

15. WIND

INTRODUCTION

- 15.1 This chapter has been written by Waterman Environmental and Building Research Establishment (BRE). It assesses the effects of all four Development Scenarios on the local wind microclimate within and around the sites of the three applications. In particular it considers the potential effects of wind upon pedestrian comfort and safety and summarises the findings of a full wind tunnel testing exercise undertaken by BRE. The full results of the wind tunnel testing are presented within Technical Appendix 15a.
- 15.2 This chapter describes the methods used to assess the effects upon the local wind environment and describes the baseline conditions currently existing at the application sites and around their immediate surrounds. The potential effects of all four Development Scenarios are presented together with mitigation measures required to prevent, reduce and offset them. The resulting residual effects of all four Development Scenarios are also identified.

PLANNING POLICY CONTEXT AND GUIDANCE

National Planning Policy

- 15.3 There are no national planning policies directly relating to wind microclimate.

Regional Planning Policy

The London Plan: Spatial Development Strategy of Greater London, 2008

- 15.4 Policy 4B.10 of The London Plan (Ref. 15.1) outlines that due consideration should be given to the potential implications of wind microclimates in the design of large-scale buildings.

Spatial Development Strategy Technical Report 19, London's Skyline, Views and High Buildings, 2002

- 15.5 The Spatial Development Strategy (SDS) Technical Report 19, London's Skyline, Views and High Buildings (Ref. 15.2) recognises that high buildings can pose potential effects on the microclimate. In particular, the document notes that high buildings should make a positive contribution to the city's environmental quality by moderating wind conditions around proposed high buildings.

Supplementary Planning Guidance on Sustainable Design and Construction, 2006

- 15.6 The Greater London Authority's (GLA's) Supplementary Planning Guidance (SPG) on Sustainable Design and Construction (Ref. 15.3) provides a description of wind microclimatic issues particularly in relation to public realm and accessible landscaped areas. Reference is made to the use and application of wind tunnel testing. Measures for avoiding potential adverse pedestrian wind effects are also suggested.

Local Planning Policy

Westminster City Council Replacement Unitary Development Plan, 2007

- 15.7 Policy ENV 13 of Westminster City Council's (WCC's) Replacement Unitary Development Plan (UDP) (Ref. 15.4) states that developers should:
- "...demonstrate that their proposals will not give rise to unacceptable microclimate conditions."*

- 15.8 These conditions include wind turbulence, in particular when tall buildings are proposed. The policy suggests that wind tunnel testing may be undertaken to highlight any microclimatic issues and indicate possible solutions.
- 15.9 Concurrent with the above, Policy DES 3: High Buildings further notes that any tall buildings within WCC should minimise and, where possible avoid, the effects of wind turbulence.

Westminster City Council Victoria Area Planning Brief, 2006

- 15.10 WCC's Victoria Area Planning Brief (VAPB) (Ref. 15.5) makes reference to Policy DES 3: High Buildings of the WCC's UDP. As such, it encourages that the detailed design of tall buildings should minimise the potential adverse effects of wind turbulence.

Guidance

English Heritage/ Commission for Architecture and the Built Environment, Guidance on Tall Buildings July 2007

- 15.11 English Heritage (EH) and Commission of Architecture for the Built Environment (CABE) Guidance on Tall Buildings (Ref. 15.6) provide advice in relation to the design of tall buildings. Paragraph 4.1.9 of this guidance recommends that in applications for tall buildings, consideration should be given to the effect on the local environment, including microclimate.

ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Assessment Methodology

Wind Tunnel Testing

- 15.12 The construction of new buildings can have the potential to cause adverse wind conditions including turbulence and funnelling. This is due to the fact that buildings can deflect high-speed winds from high levels down to pedestrian levels. This movement of air can lead to potentially adverse effects on pedestrian comfort and safety. In order to establish and quantify the effects of all four Development Scenarios, a full wind tunnel testing exercise was conducted by BRE. A summary of the methodology adopted for the wind tunnel test is provided below. The full methodology is presented within Technical Appendix 15a.
- 15.13 As shown in Figures 15.1 - 15.5, 1:250 scale physical models of the existing sites and surroundings of the three applications, and the configurations of all four Development Scenarios, were tested in an atmospheric boundary layer wind tunnel. The models were constructed with surrounding buildings extending to a radius of approximately 220m from the centre of the three application sites. Appropriate velocity profiles, turbulence profiles and turbulence spectra associated with the wind approaching the sites of the three applications were created. These wind characteristics are generated by upstream ground level roughness away from the application sites. The effects of the roughness created by buildings in the vicinity of the application sites were included in the models of all four Development Scenarios.
- 15.14 The mean and maximum gust wind speeds were modelled at pedestrian level locations around all four Development Scenarios. These locations included main building entrances, pedestrian routes, public open spaces and other open areas within the Development Scenarios. In addition, the wind speeds were measured at balcony and roof terrace locations of Buildings 5 (application 1, all four Development Scenarios) and Building 7b/c (application 2, Development Scenario 1 and 2). The test locations referred to within this assessment are shown on Figures 15.6 - 15.14.
- 15.15 As described in Chapter 5: Proposed Development Scenarios, Building 5 proposes balconies and terraces. These locations have therefore been tested in this assessment. However, this assessment has only tested the acceptability of the wind microclimate at Building 5's balconies and terraces for Development Scenario 1. This is due to the fact that Building 5 would be located within the west of application 1 (within all four Development Scenarios). Whilst, Development Scenarios 2, 3 and 4 incorporate the proposals of application sites 2 and 3, these would only

change the proposed building configurations in Development Scenarios 2, 3 and 4 approximately 70m to the east of Building 5. . Based upon professional expert judgement, this 70m separation is considered to be sufficiently large so that the effect of the eastern extents of Development Scenario 2, 3 and 4 would not be materially or significantly different upon Building 5 within Development Scenario 1.

- 15.16 The wind tunnel results were combined with statistical data relating to meteorological conditions in London. Meteorological data comprised information provided from the Meteorological Office measurement station at London Heathrow. This is considered to represent the most appropriate data set for the London area. The wind speed ratios from the model were then combined with the meteorological data adjusted to specific site conditions, in order to estimate the frequency with which certain wind speeds occur. As the application sites are located in an urban area, meteorological data was adjusted to account for the typical reduction in wind speed and increased gustiness that occurs as winds blow into urban areas. This analysis was undertaken by modelling the effects of changes in surface roughness upon the wind characteristics at the application sites above ground surface.
- 15.17 These statistical estimates of the wind speed and frequency were then compared with the BRE Comfort Criteria to quantify the suitability of the wind conditions for a range of different pedestrian activities, as described later in this chapter.
- 15.18 It is important to note that the wind tunnel test of the four Development Scenarios has not included the presence of trees or other planting. As such, the results of the modelling may be slightly more conservative than the actual conditions likely to be experienced at the application sites as a result of the four Development Scenarios. This assessment, therefore, presents a precautionary approach.

BRE Comfort Criteria

- 15.19 The assessment has used the BRE Comfort Criteria as a ‘standard’ against which wind measurements have been compared. The Criteria reflect the fact that leisurely activities, such as sitting, require low wind speeds in order to be ‘comfortable’ for the pedestrian undertaking the activity. However, more transient activities, such as walking would tolerate stronger wind conditions. For each pedestrian activity, an upper threshold of wind speed and frequency is defined, beyond which conditions are considered ‘unacceptable’ for the stated activity. Beneath the threshold, the wind conditions are described as ‘tolerable’ and therefore ‘suitable’ for the stated pedestrian activity. It is worth noting that the BRE Criteria only reflect the mechanical effects of wind on people. It is assumed that other comfort factors, such as air temperature, can be adequately compensated by suitable clothing.
- 15.20 Table 15.1 below illustrates the values of the upper and lower thresholds (in terms of the Beaufort Scale) between which conditions are tolerable. Further details on the comfort criteria and Beaufort Scale are contained within Technical Appendix 15a.

Table 15.1: Threshold Values of the BRE Comfort Criteria

Activity	Standard BRE Comfort Criteria	
	Unacceptable	Tolerable
	Beaufort Scale	Beaufort Scale
Business walking.	B5 exceeded more than 6% of the time.	B5 exceeded more than 2% of the time.
Pedestrian walking.	B4 exceeded more than 4% of the time.	B3 exceeded more than 6% of the time.
Long-term sitting.	B3 exceeded more than 6% of the time.	B2 exceeded more than 6% of the time.
Entrance doors.	B3 exceeded more than 6% of the time.	B2 exceeded more than 4% of the time.

