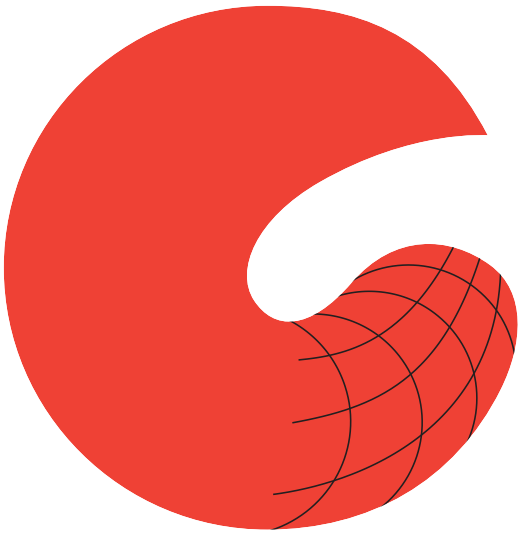

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# BRIDGE RETAIL PARK, HAYES
## Wind Assessment

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**Reference:** ML/VL/P21-2485/01

**Date:** December 2021



BRIDGE RETAIL PARK, HAYES
Wind Assessment

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# Wind Assessment

## Contents



### Registration of Amendments

| Revision and Date | Amendment Details | Revision Prepared By | Revision Approved By |
|---|---|---|---|
| | | | |
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## 1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd has been commissioned by Trinity Property consultants, on behalf of OXW Hayes Sarl (the 'Client'), to undertake a Wind Assessment for the planning application at Bridge Retail Park, Uxbridge Road, Hayes, UB4 0RH (the 'Site'). The study is provided to ensure the public space is comfortable to use, and not affected by downdraughts from adverse weather.

1.2 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.

1.3 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.

1.4 The development will be unlikely to bring new pedestrian activities into the site as areas such as a public open space are not within the remit of the proposed development; the landscape is likely to ensure that the external areas are suitable for their intended uses, i.e. parking or site access.

1.5 The study was performed at the latest stage of design and considered the heights and massing of the proposed buildings.

## 2.0 SITE LOCATION & TOPOGRAPHY

2.1 The 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.

2.2 The proposed building layout is shown in Figure 2.1.

2.3 Bridge Retail Park, Uxbridge Road, Hayes, UB4 0RH currently consists of several retail shops such as Currys PC World, Halfords, Harveys, Dreams, Staples, Argos Extra, AHF, Tapi and Metro Bank. The site is located between Uxbridge Road and Bullsbrook Road.

2.4 Figure 2.2 shows the site location plan.

2.5 The development includes the erection of a warehouse area, a two-storey transport office, and three storey office building, together with 16 dock loading doors for access and associated 17 HGV and 128 car parking spaces (ground floor); vehicular access (via Uxbridge Road).


**Figure 2.1: Proposed Building Layout**


**Figure 2.2: Site Location in the Surrounding Area**

2.6 The site lies between the following roads:

- Uxbridge Road; and
- Bullsbrook Road.

2.7 The proposed development is located within a mixed industrial-led estate with residential properties approximately 200m north from the proposed site. The centre of the Site lies at Ordnance Survey grid reference 511535E, 180514N and is within the administrative area of the London Borough of Hillingdon.

## 3.0 LEGISLATION, POLICY & GUIDANCE

### National Planning Policy

3.1 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) (Ref 1), 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.

### Regional Planning Policy

The London Plan 2021

3.2 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 30 metres (Policy D4) measured from ground to the floor level of the uppermost storey.

*Locations*

3.3 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.

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

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

*Impacts*

3.6 Development proposals should address the following impacts:

- Visual impacts
  - The views of buildings from different distances;
  - Whether part of a group or stand-alone, tall buildings should reinforce the spatial hierarchy of the local and wider context and aid legibility and wayfinding;

- Architectural quality and materials should be of an exemplary standard to ensure that the appearance and architectural integrity of the building is maintained through its lifespan;
- Proposals should take account of, and avoid harm to, the significance of London's heritage assets and their settings. Proposals resulting in harm will require clear and convincing justification, demonstrating that alternatives have been explored and that there are clear public benefits that outweigh that harm. The buildings should positively contribute to the character of the area;
- Buildings in the setting of a World Heritage Site must preserve, and not harm, the Outstanding Universal Value of the World Heritage Site, and the ability to appreciate it;
- Buildings near the River Thames, particularly in the Thames Policy Area, should protect and enhance the open quality of the river and the riverside public realm, including views, and not contribute to a canyon effect along the river;
- Buildings should not cause adverse reflected glare; and
- Buildings should be designed to minimise light pollution from internal and external lighting.

