

13 WIND

Introduction

- 13.1 This chapter of the EIS assesses the potential effects of the proposed JFH on pedestrian wind comfort and safety. This includes levels of windiness affecting pedestrians, cyclists and vehicles both onsite and in the immediate vicinity. It also describes the methods used to assess the baseline conditions on the site and in the surrounding area; measures required to prevent, reduce or offset any significant negative effects; and the likely residual effects after these measures have been adopted.
- 13.2 Excessive windiness at ground level can have significant effects on pedestrian comfort and safety. Success in addressing environmental wind issues can enhance the usability of external public spaces including building entrances.

Regulatory Guidance

- 13.3 **The Guidance on Tall Buildings** (CABE and EH, 2007) sets out how the Commission for Architectural and Built Environment (CABE) and English Heritage (EH) evaluate proposals for tall buildings. Paragraph 4.4.9 under the criteria for evaluation states that applicants seeking planning permission should ensure that the following criteria are addressed, *"The effect on the local environment, including microclimate, overshadowing, night-time appearance, vehicle movement and the environment and amenity of those in the vicinity of the building..."*

Jersey Planning Policy

- 13.4 The **Revised Island Plan 2011**, does not contain any planning policies directly relating to wind microclimate issues. However, the benefits of a high quality built environment and open spaces are emphasised throughout.

EIA Guidance

- 13.5 There is no specific guidance relating to wind assessment methodology produced by the States of Jersey. Therefore, a qualitative desk based approach based on the industry standard Lawson comfort and safety criteria was used for this assessment. A full description of the methodology is described below.

Assessment Methodology

- 13.6 A qualitative desk study was undertaken to identify the possible effects of the proposed JFH on the local wind conditions at pedestrian level on and around the site. This was carried out using aerial photos from Google Earth, 3D massing models of the proposed development and supporting design documentation provided by the design team.

Wind Climate

- 13.7 Wind data (wind speed and direction) recorded at Jersey Airport during the years 1997 to 2017 was used to establish the general strength and direction.
- 13.8 Strength and directionality of the winds are fundamental aspects of the environmental wind assessment. While in the UK the most frequent and strongest winds are from the south-west, the most frequent winds in St. Helier are slightly shifted in the direction to the west.
- 13.9 The annual wind rose shown in Figure 13.2 illustrates the directionality and strength of the prevailing winds at Jersey Airport for all times of the day and all seasons.

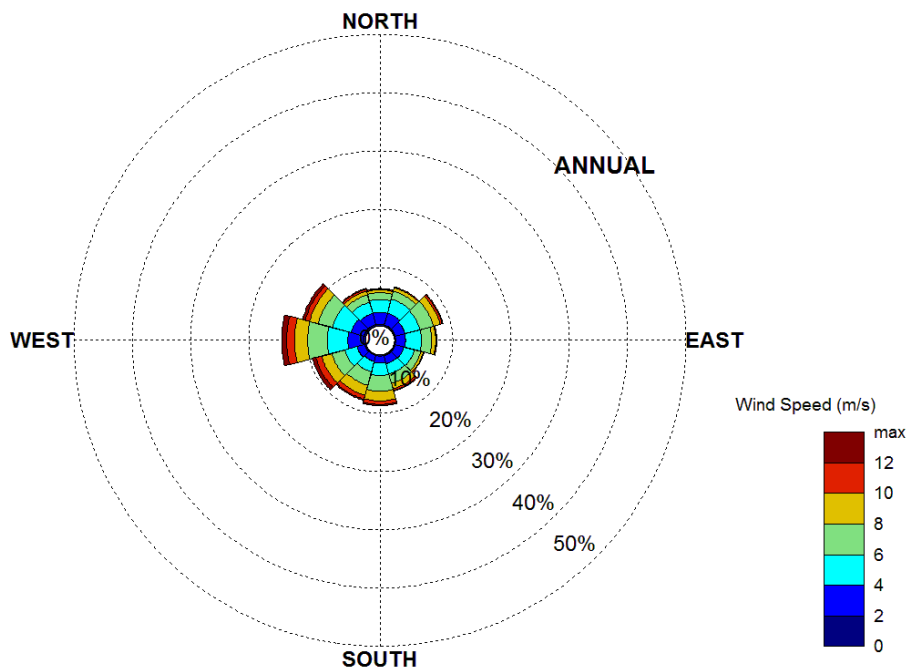






Figure 13.1 – Annual wind rose obtained from the wind data recorded at Jersey Airport (84m height) during the years 1997 to 2017

- 13.10 Other characteristics of the wind climate in Jersey are summarised below.
- The north-west and west winds are the most frequent and strongest at all times of the year. The more northerly winds are relatively cold. Most cases of serious annoyance due to strong winds around buildings are caused by these winds.
 - North-east winds are less frequent than the south and west winds. They are often associated with cold, dry conditions. These winds can be more unpleasant than their strength suggests due to the lower-than-average air temperature.
 - Finally, south-east winds are generally warm and light and are rarely associated with problematic ground level winds.

LDDC Lawson Assessment Criteria



- 13.11 The acceptability of windiness is subjective and depends on a number of important factors, particularly the type of activity being performed.
- 13.12 Lawson's comfort criteria are used to describe frequent wind conditions, and specify tolerable limits for various every-day activities. For ideal conditions, it would be desirable to achieve a category better than the comfort categories described below.
- 13.13 The terms 'Sitting', 'Standing', 'Strolling' and business 'Walking' are used in the text to describe the comfort levels of windiness as described in Table 13.1. The coloured dots are used to indicate the windiness on the referenced figures, e.g. Figure 13.5, which also show the measurement locations.

