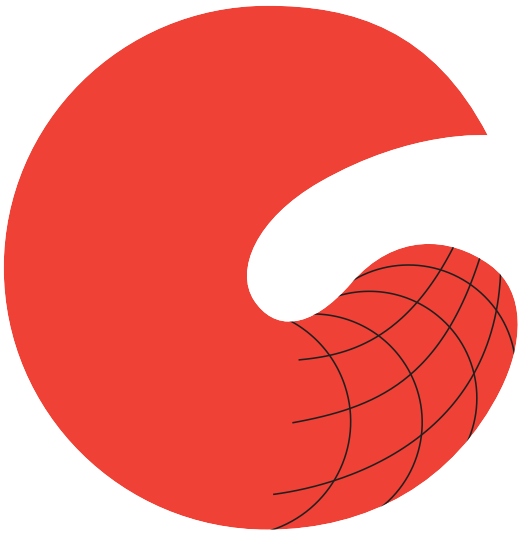

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BRIDGE RETAIL PARK, HAYES

Wind Assessment – Revision B

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BRIDGE RETAIL PARK, HAYES
Wind Assessment

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Reference: ML/VL/P21-2485/01 Rev B

Date: December 2021

BRIDGE RETAIL PARK, HAYES
Wind Assessment – Revision B

BRIDGE RETAIL PARK, HAYES
Wind Assessment
Revision B

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Appendices

Registration of Amendments

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By
Rev A 18.05.23	Updates made based on new site layouts and elevations	NP	PZ
Rev B 21.09.23	Updates made based on new site layouts and elevations	NP	PZ

1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd has been commissioned by OXW Hayes Sarl to undertake a Wind Assessment for the planning application at Bridge Retail Park, Uxbridge Road, Hayes, UB4 0RH.

1.2 The proposed development plans for the erection of a single building to accommodate use classes E(g), B2 (general industrial) and B8 (storage and distribution), with the necessary associated access via Uxbridge Road. The proposed building layout is shown in Figure 4.2. The site lies within the administrative jurisdiction of the London Borough of Hillingdon (LBH).

1.3 A qualitative assessment of wind effects has been undertaken on the proposed development in Hayes. The assessment is based on a desk study and is experience-based, no wind simulation modelling or concept model testing was completed.

1.4 The proposed development is not expected to change conditions on site significantly as most of the building footprint is low in height (i.e., below 10 stories), with part of the structure comprising three storeys of offices. Corner accelerations and façade downwash are likely to be minimal, these effects are not considered to be significant.

1.5 The development will not bring new pedestrian activities into the site, such as a public open space. The landscape is likely to ensure that the external areas are suitable for their intended uses including staff parking and deliveries.

1.6 The study is provided to ensure the public space is comfortable to use, and not affected by downdraughts from adverse weather. The study has been performed at the latest stage of design and considered the heights and massing of the proposed buildings.

2.0 LEGISLATION, POLICY & GUIDANCE

National Planning Policy

2.1 There are no national codes of practice or legislative policies relating to the assessment of environmental wind flows in the built environment. The impact of environmental wind on pedestrian spaces and the subsequent suitability of these spaces for planned usage are described by the Lawson Comfort Criteria (LCC), which are recognised by Local Planning Authorities (LPAs) as a suitable benchmark for wind assessments. LCC is applied in the wind assessment of the Application Site. This is described in Appendix A.

Regional Planning Policy

The London Plan

2.2 Policy D8 of the London Plan details requirements that must be considered for 'Public Realm'.

Development Plans and development proposals should:

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.

2.3 Policy D9 of the London Plan details requirements that must be considered for 'Tall Buildings'.

A. Definition

Based on local context, Development Plans should define what is considered a tall building for specific localities, the height of which will vary between and within different parts of London but should not be less than 6 storeys or 18 metres measured from ground to the floor level of the uppermost storey

B. Locations

1) Boroughs should determine if there are locations where tall buildings may be an appropriate form of development, subject to meeting the other requirements of the Plan. This process should include engagement with neighbouring boroughs that may be affected by tall building developments in identified locations.

2) Any such locations and appropriate tall building heights should be identified on maps in Development Plans.

3) *Tall buildings should only be developed in locations that are identified as suitable in Development Plans.*

C. *Impacts*

Development proposals should address the following impacts:

- *Visual impacts;*
- *Functional impact;*
- *Environmental impact; and*
  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.*
- *Cumulative impacts.*

D. *Public Access*

Public Access Free to enter publicly accessible areas should be incorporated into tall buildings where appropriate, particularly more prominent tall buildings where they should normally be located at the top of the building to afford wider views across London.

