11 WIND MICROCLIMATE

Introduction

11.1 This chapter of the ES assesses the potential impacts and associated likely effects of the proposed development on the local wind microclimate within and around the application site. In particular, it considers the likely effects of wind upon pedestrian comfort and safety and summarises the findings of a wind tunnel testing exercise.

11.2 The chapter describes the relevant policy context; the methods used to assess the potential impacts and likely effects of the proposed development; the baseline conditions currently existing at the application site and within its immediate surroundings; and the likely effects on wind microclimate during demolition and construction, and once the proposed development is completed taking into consideration embedded mitigation measures. Where appropriate, the mitigation measures required to prevent, reduce or offset adverse effects are identified, and the chapter concludes with a summary of the expected residual and likely significant effects.

11.3 The assessment quantifies the expected wind microclimate in pedestrian areas at ground level, podium level, roof terrace level and balcony level. The measured wind speed statistics are benchmarked against the Lawson Comfort Criteria to determine the suitability of the proposed development for different pedestrian activities. Both the existing (baseline) and those for the proposed development are assessed. Strong winds are also considered. Results for the windiest season are presented, as well as results for the summer when amenity spaces are more likely to be used frequently.

11.4 The chapter is accompanied by the following technical appendix in ES Volume 3A:

- Technical Appendix 12.1: Pedestrian Level Wind Microclimate Assessment.

Legislation and Policy Context

National Legislation and Policy

National Planning Policy Framework, 2012

11.5 The UK wide NPPF[1] came into force in March 2012. There are no national planning policies directly relating to wind microclimate issues; however, the benefits of a high quality built environment are emphasised in the NPPF. An example of this is presented in paragraph 58: *"…using streetscapes and buildings to create attractive and comfortable places to live, work and visit…"*

Planning Practice Guidance

11.6 The PPG[2] identifies the potential for a building's size and shape (particularly in the case of tall and large buildings) to affect the wind microclimate. Under the section addressing 'Design: How should buildings and the spaces between them be considered?', the PPG states in paragraph 25 and 26 ('Consider Form' and 'Consider Scale' respectively) that "*Some forms pose specific design challenges for example how taller buildings meet the ground and how they affect local wind and sunlight patterns should be carefully considered*." Furthermore that "*Account should be taken of local climatic conditions, including daylight and sunlight, wind, temperature and frost pockets*."

Regional Policy

The London Plan Spatial Development Strategy for London Consolidated with Alterations since 2011, 2016

11.7 The London Plan, 2016[3] places great importance on the creation and maintenance of a high quality environment for London. The following policies apply specifically in relation to wind microclimate:

- Policy '7.6 - Architecture' which states that "*Architecture should make a positive contribution to a coherent public realm, streetscape and wider cityscape. It should incorporate the highest quality materials and design appropriate to its context*."

  "*Buildings and structures should:*

  Not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and microclimate. This is particularly important for tall buildings."
- Policy '7.7 - Location and Design of Tall and Large Buildings' which states that "*Tall and large buildings should be part of a plan-led approach to changing or developing an area by the identification of appropriate, sensitive and inappropriate locations. Tall and large buildings should not have an unacceptably harmful impact on their surroundings*."

  "*Applications for tall or large buildings should include an urban design analysis that demonstrates the proposal is part of a strategy that will meet the criteria below. This is particularly important if the site is not identified as a location for tall or large buildings in the borough's LDF*."

  "*Tall buildings:*

  Should not affect their surroundings adversely in terms of microclimate, wind turbulence, overshadowing, noise, reflected glare, aviation and telecommunication interference."

Sustainable Design and Construction Supplementary Planning Guidance, 2014

11.8 The Sustainable Design and Construction Supplementary Planning Guidance SPG[4] states in section 2.3.7 that large buildings have the ability to alter the local wind microclimate and as such, these impacts should be assessed and their usability identified using the Lawson Comfort Criteria. If areas are assessed to be windier than desired, then mitigation measures should be developed to alleviate the wind speeds and create a suitable environment for the intended use.

Local Policy

London Borough of Camden Core Strategy 2010 - 2025, 2010

11.9 The LBC Core Strategy[5] sets out the key elements of borough's planning vision for growth and development. The plan is designed to address a number of challenges that the borough faces, such as adapting to a growing population, social changes and maintaining a successful economy. The overall vision is to ensure that "*Camden will be a borough of opportunity*".

[1] Department for Communities and Local Government, 2012. National Planning Policy Framework. London. HMSO.
[2] https://www.gov.uk/guidance/national-planning-policy-framework
[3] Greater London Authority, 2016. London Plan – The Spatial Development Strategy for London Consolidated with Alterations since 2011. London. GLA.
[4] Greater London Authority 2014. Sustainable Design and Construction Supplementary Planning Guidance, London. GLA
[5] London Borough of Camden, 2010. Core Strategy 2010-2025. London. LBC.

11.10 Polices 'CS14 - Promoting high quality places and conserving our heritage states at paragraph 14.8 that "tall buildings may have an impact on the local microclimate and will therefore have to be considered during the planning process."

London Borough of Camden Development Policies, 2010-2025, 2010

11.11 The LBC Development Policies document[6] forms part of LBC's LDF. This document acknowledge Policy that large developments can alter the local climate and that buildings can affect the flow of air and cause wind tunnels which can potentially affect the enjoyment of public space.

11.12 Policy 'DP26 - Managing the impact of development on occupies and neighbour' states that the Council will not grant permission for development that affect amenity, in respect of amongst others, microclimate.

Camden Planning Guidance - Amenity, 2016

11.13 THE LBC Planning Guidance[7], Section 10, discusses the impacts of buildings on the wind and micro-climate.

11.14 It is states that any building which is 18 m or 5 storeys above the surrounding buildings will require a wind assessment and that the Lawson Comfort Criteria will be used in the assessment (paragraph 10.7). Furthermore, that if areas around the site do not meet the intended target criterion, remedial measures should be discussed (paragraph 10.11-10.13).

Draft London Borough of Camden Local Plan, 2016

11.15 In June 2016 LBC submitted the Draft Camden Local Plan ('The Draft Local Plan') for examination. LBC intends to formally adopt the Local Plan during Summer 2017. The LBC Draft Local Plan[8] briefly mentions wind microclimate in the following policies:

- Policy '6.2 – Policy A1 managing the impact of development' discusses microclimate as a factor that will be considered and mitigated if necessary.

Draft Camden Goods Yard Planning Framework, 2017

11.16 The Camden Goods Yard Planning Framework[9] makes no specific reference to wind.

Consultation Feedback

11.17 As discussed in Chapter 2: EIA Process and Methodology, consideration has been given in this assessment to the formal EIA Scoping Opinion comments provided by the LBC and consultees in respect to the proposed development. The key considerations are summarised in Table 11.1.

Table 11.1: EIA Scoping Consultation Feedback

Consultee	Comment	Where in the Chapter this comment is addressed
LBC	The key issues, likely significant effects and approach and methodology appear appropriately identified.	Methodology and potential Impacts and Likely Effects section of this chapter.

Assessment Methodology

11.18 The following section outlines the methodologies applied to identify and assess the potential wind impacts and effects likely to result from the proposed development.

Study Area

11.19 The wind tunnel testing has been undertaken using a 1:300 scale model of the proposed development with existing and cumulative surrounding buildings and terrain covering a 360 m radius centred on the application site.

11.20 The assessment study area included the entrances, thoroughfares and amenity areas at ground, podium, balcony and terrace levels within the application site; the streets and the bus stops immediately around the application site where the proposed development could have an influence on the wind microclimate, were instrumented.

11.21 The immediate surroundings, up to approximately 180 m radius centred on the application site, was instrumented to measure the wind speed.

Baseline Characterisation

Meteorological Data

11.22 The UK Meteorological Office supplies records of the number of hours that wind occurs for ranges of wind speed (using the Beaufort Scale) and by direction. Meteorological data for London (Heathrow, Gatwick and Stansted Airports), as shown in Figure 11.1, was used in this assessment as this is deemed to provide the best representation of the local wind microclimate for the London area.

11.23 The meteorological data obtained for London indicates that the prevailing wind throughout the year is from the south-west (i.e. 210 to 240 degrees on the compass). This is typical for many areas of southern England. There is a secondary peak from the north-east during the late spring and early summer. The winds from the north-east are not as strong as the prevailing winds from the south-west, although the winds are colder.

[6] London Borough of Camden, 2010, Development Policies 2010-2025. London. LBC.
[7] London Borough of Camden, 2016. Planning Guidance. London. LBC.
[8] London Borough of Camden, 2016. Draft Local Plan. London. LBC.
[9] Camden Goods Yard Planning Framework - http://www.camden.gov.uk/ccm/cms-service/stream/asset/;jsessionid=91ABAB8BF34CA6244F2987DFA751ADDB?asset_id=3572009&.

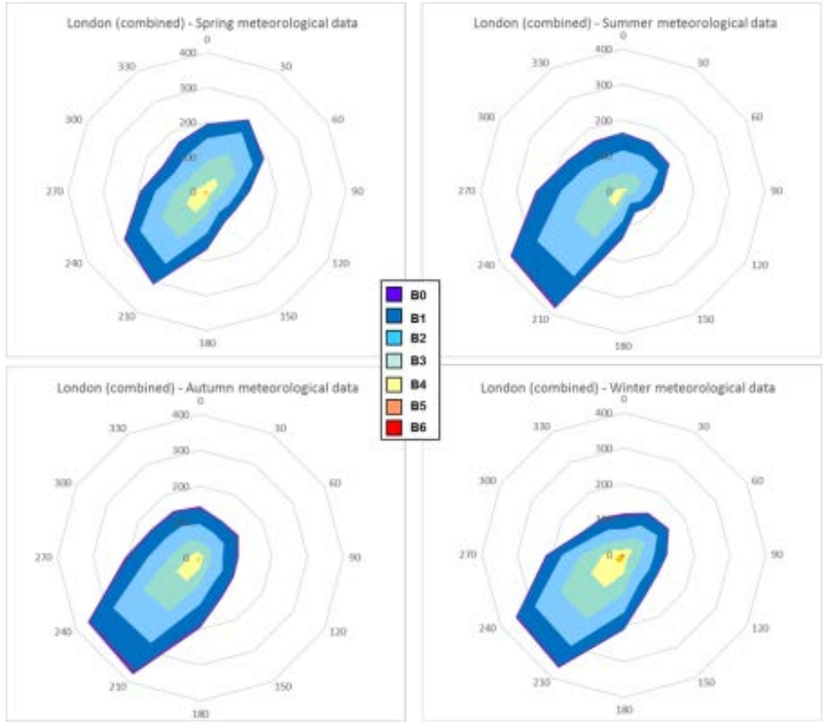

Figure 11.1: Seasonal Wind Roses for London (combined data from Heathrow, Gatwick and Stansted Airports)

11.24 The meteorological data was corrected to standard conditions of 10 m above open flat level country terrain. The meteorological model was then adjusted to the application site conditions taking into account the terrain roughness using the BREVe3 software package which models the wind characteristics caused by changes in the terrain roughness at the stated reference height of 120 m above the surface. The results are shown in Table 11.2.

Table 11.2: Site Meteorological Data Adjustment

Direction (˚N)	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°
Mean Factor	1.37	1.40	1.37	1.41	1.36	1.38	1.38	1.47	1.47	1.47	1.37	1.39

Method of Assessment

Demolition and Construction

11.25 Typically for a wind microclimate assessment in London, the likely effects during demolition and construction would be assessed using the professional judgement of an experienced wind engineer, and based on an assessment of the background wind climate at the application site and on an understanding of the effects of wind in the built environment. This approach is taken, assuming that the activity on-site during this time (i.e. construction activity) is less sensitive to wind conditions than when the proposed development is completed and occupied (which would include entrance and amenity space, for example).

11.26 A qualitative assessment of the wind microclimate during demolition and construction has therefore been undertaken and is based on professional judgement (informed by an assessment of the background wind microclimate in the area, the results of the tested configurations for the baseline and completed development scenarios, and the wind specialist's experience of assessing wind in the built environment).

Completed Development

11.27 To predict the local wind environment associated with the completed development and to determine the resulting pedestrian comfort within and immediately surrounding the application site, wind tunnel testing of the proposed development has been undertaken.

11.28 Wind tunnel testing is one of the most well-established and robust means of assessing the pedestrian wind microclimate. Such testing allows the pedestrian level wind microclimate at, and surrounding, the application site to be quantified and classified in accordance with the widely accepted Lawson Comfort Criteria[10], a summary of which are provided later in this Chapter.

11.29 Wind tunnel testing allows for a detailed assessment of the mean and gust wind conditions in and around the application site for all wind directions in terms of pedestrian comfort and strong winds (referred to later in this chapter).

11.30 The methodology for quantifying the pedestrian level wind environment is outlined below within four steps:

- **Step 1:** The subject site's induced wind speeds are measured for the appropriate configuration(s) at the appropriate pedestrian level(s) in the wind tunnel;
- **Step 2:** Standard meteorological data is adjusted to account for conditions at a subject site (for this assessment, meteorological data has been derived from London meteorological stations (Heathrow, Stansted and Gatwick airports combined));
- **Step 3:** Data from Step 1 and Step 2 are combined to obtain the expected frequency and magnitude of wind speed for the appropriate configuration(s) and at the appropriate pedestrian level(s); and
- **Step 4:** The results of Step 3 are compared with the Lawson Comfort Criteria (and where relevant, the change in the wind microclimate conditions between appropriate test configuration(s) to 'grade / score' the conditions within and around a subject site.

11.31 Full details of the assessment methodology can be obtained by reference to Appendix 12.1.

11.32 In order to model the likely effects of gustiness or turbulence (which depends on the geographical location) a series of grid, barrier and floor roughness elements have been employed in the wind tunnel in order to create a 'boundary layer' that is representative of the urban location of the application site. In addition, the wind tunnel included relevant buildings and other topographical features with regard to wind flow up to a distance of 360 m radius from the centre of the application site.

11.33 Wind speed measurements within and around the application site for the tested configurations were established using Irwin Probes. Irwin Probes measure the mean and gust wind speeds at a full-scale height of approximately 1.5 m above the surface upon which the probe is located.

11.34 The wind speed was measured at 248 locations under the existing conditions; the proposed development and the cumulative configurations for all wind directions in equal increments, with 0° representing wind blowing from the north and 90° wind from the east and so on.

11.35 The wind tunnel tests were conducted with no planting or landscaping around or within the proposed development, to ensure that the assessment was based upon a conservative (i.e. windier / worst case) scenario. The presence of planting and other landscape enhancements would generally be expected to

[10] Lawson TV, 2001. Building Aerodynamics. London. Imperial College Press.

increase shelter within the proposed development, compared to the wind conditions described above, particularly when the trees and plants are established and in full leaf.

11.36 To ensure a proportionate assessment, where the results indicate marginal exceedances (one category) of the wind criteria for a particular pedestrian use, professional judgement is typically applied in respect of the required mitigation measures and the effectiveness of the measures based on experience and based on high degree of certainty of their effectiveness. However, where the exceedances indicate two or more categories windier conditions, additional wind tunnel testing is typically undertaken.

Lawson Comfort Criteria

11.37 The assessment of the wind conditions at the application site requires a standard against which the measurements can be compared. This assessment uses the Lawson Comfort Criteria, which have been established for over 30 years. The Criteria, which seeks to define the reaction of an average pedestrian to the wind, are described in Table 11.3. If the measured wind conditions exceed the threshold wind speed for more than 5 % of the time, then they are unacceptable for the stated pedestrian activity and the expectation is that there may be complaints of nuisance or people will not use the area for its intended purpose.

11.38 The Criteria sets out four pedestrian activities and reflects the fact that less active pursuits require more benign wind conditions. The four categories are sitting, standing, strolling and walking, in ascending order of activity level, with a fifth category for conditions that are uncomfortable for all uses. In other words, the wind conditions in an area for sitting need to be calmer than a location that people merely walk past. The distinction between strolling and walking is that in the strolling scenario pedestrians are more likely to take on a leisurely pace, with the intention of taking time to move through the area, whereas in the walking scenario, pedestrians are intending to move through the area quickly and are therefore expected to be more tolerant of stronger winds.

11.39 The Criteria are derived for open air conditions and assume that pedestrians would be suitably dressed for the season. Thermal comfort is discussed with reference to acceptable wind environments but not evaluated as part of the assessment.

11.40 The coloured key in Table 11.3 corresponds to the presentation of wind tunnel test results described later in this chapter.

Table 11.3: Lawson Comfort Criteria

Key	Comfort Category	Threshold	Description
	Uncomfortable	>10 m/s	Winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended.
	Walking	8-10 m/s	Relatively high speeds that can be tolerated if the objective is to walk, run or cycle without lingering.
	Strolling	6-8 m/s	Moderate breezes that would be appropriate for strolling along a city/town centre street, plaza or park.
	Standing	4-6 m/s	Gentle breezes suitable for main building entrances, pick-up/drop-off points and bus stops.
	Sitting	0-4 m/s	Light breezes desired for outdoor restaurants and seating areas where one can read a paper or comfortably sit for long periods.