Table 13.1: Lawson Comfort Criteria

Comfort Criteria		Description
Long Term 'Sitting'		Reading a newspaper, eating and drinking
'Standing' or short term 'Sitting'		Bus stops, window shopping and building entrances
Walking or 'Strolling'		General areas of walking and sightseeing
Business 'Walking'		Areas where people are not expected to linger

- 13.14 There are also distress (or safety) criteria used to describe less frequent levels of windiness, to be exceeded less often than once a year. These are described in Table 13.2.
- 13.15 The distress limit for 'General Public Access' corresponds to an equivalent mean speed of 15 m/s and gust speed of 28 m/s. Exceeding this limit signifies a safety hazard for less able-bodied members of the public (e.g. elderly) and cyclists. In such instances, the wind tunnel results would display a single red ring around the outside of the coloured dot as shown in Table 13.2.
- 13.16 There is a further limiting distress criterion above which 'Able-bodied' individuals may find themselves in difficulties at times. This corresponds to a mean speed of 20 m/s and a gust speed of 37 m/s. Aerodynamic forces beyond this limit approach the body weight and it rapidly becomes impossible to remain standing. If these conditions are exceeded, then the wind tunnel results would display a double red ring around the outside of the dot as shown in Table 13.2. Such winds may also affect safety of some road vehicles.

Table 13.2: Lawson Distress Criteria

Distress Criteria	Description
'General Public Access'	 <p>Above which the less able and cyclists may at times find conditions physically difficult</p>
'Able Bodied Access'	 <p>Above which it may become impossible at times for an able bodied person to remain standing</p>

Significance Criteria

- 13.17 Significance of windiness at a given location is assessed for the intended pedestrian activities at that location.
- 13.18 Lawson's comfort criteria (see Table 13.1) are used to evaluate the appropriateness of windiness for everyday use.
- 13.19 An effect may be described as:
- **Beneficial:** the likely windiness is lower than needed for the intended or existing-and-continued use;
 - **Adverse:** the likely windiness is higher than needed for the intended or existing-and-continued use; or
 - **Negligible:** any changes in windiness have a negligible effect on the intended or existing-and-continued use.

13.20 An effect is categorised according to the following table:

Table 13.3: Categorisation of effects

Magnitude of Effect	Criteria for Assessment	Lawson Description
Major adverse	Levels of windiness with expected effect on future wind 'safety', particularly in areas of frequent everyday use, such as main public access routes and main building entrances.	Exceedance of Lawson's distress criteria in areas used regularly by the Public Exceedance of 'Standing' conditions at major entrances
Moderate adverse	Levels of windiness, with expected moderate effect on wind 'comfort' and 'safety'. This includes any important adverse changes to existing usage categorisation.	Exceedance of acceptable conditions in areas of less critical use, which may affect usage at times
Minor adverse	Levels of windiness with minor effect on future usage, e.g. changes in areas that are normally used only in suitable weather conditions.	Marginal exceedance of acceptable conditions or exceedance in rarely used areas
Negligible	Levels of windiness that have a negligible effect on the future usage of the Development, and in the surrounding areas. This includes areas where appropriately described wind mitigation has been incorporated into the scheme.	Acceptable conditions
Minor beneficial	Levels of windiness that contribute to future usage of the Development and surrounding areas.	Conditions are at least one-category calmer than acceptable in areas of significant usage.
Moderate beneficial	Levels of windiness with expected benefit for both wind 'comfort' and 'safety' in areas of less critical use.	Conditions are calmer than acceptable limits in areas that previously exceeded the relevant Lawson 'comfort' and 'safety' criteria.
Major beneficial	Existing wind 'safety' exceedance in areas of everyday use, such as public access routes and major building entrances is improved to acceptable levels.	No longer any exceedance of Lawson's distress criteria in areas used regularly by the Public Conditions at major entrances are improved to the acceptable 'Standing' limit.

Baseline Conditions

- 13.21 The baseline configuration for the application site with existing surroundings is shown in Figure 13.2. The majority of existing buildings on site are of similar height to the surrounding buildings which provide shelter from the easterly winds. The one exception is the '80's block which is nearly double the height of the surroundings. The western façade of this block is likely to downdraft higher winds onto the lower rooftops of the hospital buildings to the east as well as into the small courtyard.
- 13.22 The site is also exposed to the weaker but colder east winds approaching over the parade gardens. This is likely to affect conditions along The Parade and at the north-east and south-east corners of the existing development. While relatively cold, these winds are not expected to create unacceptable annoyance.