Local Planning Policy

LBH Local Plan: Part 1 Strategic Policies

2.4 Policy BE1 of the Local Plan details requirements that must be considered for 'Built Environment'.

The Council will require all new development to improve and maintain the quality of the built environment in order to create successful and sustainable neighbourhoods, where people enjoy living and working and that serve the long-term needs of all residents. All new developments should:

11. *In the case of tall buildings, not adversely affect their surroundings including the local character, cause harm to the significance of heritage assets or impact on important views. Appropriate locations for tall buildings will be defined on a Character Study and may include parts of Uxbridge and Hayes subject to considering the Obstacle Limitation Surfaces for Heathrow Airport. Outside of Uxbridge and Hayes town centres, tall buildings will not be supported. The height of all buildings should be based upon an understanding of the local character and be appropriate to the positive qualities of the surrounding townscape.*

LBH Local Plan: Part 2 Development Management Policies

2.5 Policy DMHB of the Local Plan details requirements that must be considered for ': 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. It should:

i) be located in Uxbridge or Hayes town centres or an area identified by the Borough as appropriate for such buildings;

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.

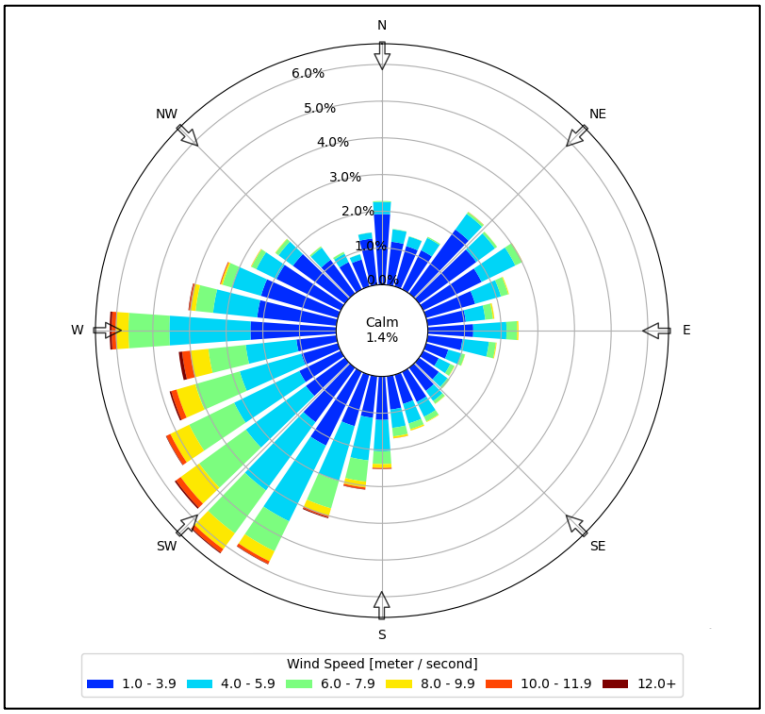
3.0 METEOROLOGICAL DATA ANALYSIS

3.1 For analysis of meteorological behaviour, it is necessary to know nearby wind data and conditions for the case. Velocity fluctuation and directional variance are hard to measure with great accuracy.

3.2 Both wind speed frequency and its direction are required. This data is commonly presented in the form of wind speed and wind frequency distribution diagrams (wind roses). Data is provided for average hourly wind speeds at 10 m above ground level. This data is monitored and recorded from meteorological stations all over England and reported by the Met office.

3.3 Meteorological data has been taken from London Heathrow (LHR) Airport, located approximately 4.3 km south of the proposed development site and is expected to be representative of site conditions at Bridge Retail Park in Hayes.

3.4 To assess wind frequency, 10 years of historical wind speed data was used. This is shown in Figure 3.1 and has been formulated using data from Iowa Environmental Mesonet Website. The figure shows where the direction the wind is blowing from, with long bars representing frequent winds and colour representing magnitude of wind speeds from January 1st, 2012, to December 31st, 2022, inclusive.