- Functional impact
  - The internal and external design, including construction detailing, the building's materials and its emergency exit routes must ensure the safety of all occupants;
  - Buildings should be serviced, maintained and managed in a manner that will preserve their safety and quality, and not cause disturbance or inconvenience to surrounding public realm. Servicing, maintenance and building management arrangements should be considered at the start of the design process;
  - Entrances, access routes, and ground floor uses should be designed and placed to allow for peak time use and to ensure there is no unacceptable overcrowding or isolation in the surrounding areas;
  - It must be demonstrated that the capacity of the area and its transport network is capable of accommodating the quantum of development in terms of access to facilities, services, walking and cycling networks, and public transport for people living or working in the building;
  - Jobs, services, facilities and economic activity that will be provided by the development and the regeneration potential this might provide should inform the design so it maximises the benefits these could bring to the area, and maximises the role of the development as a catalyst for further change in the area; and
  - Buildings, including their construction, should not interfere with aviation, navigation or telecommunication, and should avoid a significant detrimental effect on solar energy generation on adjoining buildings.
- Environmental impact
  - 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;

- Air movement affected by the building(s) should support the effective dispersion of pollutants, but not adversely affect street-level conditions; and
- Noise created by air movements around the building(s), servicing machinery, or building uses, should not detract from the comfort and enjoyment of open spaces around the building.

- Cumulative impacts
  - The cumulative visual, functional and environmental impacts of proposed, consented and planned tall buildings in an area must be considered when assessing tall building proposals and when developing plans for an area. Mitigation measures should be identified and designed into the building as integral features from the outset to avoid retrofitting.

*Public Access*

3.7 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**

London Borough of Hillingdon Local Plan: Part 1 Strategic Policies

*Sites appropriate for tall buildings*

3.8 Large parts of the London Borough of Hillingdon are sensitive to the impact of taller buildings by virtue of the high environmental quality that currently exists, with heritage and open space constraints and their lower density character and development patterns in some parts of the borough.

3.9 Tall buildings may be acceptable in a limited number of suitable locations where they will not seriously harm the surrounding area including the local characters, cause harm to the significance of heritage assets or impact important views.

3.10 Tall buildings will also deliver wider benefits to the proposed opportunity area.

3.11 Tall buildings will be of outstanding design, following best practice guidance.

3.12 The Council will prepare an assessment for tall buildings with specific consideration to the Obstacle Limitation Surfaces for Heathrow Airport due to the locational proximity of Hayes and Uxbridge areas to the airport.

3.13 In conjunction, the Council will produce a borough-wide 'Character Study' to inform the parameters for appropriate residential and non-residential densities including defining inappropriate locations for tall buildings.

3.14 Outside of Hayes and Uxbridge town centres, tall buildings will not be supported.

3.15 Tall buildings height should be appropriate to the surrounding townscape, with heights determined on an understanding of the local character and be appropriate to the positive qualities of the surrounding landscape.

3.16 Tall building heights will be assessed as per urban design proposals and the criteria for evaluation identified by CABE and English Heritage in 'Guidance on Tall Buildings' and local guidance.

3.17 Tall buildings are defined by CABE and English Heritage as a structure that is substantially taller than its neighbours or significantly changes the skyline, with buildings more than 6m taller than the local context or 30m and over. New development should optimise the potential of the site while respecting the existing context and character and make efficient use of land through good design. The emerging London Plan requires that particular consideration is given to site context, PTAL and infrastructure capacity. Appropriate density can often be achieved without tall buildings.

3.18 Tall buildings on sites identified as appropriate for tall buildings will still need to be of a suitable height and design for the local area and take into account their visibility from further away. Proposals for tall buildings should have regard to good design as outlined in the London Plan, Local Plan and other policies and guidance including 'Historic England Advice Note 4; Tall Buildings.'

3.19 Tall building design should pay attention to how the building will be viewed from a range of locations, near views and from afar. CGIs and physical models should be provided at pre-application stage to aid officers' understanding. All rooftop plant and machinery should be screened with cladding and/or landscaping to avoid unsightly appearance.

## 4.0 METHODOLOGY

### Identification of Potential Issues

4.1 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.