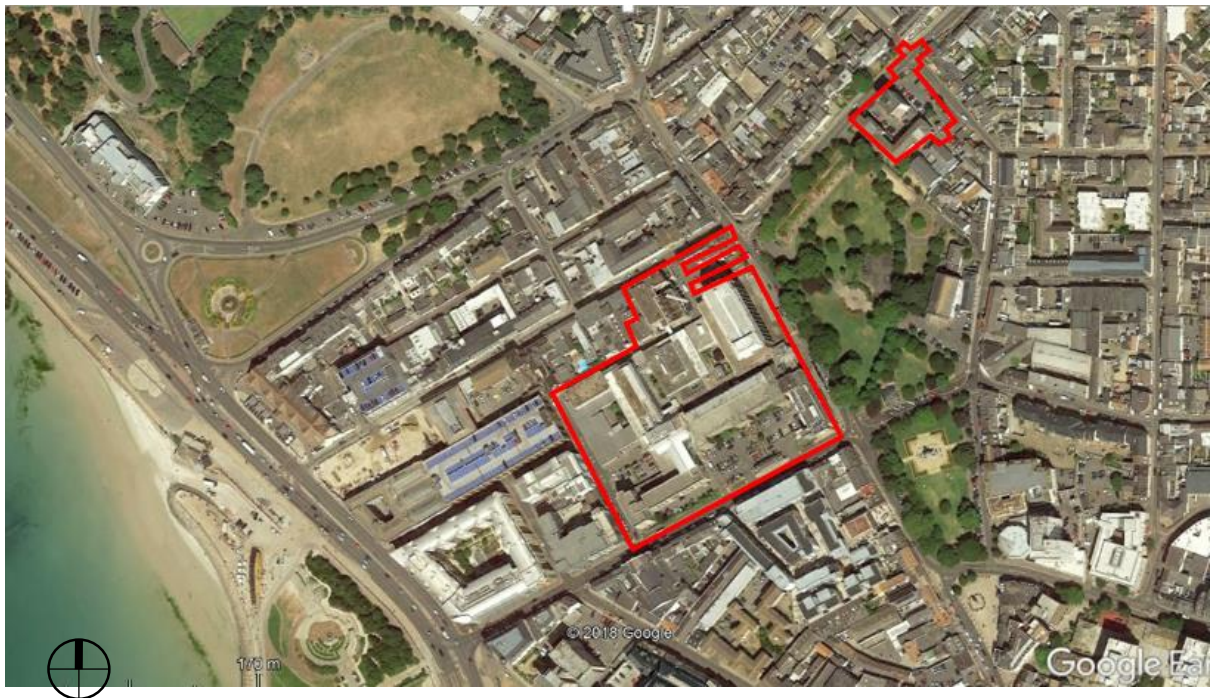


Figure 13.2 – Aerial view of the existing Jersey Hospital site within the wider surrounding context

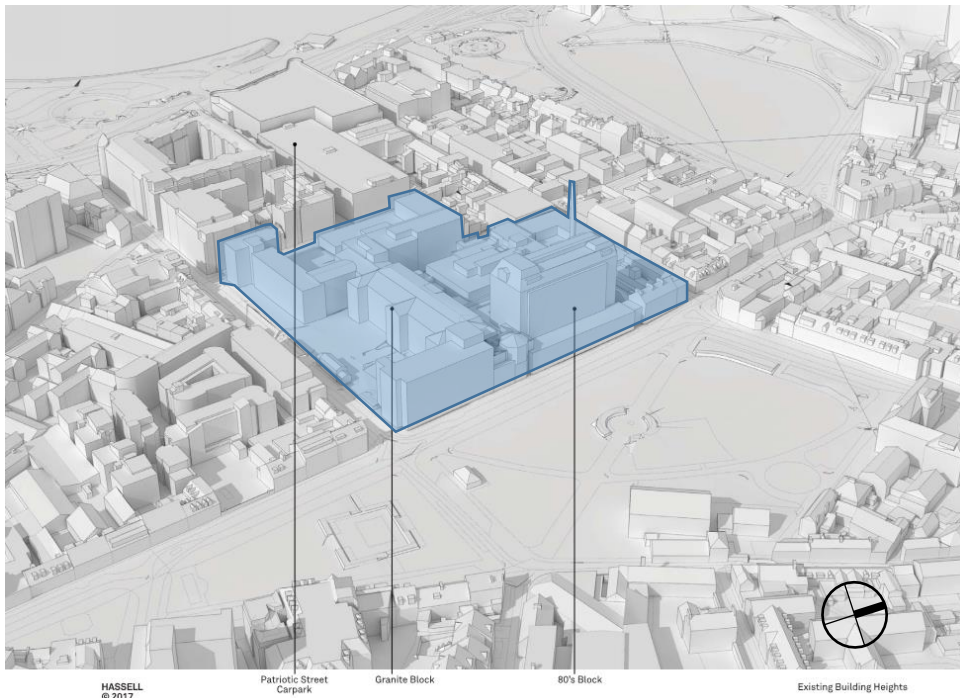


Figure 13.3 – 3D view of the existing Jersey General Hospital looking from the south-east

Assessment

Location and Massing

13.23 The proposed development includes Westaway Court on the north-eastern edge of Parade Gardens, as shown in the image below.