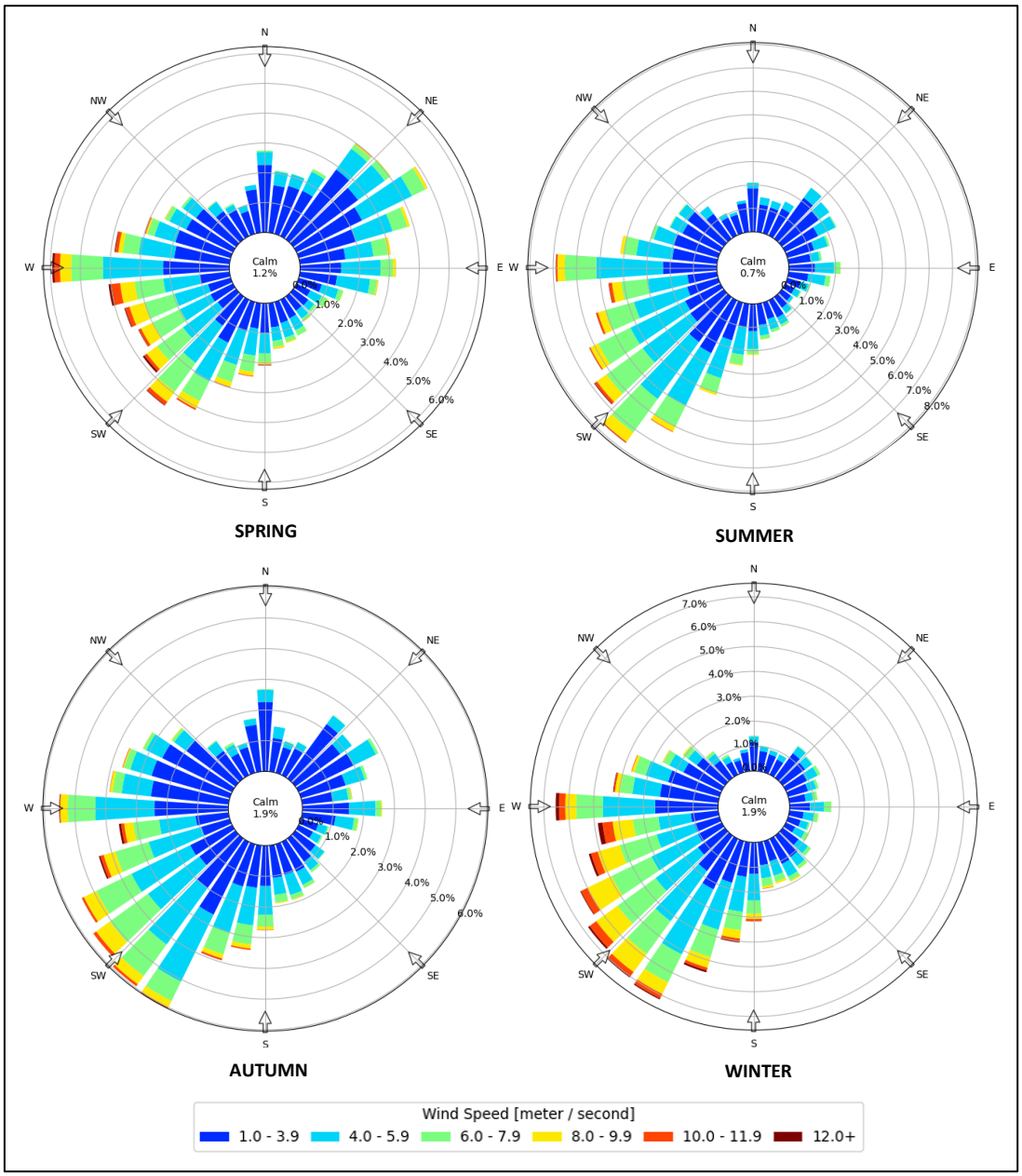


Note: Calm Values are <1.0 mps

Figure 3.1: LHR 10 Year Wind Rose Diagram 2012 to 2022

3.5 Figure 3.1 shows that the prevailing wind direction has been south westerly to westerly over the last 10-year period, with stronger wind speeds forming from this direction. The average wind speed over the decade has been 4.3 m/s.

3.6 Figure 3.2 shows 10 years of historical data based on the seasons. This shows where the direction the wind is blowing from, with long bars representing frequent winds and colour representing magnitude of wind speeds from spring, summer, autumn and winter over the 10-year period including January 1st, 2012, to December 31st, 2022.



Note: Calm Values are <1.0 mps

Figure 3.2: LHR 10 Year Wind Rose Diagram 2012 to 2022 By Season

3.7 Figure 3.2 shows that the dominating prevailing direction for all four seasons has been south westerly to westerly over the past decade.

3.8 The spring season, over the last 10 years, has shown a mix of prevailing wind directions, varying from south westerly to westerly and north easterly for large periods of time. The average wind speeds ranged from calm to 7.9 m/s, with a few episodes above 8 m/s.

3.9 The summer season, over the last 10 years, has predominantly been south westerly and westerly. The average wind speeds ranged from calm to 7.9 m/s, with a few episodes above 8 m/s.

3.10 The autumn season, over the last 10 years, has predominantly been south westerly to westerly wind directions. The average wind speeds ranged from calm to 7.9 m/s, with a few episodes above 8 m/s.

3.11 The winter season, over the last 10 years, has predominantly been south westerly to westerly wind directions. The average wind speeds ranged from calm to 9.9 m/s. The largest wind speeds occur during the winter, where speeds can reach over 12 m/s more frequently than the other seasons.

4.0 BASELINE CONDITIONS & PROPOSED DEVELOPMENT

Baseline Conditions

4.1 Bridge Retail Park, Uxbridge Road, Hayes, UB4 0RH currently consists of nine large general merchandise retail shops between one to two storeys. The site is located between Uxbridge Road and Bullsbrook Road. Figure 4.1 shows the site boundary of the proposed development with the underlying existing development.

4.2 Current conditions at the site will experience wind directed along Uxbridge Road and Bullsbrook Road, however this will still be suitable for all aspects of daily life. Bullsbrook Road is sheltered by the current buildings, thus benefits from a lower wind effect than Uxbridge Road.

4.3 The remainder of the site is likely to experience conditions suitable for all activities, and no safety issues are expected to occur. The entrance to the retail developments is in a sheltered location due to the L-shape formation funnelling from the north to south of the site, creating a low exposure. In winter, it is expected that some wind acceleration is likely to occur, similar to conditions in the surrounding area.

4.4 The entrances to retail developments to the north of the site are in an open location where wind acceleration is likely to occur on occasion, however, it is not expected to be uncomfortable for walking.