4.2 The assessments made are based on an assessment of the site wind conditions, coupled with an experience-based assessment of likely wind conditions. As such, the assessment is qualitative.

4.3 In line with common UK practice in Wind Engineering, the method used relates to the Lawson method (2001).

4.4 The Lawson method (2001) 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).

4.5 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 focusses on higher wind speeds but focusses on two hours per year;
- Discomfort and distress criteria are rare assessments of wind conditions, relating to potential for injury rather than inconvenience.

**Baseline Studies**

4.6 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**

4.7 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**

4.8 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 4.1.

| 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 4.1: Urban Pedestrian Activities for Sensitivity Evaluation in Order of Increasing**

**Sensitivity**

**Significance Evaluation**

4.9 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 follows:

| 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 4.2: Significance of Wind Conditions**

4.10 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.

**Wind Data Analysis**

4.11 For analysis of wind behaviour, it is necessary to know the relevant wind data and temperature data for the case. Velocity fluctuation and directional variance are hard to measure with great accuracy.

4.12 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). Site information for Heathrow airport is shown in Figure 4.1.

4.13 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.

4.14 Heathrow Airport forms part of the national network of weather stations maintained by the UK Met Office, internationally recognised as one of the best sources of reliable meteorological information.

4.15 To assess wind frequency, 10 years of historical wind speed data was used. The wind rose is shown in Figure 4.1. This shows the direction the wind is blowing from, with long bars representing frequent winds and colour representing magnitude of wind speeds.

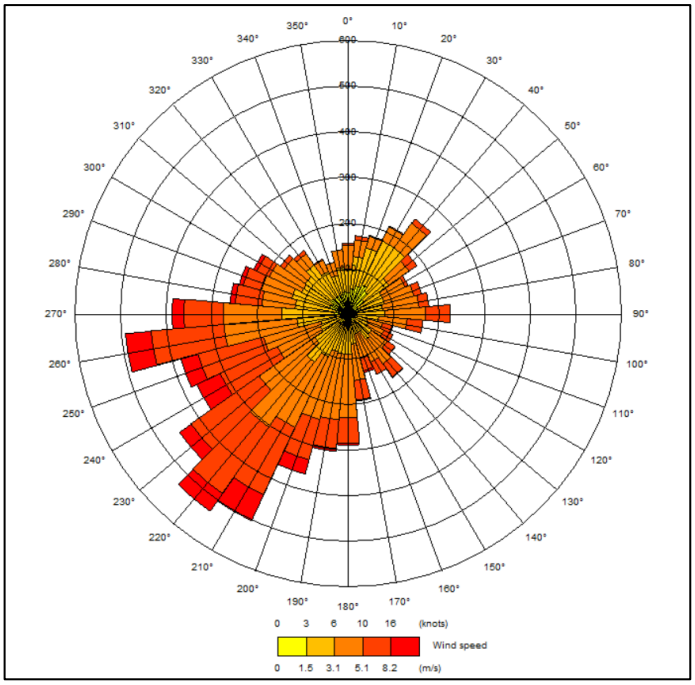


**Figure 4.1: Wind Rose for Heathrow Airport, 2019**

4.16 The seasonal wind rose plots are shown in Figure 4.2. South-westerly winds are the prevailing direction for all four seasons. The largest wind speeds occur during the winter.

4.17 During the winter there are some contributions from the north-east. Wind speeds are generally highest in the winter and spring with the seasonal pattern showing a very similar range of directions for winter, spring and autumn. Summer has southerly and westerly prevailing winds with the largest speeds from the south.

4.18 The data has not been translated to meteorological standard terrain (open country) as the project site is very close to the MET station. The project site is located approximately 6.16 km North East from Heathrow, it is assumed the Heathrow wind data will be representative to the conditions at the project site, it is a conservative assumption as Heathrow airport is likely to be more exposed to prevailing winds.