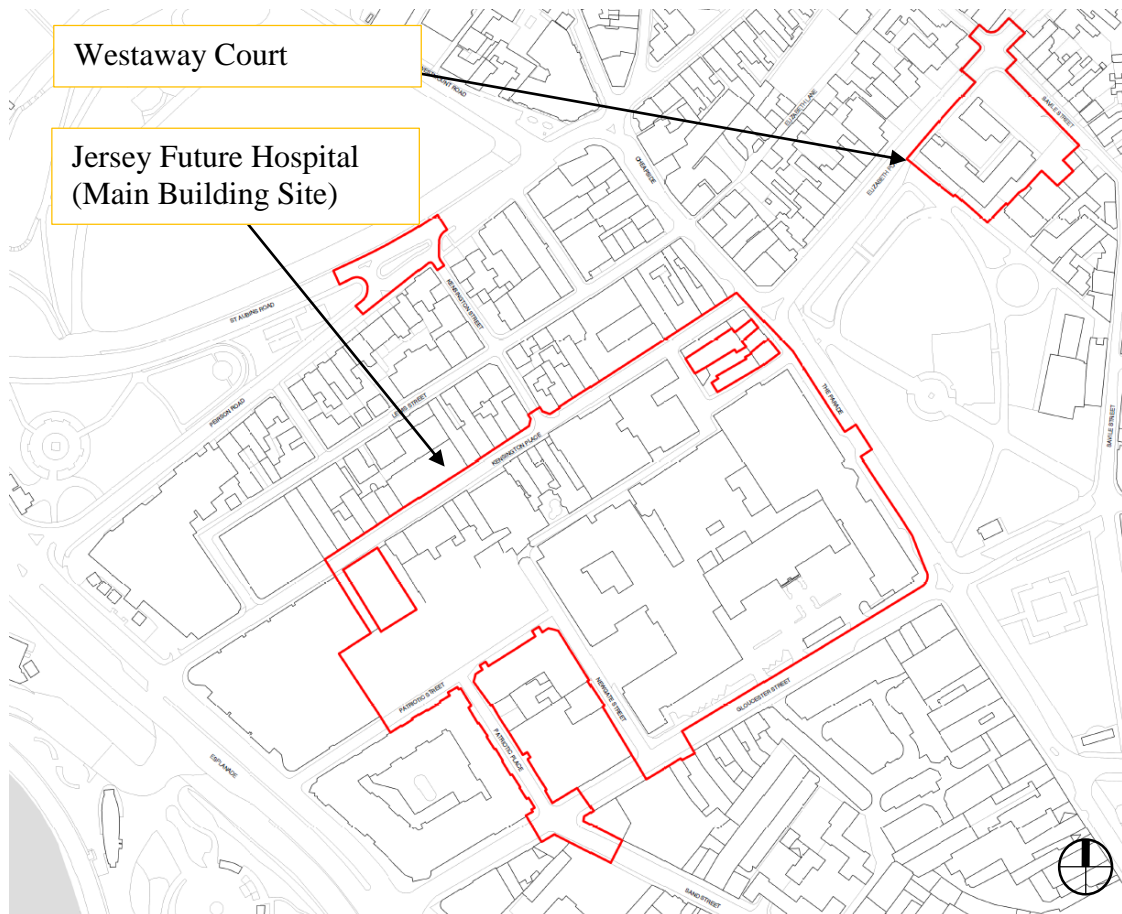


Figure 13.4 – Plan view of Jersey Future Hospital and Westaway Court

13.24 The main building is made up of three blocks (A, B and C) and an additional two half decks to the top of the Patriotic Street multi-storey car park (MSCP). The central block of the main building of the future hospital is up to 34m above ground level, which is significantly taller than the existing surroundings, as shown in the images below.

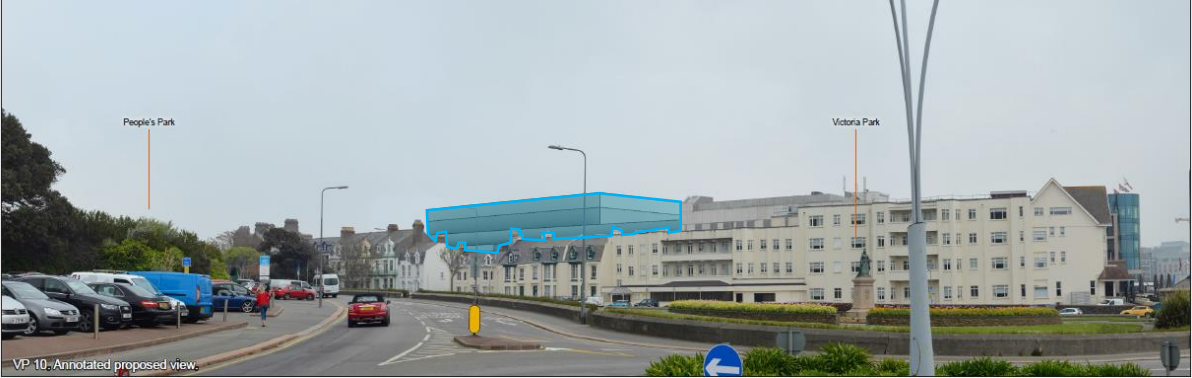


Figure 13.5: 3D view of the proposed main building for the Jersey Future Hospital development seen from the north-west