- 15.21 The results of the wind tunnel test described above were compared with the BRE Comfort Criteria to assess the potential wind effects. That is, the suitability of the four Development Scenarios for their intended pedestrian use

Significance Criteria

- 15.22 The significance criteria used in the assessment of potential and residual effects is based upon the relationship between the desired pedestrian activity at a specific location within the four Development Scenarios (as defined by the BRE Comfort Criteria shown in Table 15.1) and the predicted wind conditions at that location. Consequently, the following terminology has been used within this assessment to describe effects of the four Development Scenarios on wind microclimate:

- **Beneficial:** The wind conditions at a specific location are significantly improved compared with the baseline conditions, and the wind conditions at that location are acceptable or tolerable for the intended pedestrian activity.
- **Negligible:** The wind conditions at a specific location are acceptable or tolerable for the intended pedestrian activity at that location; and
- **Adverse:** The wind conditions at a specific location are not acceptable in relation to the intended pedestrian activity at that location.

BASELINE CONDITIONS

- 15.23 The baseline wind conditions of the three application sites are summarised in Figure 15.6. As described in Chapter 2: EIA Methodology, it should be noted that the baseline conditions have included the Abford House consented scheme (located adjacent to the south of application site 1 and 2, Development Scenarios 1 to 4). This is due to the fact that at the time of the assessment Abford House was largely constructed to its full massing. Figure 15.6 shows that the majority of the three application sites and the surrounding areas have wind conditions that are suitable for any intended pedestrian activity. As can be seen on Figure 15.6, there are a few locations around Bressenden Place and Portland House (locations 57, 62, 66, 68, 69, 89, 91 and 95) that have wind conditions that are not suitable for Long-Term Sitting or Entrance Doors, but these locations are suitable for Pedestrian Walking and Business Walking.

POTENTIAL EFFECTS

Demolition and Construction

Development Scenarios 1, 2, 3 and 4

- 15.24 Wind speeds around a building increase with building height. Therefore, during the demolition works of Timeslices 1, 2 and 6 in relation to all four Development Scenarios the wind conditions on the three application sites are likely to continuously improve, becoming the least windy when the existing buildings have been completely demolished (that is, at the end of Timeslice 6). This is based upon the presumption that the surrounding buildings would act to provide shelter to the demolished building site.
- 15.25 No wind measurements were made with the existing buildings demolished so it is not possible to quantify the resulting wind conditions. However, as noted above, the demolition process is generally likely to temporarily reduce the wind speeds across the sites of the three applications compared with the existing situation. During the construction phase the wind speeds around the new buildings would tend to increase, thus becoming similar to the conditions established by the wind tunnel testing. As landscaping (e.g. trees and kiosks) is added, it is likely that the wind conditions would then be further ameliorated, albeit slightly.

- 15.26 As areas of the application sites are completed and occupied, these operational areas would be subjected to interim wind effects up to completion of the each of the four Development Scenarios (further details are provided later in this chapter). The sequence of demolition and construction is unlikely to generate any particularly unusual or unforeseen pedestrian level wind conditions for any of the four Development Scenarios or their surrounding areas. In particular, for each phase of the demolition/construction sequence for all four Development Scenarios there would be 3m high hoarding around the construction area which would act to 'contain' the wind flow around the buildings providing shelter from some wind directions. Each construction phase is therefore unlikely to generate winds that are significantly worse for pedestrians in public areas around the three application sites than those expected around the finished Development Scenarios.
- 15.27 In light of the above, the effect of demolition and construction in relation to Development Scenario 1, 2, 3 and 4 on wind conditions is anticipated to be **negligible**.