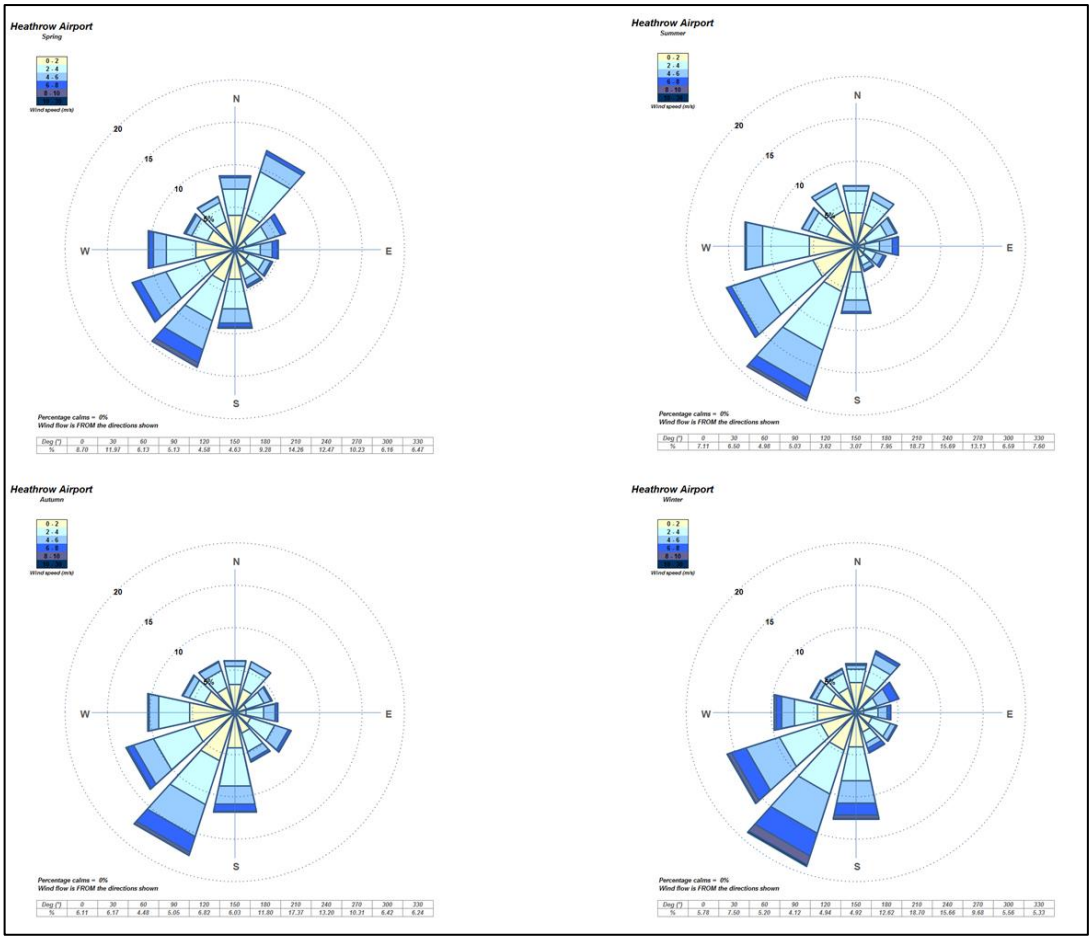


**Figure 4.2: Heathrow Airport Seasonal Wind Roses**

**Site Exposure**

4.19 In the baseline condition, the site is surrounded by small height buildings between one to five storeys in all directions.

4.20 The dominant prevailing wind direction for the site originates from the south and southwest throughout the year (around 13% and 16.3 % of the time). There is also a moderate occurrence of wind from the northeast in the Winter.

## 5.0 WIND EFFECTS

### Baseline Condition

5.1 The baseline condition (i.e. the current site) contains the following parameters:

- An outdoor car park appropriate for the retail developments in the area. The car park is between Bullsbrook Road and Uxbridge Road, it runs parallel to the front of the existing developments.
- 9 retail developments that vary between one and two storeys (predominantly furniture and carpet stores), West of Uxbridge Road and East of Bullsbrook Road.
- 1 retail development (Metro Bank) will remain existent in the development area.

5.2 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 the former road.

5.3 The remainder of the base line condition site is likely to experience conditions suitable for all activities, and no safety issues are expected to occur. The entrance to the retail developments are in a sheltered location due to the South location of Tapi Carpets, AHF Furniture and Carpets, and Argos Extra. Although in winter, some wind acceleration is likely to occur, similar to conditions in the surroundings.

5.4 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.

5.5 Under north easterly winds, the retail development entrances to the North and South will feel open and exposed, thus unsheltered. However, this is again not expected to result in significantly uncomfortable conditions for pedestrians.

### Proposed Development

5.6 The proposed development includes the erection of a warehouse area, a two storey transport office, and two storey office building, together with 16 dock loading doors for access and associated 17 HGV and 128 car parking spaces (ground floor); vehicular access (via Uxbridge Road).

