



WIND MICROCLIMATE ASSESSMENT REPORT

Prestwich Village

07 December 2023

GIA No: 20081

PROJECT DATA:

Client **The Prestwich Regeneration LLP**
Project Title **Prestwich Village**
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1 INTRODUCTION

This report outlines the results of a desktop wind microclimate assessment of the proposed development Prestwich Village.

1.1 SUMMARY

Potential wind effects were assessed for The Prestwich Village site.

Consideration was given to the potential impact of the proposed development on local thoroughfares, proposed amenity spaces and building entrances.

Various potential risk factors for raised wind speeds were considered.

This assessment has found there is low risk of raised winds on the site. This is in part due to the low lying nature of the masterplan. Where there could be wind related risks from the taller buildings on the site, these are reduced either through offsite or on-site buildings providing shelter. The landscaping will also provide additional shelter by dispersing the winds in the vicinity.

There is not considered to be a significant risk of raised wind speeds at ground level due to the proposed development.

As such, general thoroughfares and building entrances are expected to be suitable for the intended use. The scheme is therefore compliant with planning policies in section 1.3..

1.2 DEVELOPMENT DESCRIPTION

Hybrid application comprising: Full planning application proposing demolition of existing buildings and structures and the erection of a phased mixed use development including a Community Hub comprising flexible uses including library, offices, medical or health services (Use Classes F1 (a-f), F2(b), E(c), E(e), E(g)) and retail uses (Use Classes E(a), E(b) F2(a)) and Sui Generis (hot food takeaway and bar), a new Market Hall (Use Classes E(a), E(b) and Sui Generis (hot food takeaway and bar)), a Commercial Building comprising flexible uses including retail, offices, gymnasium (Use Classes E(a), E(b), E(c), E(d), E(g), F2(a), a Travel Hub comprising car parking and cycle parking (Sui Generis), a public square and public realm and associated landscaping, car parking provision, cycle storage and other associated works; and part Outline planning application (with all matters reserved) proposing a phased residential led mixed use development comprising residential (Use Class C3), flexible commercial, business, service, local community and learning uses (Use Classes E, F) and Sui Generis (hot food takeaway and bar), engineering works to Rectory Lane, new public realm, associated landscaping, car parking provision, cycle storage and other associated works.

1.3 POLICY

Planning Practice Guidance

The Planning Practice Guidance (2021) identifies the potential for tall and large buildings to affect wind microclimate. The National Design Guide (2021) states in Paragraph 71 that:

“Proposals for tall buildings (and other buildings with a significantly larger scale or bulk than their surroundings) require special consideration. This includes their [...] environmental impacts, such as [...] wind. These need to be resolved satisfactorily”.

Greater Manchester Joint Development Plan

The Greater Manchester Combined Authority Joint Development Plan, ‘Places for Everyone’ was published in 2021.

‘Policy JP-P-1 Sustainable Places’ states that “all development [...] should be consistent with: [...] comfortable and inviting, with indoor and outdoor environments: [...] addressing microclimate issues such as sunlight, indoor air quality, overheating, shade, wind and shelter”.

Bury UDP

Policy H2/1 ‘The Form of New Residential Development’

All new residential development will be expected to make a positive contribution to the form and quality of the surrounding area. Factors to be considered [...] will include [...] the impact of developments on residential amenity.

2 METHOD

To assess the terrace pedestrian comfort, safety and uplift pressures a 3D CFD model of the development and surrounding site was created. This section describes the methodology for the creation of this model and the inputs used.

2.1 ASSESSMENT METHODOLOGY

The assessment was performed as a desktop study, combining analysis of wind data from a local weather station with qualified assessment of any likely effects that the development may have on local wind conditions.

The assessment was performed by an experienced wind engineer with 10 years specific experience of performing wind microclimate studies.

The most common effects that a development could have on local wind conditions are as follows:

- Downwash:
 - High speed airflow from higher in the earth boundary layer being directed down to ground level by a building face.
- Corner flows:
 - Acceleration of the airflow due to the large pressure gradients around sharp corners.
- Channelling:
 - Acceleration of the airflow due to the flow paths being constrained between multiple buildings.