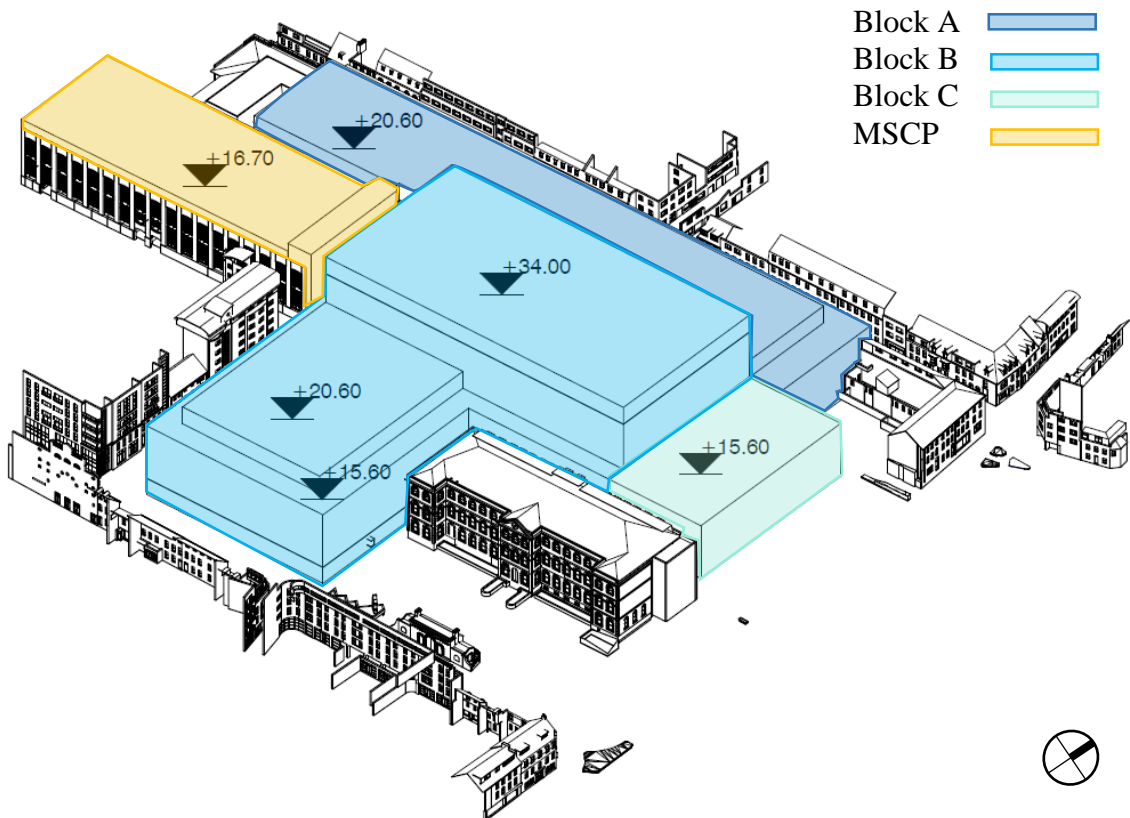


Figure 13.6: 3D view of the proposed main building for the Jersey Future Hospital development seen from the south-east

13.25 The volume parameters for the Westaway Court are shown below. The development will go up to 8.70m on the east side, then up to 12.90m on the north side and finally up to 17.90m on the west side for a plant/flue zone.

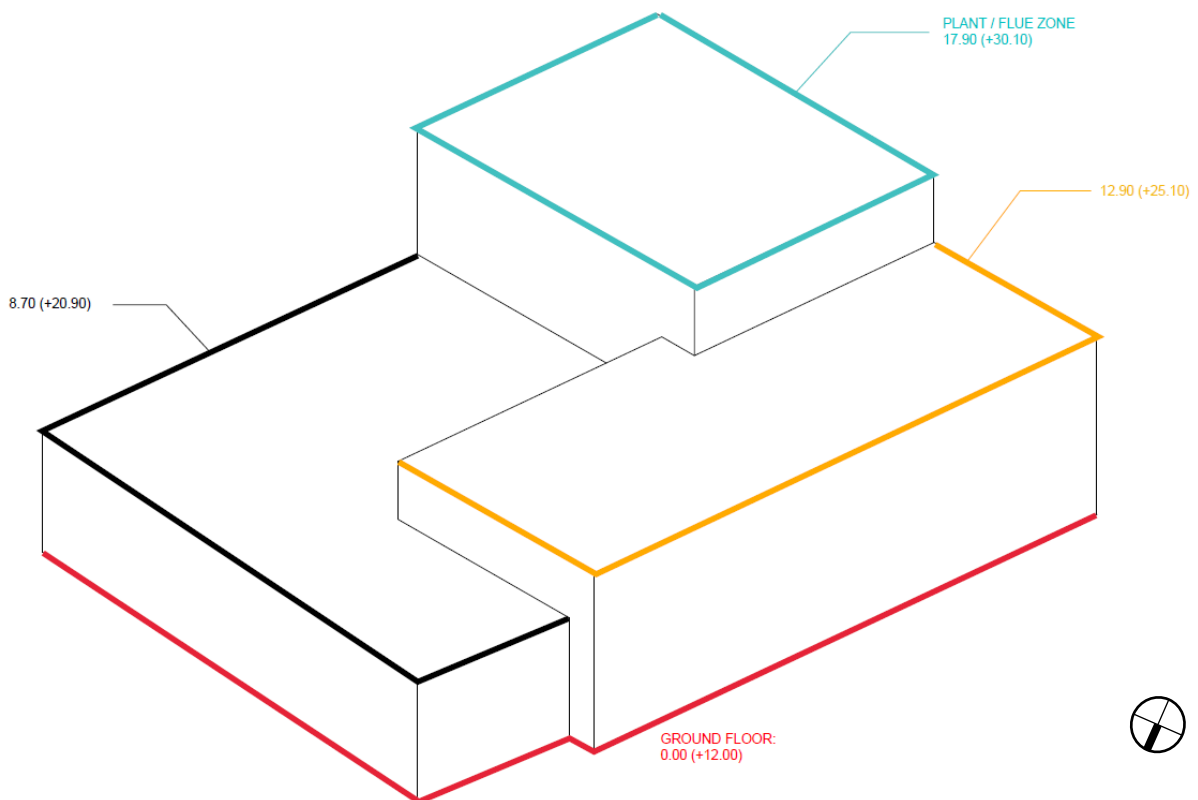


Figure 13.7: 3D view of the proposed Westaway Court development, seen from the north-east

13.26 The height and orientation of the buildings on both sites compared to the surroundings is likely to increase windiness at ground level. In particular, the south-western facade of Block B, on the main site and the western face of Westaway Court are likely to catch the prevailing west winds and direct them onto the streets below.

Wind Mechanisms

13.27 The surrounding buildings shelter most of the massing of the main hospital building. However, prevailing western winds will be down-drafted by the upper levels of Block B, which rises above the existing skyline. The down-drafted winds will create some gustiness from the northern end of Newgate Street to just past the A+E entrance, creating upper 'Standing' to 'Strolling' conditions.