Completed Development

Development Scenario 1

- 15.28 The Development Scenario 1 ground level wind conditions are summarised in Figure 15.7. This figure is very similar to the baseline summary shown in Figure 15.6, showing that the majority of Development Scenario 1 and its surrounding areas have wind conditions that are suitable for any intended pedestrian activity. As can be seen on Figures 15.8 and 15.11, all of the balcony and roof terrace test locations on Building 5 and Building 7b/c are also suitable for any intended pedestrian activity.
- 15.29 As shown on Figure 15.7, there are locations around Bressenden Place and Portland House that have wind conditions that are not suitable for Long-Term Sitting or Entrance Doors. However, these locations are suitable for Pedestrian Walking and Business Walking.
- 15.30 Comparing the Development Scenario 1 wind conditions with the baseline wind conditions, Development Scenario 1 has the potential to make the wind conditions slightly better at locations 57, 62, 69 and 89, and slightly worse at locations 26, 31, 58, 77 and 79.
- 15.31 Location 31 is in the middle of Allington Street, and Building 6a has no doorways or sitting areas at location 58. Therefore, these locations are likely to be suitable for their intended pedestrian activity (e.g. Pedestrian Walking and Business Walking).
- 15.32 Location 26 is sufficiently far away from the sites of the three applications that the wind conditions at this location are unlikely to be affected significantly by Development Scenario 1. It is judged that the predicted change in wind conditions is likely to be the result of experimental variation (especially given that this change in wind conditions was not seen on any of the subsequent Development Scenarios) which is an inevitable feature associated with measuring random wind signals. Taking this into account, it is judged that the wind conditions at location 26 are likely to be unchanged from the baseline situation. As such, this location is likely to be suitable for any intended pedestrian usage.
- 15.33 In light of these findings, the potential wind effects of Development Scenario 1 upon locations 26, 31 and 58 are anticipated to be **negligible**.
- 15.34 Locations 77 and 79 are adjacent to Portland House and are not within the three application sites. Location 77 is next to the entrance to a Health and Fitness Centre, and Location 79 is next to the main west entrance of Portland House. These locations are presently being used as entrance doors. Consequently, the potential effect of Development Scenario 1 upon pedestrian comfort at locations 77 and 79 is anticipated to be **long-term, local** and of **adverse** significance.

Development Scenario 2

- 15.35 The modelled wind conditions of Development Scenario 2 are summarised in Figure 15.12. This figure is very similar to the baseline summary shown in Figure 15.6, illustrating that the majority of Development Scenario 2 and its surrounding areas have wind conditions that are suitable for any intended pedestrian activity.

- 15.36 As described earlier, the assessment tested only the acceptability of the wind microclimate at Building 5's balconies and terraces for Development Scenario 1. For the reasons stated (i.e. the location and distance of Building 5 and the chances to Development Scenarios 2, 3 and 4), based upon professional expert judgement, the effect of the eastern extents of Development Scenario 2, 3 and 4 would not be materially or significantly different upon Building 5 within Development Scenario 1. Therefore it is judged that the balcony and roof terrace test locations on Building 5 are suitable for any intended pedestrian activity. For Building 7b/c, the testing demonstrated that the balcony and roof terrace test locations shown on Figure 15.8 are also suitable for any intended pedestrian activity.
- 15.37 As shown on Figure 15.12, there are locations around Bressenden Place and Portland House that have wind conditions that are not suitable for Long-Term Sitting or Entrance Doors, but these locations are suitable for Pedestrian Walking and Business Walking.
- 15.38 Comparing the Development Scenario 2 wind conditions with the baseline wind conditions, Development Scenario 2 has the potential to make the wind conditions slightly better at locations 57, 62, 68 and 89, and slightly worse at locations 31, 79 and 100.
- 15.39 Location 31 is in the middle of Allington Street and therefore this location is likely to be suitable for its intended pedestrian activity (e.g. Pedestrian Walking and Business Walking).
- 15.40 Location 100 is sufficiently far away from the sites of the applications 1 and 2 (which make up Development Scenario 2) that the wind conditions at this location are unlikely to be affected significantly by Development Scenario 2. It is judged that the predicted change in wind conditions at location 100 is likely to be the result of experimental variation, which is an inevitable feature associated with measuring random wind signals.
- 15.41 In light of these findings, the potential effects of Development Scenario 2 at locations 31 and 100 would be **negligible**.
- 15.42 The results in Figure 15.12 indicate that Development Scenario 2 is likely to have an effect upon location 79 (next to Portland House). This is anticipated to be of **long-term, local** and **adverse** significance.

