Level



Sitting
Entrance Doors
Standing
Leisure Walking
Business Walking
Roads & Car Parks

Receptor Locations: Terrace and Top Floors

Sitting

Entrance Doors

Standing

Leisure Walking

Business Walking

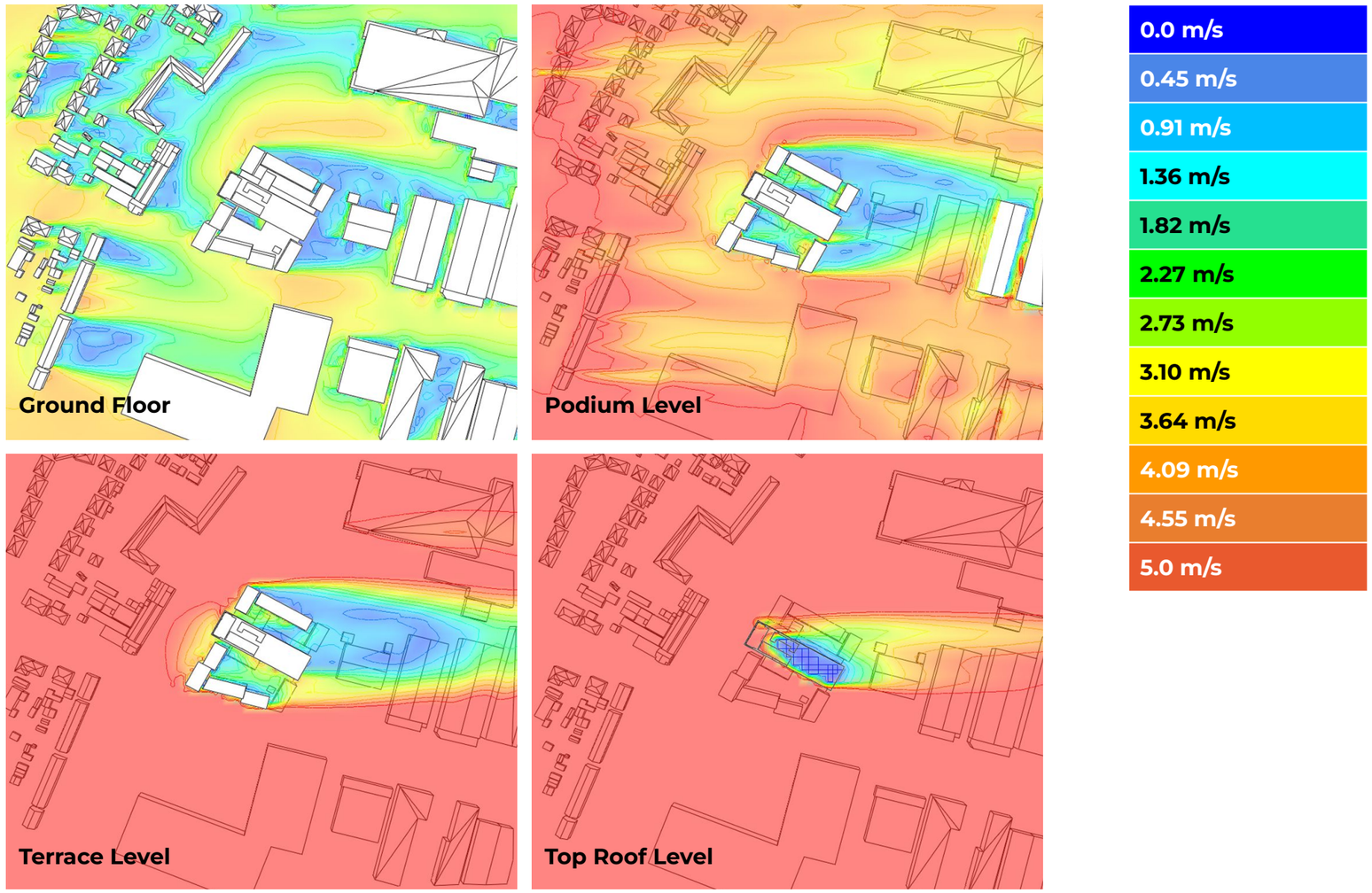
Roads & Car Parks

Receptor Locations: 15-17 Uxbridge Road GF Plan

Results

CFD Analysis was carried out for 12 directions for the baseline assessment (existing conditions), Proposed assessment (with the proposed scheme in place) and cumulative assessment (with consented schemes included, namely 15-17 Uxbridge Road).