4.5 Under north easterly winds, the retail development entrances to the north and south will feel open and exposed, thus unsheltered. However, this is not expected to result in significantly uncomfortable conditions for site users.

Proposed Development

4.6 The proposed development plans for the erection of a single building to accommodate use classes E(g), B2 (general industrial) and B8 (storage and distribution), with the necessary associated access via Uxbridge Road. The proposed building layout is shown in Figure 4.2 and includes the following parameters:

- The erection of a warehouse area;
- Adjoining two storey office building;
- 2 Level access doors and 16 dock loading doors ;
- 16 HGV parking spaces; and
- 91 car parking spaces.

4.7 For the full planning application, the effect of the proposed development is likely to be comparable to the existing situation and in some locations, such as the north and east boundaries of the site.

4.8 The remainder of the microclimates are expected to change based on the new site layout and height of the development. This is detailed in Section 5.

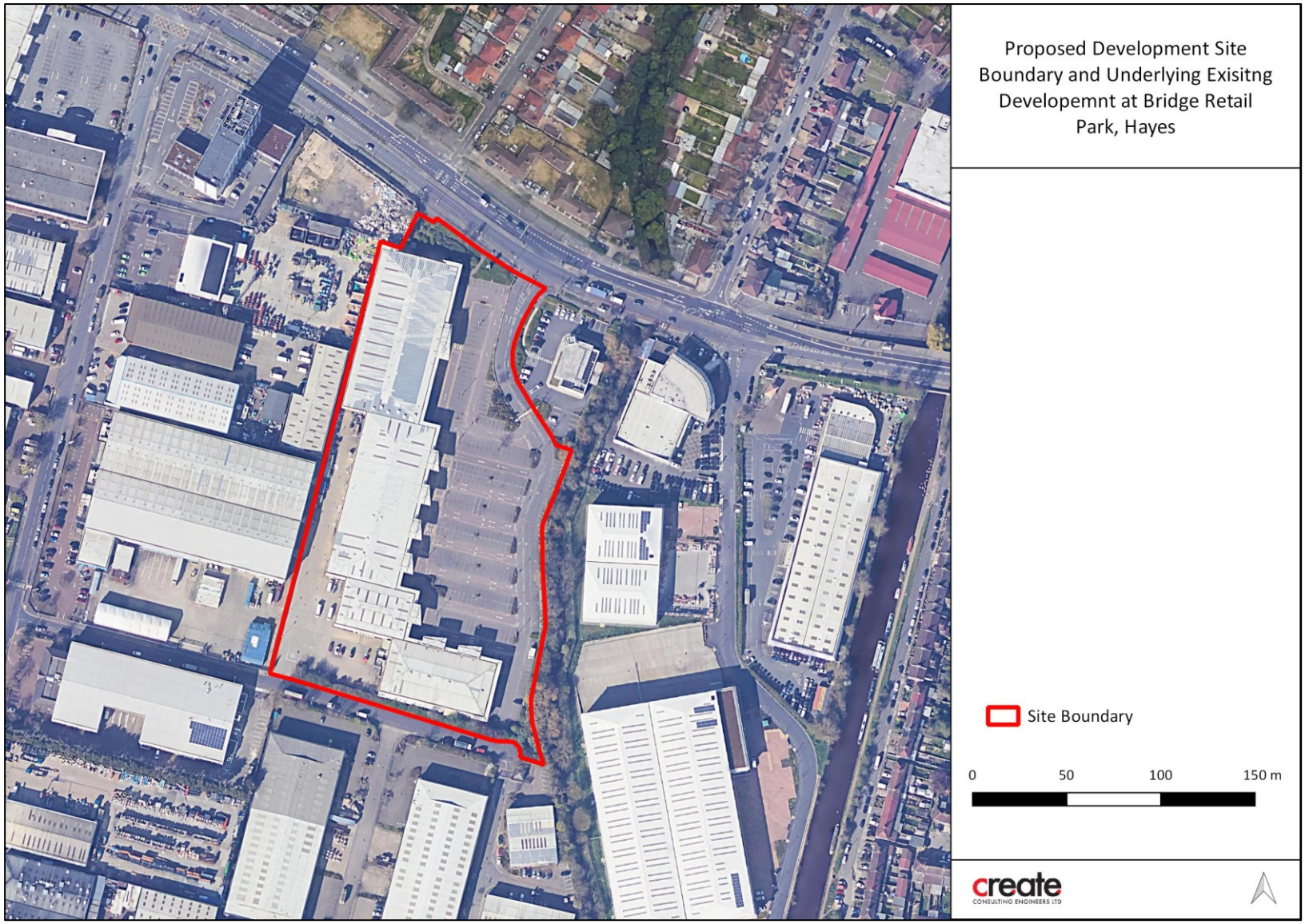


Figure 4.1: Proposed Development Site Boundary and Existing Development

Figure 4.2: Proposed Building Layout

5.0 MICROCLIMATE OF THE PROPOSED DEVELOPMENT

5.1 This section details the expected microclimate across the proposed development from an ariel perspective and each façade of the building.