2.2 SITE GEOMETRY

A 3D CAD model of the proposed development was used for the analysis, which is shown in Figure 4.

The site is located within a suburban setting of low to medium rise commercial and residential units. The surrounding area is shown in Figure 5.

2.3 WIND DATA ANALYSIS

30 years of wind data were obtained for Manchester Airport. The location of the site relative to the airport is shown in Figure 6.

Seasonal wind roses were created for the weather station. These are shown in Figure 7.

The dominant wind direction is westerly in winter, autumn, summer and spring.

The secondary wind direction observed in winter is westerly.

The dominant wind directions for high wind speeds (hourly wind speeds >8m/s at 10m height at the airport) are 250°, stronger winds are most likely to occur in summer.

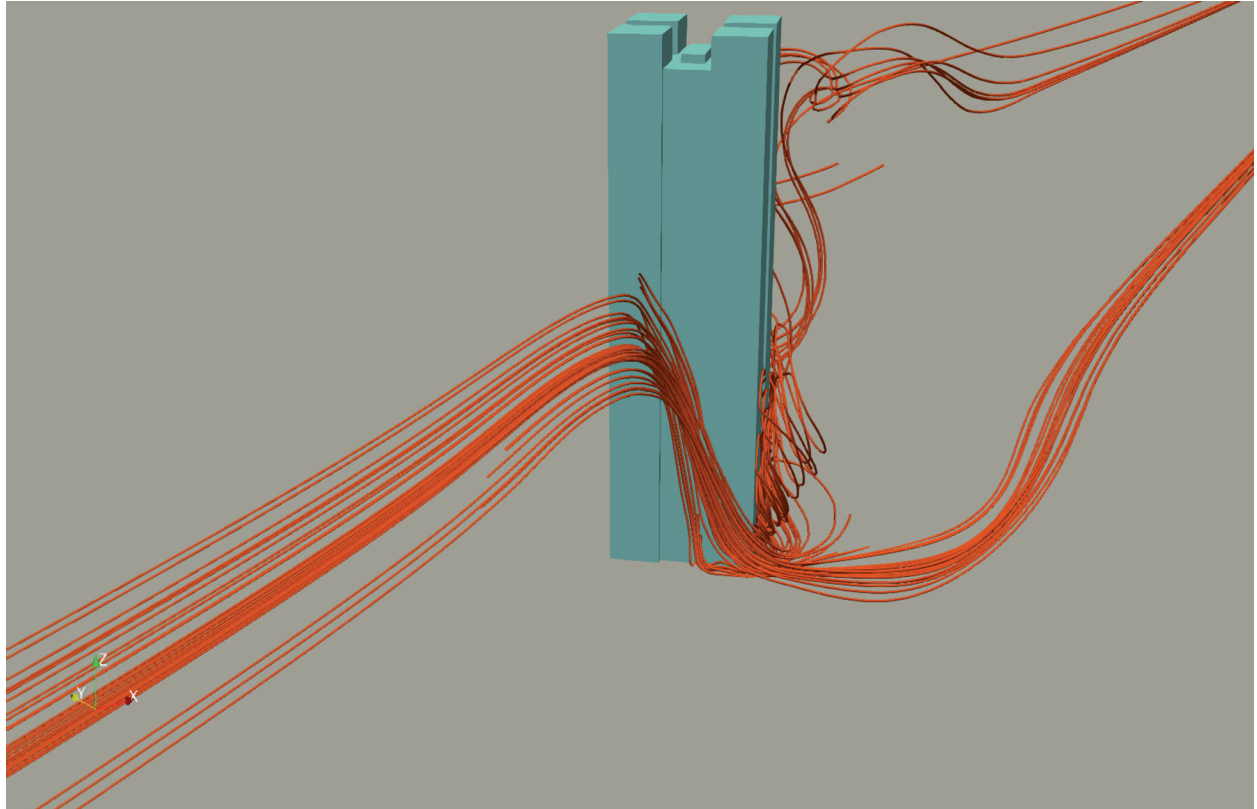


Fig. 01: Downwash

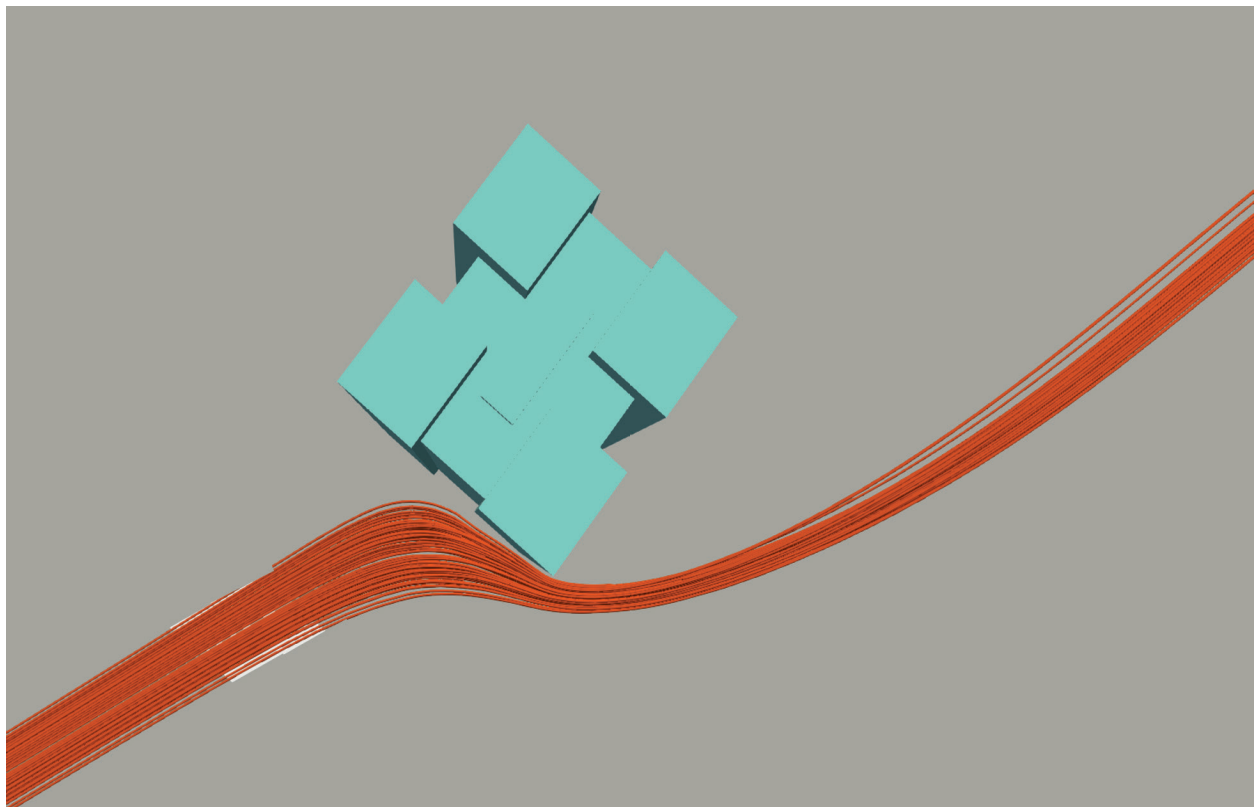


Fig. 02: Corner Flows

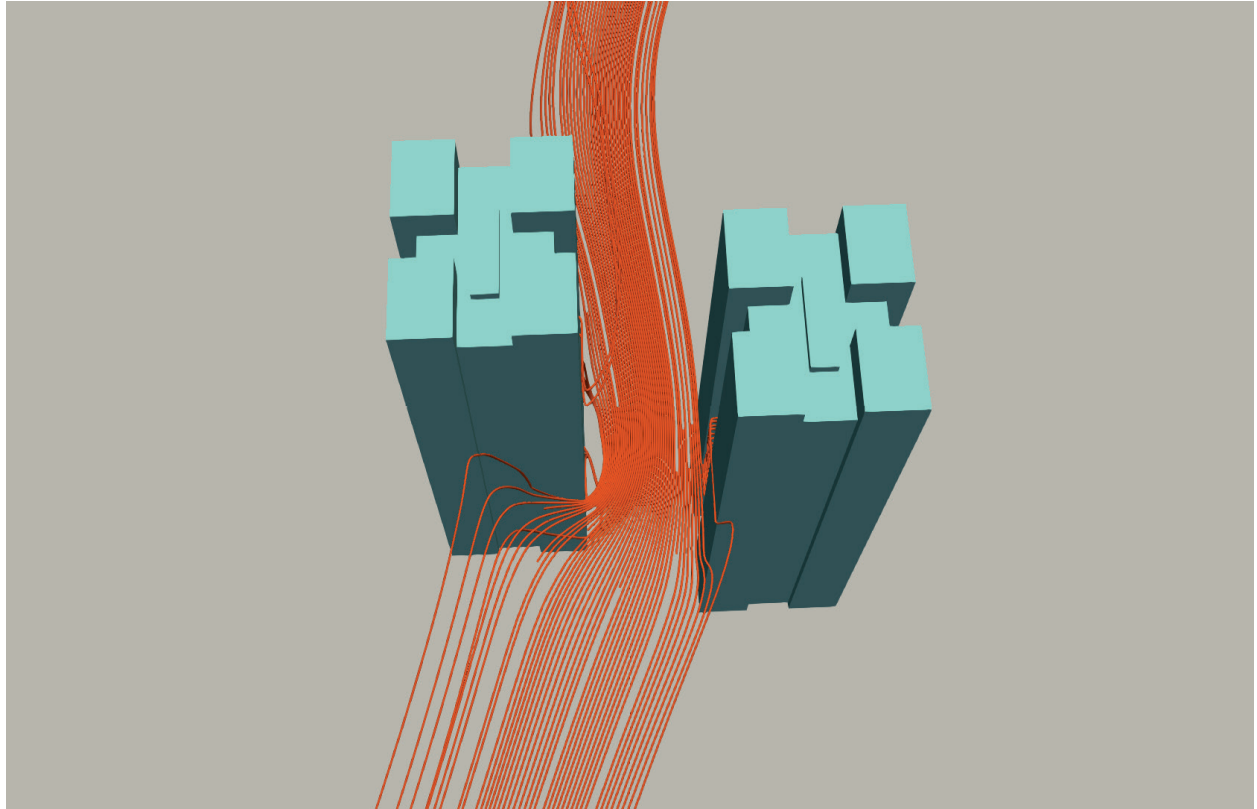


Fig. 03: Channelling



Fig. 04: The Proposed Development (3D view)



Fig. 05: Surrounding Area, with the site shown shaded in blue.