Target Wind Conditions

11.41 Wind conditions that are suitable for strolling use, or calmer, are desirable on main thoroughfares during the windiest season for a mixed-use development in an urban area, similar to the proposed development. Standing use wind conditions, or calmer, are generally required at entrances throughout the year. Wind conditions suitable for sitting in the summer season are desirable for public amenity spaces and balconies. For a mixed-use amenity space, such as outdoor gym areas, a mix of sitting and standing wind conditions is acceptable.

Strong Winds

11.42 The assessments undertaken also provide a notification of stronger winds, which are defined as wind speeds in excess of 15 m/s for more than 2 hours of the year. Strong winds are generally associated with areas which would be classified as acceptable for walking or as uncomfortable. In a residential-led urban development, walking and uncomfortable conditions would not usually form part of the 'target' wind environment and would usually require mitigation due to pedestrian comfort considerations. This mitigation would also reduce the frequency of, or even eliminate, any strong winds.

Significance Criteria

11.43 For assessing the significance of the likely and residual wind effects of the proposed development, the significance criteria used have been based upon the relationship between the desired pedestrian use (as defined by the Lawson Comfort Criteria) at a particular location, and the modelled (predicted) wind conditions at this same location. Accordingly, the following seven-point scale of significance has been used:

- Major Beneficial effect: Wind conditions are 3-steps calmer than required;
- Moderate Beneficial effect: Wind conditions are 2-steps calmer than required;
- Minor Beneficial effect: Wind conditions are 1-step calmer than required;
- Negligible effect: Wind conditions are the same or similar to those required;
- Minor Adverse effect: Wind conditions are 1-step windier than required;
- Moderate Adverse effect: Wind conditions are 2-steps windier than required; and
- Major Adverse effect: Wind conditions are 3-steps windier than required.

11.44 Strong winds (affecting pedestrian safety) are not included within this assessment of significance, but are reported separately as any strong wind exceedance is significant and cannot be scaled to major/moderate/minor. Where strong winds occur, mitigation is required (as per adverse effects related to pedestrian comfort).

Configurations / Scenarios

11.45 The following configurations were assessed in the wind tunnel:

- Configuration 1: Existing site (Baseline Scenario) with existing surrounds;
- Configuration 2: Proposed Development with existing surrounds; and
- Configuration 3: Proposed Development with existing surrounds and cumulative schemes.

11.46 It is noted that the proposed development would be delivered in a phased manner and that for a period of approximately 2 years, the PFS parcel would be occupied by a six storey building (PFS Block) that would be in use as a temporary supermarket. Given the temporary use and also the benign height of the PFS Block, a separate scenario has not been assessed for this condition on-site.

Assumptions and Limitations

11.47 The following assumptions are relevant to this assessment:

- This assessment is based on worst-case wind speeds, expected to be encountered during the winter season (December, January and February) in the UK. Additional consideration has been made for summer wind conditions due to the presence of outdoor amenity spaces and rooftop terraces. This complies with the standard methodology set out by Lawson for wind microclimate assessments; and

- It is expected that use of outdoor amenity spaces and rooftop terraces for sitting will be limited to the summer season. During the winter, it would be expected that these spaces would increase a criteria level to standing use.

Baseline Conditions

Current Baseline

Configuration 1: Existing Site with Existing Surrounds

11.48 Figure 11.2 and Figure 11.3 show the windiest and summer season results for the existing site with existing surrounding buildings, respectively (Configuration 1).

11.49 The wind microclimate conditions throughout the application site are generally as would be expected within a built-up, urban environment within London. Wind conditions at the application site range from suitable for sitting to strolling during the windiest season. The majority of the application site has wind conditions suitable for standing and sitting, which is expected due to the low-rise nature of the existing buildings and immediate surroundings of the application site. These wind conditions are suitable for thoroughfare use.

11.50 During the summer season, wind conditions are generally one category calmer with all locations having wind conditions suitable for sitting or standing. This is expected as approaching winds are typically calmer during this period of the year.

Strong Winds

11.51 There are no occurrences of winds exceeding the strong winds threshold in this configuration.

Sensitive Receptors

Existing Sensitive Receptors

11.52 The existing sensitive receptors that could be affected by the proposed development include the thoroughfare users around the application site; the public using the bus stops near to the application site; outdoor amenity spaces at immediately surrounding residential receptors; and the users of entrances at the immediate surrounding buildings.

New Sensitive Receptors

11.53 The new sensitive receptors resulting from the proposed development includes the users entering / exiting the proposed development; users of the thoroughfares, public, communal and private amenity areas in and around the proposed development; in addition to the existing sensitive receptors discussed above.

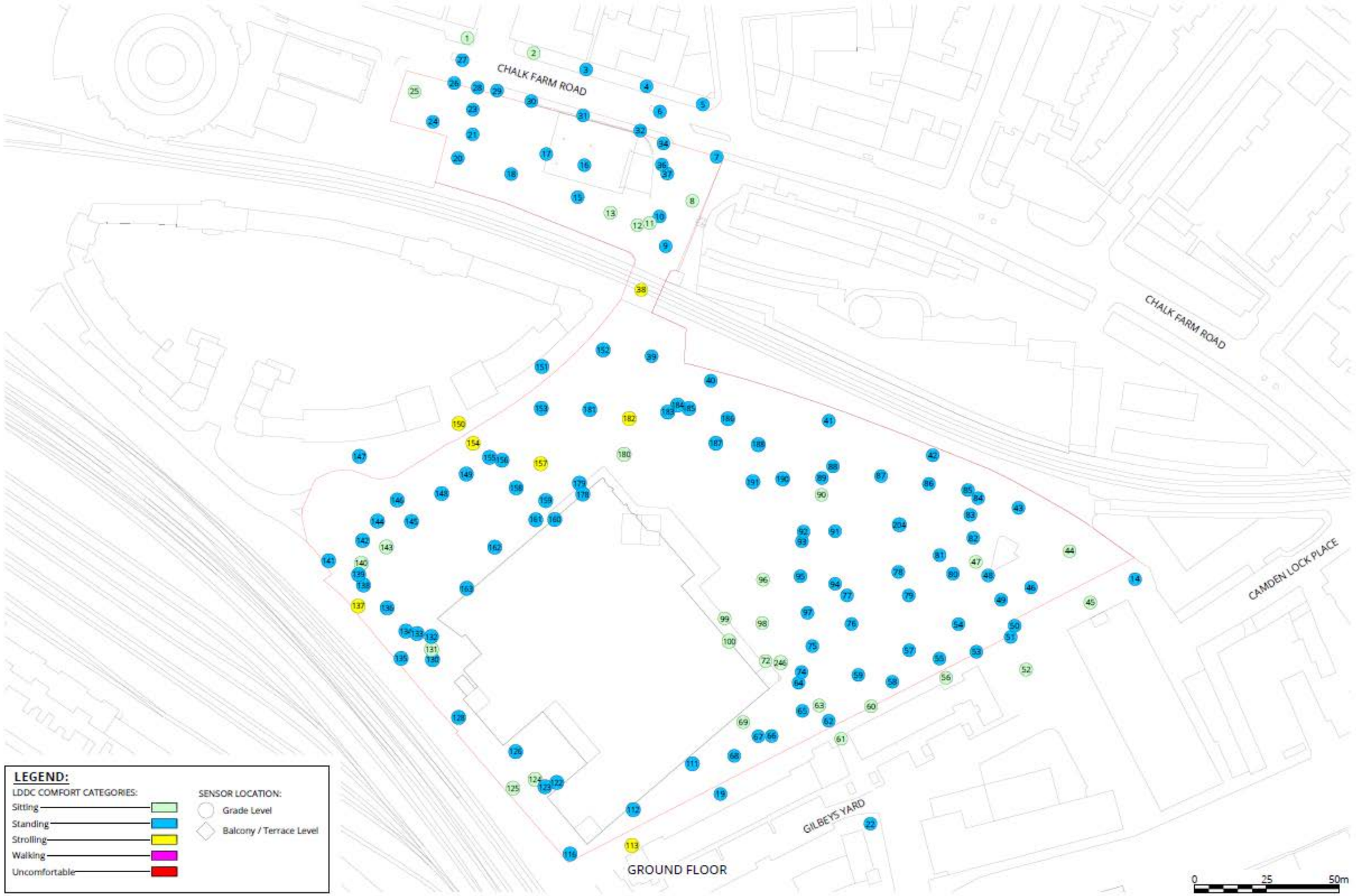

Figure 11.2: Configuration 1 - Pedestrian Comfort Conditions for Application Site, Windiest Season

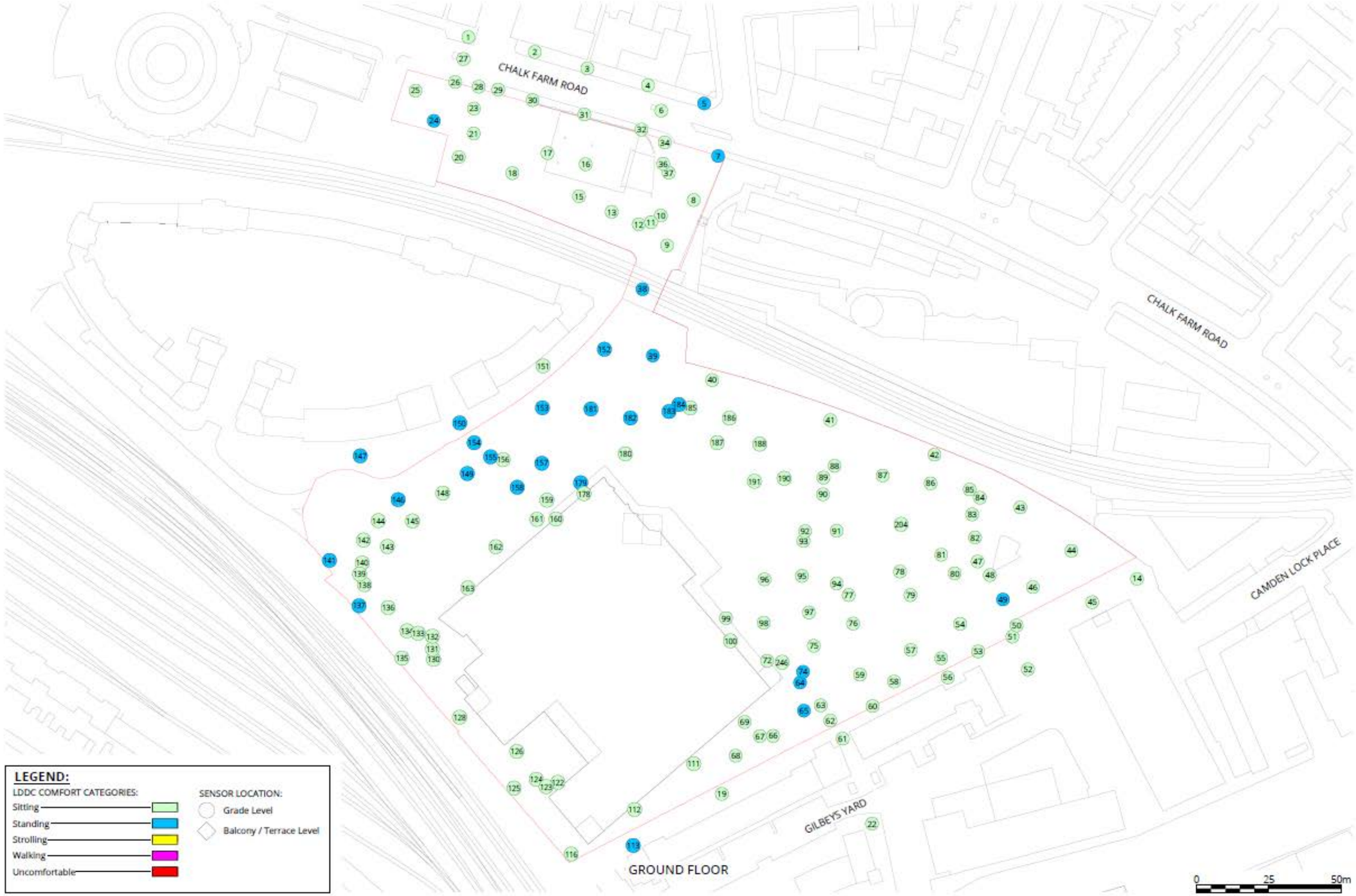

Figure 11.3: Configuration 1 - Pedestrian Comfort Conditions for Application Site, Summer Season

Potential Impacts and Likely Effects

Demolition and Construction

11.54 The application site is currently occupied by low-rise buildings of one to three storeys in height.

11.55 As indicated in ES Chapter 5: Demolition and Construction Environmental Management, the proposed development works would be sequenced as follows:

- PFS parcel Enabling, Demolition, Construction of the PFS Block and Fit Out for temporary supermarket use at ground floor and offices above; MS parcel fully operational;
- PFS parcel operational as temporary supermarket and office use (on-site receptors); MS parcel Enabling, Demolition and Construction of Blocks A, B, C; and
- PFS parcel conversion of the PFS Block from temporary supermarket to PFS; MS parcel supermarket operational, Blocks B and C near complete with Blocks A, D, E1, E2 and F under construction.

11.56 Based upon professional judgement, the demolition of the existing low-rise structures of the application site is not anticipated to give rise to any significant change to the existing (relatively calm) wind microclimate both on and off-site. Due the benign height of the PFS Block on the PFS parcel, pedestrians using the temporary supermarket would experience wind conditions that are acceptable for thoroughfare use.

11.57 The likely effect is therefore judged to be **Negligible** and wind conditions both on and off-site would remain acceptable for their intended pedestrian uses.

11.58 As construction of the proposed development proceeds, the wind conditions of the application site and its surrounds would gradually adjust to those described below for the completed development.

Completed Development

Configuration 2 – Proposed Development with Existing Surrounds

11.59 Figure 11.4 and Figure 11.5 show the wind conditions at ground level during the windiest season and the summer season, respectively, and Figure 11.6 shows the wind conditions at the top floor balcony and roof levels during summer season, for the proposed development with existing surrounding buildings.

11.60 As indicated in the assessment methodology section, no account was taken of existing landscaping and the proposed development's landscape proposals within the wind tunnel testing exercise, thus representing a worst-case assessment.

Off-Site Bus Stops

11.61 There are no off-site bus stops which would be affected by the Proposed Development.

Off-Site Residential Amenity Space

11.62 There would be no adverse effects to the wind microclimate at off-site locations along Juniper's Crescent (receptors 147, 150 and 151) and Gilbey's Yard (receptors 22 and 113). As a result, it is expected that amenity spaces, including balconies at these locations would remain consistent in regard to wind microclimate with the existing scenario when the proposed development is *in situ*. The effects would therefore be **Negligible**.

On- and Off Site Thoroughfares

11.63 Pedestrian thoroughfares ideally require strolling conditions, or calmer, during the windiest season to be considered suitable for their intended use.

11.64 Thoroughfares in and around the proposed development would have wind conditions ranging from suitable for sitting to strolling use during the windiest season. This range of conditions is acceptable for thoroughfare use and represents a **Negligible** to **Moderate Beneficial** effect.

On-Site Entrances

11.65 Entrances require standing conditions, or calmer, during the windiest season to be considered suitable for their intended use.

11.66 All entrances to the PFS Block, represented by receptors 16, 17, 29-31, 35 and 36, would have the desired standing or calmer wind condition. These would be suitable for entrance use and therefore represent a **Negligible** to **Minor Beneficial** effect.

11.67 The majority of entrances to Blocks A-F (receptors 48, 50, 64, 65, 67, 69, 72, 76, 78-80, 83, 86, 92, 94, 96, 99, 103, 105, 106, 108-110, 126, 127, 129, 143, 148, 156, 162, 166, 170, 171, 173, 175, 177, 178, 187 and 191) (see Figure 11.5) would have suitable, or calmer, conditions than required for their intended use; however, receptors 89 (Block C), 161 and 163 (Block A), 165 and 168 (Block F) would be one category windier than desired. This is a **Minor Adverse** effect and would require mitigation.

Amenity Spaces

11.68 There are a number of ground level amenity spaces north-west of the PFS Block and between Blocks A-F which would require sitting wind conditions if seating is proposed or a mix of sitting and standing for outdoor play spaces.

11.69 There is an outdoor play space north-west of the PFS Block (receptors 24-26) which would have a mix of sitting and standing wind conditions during the summer season. These would be acceptable for the intended use and therefore represents a **Negligible** effect.

11.70 There is seating proposed at receptors 95, 97, 157, 164, 167, 172, 174, 186, 188, 208 and 226:

- Receptors 95, 97, 157, 172, 174, 188 and 208 would have the desired sitting wind condition during the summer season, representing a **Negligible** effect.
- Receptors 164, 167, 186 and 226 would have standing wind conditions, one category windier than desired, resulting in a **Minor Adverse** effect. These locations would require mitigation to reduce wind speeds to a sitting classification.