Please see below an excerpt from the 0deg (north) wind direction assessment for the proposed scheme conditions at ground floor, podium level, terrace level and top roof level. A full set of outputs from the modelling are presented in the Appendices.



Modelling Output Proposed Scheme

Results

67 receptors were placed at locations within and around the Proposed Development; these included spaces assumed for sitting, standing, entrance doors, places for leisure walking, business walking and roads/car parks.

The chosen receptor locations were considered based on their sensitivity and distance from the proposed development assuming pedestrian use.

All the off site receptors indicated that there is no change to the baseline assessment.

Of the 28 onsite receptors, 13 locations were deemed to require some form of mitigation measure to improve the wind microclimate conditions. 12 of the 13 experience a moderate adverse impact:

- Four at ground floor
- Four at podium level
- Four at roof level

Only one receptor experiences a major adverse impact, this receptor is located on the highest roof space at the north end of the existing building extension, so mitigation measures will be required.

Mitigation measures are set out in the following section and include such measures as local landscaping, raised parapets, trees and canopies.

A further five receptors were considered A-E located at the next door 15-17 Uxbridge Road consented scheme for an apart-hotel. The uses around the ground at this location are changing from a derelict building site to car-park space and entrance doors.

The results of the wind assessment for the 15-17 Uxbridge Road development indicated ‘that no significant adverse effects are anticipated as a direct effect of the development scheme.’. With ou proposed development in place it is assumed that the conclusions will remain the same as the intended uses will still be suitable.

	Location	Intended Use	Actual Wind Condition	Baseline Condition/ Significance	Mitigation Required?
1	Off-site	Entrance Door	Entrance Door	Entrance Door	No
2	Off-site	Leisure Walking	Business Walking	Business Walking	No
3	Off-site	Leisure Walking	Business Walking	Business Walking	No
4	Off-site	Entrance Door	Entrance Door	Entrance Door	No
5	Off-site	Entrance Door	Entrance Door	Entrance Door	No
6	Off-site	Entrance Door	Entrance Door	Entrance Door	No
7	Off-site	Leisure Walking	Leisure Walking	Leisure Walking	No
8	Off-site	Standing	Leisure Walking	Leisure Walking	No
9	Off-site	Sitting	Business Walking	Business Walking	No
10	Off-site	Leisure Walking	Business Walking	Business Walking	No
11	Off-site	Leisure Walking	Business Walking	Business Walking	No
12	Off-site	Leisure Walking	Business Walking	Business Walking	No
13	Off-site	Leisure Walking	Business Walking	Business Walking	No
14	Off-site	Entrance Door	Entrance Door	Entrance Door	No
15	Off-site	Entrance Door	Entrance Door	Entrance Door	No
16	Off-site	Entrance Door	Entrance Door	Entrance Door	No
17	Off-site	Entrance Door	Entrance Door	Entrance Door	No
18	Off-site	Car Park	Car Park	Car Park	No
19	Off-site	Car Park	Car Park	Car Park	No
20	Off-site	Car Park	Car Park	Car Park	No
21	Off-site	Car Park	Car Park	Car Park	No
22	Off-site	Entrance Door	Entrance Door	Entrance Door	No
23	Off-site	Leisure Walking	Leisure Walking	Leisure Walking	No
24	Off-site	Leisure Walking	Business Walking	Business Walking	No
25	Off site	Leisure Walking	Business Walking	Business Walking	No