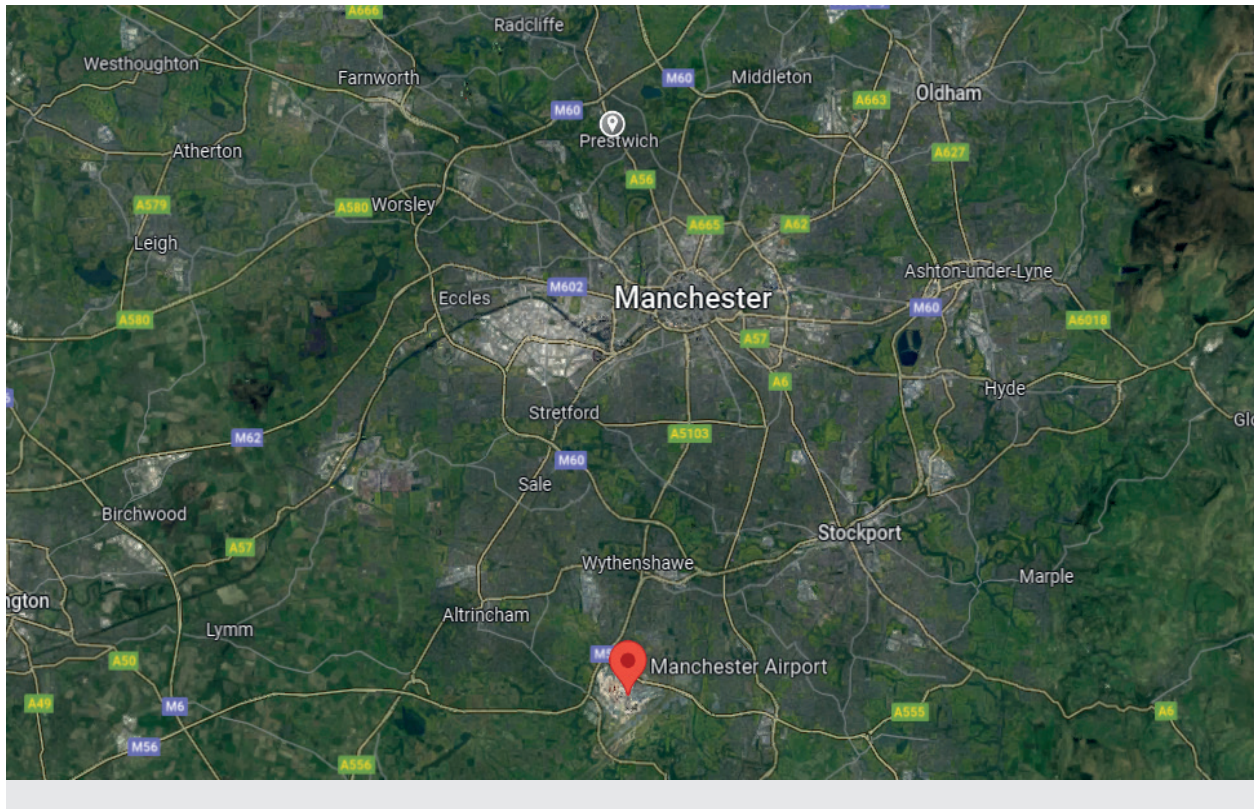


Fig. 06: Relative Locations of Site and Weather Station

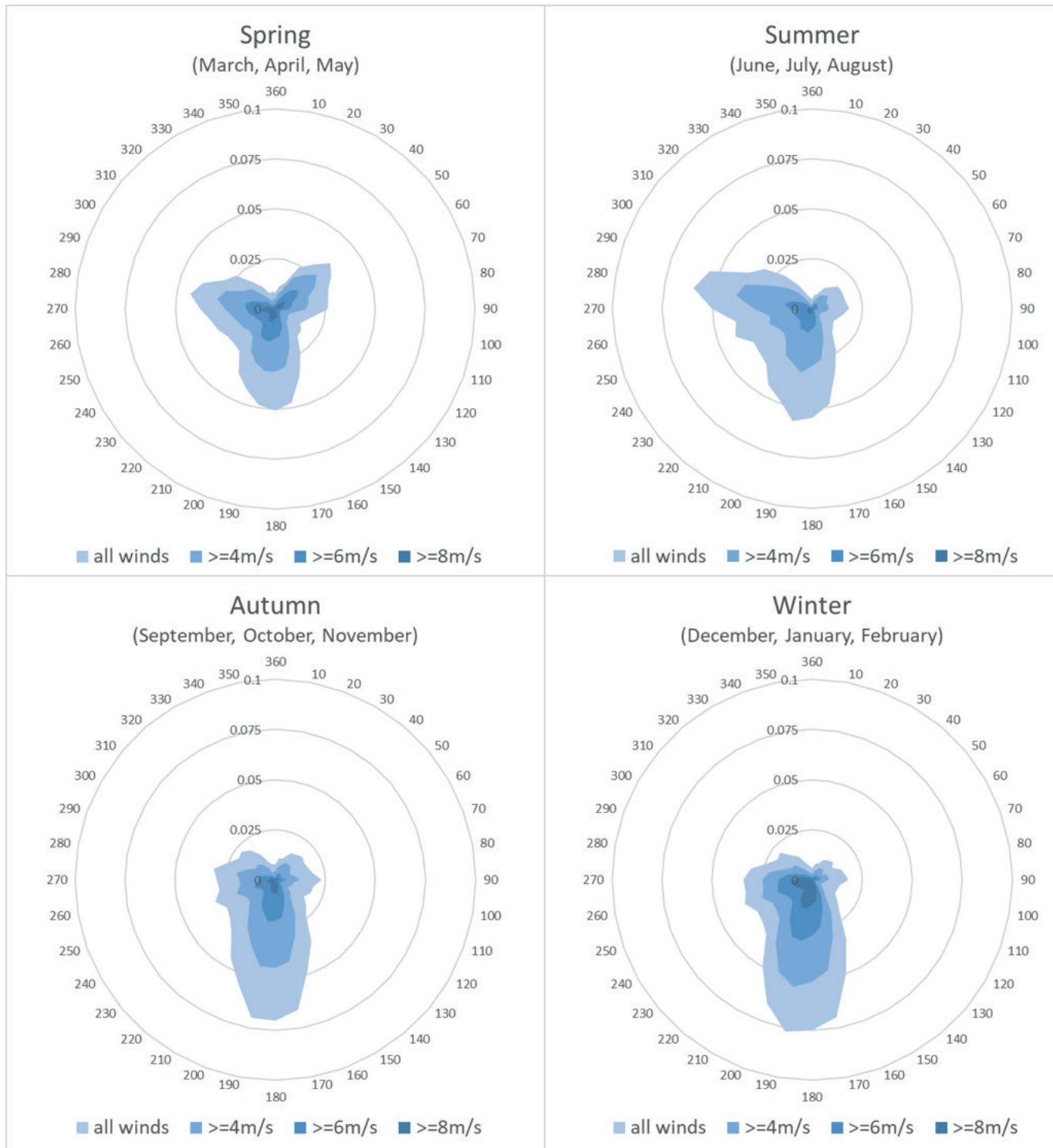


Fig. 07: Wind Roses for Manchester Airport (1990-2020)

2.4 TARGET CONDITIONS

The masterplan consists of a mixed use development containing a community and retail hub, commercial building, market hall, travel hub and residential plots. The desired wind microclimate would typically need areas acceptable for sitting, standing (including at entrances of buildings) and walking use. A description of the comfort categories to classify wind conditions in accordance with is given below.

Any areas which are predicted to be unsafe (annually) or uncomfortable (for winter) will require mitigation, unless they are in locations where pedestrian access can be controlled in the event of strong winds. This applies to all thoroughfares (for pedestrians) and roads (for cyclists) around the Development.

The areas immediately outside any building entrances should be suitable for standing use during winter to provide a “buffer” between the still conditions in interior spaces and the general thoroughfare.

Any amenity spaces should be suitable for leisure walking in the winter, and for a mixture of sitting and standing in the summer.

2.5 LIMITATIONS & ASSUMPTIONS

This study is a desktop study. This means it does not include any modelling of the actual airflow around the site. Hence any atypical local microclimatic features will not be captured.

The nature of a desktop study means that all results and conclusions are qualitative, and it is not possible to draw quantitative conclusions.