11.71 The majority of balcony locations would have the desired sitting wind condition during the summer season (receptors 198, 199, 201-203, 209, 211, 212, 214-217, 221, 222, 227, 230, 234, 235, 242, 243, 245, 247 and 248). This represents a **Negligible** effect.

11.72 Balcony receptors 218, 219, 225, 228, 232, 241 and 244 would have standing wind conditions which are one category windier than desired. These locations would require mitigation.

11.73 Roof terrace locations 192-197 on the PFS Block would have a mix of sitting, standing and strolling wind conditions. It is noted that only receptor 197 will be used for amenity use; this location has the desired sitting wind conditions and therefore represents a **negligible effect.**

11.74 The majority of roof terrace receptors on Blocks A-F (receptors 33, 189, 200, 205, 206, 207, 208, 223, 229, 239 and 240) would have the desired sitting classification during the summer season, resulting in a **Negligible** effect. However, receptors 220 and 238 (Blocks F and C respectively) would have standing wind conditions, representing a **Minor Adverse** effect and would require mitigation to reduce wind speeds to a sitting classification.

11.75 Receptors 220, 231 and 238 (which represent courtyard and roof terraces) would have standing wind conditions which represents a **Minor Adverse** effect and therefore these locations would require mitigation.

Strong Winds

11.76 Two occurrences of strong winds exceeding the 15 m/s threshold would occur at receptors 193 and 195. These are located at rooftop level on the PFS Block; however, would not require mitigation as they are rooftop plant area.

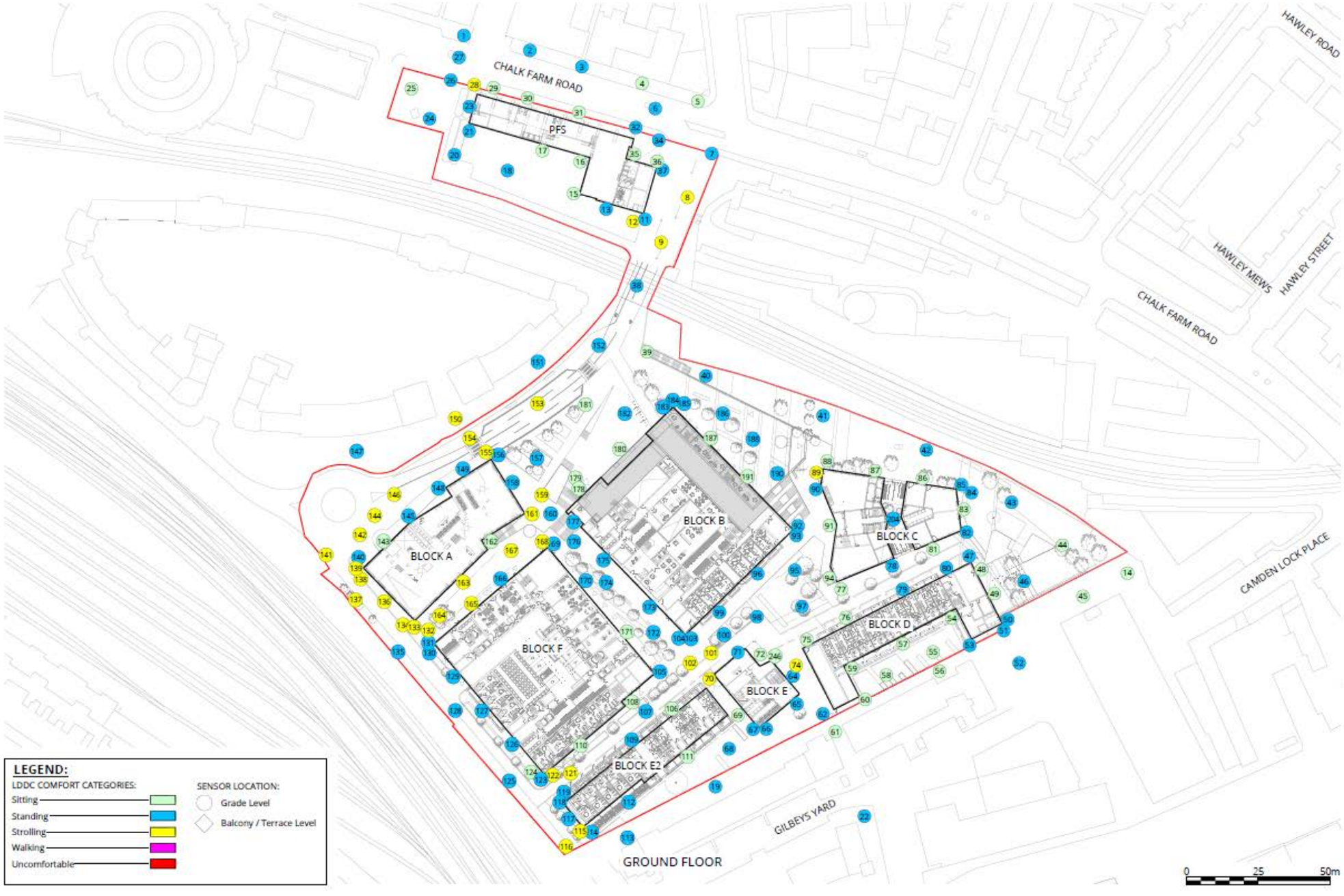

Figure 11.4: Configuration 2 - Pedestrian Comfort Conditions for Proposed Development with Existing Surrounds – Ground Level, Windiest Season

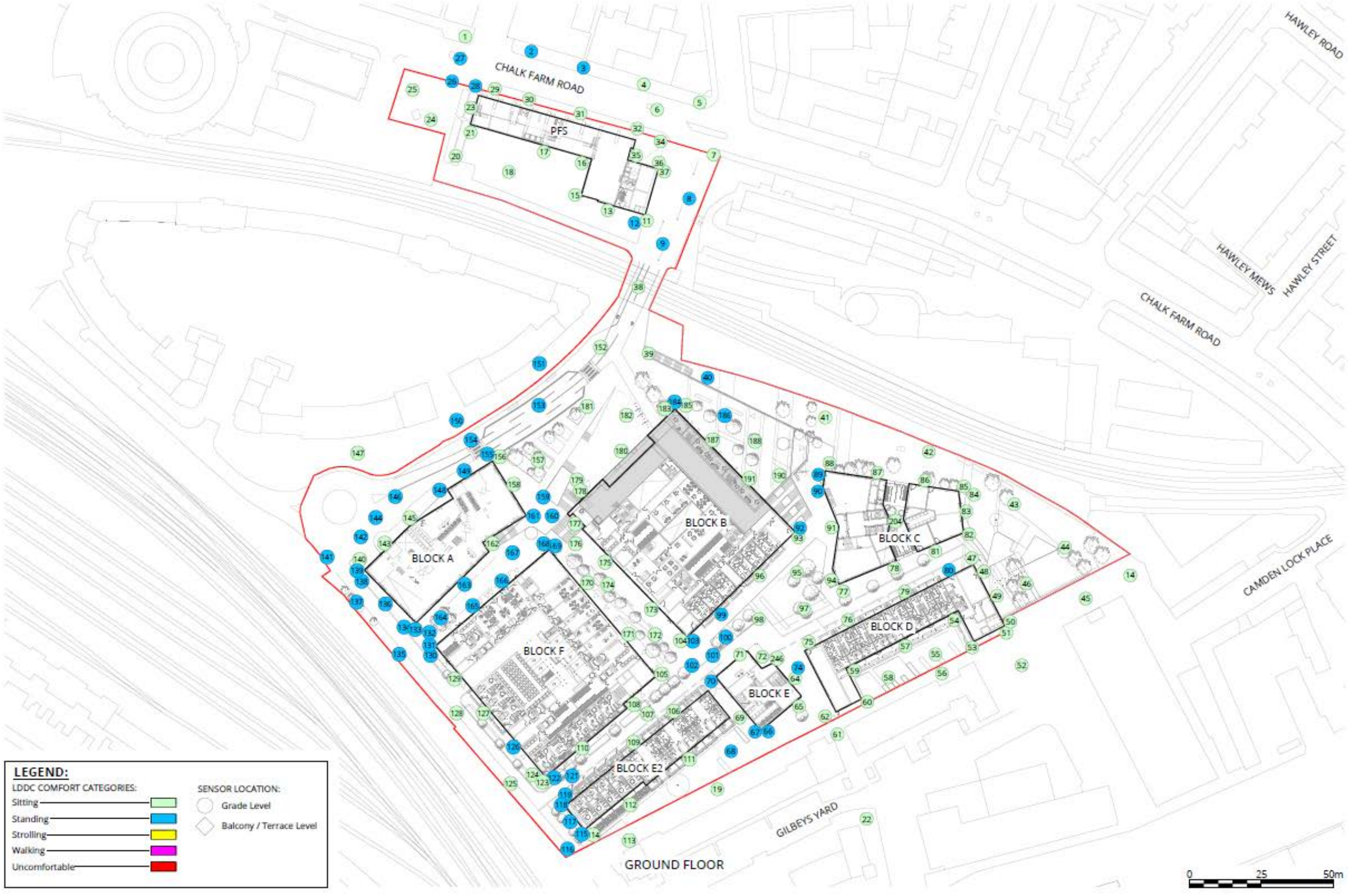

Figure 11.5: Configuration 2 - Pedestrian Comfort Conditions for Proposed Development with Existing Surrounds – Ground Level, Summer Season

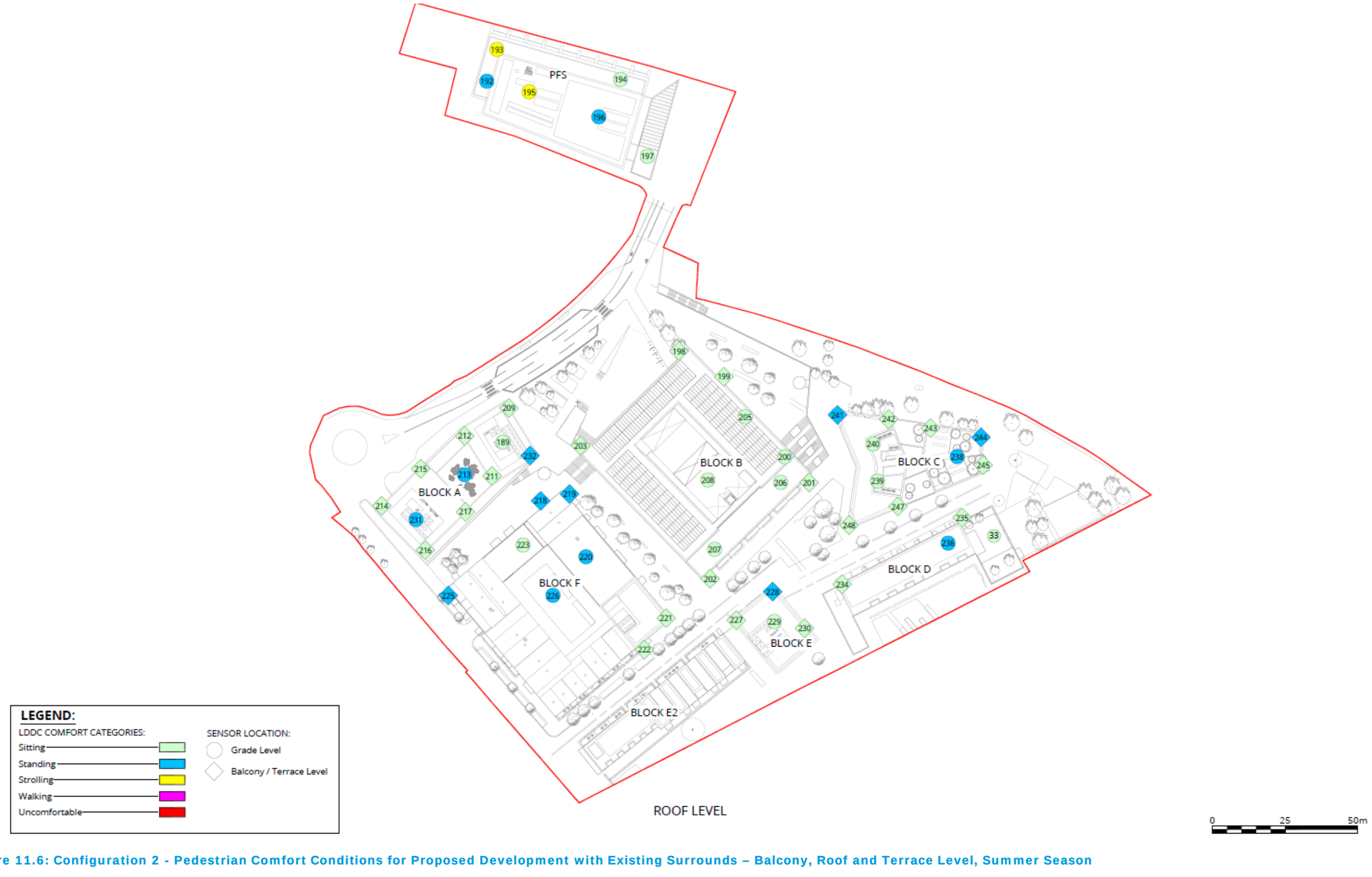

Figure 11.6: Configuration 2 - Pedestrian Comfort Conditions for Proposed Development with Existing Surrounds – Balcony, Roof and Terrace Level, Summer Season

Mitigation and Residual Effects

11.77 For the proposed development, marginal exceedances have been recorded in Configuration 2, one category windier than the desired conditions. In addition, marginal strong winds have been recorded (up to 8.7 hours above the threshold). On this basis, and as indicated in the assessment methodology section, mitigation measures were not wind tunnel tested initially as standard, localised landscape and design measures would readily mitigate these conditions.

11.78 A qualitative assessment of the proposed development's design and landscape proposals have been undertaken in consultation with the Applicant's architect and landscape architect. Where additional mitigation measures have been identified over and above the submitted proposals, these have been agreed with the landscape architect and architect.

11.79 The qualitative assessment has been undertaken based on the specialist's experience and professional judgement and benefits from a high degree of confidence in the effectiveness of the measures.

11.80 The details of these measures will be developed through further wind tunnel testing, during the detailed design process. The wind tunnel testing would be secured by means of an appropriately worded planning condition.

Demolition and Construction

11.81 No additional mitigation measures are required during the demolition and construction stage over and above those described in ES Chapter 5: Demolition and Construction Environment Management. Accordingly, the residual effect would remain **Negligible**.

Completed Development

11.82 The following receptor locations require mitigation:

- Desired standing conditions at ground level entrances: 89, 161, 163, 165 and 168;
- Desired sitting conditions at ground level amenity spaces: 164, 167, 186, 226;
- Desired sitting conditions at roof terrace level: 220 and 238; and
- Desired sitting conditions at balcony level: 218, 219, 225, 228, 232, 241 and 244.

Proposed Landscaping Scheme

11.83 A landscaping scheme for the proposed development has been designed by Gillespies LLP which has highlighted areas where landscaping and planting would be provided (Figure 11.7). The following sections describes the effectiveness of these landscaping features and if they would be sufficient to mitigate windier than desired areas/eliminate strong wind exceedances. Where this is not the case, recommendations for additional mitigation measures have been suggested.

11.84 As is standard practice, identified additional measures would be wind tunnel tested at the detailed design phase in order to confirm their effectiveness, although it is expected that the mitigation measures described in this section would readily mitigate the minor exceedances in comfort and safety noted within and around the proposed development.

Entrances

11.85 Entrance location 89 is noted to have low level soft landscaping along the northern façade of Block C. This in combination with the other landscaping features to the north and south of this entrance is expected to be beneficial in reducing wind speeds; however additional features closer to the entrance would be required to achieve a standing classification. Alternatively recessing the entrance (1.5 m) would provide a 'buffer' zone for pedestrians.

11.86 All other entrances which require mitigation (receptors 161, 163, 165 and 168) are not situated near any landscaping features and therefore would require localised mitigation such as shrubs in planters, small trees, solid screens (at least 2 m in height) or recessing of these entrances by 1.5 m to provide a suitable wind environment.

Amenity

11.87 Ground level seating located at receptors 164, 167 and 186 are situated near clusters of trees which are expected to reduce wind speeds locally and provide a sitting wind condition. However, seating at receptor 167 does not have any landscaping features surrounding it and therefore would require localised mitigation to shelter the seating areas, such as shrubs in planters, small trees, porous screens, sculptures etc. at least 1.5 m in height.

11.88 Receptor 226 is the courtyard area of Block F and is noted to have several landscaping features such as larger canopy trees, shrubs and planters which are expected to provide a sitting wind conditions when implemented.

11.89 Roof terrace level receptors 220 and 238 are at elevated areas or roof terraces. These locations are noted to have shrubs in planters (between 1-2m in height) and multi stem trees ranging from 4-6m. Such landscaping features will reduce wind speeds and are expected to create suitable wind conditions at these terraces.