Results

	Location	Intended Use	Actual Wind Condition	Baseline Condition/ Significance	Mitigation Required?
26	Off-site	Leisure Walking	Business Walking	Business Walking	No
27	Off-site	Leisure Walking	Business Walking	Business Walking	No
28	Off-site	Leisure Walking	Business Walking	Business Walking	No
29	Off-site	Leisure Walking	Business Walking	Business Walking	No
30	Off-site	Car Park	Car Park	Car Park	No
31	Off-site	Car Park	Car Park	Car Park	No
32	Off-site	Car Park	Car Park	Car Park	No
33	Off-site	Car Park	Car Park	Car Park	No
34	Off-site	Car Park	Car Park	Car Park	No
35	Off-site	Car Park	Car Park	Car Park	No
36	Off-site	Car Park	Car Park	Car Park	No
37	Off-site	Car Park	Car Park	Car Park	No
38	Off-site	Entrance Door	Business Walking	Business Walking	No
39	Off-site	Car Park	Car Park	Car Park	No
40	Ground	Entrance Door	Leisure Walking	Moderate Adverse	Yes
41	Ground	Entrance Door	Leisure Walking	Moderate Adverse	Yes
42	Ground	Entrance Door	Standing	Moderate Beneficial	No
43	Ground	Leisure Walking	Business Walking	Moderate Adverse	Yes
44	Ground	Leisure Walking	Business Walking	Moderate Adverse	Yes
45	Ground	Business Walking	Standing	Moderate Beneficial	No
46	Ground	Car Park	Car Park	Negligible	No
47	Ground	Car Park	Car Park	Negligible	No
48	Ground	Car Park	Car Park	Negligible	No
49	Podium	Sitting	Standing	Moderate Adverse	Yes
50	Podium	Leisure Walking	Standing	Moderate Beneficial	No
51	Podium	Sitting	Standing	Moderate Adverse	Yes
52	Podium	Sitting	Standing	Moderate Adverse	Yes
53	Podium	Leisure Walking	Standing	Moderate Beneficial	No
54	Podium	Sitting	Standing	Moderate Adverse	Yes
55	Podium	Leisure Walking	Standing	Moderate Beneficial	No
56	Roof	Business Walking	Leisure Walking	Moderate Beneficial	No
57	Roof	Business Walking	Leisure Walking	Moderate Beneficial	No
58	Roof	Sitting	Business Walking	Major Adverse	Yes
59	Roof	Business Walking	Leisure Walking	Moderate Beneficial	No
60	Roof	Business Walking	Leisure Walking	Moderate Beneficial	No
61	Roof	Business Walking	Standing	Moderate Beneficial	No
62	Roof	Business Walking	Standing	Moderate Beneficial	No
63	Roof	Business Walking	Leisure Walking	Moderate Beneficial	No
64	Roof	Sitting	Leisure Walking	Moderate Adverse	Yes
65	Roof	Business Walking	Car Park	Moderate Adverse	Yes
66	Roof	Sitting	Leisure Walking	Moderate Adverse	Yes
67	Roof	Sitting	Leisure Walking	Moderate Adverse	Yes
A	15-17 UR	Car Park	Car Park	Negligible	No
B	15-17 UR	Car Park	Car Park	Negligible	No
C	15-17 UR	Entrance Door	Entrance Door	Negligible	No
D	15-17 UR	Entrance Door	Entrance Door	Negligible	No
E	15-17 UR	Entrance Door	Entrance Door	Negligible	No

Section Four

4. Mitigation

Receptor Locations: Proposed Landscaping Plan (Mitigation Measures)

	Intended Use	Mitigation Measure(s)
40	Entrance Door	Landscaping & planting
41	Entrance Door	Landscaping, planting & canopy
43	Leisure Walking	Landscaping, planting & canopy
44	Leisure Walking	Landscaping & planting
49	Sitting	Landscaping, planting & External Walkways
51	Sitting	Landscaping, planting & External Walkways
52	Sitting	Landscaping, planting & External Walkways
54	Sitting	Landscaping, planting & External Walkways
58	Sitting	Landscaping, planting & Raised Parapets
64	Sitting	Landscaping, planting & Raised Parapets
65	Business Walking	Landscaping, planting & Raised Parapets
66	Sitting	Landscaping, planting & Raised Parapets
67	Sitting	Landscaping, planting & Raised Parapets