Table 01: Lawson Comfort Criteria (LDDC variant)

KEY	COMFORT CATEGORY	MEAN WIND SPEED (5% EXCEEDANCE)	DESCRIPTION
	Sitting	4 m/s	Acceptable for outdoor sitting use (e.g. cafés, benches, balconies and terraces)
	Standing	6 m/s	Acceptable for main building entrances, pick-up / drop-off points and bus stops
	Walking (leisure)	8 m/s	Acceptable for strolling
	Walking (business)	10 m/s	Acceptable for external pavements, walking purposefully without lingering
	Uncomfortable	>10 m/s	Not comfortable for regular pedestrian access

Table 02: Lawson Safety Criteria (LDDC variant)

KEY	SAFETY CATEGORY	MEAN WIND SPEED (0.025% EXCEEDANCE)	DESCRIPTION
	No Safety Exceedance	<15 m/s	
	S15 (Distress)	>15 m/s	Unsafe for frail individuals, or cyclists
	S20 (Safety)	>20m/s	Wind conditions considered unsafe for all users

3 RESULTS

In general wind conditions at the ground level are typically increased due to the phenomenon known as downwash. This captures higher velocity winds and directs it to the ground level. This mechanism increases with building height and exposure to winds (or reduced shelter from surrounding buildings). Therefore the discussion below will predominantly discuss where there may be a higher risk of downwash, and hence relatively raised winds on the ground.

Figure 8 shows a plan view of the master plan, with the primary and secondary dominant wind angles highlighted.

The masterplan consists of a mixed use development containing a community and retail hub, commercial building, market hall, travel hub and residential plots.