5.7 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 west boundaries of the site, will result in calmer conditions particularly for the residential estates

within a close proximal locality, see Figure 5.1 that shows the aerial location of the development.

5.8 Figure 5.2-3 shows the likely south westerly and north easterly impacts of wind across the façades of the development buildings.

**Northern Façade**

5.9 The two-storey office façades facing the north and the 128 car parking spaces are likely to be sheltered for the majority of the year from south westerly winds. Southerly winds are likely to cause a minimal impact on the northern façade as the entrances and car parking spots are sheltered, creating a negligible impact to future site users.

5.10 During northern wind directions, there is likely to be mild exposure to the two storey office block and car park, where both aspects of the proposed development are low in height and the impact in this area is expected to be negligible to minor adverse.

5.11 Some corner acceleration is likely to occur on the northern corners of the development, impacting the amenity of facilities to the East. However, conditions are expected be suitable for standing, sitting, walking and working most of the time.

5.12 Light façade downwash is expected on the northern side of the development, however, is not expected to affect future site users due to the infrequency of wind patterns derived from the North and vegetation located within close proximity to the entrance of the building (i.e. in the car park).

5.13 The northern façade is likely to be moderately sheltered due to the dominant south-west prevailing wind direction, a minor to moderate beneficial effect, this is likely to make the northern area of the development suitable for standing and walking for almost all the year.

**Eastern Façade**

5.14 The buildings façades facing the east of the site will be sheltered from south westerly winds making the development suitable for walking, sitting, standing and working activities. The impacts are likely to be negligible to minor adverse across the development during the majority of the year.

5.15 Easterly winds are not likely to cause problems for the development due to the low height of the warehouse unit. It is expected working, sitting standing in this area will cause negligible to minor adverse impacts.

5.16 The eastern side of the development will be subjected to downwash and corner acceleration during north easterly and easterly winds which may cause minor to moderate adverse impact

on site users. However, site users overall will enjoy sitting, standing and working at ground level with very low impact.

**Western Façade**

5.17 South westerly winds are not likely to cause problems for the warehouse unit or office buildings due to the limited, if any activity, that is occurring at the western aspects of the development.

5.18 South westerly winds may possibly induce a street canyon effect between the west side of the warehouse unit and alternate existing developments located is close proximity on that side. Although, no site entrances are located here, therefore it is unlikely an adverse effect will be experienced by outdoor users.

5.19 Overall, the proposed development is likely to be partially protected by the surrounding buildings to the west and wind effects in general are likely to be negligible.

5.20 The industrial units next to the proposed development will have negligible effect, as the reduced height / similar heights won't allow downwash and corner acceleration, making it suitable for walking and working in the environment.

**Southern Façade**

5.21 South westerly winds are not likely to cause problems for the warehouse unit or office buildings due to the limited, if any activity, that is occurring at the South aspects of the development. Furthermore, the existing vegetation strip will act as a buffer from the wind and protect the building.

5.22 It is likely that the warehouse unit will cause corner acceleration and façade downwash which may be felt by site users using the outdoor space on the southern side, although effects are unlikely as activity may be elusive in this area. Thus, the area will be suitable for walking and standing, with a negligible to minor adverse effect on outdoor users.

5.23 The vegetation arrangement to the south will offer protection to users when using the external space, making it suitable for walking and working.

5.24 The proposed development is likely to be partially protected by the surrounding buildings to the south and wind effects in general are likely to be negligible.

5.25 The industrial units next to the proposed development will have negligible effect, as the reduced height / similar heights won't allow downwash and corner acceleration.

5.26 Overall, wind speeds are likely to produce minor adverse conditions for users, thus it is suitable for sitting, standing and walking for almost all the year.