Section Five

5 Conclusion

Conclusion

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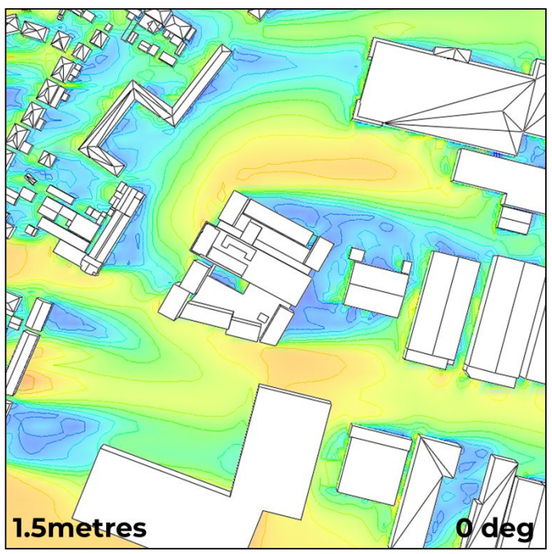
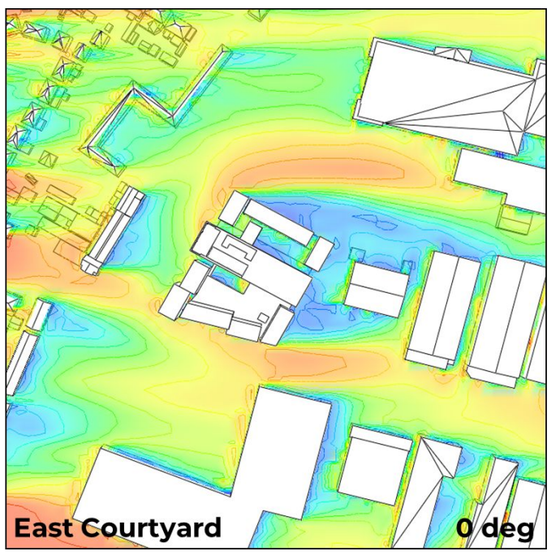
Section Six