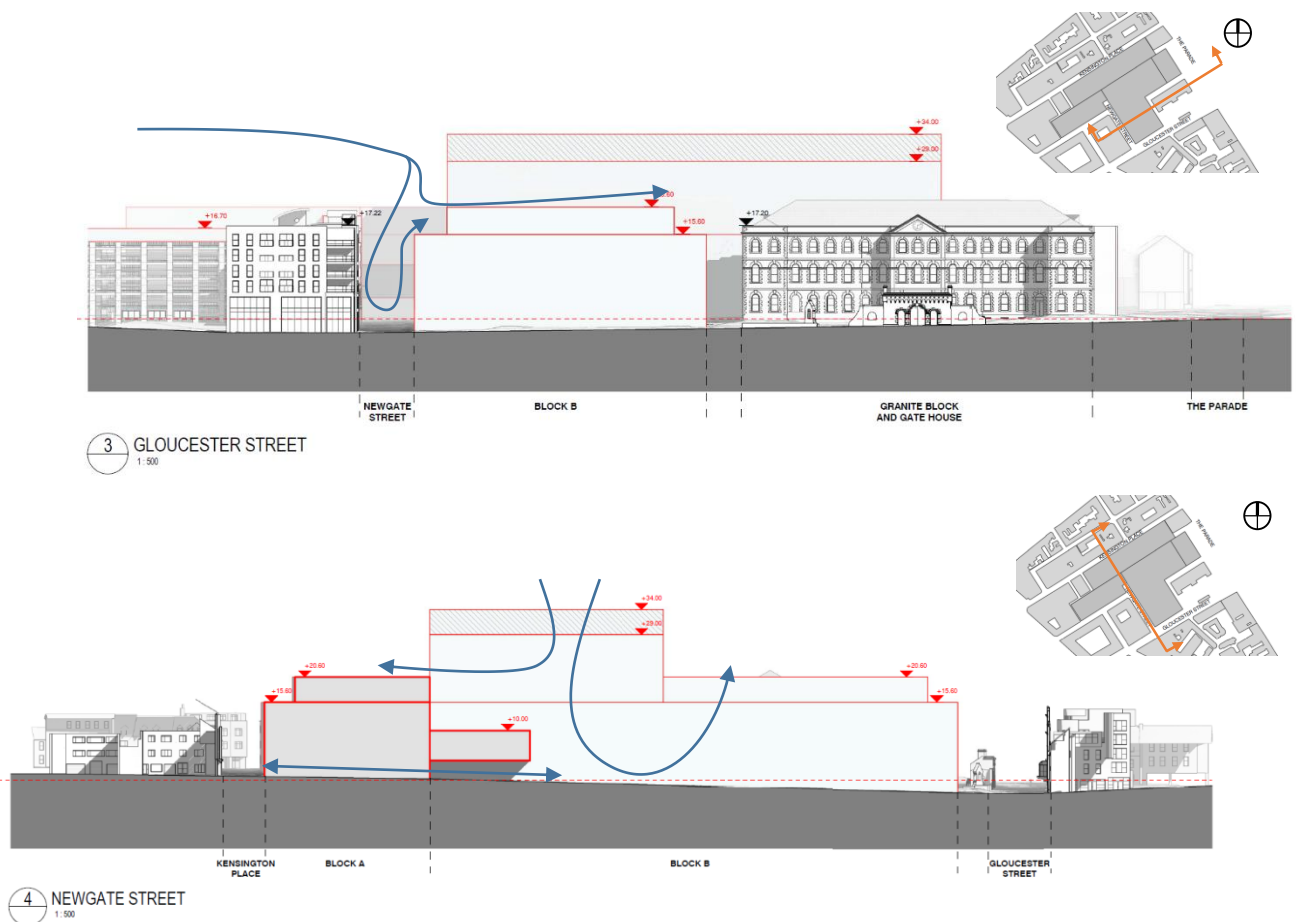


Figure 13.8: 3D view of the proposed development showing the main wind mechanisms from the west

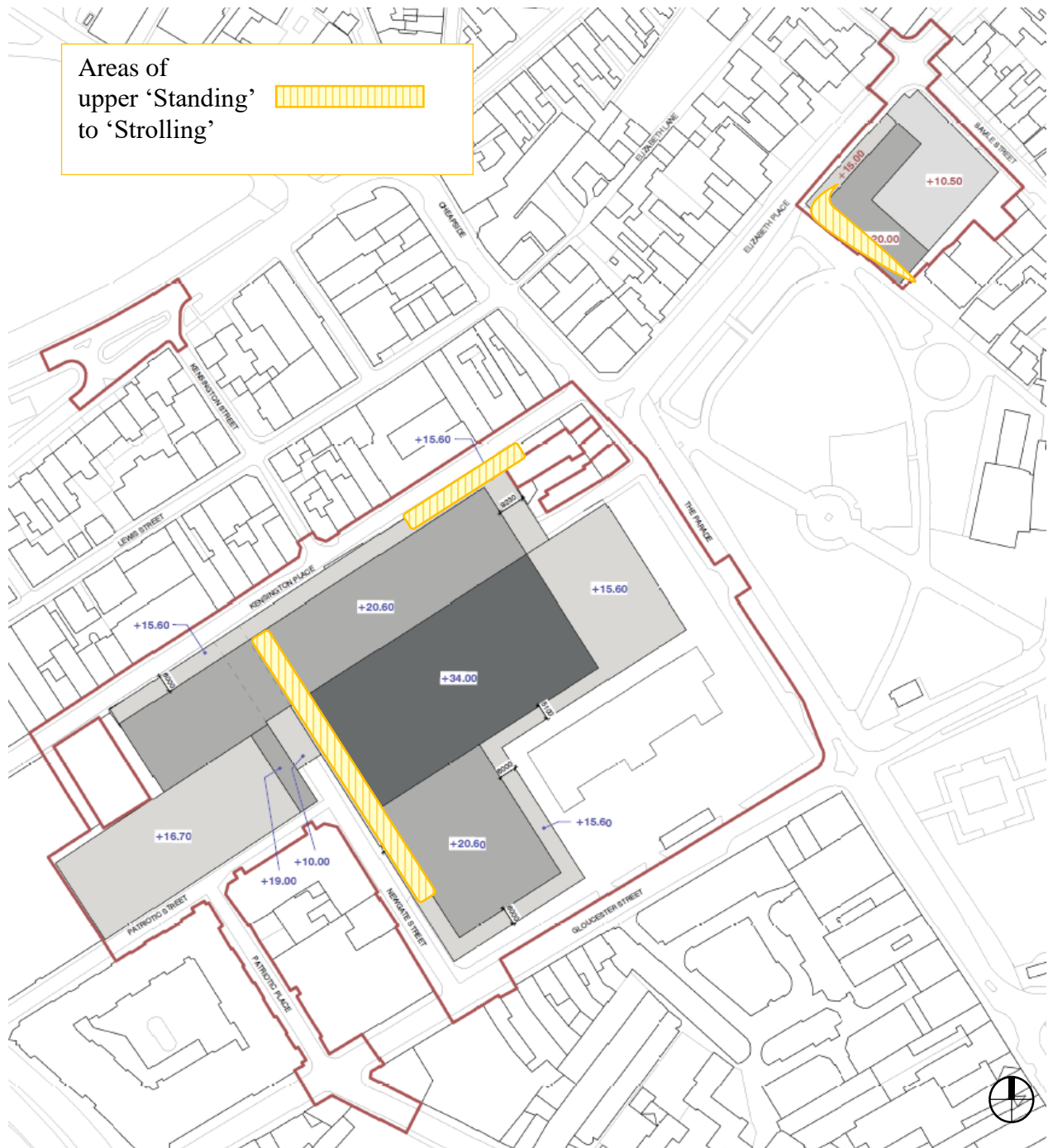
Some winds will be down-drafted of the north side of Block A onto Kensington Place. The accumulation of these breezes is expected to create 'Strolling' conditions at the north-east end of Kensington Place. These conditions are expected to quickly dissipate upon reaching the Parade.