11.90 The windier than desired balconies (receptors 218, 219, 225, 228, 232, 241 and 244) would have railing balustrades which for the wind tunnel tests were modelled as open to reflect their insignificant shelter in regards to wind. Replacing the railing balustrades with a solid (glazed) balustrade is expected to provide the necessary shelter to achieve a sitting wind condition and therefore optimise the usability of the space. It is noted that balconies represented by receptors 241 and 244 have a solid 1m high balustrade which was not included in the wind tunnel model. This is expected to provide sufficient shelter to the balcony and create suitable sitting wind conditions during the summer season.

11.91 Based on the above, the following additional mitigation measures, not already captured within the proposed landscape scheme, would need to be secured by means of an appropriately worded planning condition:

- Recessed entrances at receptor locations 89, 161, 163, 165 and 168.
- Solid balustrades on receptor locations 218, 219, 225, 228 and 232.

11.92 With the implementation of these additional mitigation measures the residual effects for the proposed development would be as follows:

- **Negligible** at off-site bus stops
- **Negligible** at surrounding residential amenity space;
- **Negligible to Moderate Beneficial** at thoroughfares;
- **Negligible to Minor Beneficial** at entrances**;**
- **Negligible** at ground level amenity spaces;
- **Negligible** at rooftop amenity spaces; and
- **Negligible** at balconies.

Figure 11.7: Proposed Development Landscaping Scheme

Summary of Mitigation and Residual Effects

11.93 Table 11.4 and Table 11.5 provide a tabulated summary of the outcomes of the wind microclimate assessment of the proposed development which take into consideration the proposed development's indicative landscape scheme (Figure 11.7). The additional mitigation measures represent the type of mitigation that is likely to be beneficial and based on RWDI's experience. The details of these measures would be developed through further wind tunnel testing during the detailed design process. This would be secured by means of an appropriately worded pre-commencement planning condition.

Table 11.4: Summary of Proposed Mitigation and Enhancement Measures

Potential Effects Identified	Proposed Mitigation / Enhancement Measures
Demolition and Construction	
Wind conditions suitable for standing and strolling conditions	No mitigation required.
Completed Development	
Standing conditions at off-site bus stops (none noted)	No mitigation required.
Sitting conditions at off-site residential amenity space	No mitigation required.
Strolling conditions at on and off-site thoroughfares.	No mitigation required.
Standing conditions at on-site entrances.	No mitigation required.
Standing conditions at on-site entrances (receptors 89, 161, 163, 165 and 168).	Localised soft/hard landscaping or recessing of entrances 1.5 m over and above those contained within the proposed landscaping scheme.
Siting conditions at ground level amenity areas (receptors 164, 167, 186, 226).	No mitigation required over and above those contained within the proposed landscaping scheme.
Sitting conditions at roof terrace amenity spaces	No mitigation required.
Sitting conditions at balcony locations (receptors 218, 219, 225, 228 and 232).	Solid glazed balustrades.

Table 11.5: Summary of Residual Effects

Receptor	Description of Residual Effect	Nature of Residual Effect*					
		Significance**	+ -	D I	P T	R IR	St Mt Lt
Demolition and Construction							
Pedestrians and on-site users of thoroughfares	Wind conditions suitable for standing and strolling conditions	Negligible	N/A	D	T	IR	St
Completed Development							
Pedestrian users of bus stops	Wind conditions at bus stop suitable for standing	Negligible to minor	+	D	P	IR	Lt
Off-site residential amenity space	No change in wind conditions at off-site residential amenity spaces	Negligible	N/A	D	P	IR	Lt
Pedestrians and on-site users	Wind conditions at thoroughfares suitable for strolling	Negligible to moderate	+	D	P	IR	Lt
	Wind conditions at entrances suitable for entrance use	Negligible to minor	+	D	P	IR	Lt
On-site residents and on-site users	Wind conditions at ground level amenity users suitable for sitting	Negligible	N/A	D	P	IR	Lt
	Wind conditions at roof amenity suitable for sitting	Negligible	N/A	D	P	IR	Lt
	Wind conditions at balconies suitable for sitting	Negligible	N/A	D	P	IR	Lt

Notes:
* - = Adverse/ + = Beneficial; D = Direct/ I = Indirect; P = Permanent/ T = Temporary; R=Reversible/ IR= Irreversible; St- Short term/ Mt –Medium term/ Lt –Long term.
**Negligible/Minor/Moderate/Major

Likely Significant Environmental Effects

11.94 On the basis that the magnitude by which the suitability thresholds are exceeded is marginal (i.e. one category windier than desired or a minor exceedance of the strong winds threshold) the adverse effects are likely to be readily mitigated with standard, localised mitigation measures (e.g. appropriately designed soft landscaping and screening). The details of these measures would be developed through further wind tunnel testing to confirm they are effective, during the detailed design process. This would be secured by means of an appropriately worded pre-commencement planning condition.

11.95 Following adoption of the proposed additional mitigation measures there would be no significant effects.

Cumulative Effects

11.96 The cumulative schemes considered in the cumulative effects assessment comprise:

- 28 Camden Wharf;
- 1 Centric Close;
- 44 Gloucester Avenue;
- 100 Chalk Road; and
- Marine Ices.

Demolition and Construction

11.97 The application site is currently occupied by low-rise buildings of one to three storeys in height.

11.98 Based upon professional judgement, the demolition of the existing low-rise structures of the application site together with construction works of the cumulative schemes listed above are not anticipated to give rise to any significant change to the existing (relatively calm) wind microclimate both on or off the application site. The likely effect is therefore judged to be **Negligible** and wind conditions both on and off-site would remain acceptable for their intended pedestrian uses.

11.99 As construction of the proposed development and the above mentioned cumulative schemes proceed, the wind conditions of the application site and its surrounds would gradually evolve to the conditions described below for the completed development.

Completed Development

11.100 Figure 11.8 and Figure 11.9 show the wind conditions at ground level during the windiest season and the summer season, respectively. Figure 11.10 shows the wind conditions at balcony and terrace level during summer season for the proposed development with cumulative surrounding buildings (Configuration 3). Configuration 3 was wind tunnel tested without any existing or proposed landscaping.

11.101 With the cumulative scheme *in-situ*, wind conditions range from suitable for sitting to strolling in the windiest season with the majority of the proposed development having sitting and standing wind conditions during summer season. These are largely consistent with Configuration 2 (with some areas becoming one category windier and other areas becoming one category calmer) and are caused by the cumulative schemes being situated in non-prevailing wind directions, and as the height and massing of the proposed cumulative schemes' buildings are not significantly taller than their immediate surroundings.

11.102 With the mitigation measures, described in the Mitigation and Residual Effect section, implemented, all adverse effects around the proposed development would reduce to **Negligible**.

Off-Site Bus Stops

11.103 There are no off-site bus stops which would be affected by the proposed development.

Off-Site Residential Amenity Space

11.104 There would be no adverse effects to the wind microclimate at off-site locations along Juniper's Crescent (receptors 147, 150 and 151) and Gilbey's Yard (receptors 22 and 113). As a result, it is expected that amenity spaces, including balconies at these locations would remain consistent in regard to wind microclimate with the existing scenario when the proposed development is *in situ*. The effects would therefore be **Negligible**.

Off and On-Site Thoroughfares

11.105 All thoroughfare locations in and around the proposed development would be acceptable for the desired pedestrian use, with conditions acceptable for sitting, standing and strolling in the windiest season, resulting in a **Negligible to Moderate Beneficial** effect.

On-Site Entrances

11.106 All entrances to the PFS Block would be suitable for their intended use, or calmer (receptors 16, 17, 29-31, 35 and 36), representing a **Negligible** to **Minor Beneficial** effect.

11.107 The majority of entrances to Blocks A-F would experience conditions that are suitable, or calmer than required (receptors 48, 50, 64, 65, 67, 69, 72, 76, 78-80, 83, 86, 92, 94, 96, 99, 105, 106, 108-110, 126, 127, 129, 143, 148, 156, 162, 170, 171, 173, 175, 177, 178, 187 and 191). These conditions represent a **Negligible** to **Minor Beneficial** effect.

11.108 However, receptor 89 (Block C); receptor 103 (Block B); receptors 161 and 163 (Block A); and receptors 165 and 168 (Block F) would have leisure walking wind conditions and would require mitigation, resulting in a **Minor Adverse** effect.

Amenity Spaces

11.109 There would be a number of ground level amenity spaces north-west of the PFS Block and between Blocks A-F of the MS parcel which would require wind conditions suitable for sitting if seating provisions are proposed, or a mix of sitting and standing conditions for outdoor play spaces.

11.110 There is an outdoor pocket park north-west of the PFS Block (receptors 24-26) which would have a mix of sitting and standing wind conditions during the summer season. These are acceptable for the intended use and therefore represents a **Negligible** effect.

11.111 There are noted seating provisions at receptors 95, 97, 157, 164, 167, 172, 174, 186, 188, 208 and 226.

11.112 Receptors 95, 97, 157, 172, 174, 188 and 208 would have the desired sitting wind condition during the summer season, representing a **Negligible** effect. However, receptors 164, 167 and 186 would have standing wind conditions, one category windier than desired, resulting in a **Minor Adverse** effect. These locations would require mitigation to reduce wind speeds to a sitting classification.

11.113 The majority of balcony locations would have the desired sitting wind conditions during the summer season (receptors 198, 199, 201-203, 209, 211, 212, 214-217, 221, 222, 227, 230, 234, 235, 242, 243, 245 and 247). This represents a **Negligible** effect.

11.114 Balcony receptors 218, 219, 225, 228, 232, 241, 244 and 248 would have standing wind conditions which are one category windier than desired. These balconies would require mitigation to reduce wind conditions to a sitting classification, in the form of a solid balustrade.

11.115 The wind conditions on the accessible roof terrace of the PFS Block remained consistent with Configuration 2, with sitting wind conditions at receptor 197. This represents a **Negligible** effect.

11.116 The majority of roof terrace receptors on Blocks A-F (receptors 33, 189, 200, 205, 206, 208, 223, 229, 239 and 240) had the desired sitting classification during the summer season, resulting in a **Negligible** effect.

11.117 Receptors 207, 213, 220, 226 and 238 would have standing wind conditions which represents a **minor adverse** effect and therefore would require mitigation.

Strong Winds

11.118 Four occurrences of strong winds exceeding the 15m/s threshold would occur at receptors 116 and 122 at ground level and receptors 193 and 195 on the PFS Block. Locations 193 and 195 would not require mitigation as they are plant rooftop areas. The ground level receptors (116 and 11) would require mitigation; however, this is expected to be eliminated with the proposed landscaping scheme.

11.119 It is expected that the mitigation measures described for Configuration 2 would be effective in eliminating these strong wind exceedances in the cumulative scenario (Configuration 3).

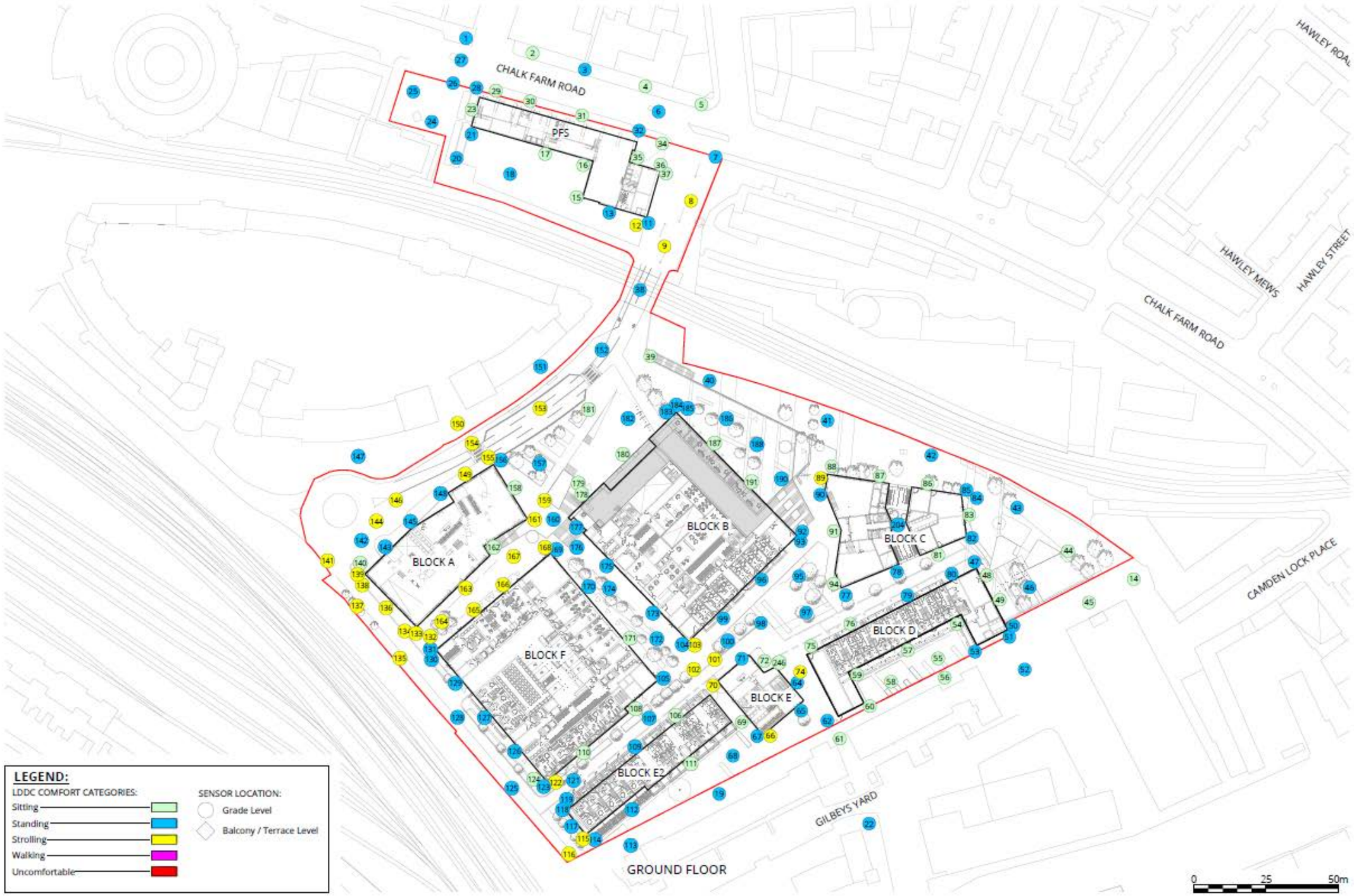

Figure 11.8: Configuration 3 - Pedestrian Comfort Conditions for the Proposed Development with Cumulative Surrounds – Ground Level, Windiest Season

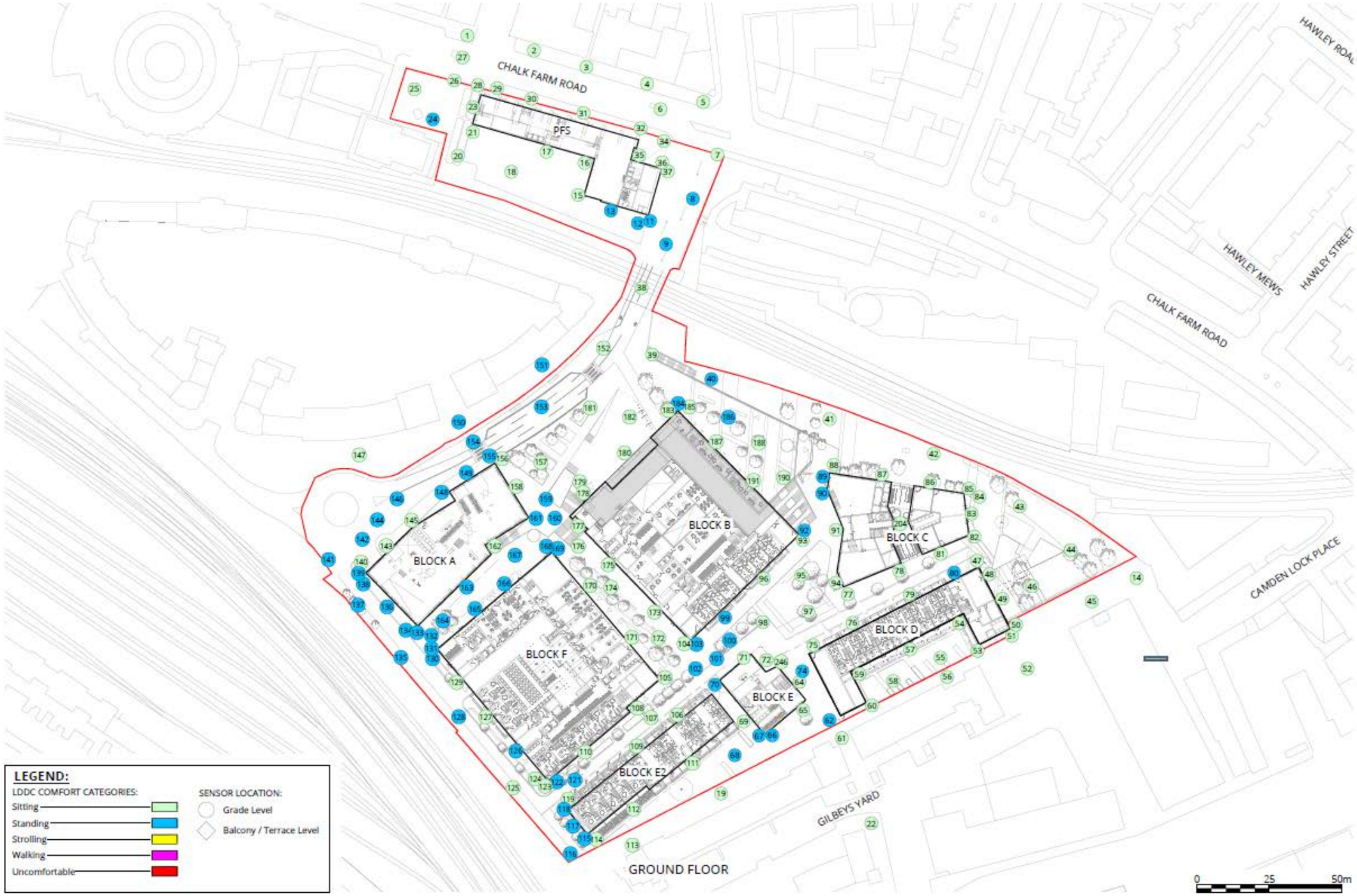

Figure 11.9: Configuration 3 - Pedestrian Comfort Conditions for the Proposed Development with Cumulative Surrounds – Ground Level, Summer Season