Development Scenario 3

- 15.43 Development Scenario 3 ground level wind conditions are summarised in Figure 15.13. This figure is similar to the baseline summary shown in Figure 15.6, exemplifying that the majority of the Development Scenario 3 and the surrounding areas have wind conditions that are suitable for any intended pedestrian activity.
- 15.44 As described earlier, the assessment tested only the acceptability of the wind microclimate at Building 5's balconies and terraces for Development Scenario 1. For the reasons stated (i.e. the location and distance of Building 5 and the chances to Development Scenarios 2, 3 and 4), based upon professional expert judgement, the effect of the eastern extents of Development Scenario 2, 3 and 4 would not be materially or significantly different upon Building 5 within Development Scenario 1. Therefore it is judged that the balcony and roof terrace test locations on Building 5 are suitable for any intended pedestrian activity.
- 15.45 As shown on Figure 15.13, there are locations around Bressenden Place and Portland House that have wind conditions that are not suitable for Long-Term Sitting or Entrance Doors, but these locations are suitable for Pedestrian Walking and Business Walking.
- 15.46 Comparing Development Scenario 3 wind conditions with the baseline wind conditions, Development Scenario 3 has the potential to make the wind conditions slightly better at locations 68, 69 and 89, and slightly worse at locations 31, 56, 58, 59, 77 and 79.
- 15.47 Location 31 is in the middle of Allington Street, and Building 6a has no doorways or sitting areas at locations 56, 58 and 59. Therefore all of these locations are likely to be suitable for their intended pedestrian activity (e.g. Pedestrian Walking and Business Walking).
- 15.48 In light of these findings, the potential wind effects of Development Scenario 3 on locations 31, 56, 58 and 59 are anticipated to be **negligible**.

- 15.49 The results in Figure 15.13 indicate that Development Scenario 3 is likely to have an effect on Location 77 (next to the entrance to a Health and Fitness Centre) and Location 79 (adjacent to the main entrance of Portland House). The wind impact at these locations is anticipated to be of **long-term, local** and of **adverse** significance.

Development Scenario 4

- 15.50 Development Scenario 4 wind conditions are summarised in Figure 15.14. This figure is very similar to the baseline summary shown in Figure 15.6, and it shows that the majority of the Development Scenario 4 and the surrounding areas have wind conditions that are suitable for any intended pedestrian activity.
- 15.51 As described earlier, the assessment tested only the acceptability of the wind microclimate at Building 5's balconies and terraces for Development Scenario 1. For the reasons stated (i.e the location and distance of Building 5 and the changes to Development Scenarios 2, 3 and 4), based upon professional expert judgement, the effect of the eastern extents of Development Scenario 2, 3 and 4 would not be materially or significantly different upon Building 5 within Development Scenario 1. Therefore it is judged that the balcony and roof terrace test locations on Building 5 are suitable for any intended pedestrian activity
- 15.52 As shown on Figure 15.14, there are locations around Bressenden Place and Portland House that have wind conditions that are not suitable for Long-Term Sitting or Entrance Doors, but these locations are suitable for Pedestrian Walking and Business Walking.
- 15.53 Comparing the Development Scenario 4 wind conditions with the baseline, Development Scenario 4 has the potential to make the wind conditions slightly better at locations 57, 89 and 91, and slightly worse at locations 31, 56, 64, 77 and 79.
- 15.54 Location 31 is in the middle of Allington Street, and therefore this location is likely to be suitable for its intended pedestrian activity (i.e. Pedestrian Walking and Business Walking). Likewise, locations 56 and 64 are in the Bressenden Place roadway, and therefore these locations are suitable for the intended pedestrian activities of Pedestrian Walking and Business Walking.
- 15.55 In light of these findings, the potential wind effects of Development Scenario 4 on locations 31, 56 and 64 are anticipated to be negligible.
- 15.56 The results in Figure 15.14 indicate that Development Scenario 4 is likely to have an effect on Locations 77 and 79 are adjacent to Portland House which is anticipated to be of **long-term, local** and of **adverse** significance.

MITIGATION

Demolition and Construction

Development Scenarios 1, 2, 3 and 4

- 15.57 As noted above, the demolition and construction programmes for each of the four Development Scenarios are unlikely to generate winds that are significantly worse for pedestrians in public areas around the three application sites than those currently existing and in comparison to the modelled and expected wind conditions completion of the four Development Scenarios. Therefore, the potential effect of all four Development Scenarios is judged to be negligible and additional mitigation would not be required during demolition and construction.

Completed Development

Development Scenarios 1, 2, 3 and 4

- 15.58 The wind conditions within and around the three application sites are predicted to be suitable for their intended pedestrian activities with all four Development Scenarios in place. Therefore the four Development Scenarios have negligible effects upon the wind microclimate at the applications sites and no mitigation measures would be required.