Figure 09 shows an annotated master plan which will be used to describe the wind conditions. Figures 10 and 11 show images of the masterplan from the South and West (dominant wind angles).

Plots A, B, C and G are relatively low lying with a maximum height of 4 storeys. These lower lying buildings are at a lower risk of creating raised winds.

Plots D, E and F are outline planning and therefore their heights are considered maximum in this assessment. These are the taller buildings on the masterplan have a higher risk of raised winds. These are plots D, E and F with heights of 6, 6, and 7 storeys respectively. Plot E, the tallest, is sheltered from the dominant southerly winds, and hence has a low risk of generating raised winds. Plot D being on the periphery of the masterplan has a higher risk of generating raised winds. Plot D is a 6 storey building, and is partially sheltered from the winds from the south by the 3 storey, rectory lane development. The upper 3 storeys of plot D is therefore exposed to the dominant winds. This is not a significant exposure and therefore does not pose a high risk of generating raised winds at the ground.

When reviewing the impact of winds from the secondary direction (westerly winds). Plot F is

sheltered by the neighbouring The Radius. The lower lying plots A, B and C provide shelter from the westerly winds for plots D and E. Therefore this wind direction poses a low risk for generating raised winds around plots C, D and E.

Figure 12 shows the Landscaping plan for the masterplan. While there is a low risk of raised winds at the ground, the landscaping plan should help to generate calmer conditions. Trees and other landscaping identified around the site, are typically located between buildings and will help to disperse the winds, providing shelter in these locations.

Based on this assessment, and review of policy conditions are considered acceptable



Fig. 08: Plan View of the Proposed Development



Fig. 09: Masterplan Plot Annotations

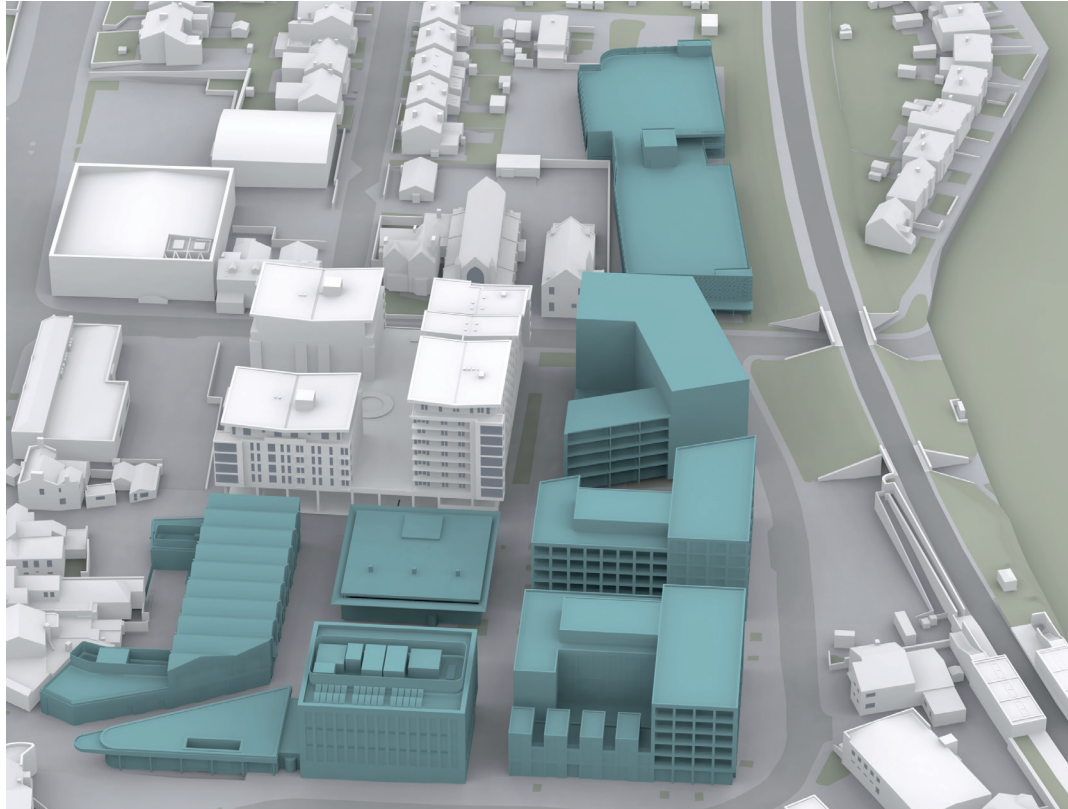


Fig. 10: The Proposed Development, as Viewed from the Dominant Wind Angle (South)