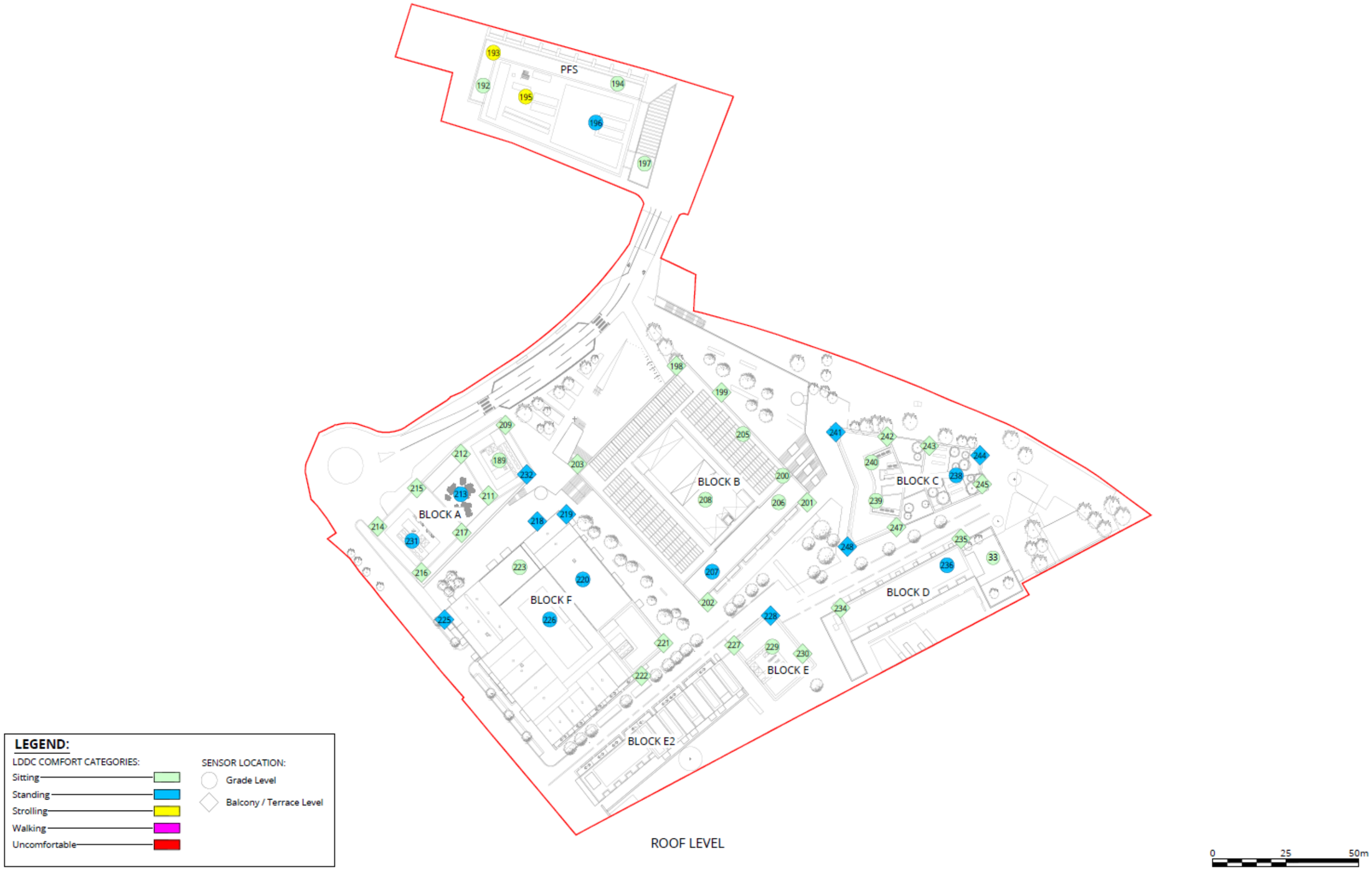

Figure 11.10: Configuration 3 - Pedestrian Comfort Conditions for the Proposed Development with Cumulative Surrounds – Balcony and Terrace Level, Summer Season

Summary

Background

11.120 This chapter presents an assessment of the proposed development's effect on the wind microclimate on the application site and surrounding local area.

11.121 Wind tunnel tests were undertaken to assess the effect of the proposed development on the wind microclimate on the application site and surrounding local area. Wind tunnel testing is the most well-established and robust means of assessing the pedestrian wind environment. The wind tunnel tests were undertaken to enable the pedestrian level wind microclimate at the application site to be quantified and classified in accordance with the widely accepted Lawson Comfort Criteria. The wind tunnel testing did not take account of any existing and proposed landscaping and therefore represents the worst-case scenario.

11.122 The wind tunnel tests provide a detailed assessment of the mean and gust wind conditions around the proposed development in terms of pedestrian comfort and safety, and a basis to assess the effect of the proposed development relative to the existing application site conditions and the suitability of the wind microclimate for various desired pedestrian activity. The following three configurations were tested:

- the existing site with existing surrounds (baseline);
- the Proposed Development with existing surrounds; and
- the Proposed Development with cumulative surrounds.

Baseline Scenario

11.123 The majority of the areas within and around the application site have relatively calm sitting or standing wind conditions with isolated strolling conditions.

Demolition and Construction

11.124 The wind effects during the demolition and construction works have been assessed using professional judgement and are based on the wind tunnel results for the conditions at the existing application site and proposed development.

11.125 The demolition of the existing low-rise structures on the application site is not anticipated to give rise to any significant change to the existing (relatively calm) wind microclimate both on and off-site. On this basis, the temporary effects would be **Negligible**.

11.126 As construction of the proposed development progresses, the wind conditions of the application site and the surrounding area would gradually adjust to those described below for the completed development.

11.127 Based upon professional judgement, the demolition of the existing low-rise structures of the application site is not anticipated to give rise to any significant change to the existing (relatively calm) wind microclimate both on and off-site. Due the benign height of the PFS Block on the PFS parcel, pedestrians using the temporary supermarket would experience wind conditions that are acceptable for thoroughfare use.

Completed Development

11.128 With the proposed development *in situ*, which is significantly larger in massing compared to the existing buildings on the application site, the wind microclimate increases around the proposed development; however, the wind microclimate remains acceptable for thoroughfare use (walking and strolling).

Off-Site Bus Stops

11.129 There would be no off-site bus stops which would be affected by the proposed development.

Off-Site Residential Amenity Space

11.130 There would be no adverse effects to the wind microclimate at off-site locations along Juniper's Crescent (receptors 147, 150 and 151) and Gilbey's Yard (receptors 22 and 113). As a result, it is expected that amenity spaces, including balconies at these locations would remain consistent in regard to wind microclimate with the existing scenario when the proposed development is *in situ*. The effects would therefore be **Negligible**.

On-Site Entrances

11.131 The majority of entrances to Blocks in the proposed development would be suitable for their intended use with entrances having the required wind conditions or calmer (suitable for walking and standing). There would be six entrances which would be windier than desired (receptors 89 (Block C), 161, 163, 134 (Block A), 165 and 168 (Block F)).

On-Site Residential Amenity Space

11.132 At ground level, amenity spaces would be located to the north-west of the PFS Block and between the Blocks of the MS parcel. The amenity space to the north-west of the PFS Block would have the desired mix of sitting and standing wind conditions suitable for a pocket park; receptor 95, 97, 157, 172, 174, 188 and 208 would have the desired sitting wind conditions; however, receptors 164, 167 and 186 would have one category windier conditions than desired.

11.133 Balcony receptors (198, 199, 201-203, 209, 211, 212, 214-217, 221, 222, 227, 230, 234, 235, 242, 243, 245, 27 and 248) would have the desired sitting wind conditions during the summer; however, receptors 218, 219, 225, 228, 232, 241 and 244) would have standing wind condition. These balconies would require mitigation in the form of a solid balustrade in place of the railing currently proposed within the design.

11.134 The majority of roof terraces would have the desired sitting wind condition; however, receptors 192-197 (if desired for amenity use) and receptors 213, 220 and 238 would have windier than desired conditions.

11.135 Two occurrences of strong winds exceeding the 15m/s threshold would occur at receptors 193 and 195 (PFS Block –terrace level); however, these are noted to be plant areas and therefore would not require mitigation.

11.136 Exceedances of the required wind microclimate conditions are marginal and would be readily mitigated by standard measures such as soft landscaping features including shrubs in planters, small trees, porous/solid screens and artwork.

11.137 On review of the proposed development's landscaping scheme the majority of wind locations would be addressed. Additional mitigation would be required at 24 locations and these would consist of the following:

- Shrubs in planters (1.5-2 m);
- Small trees (at least 1.5 m);
- Porous screens/artwork/sculptures (at least 2 m)
- Solid balustrades on balconies; and
- Recessing of entrances (1.5 m recess).

11.138 These measures would be tested at the detailed design stage to confirm their effectiveness.

Cumulative Effects

11.139 With the cumulative schemes built out, wind conditions in and around the proposed development remain largely consistent (with some areas becoming one category windier and other areas becoming one category calmer) with Configuration 2. Any windier than desired conditions would be mitigated with the combination of the landscaping scheme and the additional mitigation measures suggested for Configuration 2.

12 CUMULATIVE EFFECTS

Introduction

12.1 The EIA Regulations require that all likely significant effects of a development are taken into account, including cumulative effects.

12.2 There is no prescriptive guidance on the methodology for the assessment of cumulative effects; however, The Planning Inspectorate (PINS) document 'Using the 'Rochdale Envelope' (April 2012)[1] which was actually drafted in relation to Infrastructure Planning Commission (IPC) developments such as windfarms, states the following:

"The potential cumulative impacts with other major developments will also need to be carefully identified such that the likely significant impacts can be shown to have been identified and assessed against the baseline position (which would include built and operational development). In assessing cumulative impacts, other major development should be identified through consultation with the local planning authorities and other relevant authorities."

12.3 PINS have also published an Advice Note (17)[2] on the approach to cumulative effects assessment relevant to nationally significant infrastructure projects, which provides more useful context.

12.4 The Institute of Environmental Management and Assessment (IEMA) Guidance[3] identifies two types of cumulative effects:

- Inter-project effects – incremental changes caused by other reasonably foreseeable development schemes occurring together with the proposed development and the cumulative effects combining to worsen the effect of a particular impact; and
- Intra-project effects – those effects that occur as a result of impact interaction between different environmental topics within the same project. For example, a project might affect bird species as a result of direct loss of habitat and by noise and light disturbance. Each of these when considered in isolation may have a limited effect but taken together the sum is greater than the parts.

Inter-Project Cumulative Effects

12.5 A list of cumulative schemes for consideration in the inter-project cumulative effect assessment of the proposed development was provided to the LBTH as part of the EIA Scoping Opinion Request Report (ES Volume 3: Technical Appendix 2.1). The response received from the LBC, dated 23 December 2016 (ES Volume 3: Technical Appendix 2.2) provided further input to the list of identified schemes. Details of these schemes are outlined in Chapter 2: EIA Process and Methodology of this ES).

12.6 Inter-project effects have been addressed in each technical chapter of the ES (Chapters 6-12, ES Volume 2A and ES Volume 2B), as appropriate. To avoid significant repetition, information on the potential combined effects of the proposed development together with cumulative schemes is not presented within this chapter of the ES.

Intra-Project Cumulative Effects

12.7 The potential for intra-project cumulative effects is assessed within this chapter.

[1] The Planning Inspectorate. April 2012. Using the 'Rochdale Envelope'.
[2] The Planning Inspectorate, December 2015. Cumulative Effects Assessment.

Intra-Project Cumulative Effects

Assessment Approach

12.8 As mentioned earlier, there is no established EIA methodology for assessing and quantifying the combined effects of individual effects on sensitive receptors. Accordingly Ramboll Environ has developed an approach which uses the defined residual effects of the proposed development to determine the potential for effect interactions and so the potential for combined cumulative effects of individual effects.

12.9 A review of the residual effects (and in particular the likely significant environmental effects) presented within this ES has been undertaken. This was followed by an exercise which tabulates the residual effects against receptors or receptor groups in order to identify the potential for effect interactions and so combined cumulative effects.

12.10 For the purposes of this assessment, the relevant receptors or receptor groups that have been considered are from the list of those defined within Chapter 2: EIA Process and Methodology of this ES, i.e. the receptors or receptor groups which could be affected by the proposed development. It should however be noted that only those receptors which would be subject to a residual effect of greater than negligible significance have been assessed for intra project cumulative effects.

12.11 For some environmental aspects, no interactions with other aspects can occur and so no intra-project cumulative effects are likely to arise. Where there is considered to be no likelihood for effect interactions this has been stated.

12.12 For other environmental aspects, where it is apparent that interactions with other aspects could occur and could affect an individual receptor or receptor group in different ways, intra-project cumulative effects could occur. In instances like these, intra-project cumulative effects are more likely to arise when the receptor or receptor group is more sensitive to change, such as human receptors.

12.13 Where there is more than one effect on a particular receptor, the potential for effect interactions has been determined. If there is the potential for effect interactions, consideration has been given as to whether there is the potential for any resultant intra-project cumulative effects. The results of the review are presented within a tabular format within the following section of this chapter.

Assessment Results

12.14 Based on the methodology detailed above, Table 12.1 and Table 12.2 present the review of the potential for interactions of individual effects during the demolition and construction works and once the proposed development is complete and operational, respectively.

[3] Institute of Environmental Management and Assessment. The State of Environmental Impact Assessment Practice in the UK. 2011.