- 15.59 However, Development Scenarios 1 to 4 are likely to have an **adverse** effect upon the wind microclimate at test location 79. Furthermore, Development Scenarios 1, 3 and 4 are likely to have an **adverse** effect upon the wind microclimate at test location 77. As noted above location 79 is next to the main west entrance doors of Portland House, and location 77 is next to the entrance doors of the nearby Health and Fitness Centre. The wind tunnel study has showed that that the baseline wind conditions at these entrances is suitable for entrance doors.
- 15.60 These effects are capable of being mitigated using measures on land within the control of the Applicant. These measures can be secured through appropriate planning conditions or obligations.
- 15.61 The Applicant is actively working with WCC to mitigate the adverse wind conditions generated by the nearby Cardinal Place. The present proposals have concentrated upon improving the wind conditions under the Cardinal Place canopy. However, the changes are intended to ameliorate specific wind conditions in localised areas, and are therefore not likely to reduce the ambient windiness of the general areas surrounding the application sites.

RESIDUAL EFFECTS

Demolition and Construction

Development Scenarios 1, 2, 3 and 4

- 15.62 No significant potential wind effects have been identified during the demolition and construction works associated with all four Development Scenarios. The residual effects for Development Scenarios 1, 2, 3 and 4 would therefore be **negligible**.

Completed Development

Development Scenarios 1, 2, 3 and 4

- 15.63 The wind conditions within and around the three application sites are predicted to be suitable for their intended pedestrian activities with all four Development Scenarios in place. Therefore the four Development Scenarios have **negligible** effects upon the wind microclimate at the applications sites and no mitigation measures would be required.
- 15.64 However, Development Scenarios 1, 2, 3 and 4 are likely to have an **adverse** effect upon the wind microclimate at test locations 79. Development Scenarios 1, 3 and 4 has an **adverse** wind effect only upon location 77. As noted above location 79 is next to the main west entrance doors of Portland House, and location 77 is next to the entrance doors of the nearby Health and Fitness Centre. The wind tunnel study has showed that that the baseline wind conditions at these entrances is suitable for entrance doors.
- 15.65 These effects are capable of being mitigated using measures on land within the control of the Applicant. These measures can be secured through appropriate planning conditions or obligations. The Applicant is actively working with WCC to mitigate the adverse wind conditions generated by the nearby Cardinal Place. However, the present proposals have concentrated upon improving the wind conditions under the Cardinal Place canopy. However, these changes are intended to ameliorate specific wind conditions in localised areas, and are therefore are not likely to reduce the ambient windiness of the general areas surrounding the application sites.
- 15.66 Without appropriate wind amelioration, and demonstrating their efficacy, the residual wind impacts are that the wind effects at Portland House entrance (location 79) are of **long-term, local** and **adverse** as a result of Development Scenarios 1, 2, 3 and 4 and the wind effects at the Health and Fitness Centre entrance (location 77) are of **long-term, local** and **adverse** significance under Development Scenarios 1, 3 and 4. Mitigation measures can be secured through planning conditions or obligations to adequately mitigate these effects.

SUMMARY AND CONCLUSIONS

- 15.67 The construction of new buildings and, in particular tall buildings, can have the potential to cause adverse wind conditions including turbulence and funnelling due to the fact that buildings can deflect high-speed winds from high levels down to pedestrian levels. This movement of air can lead to potentially adverse effects on pedestrian comfort and safety.
- 15.68 In order to establish and quantify the effects of all four Development Scenarios, a full wind tunnel testing exercise was conducted. Wind tunnel tests were conducted using scale models of the four Development Scenarios with the results compared to the BRE Comfort Criteria.
- 15.69 The results showed that compared with the existing baseline wind conditions, for Development Scenarios 1, 2, 3 and 4 the majority of the application sites and their surroundings are likely to have similar conditions. However, there are a few locations where the four Development Scenarios are likely to lead to a deterioration in the prevailing wind microclimate.
- 15.70 Taking into account the intended pedestrian usage, at all of the locations within and immediately around the application sites the wind conditions are predicted to be suitable for their intended purpose. Therefore the wind effects of the four Development Scenarios within and immediately around the application sites are **negligible**.
- 15.71 However the testing indicates that Development Scenario 1, 2, 3 and 4 are likely to have a wind effect of **long-term, local** and **adverse** significance at test location 79, and Development Scenario 1, 3 and 4 are likely to have a wind effect of **long-term, local** and **adverse** significance at test location 77. These locations are the entrances to Portland House (location 79) and the nearby Health and Fitness Centre (location 77). These effects can be mitigated on land with the control of the Applicant.
- 15.72 The Applicant is actively working with WCC to mitigate the adverse wind conditions generated by the nearby Cardinal Place. However, for reasons given above these changes are not likely to reduce the ambient windiness of the general areas surrounding the application sites.