Aerial View

5.2 Figure 5.1 shows an aerial view of the proposed development with areas of shelter and exposure during the predominant wind direction experiences over the last decade, south westerlies.

5.3 The warehouse access area to the west and the car park near the offices to the north are expected to be sheltered for the majority of the year, during south westerly winds due to the height of the building, providing protection for all activities. Additionally, units to the north and northeast of the development are likely to benefit from the sheltering provided by the warehouse.

5.4 The south and western facades will experience downwash and are expected to be exposed for the majority of the year. There are no onsite activities taking place here, however the development is adjacent to other units. The neighbouring tall units will provide a level of shelter which will make those areas suitable for walking and standing activities.

5.5 In addition, there is expected to be corner acceleration at the southwestern edge of the warehouse which will create a negligible to minor impact upon adjacent site users. The surrounding buildings will provide protection from this effect This will be suitable for walking and standing activities for the majority of the year. Based on the site area, the height of the building should not cause obstruction to the neighbouring activities.

5.6 During north easterly winds, the whole development is expected to be exposed. Based on the wind speeds analysed over the 10-year period, it is envisioned that during high wind speeds of up to 9.9 m/s, the development will be suitable for driving lorries and walking or carrying out duties around the site.

Northern Façade

5.7 Figure 5.2 shows the northern façade will be sheltered for the majority of the year where the car park can be used to walk, sit and stand comfortably. Offsite, along Uxbridge Road, the pedestrian pathway would be sheltered by the façade of the building, providing protection to public users.

5.8 When winds are northly and north easterly, the area would become exposed, creating a minor impact in the car park. It is expected that this area will be suitable for driving, walking, standing and sitting during these periods.

5.9 Corner acceleration is expected to affect the northeastern corner the offices, however, will cause a negligible impact to site users. The pathway would be suitable for walking activities throughout the year.

Southern Façade

5.10 Figure 5.3 shows the southern façade will experience downwash and is likely to be exposed for the majority of the year. There are no onsite activities taking place here, however the development is adjacent to other units. The neighbouring tall units will provide some level of shelter to the down washing effect which will make those areas suitable for walking and standing activities.

5.11 In addition, there is expected to be corner acceleration at the southwestern edge of the warehouse which will create a negligible to minor impact upon adjacent site users. The surrounding buildings will provide protection from this effect This will be suitable for walking and standing activities for the majority of the year. Based on the site area, the height of the building should not cause obstruction to the neighbouring activities.

5.12 The HGV parking spaces are expected to be sheltered as the western and southern façades provide a barrier to the wind, creating a negligible impact.

5.13 During northly and north easterly winds, the façade will be sheltered, and the HGV parking spaces will become exposed, creating a minor impact. It is expected that this area will be suitable driving, walking, standing and sitting during these periods.

Eastern Façade

5.14 Figure 5.4 shows the eastern façade will be sheltered for the majority of the year, where the HGV level access and loading door areas alongside the HGV parking area can be used to walk, sit and stand comfortably. Offsite, along the site access road (via Uxbridge Road) and units to the east of the site, will be sheltered by the façade of the building, providing protection to other public users and creating a low exposure.

5.15 The shape of the roofing along the warehouse may allow pockets of wind to collect and circulate. This can happen from any wind direction. This is expected to create a minor adverse impact. However, the roof is not accessible, will not be used for day-to-day activities and therefore will not impede the sites intended use on the ground floor.

5.16 When winds are northly and north easterly, the area would become exposed along with downwash of wind on the façade, creating a minor impact to slight adverse impact at the HGV level access and loading door areas and the HGV parking area. It is expected that this area will be suitable driving, walking and standing during these periods.

5.17 There is some corner acceleration expected at the northern edge of the building, comprising of offices. This is expected to create a minor impact as the promotion of downwash is created. This area would not be suitable for standing in high-speed winds above 12 m/s. These wind conditions would be rare, based on the 10-years of data at LHR meteorological station.

Western Façade

5.18 Figure 5.5 shows the western façade will experience downwash and is likely to be exposed for the majority of the year. There are no onsite activities taking place here, however the development is adjacent to other units. The neighbouring tall units will provide some level of shelter to the down washing effect which will make those areas suitable for walking and standing activities.

5.19 In addition, there is expected to be corner acceleration at the southwestern edge of the warehouse which will create a negligible to minor impact upon adjacent site users. The surrounding buildings will provide protection from this effect, creating an environment that will be suitable for walking and standing activities for the majority of the year. Based on the site area, the height of the building should not cause obstruction to offsite neighbouring activities.

5.20 The shape of the roofing along the warehouse may allow pockets of wind to collect and circulate. This can happen from any wind direction. This is expected to create a minor adverse impact. However, the roof is not accessible, will not be used for day-to-day activities and therefore will not impede the sites intended use on the ground floor.

5.21 During northly and north easterly winds, the façade will be sheltered. It is expected that this area will be suitable driving, walking, standing and sitting during these periods.

Summary

5.22 The wind speeds experienced on the site will generally be within acceptable limits for large parts of the year (less than 10 m/s). Therefore, although conditions will sometimes be windier, people will not consider them distressful. They will be suitable for onsite and offsite activities.