The Westaway Court is partially sheltered from prevailing winds by Parade Park to the west and south-west and by the existing 2 to 3 storey buildings to the west and north-

west. Therefore, prevailing winds that do reach the building will be slightly weaker than those that reach the main hospital building. These reduced winds will be downdrafted by the taller western façade creating high positive pressure on the western face and accelerated winds around the north-western corner.

Pedestrian Comfort and Safety

- 13.28 The wind mechanisms described above are expected to create upper 'Standing' to 'Strolling' conditions in some areas along Newgate Street and along the western edges of Westaway Court. The affected areas are graphically shown in the figure below.

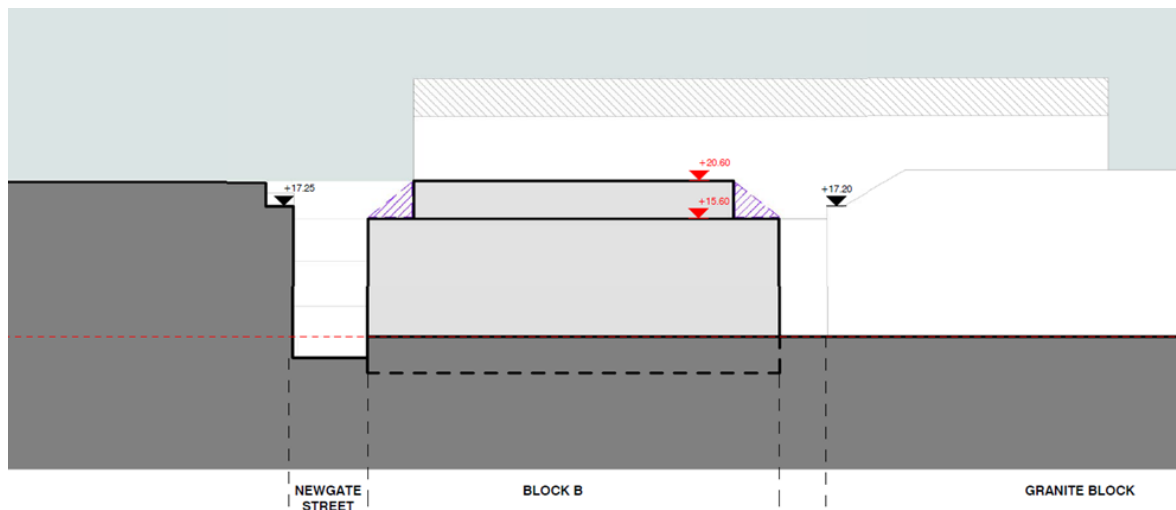


13.9: Plan view of the development showing areas of excessive windiness

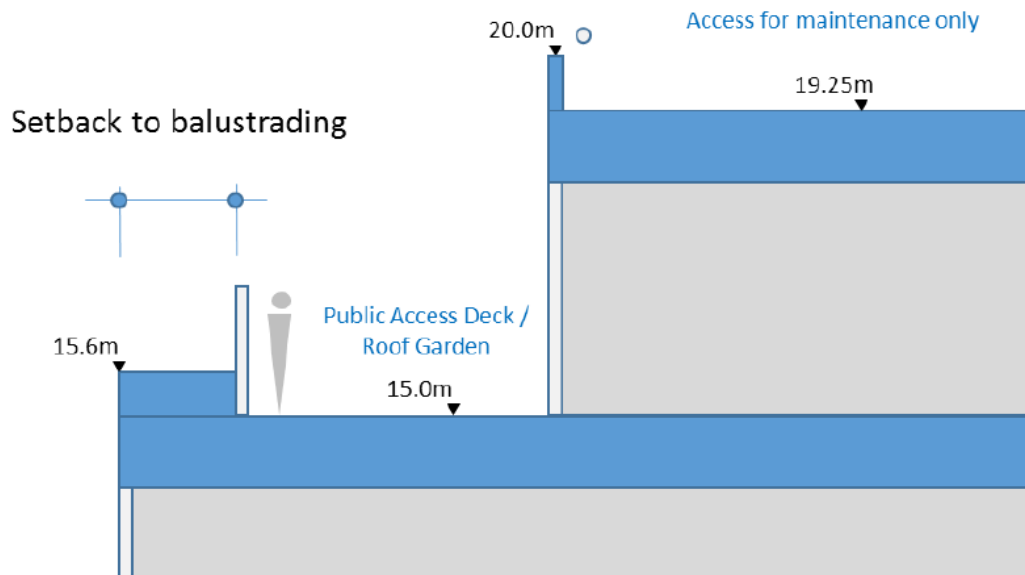
13.29 Around the main hospital building, several sensitive areas such as the patient transport services along Newgate Street, will be affected by these wind conditions. As it is expected that less able members of the public would regularly be using such spaces, the wind conditions would need to be at or below 'Standing' conditions. Without