Table 12.1: Intra-Project Cumulative Assessment – Demolition and Construction

Sensitive Receptor / Receptor Group	Demolition and Construction Residual Effects	Potential for Effect Interaction and so Combined Cumulative Effects?
Commercial users of the application site and study area	• **Socio-Economics** (Generate expenditure - existing businesses) - Minor Beneficial at neighbourhood level. • **Socio-Economics** (Generate construction productivity) - Minor Beneficial at local and wider level • **Transport and Accessibility** (Severance on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Transport and Accessibility** (Driver Stress on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Air Quality** (Demolition and Construction Traffic) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Plant Noise – closest off site and new on-site NSRs) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Vibration - off site and new on-site receptors) –Minor Adverse	**Yes** In relation to Transport, Air Quality, Noise and Vibration. Socio-economics effects would not interact with air quality, noise and vibration and transport effects
Existing residential occupants/ properties in proximity to the application site	• **Transport and Accessibility** (Severance on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Transport and Accessibility** (Driver Stress on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Air Quality** (Construction Traffic) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Plant Noise - closest off site NSRs) – Minor Adverse • **Noise and Vibration** (Demolition and Construction Vibration - off site and new on-site receptors) -Minor Adverse • **Townscape and Visual** (Change in views) - None to Major Adverse • **Townscape and Visual (**Change in townscape character) - None to Major Adverse	**Yes** In relation to Transport, Air Quality, Noise and Vibration, Views and Townscape Character
Existing hotel uses in proximity to the application site	• **Socio-Economics** (Generate expenditure - existing businesses) - Minor Beneficial at neighbourhood level. • **Socio-Economics** (Generate construction productivity) - Minor Beneficial at local and wider level • **Air Quality** (Demolition and Construction Traffic) - Minor Adverse	**No** Socio-economics effects would not interact with air quality and noise effects
Local community, leisure and amenity facilities	• **Transport and Accessibility** (Severance on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Transport and Accessibility** (Driver Stress on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Air Quality** (Construction Traffic) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Plant Noise-– closest off site) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Vibration - off site receptors) - Minor Adverse	**Yes** In relation to Transport, Air Quality, Noise and Vibration

Table 12.1: Intra-Project Cumulative Assessment – Demolition and Construction

Sensitive Receptor / Receptor Group	Demolition and Construction Residual Effects	Potential for Effect Interaction and so Combined Cumulative Effects?
Existing open space facilities and amenity areas	• **Air Quality** (Demolition Construction Traffic) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Plant Noise – closest off site receptors) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Vibration - off site receptors) - Minor Adverse • **Townscape and Visual** (Change in views) - None to Major Adverse • **Townscape and Visual (**Change in townscape character) - None to Major Adverse	**Yes** In relation to Air Quality, Noise and Vibration, Views and Townscape Character
Existing above ground heritage assets including listed buildings and conservation areas, registered parks and gardens	• **Townscape and Visual** (Change in views) - None to Major Adverse • **Townscape and Visual** (Change in townscape character) - None to Major Adverse • **Heritage** (Setting of conservation areas) - Minor to Moderate Adverse • **Heritage** (Setting of statutory listed buildings) - Nil to Moderate Adverse • **Heritage** (Setting of locally listed buildings) - Nil to Minor Adverse • **Heritage** (Setting of Regents Park) - Moderate Adverse	**Yes** (these effects are interrelated and would not combine)
Townscape views and townscape character areas	• **Townscape and Visual** (Change in views) - None to Major Adverse • **Townscape and Visual** (Change in townscape character – off site and on site receptors) - None to Major Adverse	**No** (these effects are interrelated and would not combine)
Local Air Quality	• **Air Quality** (Construction Traffic) - Minor Adverse	**No** (Effects are only related to Air Quality)
Existing transport infrastructure and vehicle users	• **Transport and Accessibility** (Driver Stress on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Transport and Accessibility** (Highway Capacity at Chalk Farm Road/Ferdinand Street/Juniper Crescent signal junction) No effects identified	**No** (these effects are interrelated and would not combine)
Pedestrians and cyclists	• **Transport and Accessibility** (Severance on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Transport and Accessibility** (Driver Stress on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Air Quality** (Demolition and Construction Traffic) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Plant Noise - off site and new on-site receptors) – Minor Adverse • **Noise and Vibration** (Construction Vibration - off site and new on-site receptors) - Minor Adverse	**Yes** In relation to Transport, Air Quality and Noise and Vibration

Table 12.1: Intra-Project Cumulative Assessment – Demolition and Construction

Sensitive Receptor / Receptor Group	Demolition and Construction Residual Effects	Potential for Effect Interaction and so Combined Cumulative Effects?
Future residential and commercial facility occupants and users of completed early phases	• **Transport and Accessibility** (Severance on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Transport and Accessibility** (Driver Stress on Juniper Crescent, Chalk Farm Road (west)) - Minor Adverse • **Air Quality** (Demolition and Construction Traffic) - Minor Adverse • **Noise and Vibration** (Demolition and Construction Plant Noise –on-site receptors) – Minor Adverse • **Noise and Vibration** (Demolition Construction Vibration - on-site receptors) - Minor Adverse	**Yes** In relation to Transport, Air Quality and Noise and Vibration

Table 12.2: Intra-Project Cumulative Assessment – Completed Development

Sensitive Receptor / Receptor Group	Completed Development Residual Effects	Potential for Effect Interaction and so Combined Cumulative Effects?
Commercial users of the proposed development and study area	• **Socio Economics** (Increase employment opportunities and generate operational productivity) - Minor Beneficial at neighbourhood and local levels • **Socio Economics** (Enhance local labour provision and skills) - Major Beneficial at neighbourhood level and Moderate Beneficial at local level • **Socio Economics** (Increase local business space and support business activity) - Minor Beneficial at local level • **Socio Economics** (Generate income and expenditure to existing and future businesses) - Major Beneficial at neighbourhood level and moderate Beneficial at local level • **Socio Economics** (Reduced crime levels through increased local activity) – Minor Beneficial at neighbourhood level • **Transport and Accessibility** (Severance on Juniper Crescent) - Minor Adverse • **Transport and Accessibility** (Fear and Intimidation on Juniper Crescent) - Minor Beneficial • **Transport and Accessibility** (Driver Delay on Juniper Crescent, Chalk Farm Road (east and west), Ferdinand Street) - Minor Adverse • **Transport and Accessibility** (Pedestrian Delay on Juniper Crescent, Chalk Farm Road (east and west), Ferdinand Street) - Minor Adverse	**Yes** In relation to Transport and Socio-economics
Existing residential occupants/ properties in proximity to the application site	• **Socio Economics** (Increase employment opportunities and generate operational productivity) - Minor Beneficial at neighbourhood and local levels • **Socio Economics** - (Provide new housing, including affordable) - Minor Beneficial at local level • **Socio Economics** (Increase demand for secondary education facilities) - Minor Adverse at neighbourhood level	**Yes** In relation to Socio-Economics, Noise and Vibration, Transport, Daylight and Sunlight, and Wind

Table 12.2: Intra-Project Cumulative Assessment – Completed Development

Sensitive Receptor / Receptor Group	Completed Development Residual Effects	Potential for Effect Interaction and so Combined Cumulative Effects?
	• **Socio Economics** (Increase demand for open space and recreation facilities) - Minor Beneficial neighbourhood level • **Socio Economics** (Increase demand for children's playspace) – Minor Beneficial at neighbourhood level • **Socio Economics** (Reduced crime levels through increased local activity) - Minor Beneficial at neighbourhood level • **Transport and Accessibility** (Severance on Juniper Crescent) - Minor Adverse • **Transport and Accessibility** (Fear and Intimidation on Juniper Crescent) - Minor Beneficial • **Transport and Accessibility** (Pedestrian Delay on Chalk Farm Road (east and west), Ferdinand Street and Juniper Crescent - Minor Adverse • **Transport and Accessibility** (Driver Delay on Chalk Farm Road (east and west), Ferdinand Street and Juniper Crescent - Minor Adverse • **Transport and Accessibility** (Public Transport Capacity at bus Stops) – Minor Adverse • **Noise and Vibration** (Commercial noise) - Minor Adverse • **Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution** (Loss of daylight and sunlight amenity to identified existing off-site properties) - Major Adverse to Negligible • **Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution** (overshadowing to surrounding amenity areas) - Minor Adverse • **Wind** (Wind conditions at bus stops suitable for standing) - Negligible to Minor Beneficial • **Wind** (Wind conditions at thoroughfares suitable for strolling) - Negligible to Moderate Beneficial • **Wind** (Wind conditions at entrances suitable for entrance use) - Negligible to Minor Beneficial	
Existing hotel uses in proximity to the application site	• **Socio Economics** (Increase employment opportunities and generate operational productivity) - Minor Beneficial at neighbourhood and local levels. • **Socio Economics** (Enhance local labour provision and skills) - Major Beneficial at neighbourhood level and Moderate Beneficial at local level • **Socio Economics** (Increase local business space and support business activity) - Minor Beneficial at local level • **Socio Economics** (Generate income and expenditure to existing and future businesses) – Major Beneficial at neighbourhood level and Moderate Beneficial at local level • **Socio Economics** (Reduced crime levels through increased local activity) – Minor Beneficial at neighbourhood level	**No** All effects are related to Socio-economics

Table 12.2: Intra-Project Cumulative Assessment – Completed Development

Sensitive Receptor / Receptor Group	Completed Development Residual Effects	Potential for Effect Interaction and so Combined Cumulative Effects?
Local community, leisure and amenity facilities	• **Socio Economics** (Increase demand for secondary education facilities) - Minor Adverse at neighbourhood level • **Socio Economics** (Increase demand for open space and recreation facilities) – Minor Beneficial neighbourhood level • **Socio Economics** (Increase demand for children's playspace) – Minor Beneficial at neighbourhood level • **Socio Economics** (Reduced crime levels through increased local activity) – Minor Beneficial at neighbourhood level	**No** All effects are related to Socio-economics
Existing open space facilities and amenity areas	• **Socio Economics** (Increase demand for open space and recreation facilities) - Minor Beneficial neighbourhood level • **Socio Economics** (Increase demand for children's playspace) – Minor Beneficial at neighbourhood level • **Socio Economics** (Reduced crime levels through increased local activity) – Minor Beneficial at neighbourhood level • **Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution** (Overshadowing of amenity areas) – Minor Adverse • **Townscape and Visual** (Change in views) - Neutral, Negligible, Moderate - Major Beneficial • **Townscape and Visual** (Change in townscape character) – None, Negligible, Minor Beneficial	**No** None of these effects would combine
Existing above ground heritage assets including listed buildings and conservation areas	• **Townscape and Visual** (Change in views) - Neutral, Negligible, Moderate - Major Beneficial • **Townscape and Visual** (Change in townscape character) – None, Negligible, Minor Beneficial • **Heritage** (Setting of conservation areas) –Negligible, Neutral, Minor to Moderate Adverse • **Heritage** (Setting of statutory listed buildings) – Nil/Negligible, Neutral, Minor Adverse • **Heritage** (Setting of locally listed buildings) – Nil/Negligible, Neutral, Minor Beneficial • **Heritage** (Setting of Regents Park) - Moderate Adverse	**No** All effects are interrelated and would not combine
Townscape views and townscape character areas	• **Townscape and Visual** (Change in views) - Neutral, Negligible, Moderate - Major Beneficial • **Townscape and Visual** (Change in townscape character) – None, Negligible, Minor Beneficial	**No** All effects are related to Townscape and Visual Impact))
Local Air Quality	• No effects identified	**No** No aspects/effects identified

Table 12.2: Intra-Project Cumulative Assessment – Completed Development

Sensitive Receptor / Receptor Group	Completed Development Residual Effects	Potential for Effect Interaction and so Combined Cumulative Effects?
Existing transport infrastructure and vehicle users	• **Transport and Accessibility** (Driver delay on Chalk farm Road (east), Chalk Farm Road (west), Ferdinand Street and Juniper Crescent)) – Minor Adverse • **Transport and Accessibility** (Public transport capacity at bus stops site and Chalk Farm Road, Chalk Farm and Camden Town Underground Stations, Kentish Town West Railway Station) - Minor Adverse • **Wind** (Wind conditions at bus stops suitable for standing) - Negligible to Minor Beneficial	**No** The adverse effects in respect of transport would not interact with wind conditions
Pedestrians and cyclists	• **Transport and Accessibility** (Severance on Juniper Crescent) - Minor Adverse • **Transport and Accessibility** (Fear and Intimidation on Juniper Crescent) - Minor Beneficial • **Wind** (Wind conditions at thoroughfares suitable for strolling) - Negligible to Moderate Beneficial • **Wind** (Wind conditions at bus stops suitable for standing) -Negligible to Minor Beneficial	**No** The beneficial and adverse effects in respect of transport would not interact with beneficial effects wind
Future on-site residential and commercial facility occupants and users	• **Socio Economics** (Increase local business space and support business activity) - Minor Beneficial at local level • **Socio Economics** (Generate income and expenditure to existing and future businesses) - Major Beneficial at neighbourhood level and moderate Beneficial at local level • **Socio Economics** (Increase demand for open space and recreation facilities) - Minor Beneficial neighbourhood level • **Socio Economics** (Reduced crime levels through increased local activity) - Minor Beneficial at neighbourhood level • **Transport and Accessibility** (Severance on Juniper Crescent) - Minor Adverse • **Transport and Accessibility** (Pedestrian Delay on Chalk Farm Road (east and west), Ferdinand Street and Juniper Crescent - Minor Adverse • **Transport and Accessibility** (Driver Delay on Chalk Farm Road (east and west), Ferdinand Street and Juniper Crescent - Minor Adverse • **Transport and Accessibility** (Fear and Intimidation on Juniper Crescent) - Minor Beneficial • **Noise and Vibration** (Commercial noise) - Minor Adverse • **Noise and Vibration** (Ambient noise in external spaces) - Negligible to Moderate Adverse. • **Noise and Vibration** (Vibration) - Negligible to Minor Adverse. • **Wind** (Wind conditions at bus stops suitable for standing) -Negligible to Minor Beneficial • **Wind** (Wind conditions at thoroughfares suitable for strolling) - Negligible to Moderate Beneficial • **Wind** (Wind conditions at entrances suitable for entrance use) - Negligible to Minor Beneficial	**Yes** In relation to Noise and Vibration, Transport and Wind Socio-economics effects would not interact with noise, transport and wind effects

Explanation of Potential Intra-Project Effects

Demolition and Construction

12.15 As shown in Table 12.1, there is the potential for interactions between noise and vibration; air quality; and transport effects on existing commercial users; existing hotel uses and community uses; existing residential uses; open spaces; pedestrians; cyclist; and future on-site receptors of completed early phases. In addition visual and townscape character effects could furthermore combine at existing residential receptors and open space receptors.

12.16 It accepted that as part of any construction works, receptors in close proximity would be affected to some degree by a combination of noise, dust, visual disturbance and increased traffic movements. However, by minimising all of these effects at source through application of control measures in the CMP; maintaining good housekeeping; undertaking monitoring where necessary; requiring just-in-time deliveries; and providing a public liaison whereby the public can communicate any complaints or unforeseen effects to the Applicant, it is expected that these combined effects would not be significant. Accordingly the residual intra-cumulative demolition and construction effects are likely to be **Minor Adverse** and temporary.

Completed Development

12.17 As shown in Table 12.2 there is the potential for some degree of interaction between socio-economics; noise and vibration; transport; daylight, sunlight and overshadowing; and wind effects in relation to existing commercial uses and residential occupants or properties in proximity to the application site. On the whole beneficial effects would arise in respect of socio-economics and wind. Adverse effects would be arise from the proposed development reducing the existing levels of daylight and sunlight to surrounding residential properties and amenity spaces although the existing site is afforded very high levels of daylight and sunlight for an urban location such as this. Furthermore adverse effects would arise in respect of commercial noise, severance, fear and intimidation, pedestrian delay and driver delay.

12.18 Considering both beneficial and adverse effects, the resulting intra-cumulative effects at commercial uses would be **Minor Adverse**. Similarly, at surrounding residential receptors, the intra-project effects would be would be **Minor Adverse**, with the exception of those properties where significant losses in daylight levels would arise. In these instances the cumulative effect would be **Moderate to Major Adverse**. As noted earlier, unusually high levels of existing daylight levels are enjoyed at these properties and therefore this effect is not considered to be a material consideration.

12.19 In addition, potential intra-cumulative effects to future on-site residential occupants and users could arise as a result of noise and vibration, transport and accessibility and wind conditions. Taking into consideration both beneficial and adverse effects, it is considered that the residual intra-cumulative effects are likely to be **Minor Neutral.**

Conclusions

12.20 From the assessment of the potential for intra-project cumulative effects it can be seen that there is the potential for adverse intra-project cumulative effects during the demolition and construction stage, primarily in respect of noise, vibration, air quality and transport. The combined cumulative effects have the potential to affect existing commercial and residential receptors in close proximity to the demolition and construction works, as well as pedestrians, cyclists and occupants of early completed phases of the proposed development. However the mitigation measures described in Chapter 5 and other technical ES Chapters would reduce the potential combined cumulative effects, such that the adverse effects would not be significant.

12.21 Upon completion both beneficial and adverse effects are likely to arise. On balance the intra-cumulative socio-economic, noise, transport and wind effects would be no more than Minor Adverse at surrounding commercial uses and residential receptors, with the exception of those residential receptors where significant daylight losses are likely to arise. Here the intra-cumulative effects would range from Moderate to Major Adverse. At newly introduced residential uses the beneficial noise, vibration, transport and wind condition would on balance represent Minor Neutral intra-cumulative effects.

13 RESIDUAL EFFECTS AND MITIGATION

Introduction

12.1 This chapter summarises the mitigation and enhancement measures identified in the technical chapters of the ES (chapters 6-11 of ES Volume 1, ES Volume 2A and ES Volume 2B) and provides a summary of the residual effects and the likely significant environmental effects attributed to the proposed development.

Mitigation and Enhancement

12.2 As set out in Chapter 2: EIA Process and Methodology, the main aim of an EIA is to develop measures to avoid, offset or reduce the potentially significant adverse effects of a project and to enhance any beneficial effects.

12.3 Within each of the technical assessments, a number of additional mitigation measures have been identified to avoid or minimise likely significant adverse effects as far as reasonably possible. In addition, opportunities for environmental enhancement have been explored where practicable. The proposed mitigation and enhancement measures are in addition to the embedded mitigation measures (as described in ES Chapter 4: Proposed Development), and standard demolition and construction measures (as described in ES Chapter 5: Demolition and Construction), which have been considered within the technical assessments.

12.4 Table 13.1 presents a summary of the additional mitigation and enhancement measures categorised under the following stages:

- Demolition and Construction; and
- Completed Development.