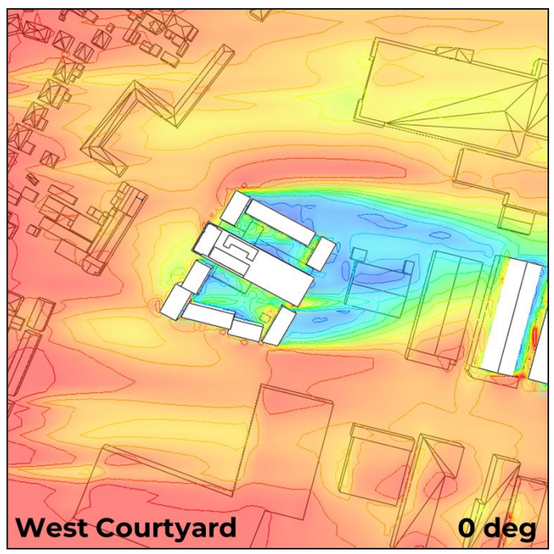
6 Appendices

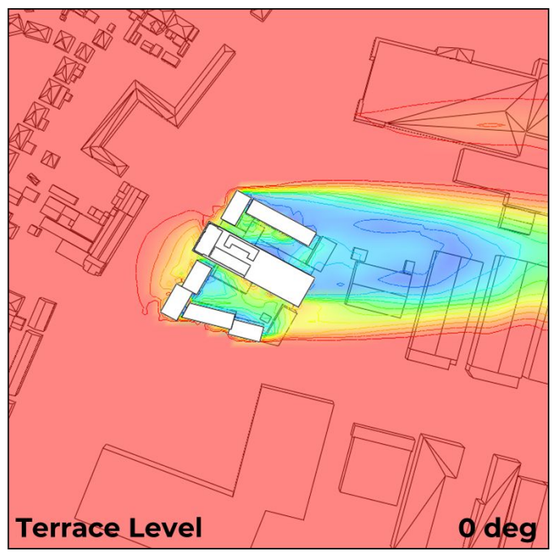
Appendix A - Baseline Assessment

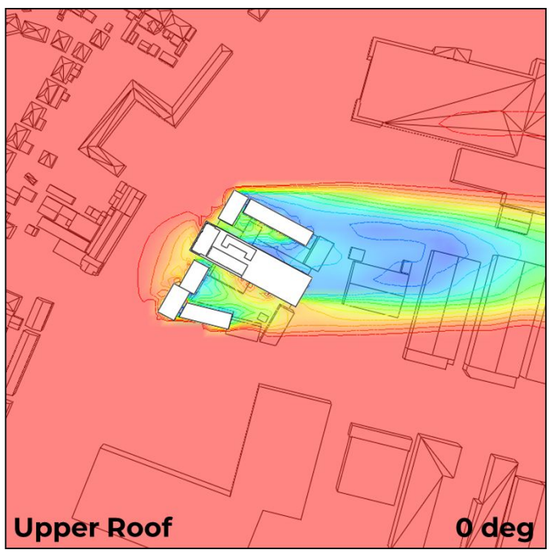
Appendix B - Proposed Assessment

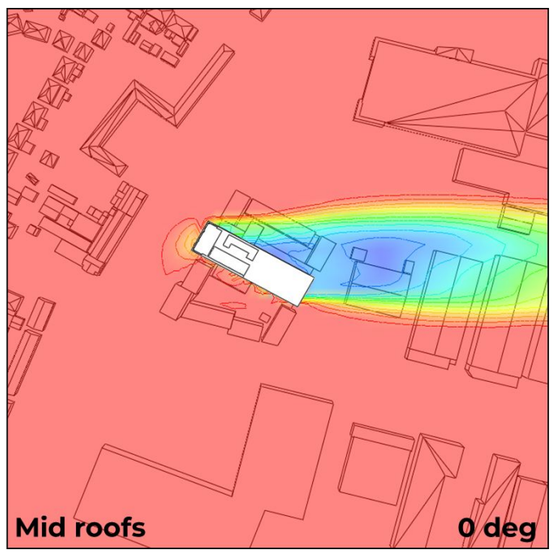


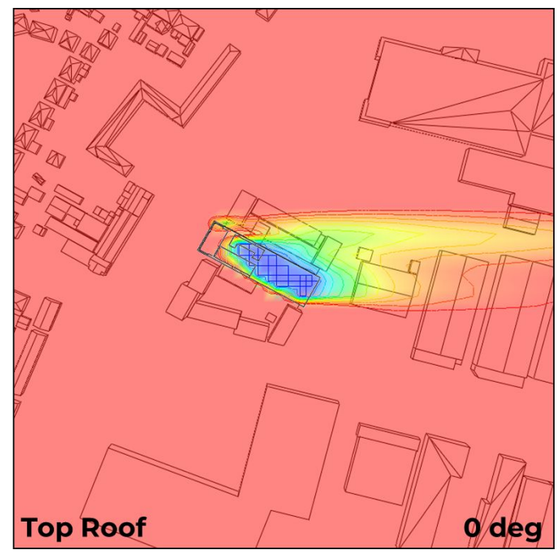




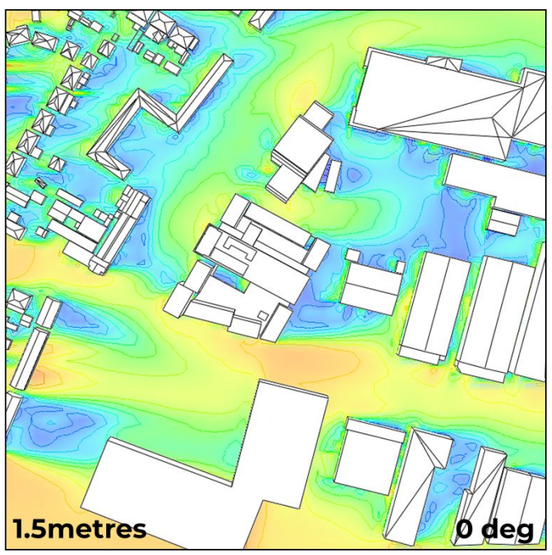


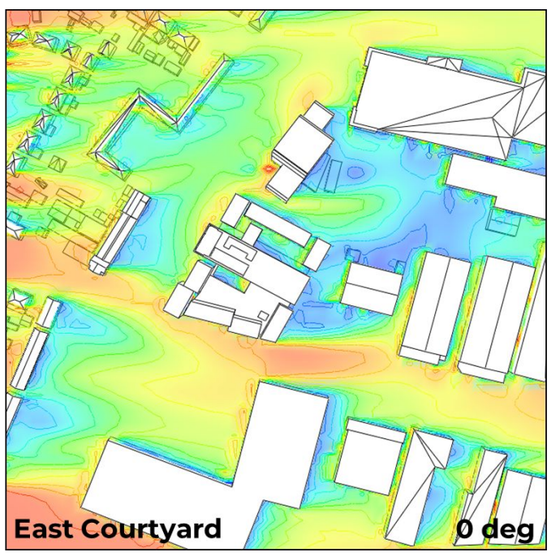


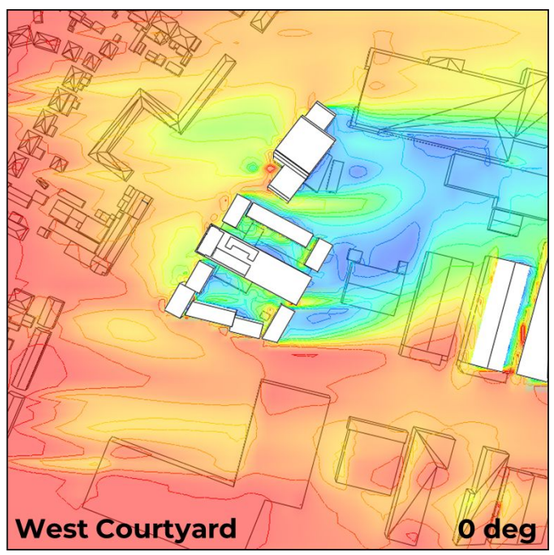