mitigation, the conditions in these sensitive areas create a Moderate to Major Adverse effect.

- 13.30 Several public access decks or roof gardens run around the upper levels of the development, including those overlooking Kensington Place and Newgate Street. Those exposed to the prevailing western winds will be uncomfortable for 'Sitting' or 'Standing' for most of the year while those facing away from the prevailing winds will be sheltered by the mass of the development and enjoy calmer conditions.
- 13.31 Roof spaces are not expected to be used all year round and therefore do not strictly apply to the Lawson criteria. However, the frequency of use for these spaces should be examined during the detailed design stage, when local mitigation measures to reduce windiness can be explored.



13.10: Section through Block B of the main hospital building showing the location of proposed balconies



13.11: Proposed cross section of a public access balcony/roof garden

13.32 Around the Westaway development, conditions in most areas are acceptable for the intended activity. However, conditions along the western face are above the acceptable level for entrances (i.e. 'Standing') and are considered undesirable for less able members of the public. Without mitigation, this represents a Moderate to Major Adverse condition.

13.33 All other areas around the development are expected to meet acceptable conditions for 'Standing' or better. This is acceptable for the intended uses and constitutes a Negligible or Minor Beneficial effect.

Additional Mitigation Measures

13.34 Several options can be considered to resolve the wind issues along Newgate Street as discussed further below. All options considered should be checked and verified at the detailed design stage, possibly with physical wind tunnel testing if the effectiveness of the feasible mitigation is not clear.

13.35 Alternatively, local mitigation, such as porous vertical screens or landscaping at the corners where the wind is most severe, may also be practical and effective. The exact type and positioning of such mitigation would need to be reconsidered a later stage in the design. If the effectiveness of practical measures is not clear, then wind tunnel testing may be appropriate.

- 13.36 Downdrafted winds may also be further deflected by pulling the building massing of the upper levels back from the western edge to create a larger step or podium, to catch high level winds.
- 13.37 Entrances along the western edge of Westaway Court will experience high pressures from oncoming prevailing winds. These entrances should be fitted with robust mechanisms to prevent damage or slamming. Revolving doors may be needed in some situations when the pressure on local doors is too high or infiltration becomes an issue. This can be explored at the detailed design stage.
- 13.38 Entrances around the north-western corner should be recessed by at least 1m to provide shelter from accelerated winds. Alternatively, local mitigation, such as hard or soft landscaping, can be employed around these entrances to provide another form of local shelter. The exact type and positioning of such mitigation would need to be reconsidered a later stage in the design. If the effectiveness of practical measures is not clear, then wind tunnel testing may be appropriate.

Residual Effects

Existing

- 13.39 With the additional mitigation along Newgate Street and around the western entrances to Westaway Court (as discussed above), it is expected to achieve conditions which are acceptable for the intended use of all pedestrian areas within the proposed JFH.

Assessment Summary

- 13.40 Table 13.4 summarises residual effects of the Development with proposed mitigation of the pedestrian wind environment on and off site. The significance for pedestrians is described using the terminology and criteria described in Table 13.1.

Table 13.4: Summary of residual effects

Pedestrian Level Wind Condition	Pre-mitigation Significance	Possible Mitigation	Residual Pedestrian Level Wind Condition	Residual Significance
Proposed Development with Existing Surroundings				
Exceedance of 'Standing' conditions along Newgate Street where the A+E entrance is located.	Major adverse	Addition of mitigation measures along Newgate Street (either a roof or tested landscaping such as trees and/or porous vertical screens).	Acceptable 'Standing' conditions around entrances	Negligible
Exceedance of 'Standing' conditions around the western face and corners of the Westaway development, where entrances are to be located.	Major adverse	Addition of local mitigation measures around entrances such as soft landscaping, porous vertical screens or recessing of the entrances by at least 1m.	Acceptable 'Standing' conditions around entrances	Negligible
Unsheltered, west facing public access decks or roof gardens.	Minor Adverse	Addition of local hard and/or soft landscaping. To be designed during the detailed design stage.	Acceptable 'Standing' to 'Strolling' conditions achieved in the summer	Negligible
Acceptable wind conditions around all other areas of the development.	Negligible	None required	Acceptable 'Strolling' to 'Sitting' conditions	Negligible to Moderate Beneficial

Conclusions

- 13.41 Within the currently available information of the current masterplan, there is likely to be some inconvenient windiness to the west facing portions of the development.
- 13.42 Mitigation options are available to resolve the adverse wind conditions and are discussed in paragraphs 13.36-13.40. The mitigation options should be reviewed again at a later stage to determine the exact placement and effectiveness. In case of doubt then the use of wind tunnel testing should be considered as the design is developed.

References

- 13.43 'The Determination of the Wind Environment of a Building Complex Before Construction', TV Lawson, TVL 9025, 1st May, 1990, produced for the London Docklands Development Corporation (Lawson LDDC Criteria).