12.5 Reference should be made to individual technical chapters for more detail.

Table 13.1: Summary of Proposed Mitigation and Enhancement Measures

Topic	Proposed Mitigation and Enhancement Measures
Demolition and Construction	
Socio-Economics	• No additional mitigation required. • Enhancement measures include the potential for the implementation of a Local Employment Framework to be secured by means of an appropriately worded planning condition.
Transport and Accessibility	• Provide suitable signage for motorists on approach to site confirming new road layout, and ensure future changes are communicated to customers in store (e.g. on noticeboards). To be secured by means of suitable S106 contributions. • No enhancement measures proposed.
Air Quality*	• Best practice air quality management measures to be implemented on-site by means of the CMP. To be secured by means of suitably worded planning condition. • No enhancement measures proposed.
Noise and Vibration	• No additional mitigation required. • No enhancement measures proposed.
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution	• No additional mitigation measures required. • No enhancement measures proposed.
Wind	• No additional mitigation required. • No enhancement measures proposed.
Townscape, Heritage and Visual	• No additional mitigation required. • No enhancement measures proposed.
Built Heritage	• No additional mitigation required. • No enhancement measures proposed.
Completed Development	
Socio-Economics	• No additional mitigation required although financial contribution may be secured via CIL for primary school, secondary school and healthcare provisioning. • Enhancement measures include the potential for the implementation of a Local Employment Framework to be secured by means of an appropriately worded planning condition.
Transport and Accessibility	• No additional mitigation required. • No enhancement measures proposed.
Air Quality	• No additional mitigation required. • No enhancement measures proposed.
Noise and Vibration	• No additional mitigation required. • No enhancement measures proposed.
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution	• External shading with fins or louvres on the northern and southern facades of the PFS Block to be secured by means of an appropriately worded planning condition. • No enhancement measures proposed.
Wind	• Localised soft/hard landscaping or recessing of entrances 1.5 m over and above those contained within the proposed landscaping scheme to achieve standing conditions at on-site entrances (receptors 89, 161, 163, 165 and 168). • Solid glazed balustrades to achieve sitting conditions at balcony locations (receptors 218, 219, 225, 228 and 232). • No enhancement measures proposed.
Townscape and Visual	• No additional mitigation required. • No enhancement measures proposed.
Built Heritage	• No additional mitigation required. • No enhancement measures proposed.

Notes: *The air quality assessment does not account for the CMP measures set out in Chapter 5: Demolition and Construction, as embedded mitigation, due to published assessment guidance.

Residual Effects

12.6 This section summarises the predicted residual effects of the proposed development following the adoption and inclusion of the additional mitigation and enhancement measures that are set out in Table 13.1.

12.7 Reference should be made to individual technical chapters (Chapters 6 – 11, Volume 2A and Volume 2B) of the ES for a detailed description of residual and likely significant environmental effects.

Residual Effects during Demolition and Construction

12.8 Table 13.2 summarises the residual effects which have been identified by the individual technical assessments as likely to arise as a result of the demolition and construction of the proposed development. Those effects which are considered to be 'Significant' in the context of the EIA Regulations[1] are presented in bold.

Table 13.2: Residual Effects during Demolition and Construction Phase of Proposed Development

Topic Area	Description of Residual Effect	Significance of Effect	Adverse/ Beneficial/ Neutral	Duration of Effect
Socio-Economics	Support construction employment	Negligible (neighbourhood level) Minor (local and wider levels)	Beneficial	Medium term
	Support construction apprenticeships	**Major** (local level) Minor (wider level)	Beneficial	Medium term
	Generate construction productivity	Minor (local and wider levels)	Beneficial	Medium term
	Generate expenditure	Minor (neighbourhood level) Negligible (local and wider levels)	Beneficial	Medium term
Transport and Accessibility	Severance at Juniper Crescent, Chalk Farm Road (west)	Minor	Adverse	Medium Term
	Driver Delay on Chalk Farm Road (east), Chalk Farm Road (west), Ferdinand Street and Juniper Crescent	Negligible	N/A	Medium Term
	Pedestrian Delay for pedestrians along Chalk Farm Road (east), Chalk Farm Road (west), Ferdinand Street and Juniper Crescent	Negligible	N/A	Medium Term
	Fear and Intimidation at Juniper Crescent, Chalk Farm Road (west)	Negligible	N/A	Medium Term
	Pedestrian Amenity at Juniper Crescent, Chalk Farm Road (west)	Negligible	N/A	Medium Term
	Accidents and Safety at Chalk Farm Road (east and west)	Negligible	N/A	Medium Term
	Driver Stress at Juniper Crescent, Chalk Farm Road (west)	Minor	Adverse	Medium Term
	Highway Capacity at Chalk Farm Road/Ferdinand Street/Juniper Crescent signal junction	Negligible	N/A	Medium Term
	Public Transport Capacity Bus stops at site and Chalk Farm Road, Chalk Farm and Camden Town Underground Stations, Kentish Town West Railway Station	Negligible	N/A	Medium Term
Air Quality	Dust soiling and elevated PM_{10} concentrations due to demolition and construction works at on and off-site residential receptors	Negligible	N/A	Short Term
	Generation of construction traffic emissions	Minor	Adverse	Short Term
Noise and Vibration	Generation of demolition and construction plant noise at closest on and off-site NSR (3, 4, 7, 8, 9)	Minor	Adverse	Short Term
	Generation of demolition and construction plant noise at all other NSR	Negligible	Adverse	Short Term
	Generation of demolition and construction traffic noise at all NSR	Negligible	Adverse	Short Term
	Generation of demolition and construction vibration at all NSR	Minor	Adverse	Short Term
Daylight, Sunlight, Overshadowing and Solar Glare	Change in Daylight levels at surrounding residential receptors	Evolving and less than completed development	N/A	Short Term
	Change in Sunlight levels at surrounding residential receptors	Evolving and less than completed development	N/A	Short Term
	Change in Overshadowing levels at surrounding amenity areas	Evolving and less than completed development	N/A	Short Term

[1] HM Government. The Town and Country Planning (Environmental Impact Assessment) (Amendment) Regulations. London: HMSO, 2015. SI 2015/660.

Table 13.2: Residual Effects during Demolition and Construction Phase of Proposed Development

Topic Area	Description of Residual Effect	Significance of Effect	Adverse/ Beneficial/ Neutral	Duration of Effect
	Creation of Solar Glare in respect of train drivers	Evolving and less than completed development	N/A	Short Term
Wind	Wind conditions suitable for standing and strolling conditions for pedestrians and onsite users	Negligible	N/A	Short Term
Townscape and Visual	Disruption of views by the visibility of cranes, machinery and partly constructed buildings.	None to Major (but not significant)	Adverse	Short to Medium Term
	Views of cranes, machinery and partly constructed buildings from within townscape character areas.	None to Major (but not significant)	Adverse	Short to Medium Term
Built Heritage	Change in setting of Camden Town Conservation Area due to demolition and construction activities	Minor	Adverse	Medium Term
	Change in setting of Regent's Canal, Primrose Hill, Harmood Street Conservation Areas due to demolition and construction activities of	Moderate (but not significant)	Adverse	Medium Term
	Change in setting of statutory listed buildings	Nil	N/A	Medium Term
		Negligible	N/A	Medium Term
		Moderate	Adverse	Medium Term
	Change in setting of registered parks and gardens – Regent's Park	Moderate	Adverse	Medium Term
	Locally Listed Building	Minor	Adverse	Medium Term

Residual Effects during Completed Development

12.9 Table 13.3 summarises the residual effects which have been identified by the individual technical assessments as likely to arise as a result of the operation of the proposed development. Those effects which are considered to be 'Significant' in the context of the EIA Regulations[1] are in bold.

Table 13.3: Residual Effects during Completed Development Stage of Proposed Development

Topic Area	Residual Effect	Significance of Effect	Adverse/ Beneficial/ Neutral	Duration of Effect
Socio-Economics	Increase employment opportunities	Minor (neighbourhood and local levels) Negligible (wider level)	Beneficial	Long Term

Table 13.3: Residual Effects during Completed Development Stage of Proposed Development

Topic Area	Residual Effect	Significance of Effect	Adverse/ Beneficial/ Neutral	Duration of Effect
	Generate operational productivity	Minor (neighbourhood and local levels) Negligible (wider level)	Beneficial	Long Term
	Enhance local labour provision and skills	**Major** (neighbourhood level) **Moderate** (local level) Negligible (wider level)	Beneficial	Long Term
	Increase local business space and support business activity	Minor (local level)	Beneficial	Long Term
	Provide new housing, including affordable	Minor (local level)	Beneficial	Long Term
	Generate income and expenditure	**Major** (neighbourhood level) **Moderate** (local level) Negligible (wider level)	Beneficial	Long Term
	Generate Council Tax revenue	**Moderate** (local level)	Beneficial	Long Term
	Generate New Homes Bonus payments	**Major** (local level)	Beneficial	Short Term
	Generate business rate revenue	**Moderate** (local level)	Beneficial	Long Term
	Increase demand for primary education facilities	Negligible (neighbourhood level)	N/A	N/A
	Increase demand for secondary education facilities	Minor (neighbourhood level)	Adverse	Long Term
	Increase demand for health facilities	Negligible (neighbourhood level)	N/A	N/A
	Increase demand for open space and recreation facilities	Minor (neighbourhood level)	Beneficial	Long Term
	Increase demand for children's playspace	Minor (neighbourhood level)	Beneficial	Long Term
	Reduced crime levels through increased local activity	Minor (neighbourhood level)	Beneficial	Long Term
Transport and Accessibility	Severance at Juniper Crescent	Minor	Adverse	Long Term

Table 13.3: Residual Effects during Completed Development Stage of Proposed Development

Topic Area	Residual Effect	Significance of Effect	Adverse/ Beneficial/ Neutral	Duration of Effect
	Driver Delay on Chalk Farm Road (east), Chalk Farm Road (west), Ferdinand Street and Juniper Crescent	Minor	Adverse	Long Term
	Pedestrian Delay along Chalk Farm Road (east), Chalk Farm Road (west), Ferdinand Street and Juniper Crescent	Minor	Adverse	Long Term
	Fear and Intimidation at Juniper Crescent,	Minor	Beneficial	Long Term
	Pedestrian Amenity at Juniper Crescent,	Negligible	N/A	Long Term
	Accidents and Safety at Chalk Farm Road (east and west)	Negligible	N/A	Long Term
	Driver Stress at Juniper Crescent	Negligible	N/A	Long Term
	Highway Capacity at Chalk Farm	Negligible	N/A	Long Term
	Highway Capacity at Chalk Farm Road/Ferdinand Street/Juniper Crescent signal junction	Negligible	N/A	Long Term
	Public Transport Capacity at Bus stops at site and Chalk Farm Road, Chalk Farm and Camden Town Underground Stations, Kentish Town West Railway Station	Minor	Adverse	Long Term
Air Quality	Change in air quality due to traffic and CHP emissions at off-site residential receptors	Negligible	N/A	Long Term
	Change in air quality due to traffic and CHP emissions at on-site residential receptors	Negligible	N/A	Long Term
Noise and Vibration	Effect of existing noise environment on internal residential noise levels	Negligible	N/A	Long Term
	Effect of existing noise environment on external amenity spaces	Negligible to Moderate (but not significant)	Adverse	Long Term

Table 13.3: Residual Effects during Completed Development Stage of Proposed Development

Topic Area	Residual Effect	Significance of Effect	Adverse/ Beneficial/ Neutral	Duration of Effect
	Change in road traffic noise at off-site receptors.	Negligible	Adverse	Long Term
	Generation of plant noise at existing and proposed on-site sensitive receptors	Negligible	N/A	Long Term
	Generation of commercial noise on existing and proposed on-site sensitive receptors	Minor	Adverse	Long Term
	Effect of existing vibration levels on proposed development	Negligible to Minor	Adverse	Long Term
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution	Change in Daylight levels at surrounding residential receptors	Negligible to Minor Adverse to 12 properties, Minor to **Moderate** adverse to seven properties, **Moderate** adverse to one property and **Moderate to Major Adverse** to two properties.	Adverse	Long Term
	Change in Sunlight levels at surrounding residential receptors	Negligible	Neutral	Long Term
	Change in Overshadowing levels at surrounding amenity areas	Minor	Adverse	Long Term
	Creation of Solar Glare in respect of train drivers	Negligible	Adverse	Long Term
	Change in Daylight levels at surrounding residential receptors	Negligible	Adverse	Long Term
Wind	Wind conditions at bus stop suitable for standing	Negligible to Minor	Beneficial	Long Term
	No change in wind conditions at off-site residential amenity spaces	Negligible	N/A	Long Term
	Wind conditions at thoroughfares suitable for strolling	Negligible to **Moderate**	Beneficial	Long Term
	Wind conditions at entrances suitable for entrance use	Negligible to Minor	Beneficial	Long Term

Table 13.3: Residual Effects during Completed Development Stage of Proposed Development

Topic Area	Residual Effect	Significance of Effect	Adverse/ Beneficial/ Neutral	Duration of Effect
	Wind conditions at ground level amenity users suitable for sitting	Negligible	N/A	Long Term
	Wind conditions at roof amenity suitable for sitting	Negligible	N/A	Long Term
	Wind conditions at balconies suitable for sitting	Negligible	N/A	Long Term
Townscape, Heritage and Visual	Visibility of the proposed development within the Parliament Hill LVMF 2A.2 View	Negligible	N/A	Long Term
	Visibility of the proposed development from Primrose Hill top viewing area	**Moderate**	Beneficial	Long Term
	Visibility of proposed development within assessment views 3, 7, 9, 14, 20	Negligible	N/A	Long Term
	Visibility of proposed development within assessment view 30	Negligible	Neutral	Long Term
	Visibility of proposed development within assessment views 10,11,12,15,17,27,28,32 33,34,35	Minor	Neutral	Long Term
	Visibility of proposed development within assessment views 13,16,,18,21,23,23,24 25,26	Moderate	Neutral	Long Term
	Visibility of proposed development within assessment views 19,29,36,37	**Moderate**	Beneficial	Long Term
	Visibility of proposed development within assessment views 22,31	**Major**	Beneficial	Long Term

Table 13.3: Residual Effects during Completed Development Stage of Proposed Development

Topic Area	Residual Effect	Significance of Effect	Adverse/ Beneficial/ Neutral	Duration of Effect
	Change in character of South Kentish Town, Maitland park, Belsize Park townscape character areas	None	N/A	Long Term
	Change in character of Primrose Hill, Regent's Park, Mornington Crescent and Gloucester Crescent townscape character areas	Negligible	N/A	Long Term
	Change in character of Regent's Canal and Rail Interchange townscape character areas	Minor	Beneficial	Long Term
Built Heritage	Change in setting of Regent's Canal Conservation Area due to introduction of new buildings, public realm/landscaping and highway works.	Neutral	Adverse	Long Term
	Change in setting of Camden Town Conservation Area due to introduction of new buildings, public realm/landscaping and highway works.	Negligible	N/A	Long Term
	Change in setting of Harmood Street Conservation Area due to introduction of new buildings, public realm/landscaping and highway works.	Minor	Adverse	Long Term
	Change in setting of Primrose Hill Conservation Area due to introduction of new buildings, public realm/landscaping and highway works.	**Moderate**	Adverse	Long Term
	Change in setting of statutory listed buildings	Neutral	N/A	Long Term
		Nil/Negligible	N/A	Long Term
		Minor	Adverse	Long Term

Table 13.3: Residual Effects during Completed Development Stage of Proposed Development				
Topic Area	**Residual Effect**	**Significance of Effect**	**Adverse/ Beneficial/ Neutral**	**Duration of Effect**
	Change in setting of registered parks and gardens (Regent's Park) due to introduction of new buildings, public realm/landscaping and highway works.	**Moderate**	Adverse	Long Term
	Locally Listed Building	Neutral	N/A	Long Term
		Nil/Negligible	N/A	Long Term
		Negligible	N/A	Long Term
		Minor	Beneficial	Long Term