5.23 Wind speeds will be within safe limits. Only in extreme gales will there be difficult conditions for site users, however due to the low height of the developments footprint that forms the site, it is unlikely that conditions will be above the safety threshold.

5.24 Based on the current design, the development has areas of sheltered and exposed façades. During south westerly and westerly winds, the development has a low exposure level, sheltered by surrounding buildings to the south, that will reduce offsite exposure impacts and the site activities will be sheltered by the development building.

5.25 North and north easterly winds will not occur regularly; however, the microclimate will be suitable for all required activities including walking and standing. When compared to the baseline, the effects of the proposed development are likely to be negligible.

Mitigation Measures

5.26 No specific mitigation measures are suggested as conditions on the proposed development site are expected to be suitable for the warehouse use, offsite industrial uses and pedestrians for most of the year.

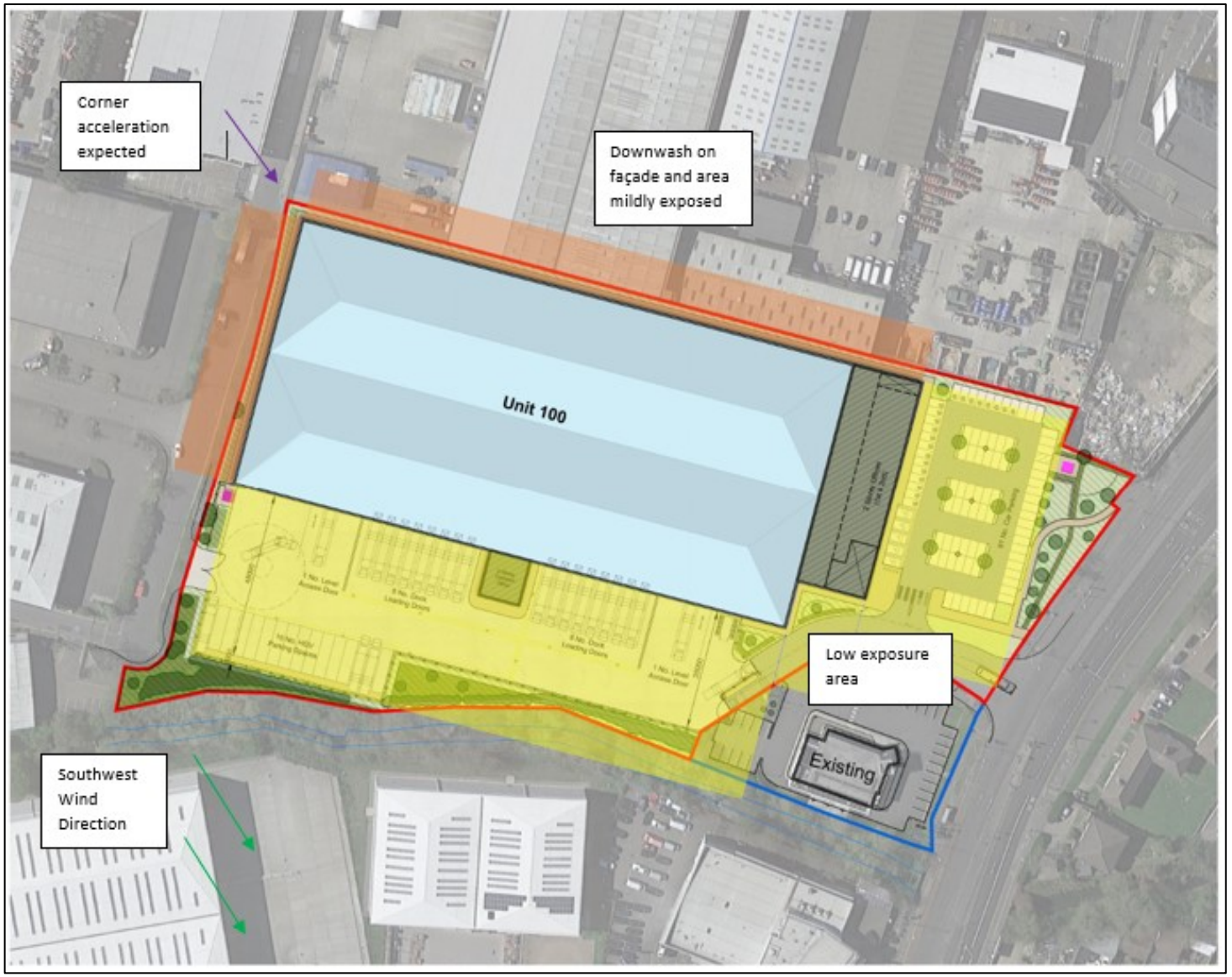


Figure 5.1: Microclimate at an Aerial View of the Development

Figure 5.2: Microclimate on the northern façade of the Development

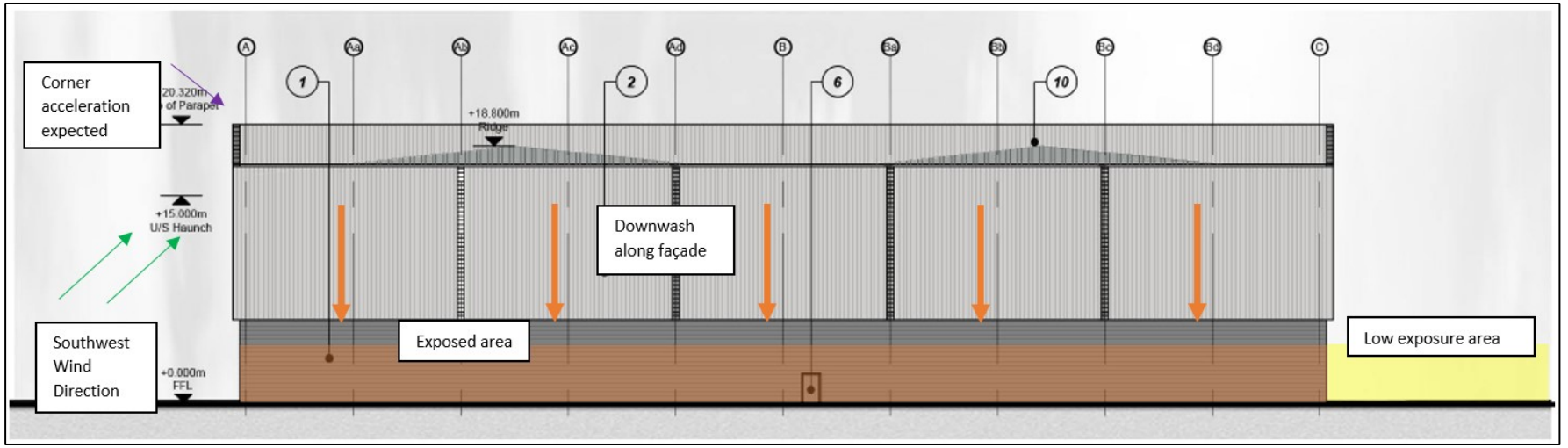


Figure 5.3: Microclimate on the southern façade of the Development

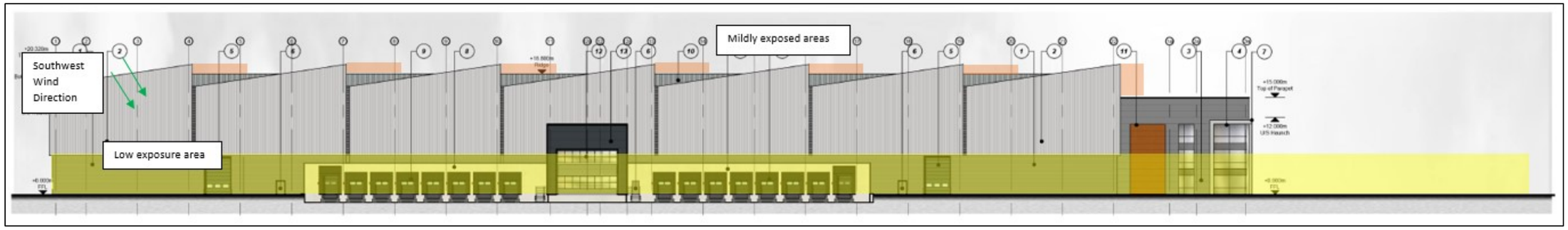


Figure 5.4: Microclimate on the eastern façade of the Development

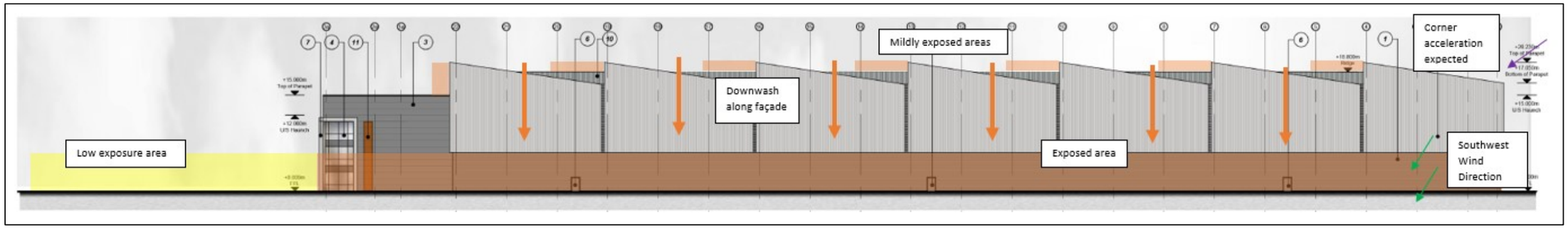


Figure 5.5: Microclimate on the western façade of the Development

6.0 CONCLUSIONS

6.1 Create Consulting Engineers Ltd has been commissioned by OXW Hayes Sarl to undertake a Wind Assessment for the planning application at Bridge Retail Park, Uxbridge Road, Hayes, UB4 0RH.

6.2 The proposed development plans for the erection of a single building to accommodate use classes E(g), B2 (general industrial) and B8 (storage and distribution), with the necessary associated access via Uxbridge Road

6.3 A qualitative assessment of wind effects has been undertaken on the proposed development in Hayes. The assessment is based on a desk study only.