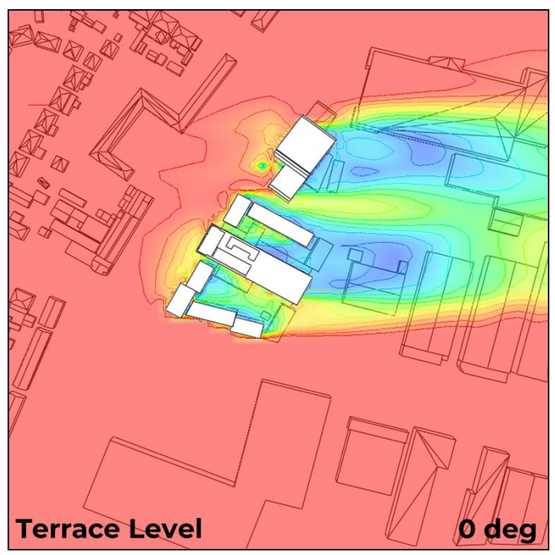


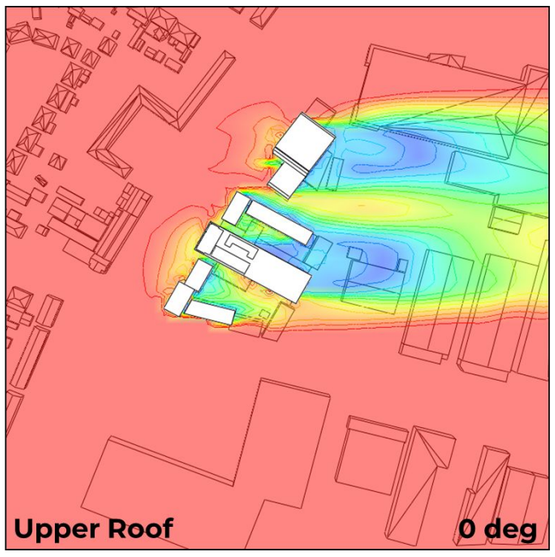
Appendix C - Cumulative Assessment











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Our work encompasses all stages of a building's lifetime; from advising developers on new development to landowners on improving their building stock. Our experience of each RIBA Stage enabling us to better advise on the other.

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