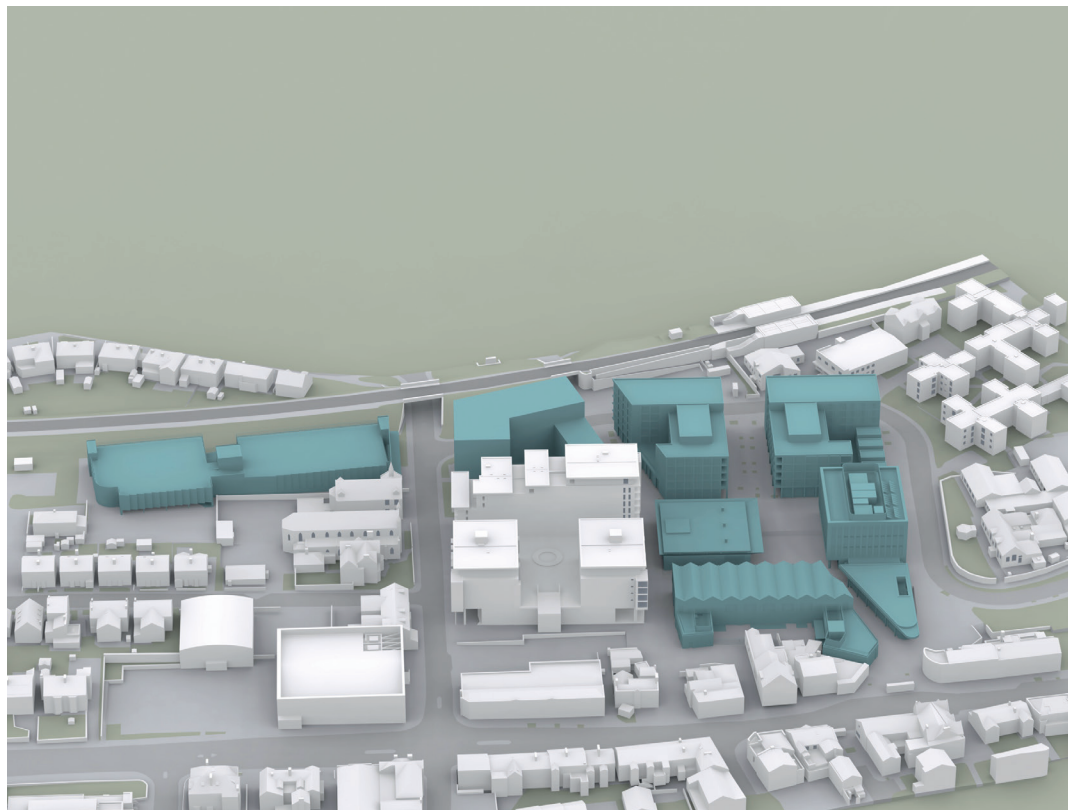


Fig. 11: The Proposed Development as Viewed from the Dominant Wind Angle (West)



Fig. 12: Landscaping plan

4 CONCLUSIONS

Potential wind effects were assessed for The Prestwich Village site.

Consideration was given to the potential impact of the proposed development on local thoroughfares, proposed amenity spaces and building entrances.

Various potential risk factors for raised wind speeds were considered.

This assessment has found there is low risk of raised winds on the site. This is in part due to the low lying nature of the masterplan. Where there could be wind related risks from the taller buildings on the site, these are reduced either through off-site buildings or the smaller on-site buildings providing shelter. The landscaping will also provide additional shelter by dispersing the winds in the vicinity.

There is not considered to be a significant risk of raised wind speeds at ground level due to the proposed development.

As such, general thoroughfares and building entrances are expected to be suitable for the intended use. The scheme is therefore compliant with planning policy.



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