6.4 The current design details that the development has areas of sheltered and exposed façades. During south westerly and westerly winds, the development has a low exposure level, sheltered by surrounding buildings to the south, that will reduce offsite exposure impacts and the site activities will be sheltered by the development. North and north easterly winds will not occur regularly; however, the microclimate will be suitable for all required activities including walking and standing.

6.5 Wind speeds will be within safe limits all the time. Only in extreme gales will there be difficult conditions for site users, however due to the low height of the developments footprint that forms the site it is unlikely that conditions will be above the safety threshold.

6.6 When compared to the baseline, the effects of the proposed development are likely to be negligible.

6.7 Based on the assessment results, microclimate is not considered a constraint to planning consent for the proposed development.

7.0 DISCLAIMER

7.1 Create Consulting disclaims any responsibility to the Client, OXW Hayes Sarl and others in respect of any matters outside the scope of this report.

7.2 The copyright of this report is vested in Create Consulting Engineers Ltd and OXW Hayes Sarl. The Client, or his appointed representatives, may copy the report for purposes in connection with the development described herein. It shall not be copied by any other party or used for any other purposes without the written consent of Create Consulting Engineers Ltd or OXW Hayes Sarl.

7.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

8.0 REFERENCES

8.1 *A Vision for 2026, Local Plan: Part 1 Strategic Policies.* London Borough of Hillingdon (2012)

8.2 *Iowa Environmental Mesonet.*Iowa State University (2023)
[Available at: https://mesonet.agron.iastate.edu/sites/locate.php]

8.3 *Local Plan Part 2: Development Management Policies*. London Borough of Hillingdon (2020)

8.4 *The Determination of the Wind Environment of a Building Complex Before Construction*. Lawson T.V, University of Bristol: Department of Aeronautical Engineering (1990)

8.5 *The London Plan: The Spatial Development Strategy for Greater London*. Greater London Authority (2021)

APPENDICIES

APPENDIX A

METHODOLOGY

METHODOLGY

This section identifies the methodology undertaken to identify and determine the microclimate at each façade and varying heights of the proposed development.

Identification of Potential Issues

To identify any changes in the microclimate, the development, immediate surrounding environment and building structures need to be studied. This is a subsection of a larger region, which represents the broader urban environment. The elements of this type of study that will affect the wind environment are:

- Building form, shape, height, location and orientation;
- Surrounding areas and local terrain topography (photographs);
- Local wind climate;
- Landscape (trees, fences, hedges);
- Effects of the proposed development on the surrounding pedestrian areas; and
- Construction stages of the buildings that form the scheme and surrounding developments.

In line with common UK practice in Wind Engineering, the method used relates to the Lawson method (2001). The Lawson method is an assessment and criteria of the wind conditions at a development that is adopted to define if a specific area of the development could be comfortable and safe to pedestrians for its designated activity (i.e. standing/walking/sitting/working).

The criteria outlines:

- Pedestrian wind comfort in absolute terms and defines the reaction of an average person to the wind;
- Discomfort criteria that may be encountered for hundreds of hours per year;
- Distress criteria that focus on higher wind speeds but focusses on two hours per year; and
- Discomfort and distress criteria are rare assessments of wind conditions, relating to potential for injury rather than inconvenience.

Baseline Studies

Baseline conditions have been assessed using the same criteria as the proposed development, as described below. The assessment is based on historical wind records and an analysis of the surrounding terrain.

Impact Magnitude

Likely wind conditions are judged based on experience of similar developments. This analysis includes an assessment of building form, layout and relative massing as well as site landscaping and topography.

Receptor Sensitivity

The key receptors in this case are pedestrians using the site. Sensitivity to strong winds is dependent upon activity and, in line with the Lawson method, the following activity classes are used, in order of increasing sensitivity, as depicted in Table A1.

Receptor Sensitivity	Activity
Low	Roads and car parks
Low	People around buildings
Low / Moderate	Pedestrian walk-through
Moderate	Pedestrian standing
Moderate / High	Entrance doors
High	Sitting

Table A1: Urban Pedestrian Activities for Sensitivity Evaluation in Order of Increasing

Significance Evaluation

Where wind impacts are identified, their significance is judged in terms of the likely effect on planned activities, in terms of the Lawson assessment method. This is a function of the receptor sensitivity and the magnitude of the impact and results in a classification as shown in Table A2.

Impact Significance	Description
None	No change in wind conditions
Negligible	Wind conditions are likely to be suitable for the intended activity
Minor adverse	Wind conditions are likely to be tolerable for the intended activity
Moderate adverse	Wind conditions are likely to be classed uncomfortable for the intended activity, but safety is unlikely to be compromised
Major adverse	Safety concerns are likely

Table A2: Significance of Wind Conditions

The criteria used to assess the magnitude of the wind impacts are as follows:

- Adverse – detrimental or negative impacts to an environmental resource or receptor compared with the baseline; and
- Beneficial – advantageous or positive impact to an environmental resource or receptor compared with the baseline.