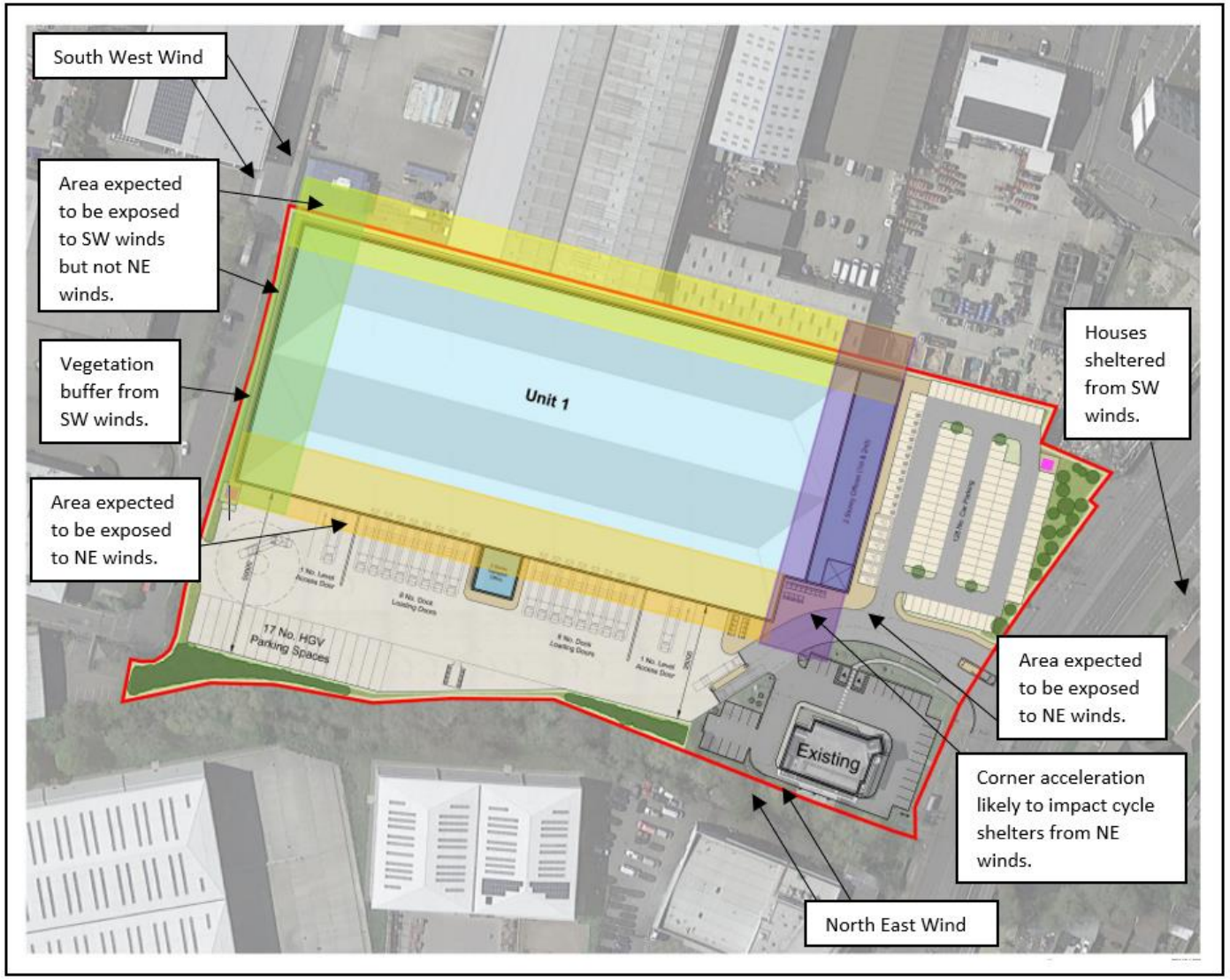


**Figure 5.1: Areal Location of the Development**

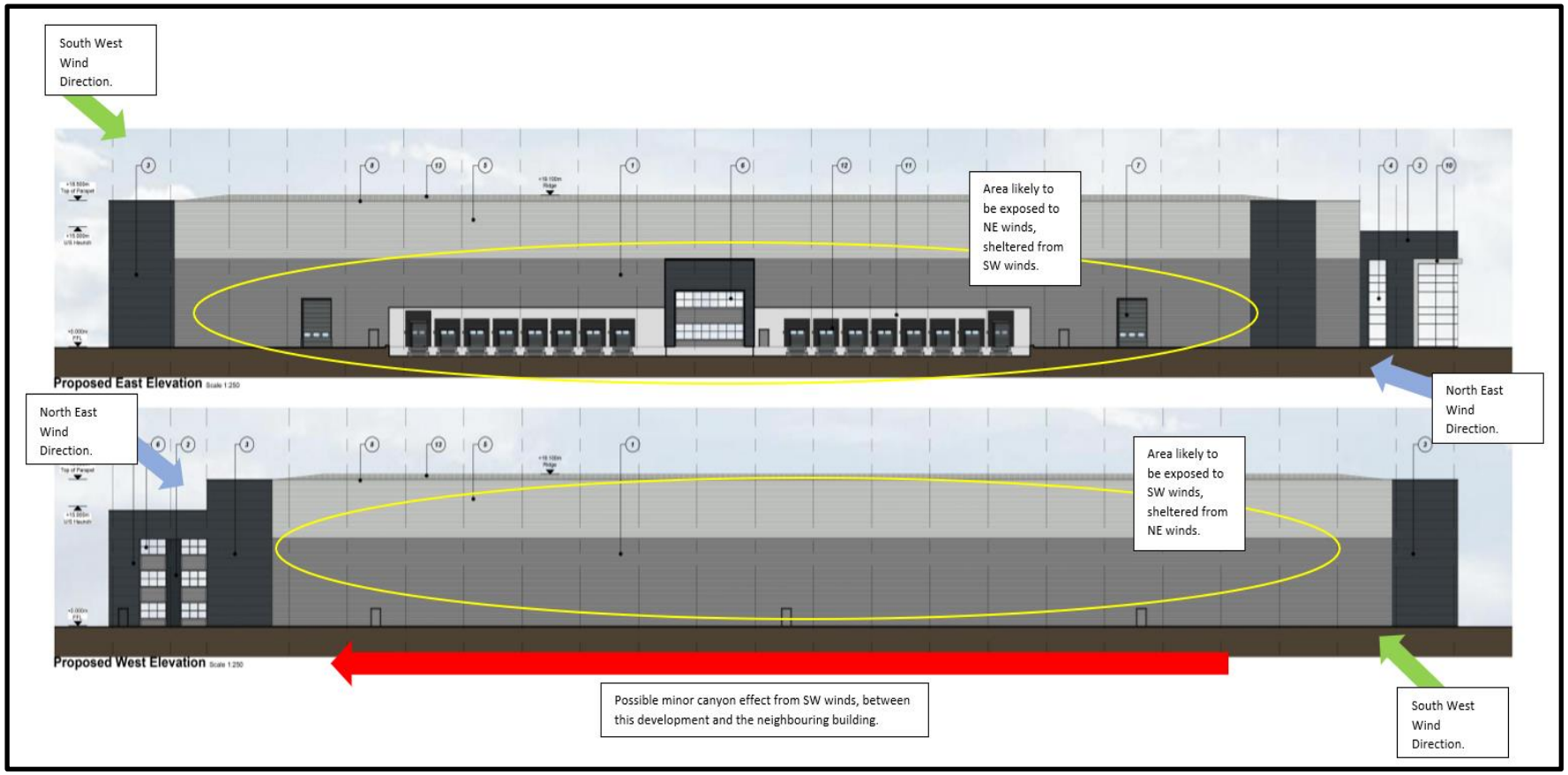


**Figure 5.2: Wind Effects Around East and West Façades of the Building**

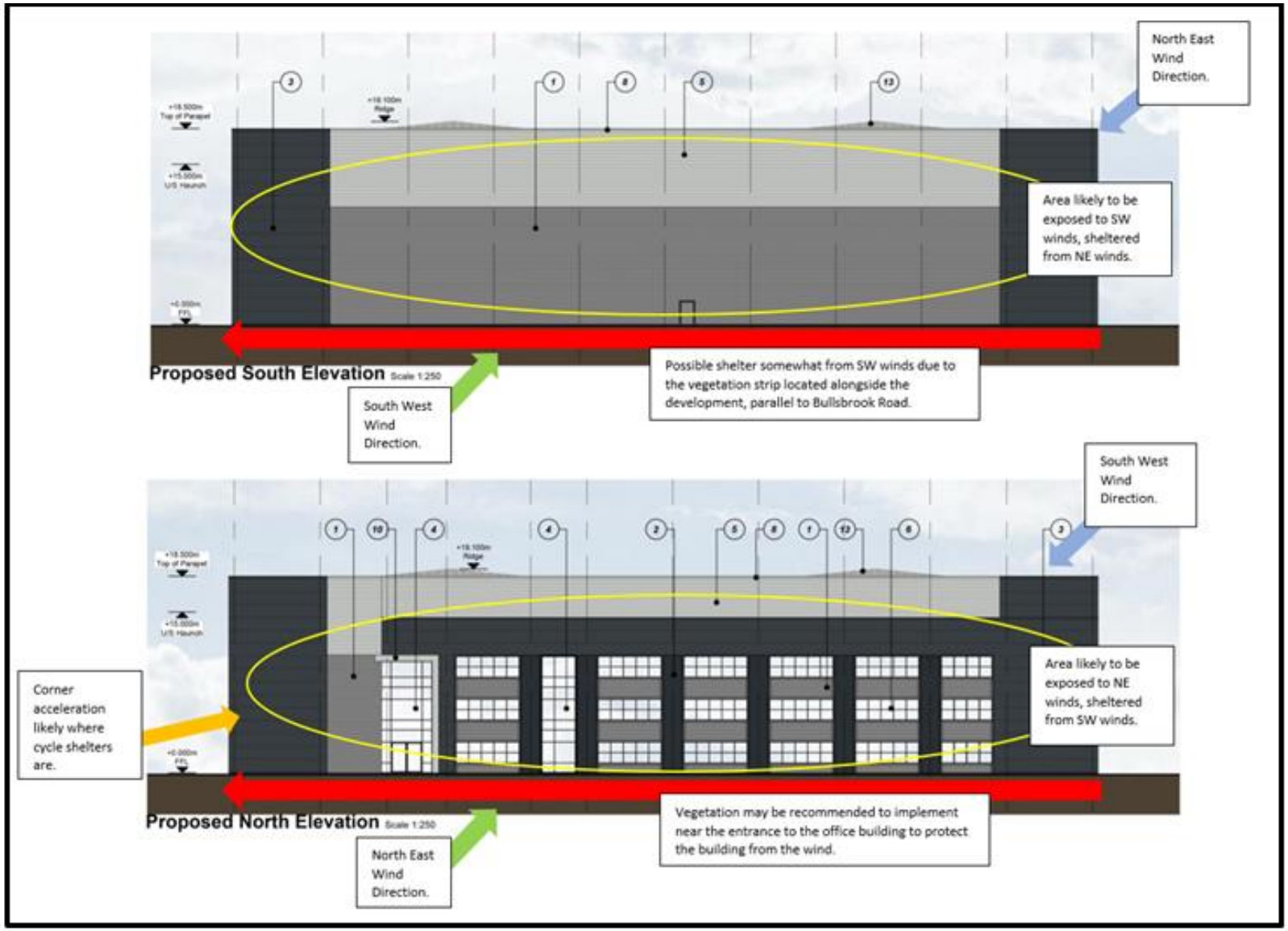


**Figure 5.3: Wind Effects Around North and South Façades of the Building**

5.27 The current design includes the maximum parameters of construction. It is likely the impact of the proposed development is likely to be negligible or beneficial.

Comfort

5.28 The wind speeds experienced on the site will generally be within acceptable limits for large parts of the year (less than 10 m/s), meaning that although conditions will sometimes be windier, people will not consider them distressful.

Safety

5.29 Wind speeds will be within safe limits. Only in extreme gales will there be difficult conditions for pedestrians, and it is unlikely that conditions will be above the safety threshold shown in Table 4.2.

## 6.0 MITIGATION

6.1 No specific mitigation measures are suggested as conditions on the proposed development site are expected to be suitable for pedestrian walking and business/industrial working for most of the year and other internal areas (such as loading bays and car parks) for the intended activity. On particularly windy days, however, site users may feel more uncomfortable in areas where façade downwash and wind acceleration are expected to occur, although this will fall within acceptable parameters.

6.2 Increased vegetation or a structural barrier (e.g. a screen) could be implemented around the building to protect the development from the wind, particularly in pedestrianised areas near the entrances of the office buildings and the loading bays on the East side.

## 7.0 CONCLUSIONS

7.1 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.The study is provided to ensure that any potential public space or industrial areas are comfortable to use, and not affected by downdraughts.

7.2 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.

7.3 The proposed development includes 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.

7.4 Findings show that the introduction of the proposed development is not likely to result in considerable wind acceleration. Some areas have been identified as being likely to experience corner accelerations and façade downwash. However, the wind speeds experienced on the site will generally be within acceptable limits for large parts of the year, meaning that although conditions will sometimes be windier, site users will not consider them distressful.

7.5 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.

7.6 When compared to the baseline, the effects of the proposed development are likely to be minor.

## 8.0 DISCLAIMER

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

8.2 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.

8.3 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.

## 9.0 REFERENCES

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

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

9.3 *The London Plan: The Spatial Development Strategy for Greater London*. Greater London Authority. 2021