GLOSSARY OF TERMS

Accurate Visual Representations	A static or moving image which shows the location of a proposed development as accurately as possible; it may also illustrate the degree to which the development will be visible, its detailed form or the proposed use of materials. AVRs are produced by accurately combining images of the proposed building with a representation of its context.
ADMS-Roads	Atmospheric Dispersion Modelling System Roads is a line-source Gaussian dispersion model with the capability to model 3 point sources.
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near (LA_{Feq},T).
Amenity	A pleasant or advantageous aspect of the environment.
Annual Probable Sunlight Hours	A measure of sunlight that a given window may expect over a year period.
Aquifer	A below ground, water-bearing layer of soil or rock.
Arisings	Material (often spoil) derived from the ground through excavation
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Baseline Studies	Studies of existing environmental conditions which are designed to establish the baseline conditions against which any future changes can be measured or predicted.
Biodiversity	The diversity, or variety of plants and animals and other living things in a particular area of region. It encompasses landscape diversity, ecosystem diversity, species diversity and genetic diversity.
Borehole	A deep hole bored into the ground as part of intrusive geological investigations.
Brownfield Site	A site comprising previously developed land.
Carbon Dioxide (CO_2)	Carbon dioxide is a naturally occurring gas comprising 0.04% of the atmosphere. The burning of fossil fuels releases carbon dioxide fixed by plants many millions of years ago, and this has increased its concentration in the atmosphere by some 12% over the past century. It contributes about 60 per cent of the potential global warming effect of manmade emissions of greenhouse gases.
Combined Heat and Power	A low carbon technology which generates electricity whilst also capturing usable heat that is produced in the process.
Completed Development	A development scheme which has been build out.
Conservation Area	An area designated by the Local Authority as being of special architectural or historic interest under the provisions of the Planning (Listed Buildings and Conservation Areas 1990) Act, the character or appearance of which it is desirable to preserve or enhance.
Construction Environmental Management Plan	A documented management system with environmental procedures to monitor residual impacts of the construction phase of a development.
Construction Logistics Plan	A documented travel plan specific for a construction site.
Construction Method Statement	A document which addresses the health and safety risks to workers and other personnel on-site during the construction phase of the development.
Cumulative Schemes	Developments that typically have received planning permission and have a signed legal agreement in place. They are assumed to be in place by the time the Development being assessed is completed.
Cumulative Effects	Effects that result from incremental changes caused by other past, present or reasonably foreseeable actions.
Decibel	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa.
Desk-top Study	A non-intrusive study and review of all available information pertaining to a site, including historical records, collated and monitored data, and consultation with relevant stakeholders.
Dewatering	The removal of water from the ground to make it dry.
Directive	European Union (EU) Directives impose legal obligations on European Member States. They are binding as to the results to be achieved, but allow individual states the right to decide the form and methods used to achieve the results. An example of this is the EU Air Quality Framework Directive (1996) that is brought into legal effect in the UK by the Air Quality (England) Regulations (2000).
Displacement	An estimate of economic factors that may have reasonably been attained by other competitors in the absence of the development.
Early Medieval (Saxon)	Historic time period from AD 410-AD 1066.
EIA Scoping	An initial stage in determining the nature and potential scale of the environmental impacts arising from a proposed development, and assessing what further studies are required to establish their significance.
EIA Scoping Opinion	A written statement of the opinion of the relevant planning authority as to the information to be provided in the Environmental Statement.
EIA Screening	An initial stage in which the need for EIA is considered in respect of a development. Some developments are automatically subject to EIA by means of their inevitable size; nature and effects (Schedule 1 developments. Other projects are made subject to EIA because it is anticipated that they are likely to have significant environmental effects (Schedule 2 developments).
Emission	A material that is expelled or released to the environment. Usually applied to gaseous or odorous discharges to the atmosphere.
Environmental Impact Assessment	A process by which information about the environmental effects of a development is collected and taken into account by the relevant decision-making body before a decision is given on whether the development should go ahead.

Environmental Statement	A statement that includes such information that is reasonably required to assess the environmental effects of a development.
Facade	The front or face of a building.
Fit-out	Installation of all non-substructure and non-superstructure items such as electrical water services, as well as final internal finishings.
FreeField	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m
Geotechnical	Ground investigation, typically in the form of boreholes and/or trial/test pits, carried out for engineering purposes to determine the nature of the subsurface deposits.
Glare	The uncomfortable brightness of a light source or illuminated area when viewed against a dark background.
Gross External Area	A measure of floor space calculated in accordance with the Royal Institution of Chartered Surveyors (RICS) Code of Measuring Practice.
Gross Internal Area	A measure of the area of a building measured to the internal face of the perimeter walls at each floor level.
Groundwater Source Protection Zone	An area in which groundwater is abstracted for public water supply.
Heritage Asset	A building, area or scene which makes a positive contribution of special architectural, historic or environmental interest.
Hoarding	A temporary board fence set up on the perimeter of a building site.
Hydrogeology	The study of geological factors relating to the Earth's water.
In-situ	In the natural, original or appropriate position.
Intrusive Investigation	An in-depth investigation involving further sampling and analysis, such as the gathering of samples from the ground, walls, ceilings for the detection of contamination, asbestos and or archaeological remains.
$L_{AFeq,T}$	The A-weighted noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{AFmax,T}$	The A-weighted noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{AF90,T}$	The A-weighted noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{AF10,T}$	The A-weighted noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Lawson Comfort Criteria	The so called 'Lawson' criteria which define whether a space is comfortable for walking, strolling, standing or sitting by a threshold wind speed i.e. the hourly mean wind speed exceeded 5% of the time.
Lawson Safety Criteria	Criteria for the safety of an individual in relation to the wind environment. There are two categories: S1: unsafe for typical use (threshold speed 20m/s) and S2: unsafe for sensitive use (threshold speed 15m/s).
Listed Building	A building or structure of special architectural or historic interest which is included in a list made by the Secretary of State.
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London Plan	The adopted Spatial Development Strategy for London that sets out a vision for London and identifies the means by which this vision might be achieved. Issued in 2016.
Made Ground	Soils or other material which has been deposited by man rather than natural processes, for example to make up ground levels.
Mechanical Ventilation Heat Recovery	An energy recovery ventilation system using equipment known as a heat recovery ventilator, heat exchanger, air exchanger, or air-to-air heat exchanger which employs a cross flow or counter-flow heat exchanger (countercurrent heat exchange) between the inbound and outbound air flow. The system provides fresh air and improved climate control, while also saving energy by reducing heating (and cooling) requirements.
Mitigating Factor	A matter to be taken into account as a benefit on balance to offset against any perceived or demonstrable harmful impact.
Mitigation	Any process, activity of thing designed to avoid, reduce or remedy adverse environmental impacts likely to be caused by a development project.
Mitigation Measure	Measure aiming at reducing an adverse environmental effect.
National Planning Policy Framework	Came into force on 27 March 2012. It sets out the Government's economic, environmental and social planning policies for England and summarises, in a single document, all previous national planning policy advice (Planning Policy Statements and Planning Policy Guidance notes).
Nitrogen dioxide	Road transport and the burning of fossil fuels for power are the main sources of Nitrogen dioxide. In addition to being a greenhouse gas it also contributes to photochemical smog formation. It is an irritant to the respiratory system.
Non-Technical Summary	A summary of the Environmental Statement in 'non-technical language'.
No-sky Line	A measure of the distribution of diffuse daylight within a room.
Open Space	Includes all open spaces, plus other spaces that provide a break from the densely built-up urban form, such as pedestrianised areas and station concourses; hard-landscaped areas with private access; pedestrian/cycle and wildlife routes; and all the green infrastructure that links open spaces together, including green corridors, private residential gardens, trees, green roofs, and green landscaped areas.
Ordnance Datum	Land levels are measured relative to the average sea level at Newlyn, Cornwall. This average level is referred to as 'Ordnance Datum'.
Overshadowing	Overshadowing occurs when a structure blocks out sunlight from neighbouring properties mainly on the northern side of that structure. It can affect the amount of daylight let into neighbouring properties when the shadow cast falls across windows or glazed doors, or on amenity spaces.

Particulate Matter	Discrete particles in ambient air, sizes ranging between nanometres (nm, billionths of a metre) to tens of micrometres (µm, millionths of a metre).
Pathways	The routes by which impacts are transmitted through air, water, soils or plants and organisms to their receptors.
Pedestrian Level Wind Speed	Mean or gust wind speed measured at 1.5 m above ground level.
Permeability	The extent to which an environment allows people a variety of access routes through it. A permeable environment is one where there is ease of movement and where people have a choice of the routes they may use.
Photomontage	The use of photographs of a site from a certain viewpoint to show both the current base (pre-development) state of the site and the anticipated view of the site once development is complete.
Pile	A timber, steel or concrete post which is driven, jacked or cast (bored) into the ground to carry vertical or horizontal loads.
Plant	A building's generator, heating, ventilation, and/or electricity-production system.
Planning Practice Guidance	A web-based resource that came into force in 2014. It seeks to consolidate existing technical guidance into a consolidated online format and provides further detail on the policies contained within the NPPF.
Pollution Pathway	A pollution pathway exists when a source of pollution has been identified which can impact upon a receptor in some way.
Post- Medieval	Historic time period from AD 1485-present
Pre-Historic	Historic time period from 7500,000-AD ad43
Preservation by Record	Archaeological mitigation strategy where archaeological remains are fully excavated and recorded archaeologically and the results published. For remains of lesser significance, preservation by record might comprise an archaeological watching brief or evaluation.
Preservation *in situ*	Archaeological mitigation strategy where nationally important (whether Scheduled or not) archaeological remains are preserved in situ for future generations, typically through modifications to design proposals to avoid damage or destruction of such remains.
Public Transport Accessibility Level Assessment	A means of quantifying and comparing accessibility by public transport for a given site.
Public Realm	The space between and within buildings that are publicly accessible, including streets, squares, forecourts, parks and open spaces.
Rating Noise Level	The specific noise level plus any adjustment for the characteristic features of the noise ($L_{Ar,T}$).
Receptor (Sensitive)	A component of the natural, created, or built environment such as human being, water, air, a building, or a plant that is affected by an impact.
Residual Effects	Those effects of a development that cannot be mitigated following implementation of mitigation proposals.
Risk Assessment	An assessment of the likelihood and severity of an occurrence.
Roman	Historic time period from AD 43-AD 410.
Setting	The context in which a building or area can be appreciated.
Severance	The perceived divisions that can occur within a community when it becomes separated by a traffic route.
Site of Importance for Nature Conservation	A non-statutory site identified as being areas of importance for wildlife and geology. There are three tiers of sites: Sites of Metropolitan Importance, Sites of Borough Importance and Sites of Local Importance.
Specific Noise Level	The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source (the noise source under investigation) over a given time interval (LAeq,T)
Statutory Consultees	Groups or bodies that, by law, must be consulted as part of the planning application process for EIA development.
Strata	Layer of rock or soil.
Substructure	Elements of a development below ground level, typically basements and foundations.
Superstructure	Elements of a development above ground principally the mega frame, supporting northern core and outer shell cladding.
Supplementary Planning Document	Documents which seek to give guidance and support on the Council's planning processes and are one of the material considerations in determining planning applications.
Sustainable Development	Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.
The Applicant	The person or entity making the planning application.
The application site	The extent of the development site, as defined by the red-line boundary plan.
Topography	The natural and man-made features of an area collectively.
Transport Assessment	Prepared and submitted alongside planning applications for developments likely to have significant transport implications. For major proposals, assessments should illustrate the following: accessibility to the site by all modes, the likely modal split of journeys to and from the site and proposed measures to improve access by public transport, walking and cycling. Statutory plans produced by each borough which integrate strategic and local planning responsibilities through policies and proposals for the development and use of land in their area.
Travel Plan	A document which puts measures in place that will encourage sustainable travel and reduce reliance on single occupancy cars.
Vertical Sky Component	A 'spot' measure of the skylight reaching the mid-point of a window from an overcast sky. It represents the amount of visible sky that can be seen from that reference point, from over and around an obstruction in front of the window.
Ward	An administrative division of a city or borough that typically elects and is represented by a councillor or councillors.
Watching Brief (archaeological)	An archaeological watching brief is 'a formal programme of observation and investigation conducted during any operation carried out for non–archaeological reasons.'
Wireline	A single line representing the outline of the building.

GLOSSARY OF TERMS

Accurate Visual Representations	A static or moving image which shows the location of a proposed development as accurately as possible; it may also illustrate the degree to which the development will be visible, its detailed form or the proposed use of materials. AVRs are produced by accurately combining images of the proposed building with a representation of its context.
ADMS-Roads	Atmospheric Dispersion Modelling System Roads is a line-source Gaussian dispersion model with the capability to model 3 point sources.
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near (LA_{Feq},T).
Amenity	A pleasant or advantageous aspect of the environment.
Annual Probable Sunlight Hours	A measure of sunlight that a given window may expect over a year period.
Aquifer	A below ground, water-bearing layer of soil or rock.
Arisings	Material (often spoil) derived from the ground through excavation
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Environmental Statement	A statement that includes such information that is reasonably required to assess the environmental effects of a development.
Facade	The front or face of a building.
Fit-out	Installation of all non-substructure and non-superstructure items such as electrical water services, as well as final internal finishings.
FreeField	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m
Geotechnical	Ground investigation, typically in the form of boreholes and/or trial/test pits, carried out for engineering purposes to determine the nature of the subsurface deposits.
Glare	The uncomfortable brightness of a light source or illuminated area when viewed against a dark background.
Gross External Area	A measure of floor space calculated in accordance with the Royal Institution of Chartered Surveyors (RICS) Code of Measuring Practice.
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Risk Assessment	An assessment of the likelihood and severity of an occurrence.
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Sustainable Development	Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.
The Applicant	The person or entity making the planning application.
The application site	The extent of the development site, as defined by the red-line boundary plan.
Topography	The natural and man-made features of an area collectively.
Transport Assessment	Prepared and submitted alongside planning applications for developments likely to have significant transport implications. For major proposals, assessments should illustrate the following: accessibility to the site by all modes, the likely modal split of journeys to and from the site and proposed measures to improve access by public transport, walking and cycling. Statutory plans produced by each borough which integrate strategic and local planning responsibilities through policies and proposals for the development and use of land in their area.
Travel Plan	A document which puts measures in place that will encourage sustainable travel and reduce reliance on single occupancy cars.
Vertical Sky Component	A 'spot' measure of the skylight reaching the mid-point of a window from an overcast sky. It represents the amount of visible sky that can be seen from that reference point, from over and around an obstruction in front of the window.
Ward	An administrative division of a city or borough that typically elects and is represented by a councillor or councillors.
Watching Brief (archaeological)	An archaeological watching brief is 'a formal programme of observation and investigation conducted during any operation carried out for non–archaeological reasons.'
Wireline	A single line representing the outline of the building.

ABBREVIATIONS

μgm^{-3}	Micrograms per cubic metre
μm	Micrometres
3D	Three Dimensional
AADT	Annual Average Daytime Traffic Flows
AAWT	Annual Average Weekly Traffic Flows
ACM	Asbestos containing materials
ADF	Average Daylight Factor
ADMS	Atmospheric Dispersion Modelling System
agl	Above ground level
AIA	Arboriculture Impact Assessment
AOD	Above Ordnance Datum
APS	Annual Populations Survey
APSH	Annual Probable Sunlight Hours
ASHE	Annual Survey of Hours and Earnings
ASHPs	Air Source Heat Pumps
AQ	Air Quality
AQA	Air Quality Assessments
AQAL	Air Quality Assessment Level
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Strategy
ATC	Automatic Traffic Counters
AVRs	Accurate Visual Representations
AAWT	Annual Average Weekday Traffic flows
B	Beaufort
BAME	Black, Asian and Minority Ethnic
BAP	Biodiversity Action Plan
BAT	Best Available Techniques
BC	Before Christ
BEB	Building Emissions Benchmark
bgl	Below Ground Level
BGS	British Geological Survey
BIA	Basement Impact Assessment
BNL	Base Noise Level
BPM	Best Practicable Means
BRE	Building Research Establishment
BREEAM	British Research Establishment Environmental Assessment Method
BRES	Business Register and Employment Survey
BS	British Standard
BSI	British Standard Institute
CA	Conservation Area
CAR	Control of Asbestos Regulations
CAZ	Central Activities Zone
CCTV	Closed circuit television
C&D	Construction and Demolition
CDM	Construction Design and Management
CEA	Cumulative Effects Assessment
CEMP	Construction Environmental Management Plan
CEZ	Construction Exclusion Zone
CFA	Continuous Flight Auger
CHP	Combined Heating and Power
CIE	Commission Internationale de L'Eclairage
CIPH	Camden & Islington Public Health
CIL	Community Infrastructure Levy
CIRIA	Construction Industry Research and Information Association
CLP	Construction Logistics Plan
CLOCS	Construction Logistics and Community Safety
CMS	Construction Method Statement
CO_2	Carbon dioxide
CoCP	Code of Construction Practice
CoPA	Control of Pollution Act
COSHH	Control of Substances Hazardous to Health
CPG	Camden Planning Guidance
CRN	Calculation of Railway Noise
CRoW	The Countryside and Rights of Way
CLP	Construction Logistics Plan
CRTN	Calculation of Road Traffic Noise
CS	Characteristic Situation
CSM	Conceptual Site Model

CTMP	Construction Traffic Management Plan
DAS	Design and Access Statement
dB	Decibel
DBA	Desk Based Assessment
DCLG	Department for Communities and Local Government
DCO	Designing Out Crime Officer
DEFRA	Department of Environment, Food and Rural Affairs
DETS	Derwentside Environmental Testing Services
DFD	Computational Fluid Dynamics
DfE	Department for Education
DfT	Department for Transport
DLR	Docklands Light Railway
DMRB	Design Manual for Roads and Bridges
DMP	Dust Management Plan
DOE	Department of the Environment
DQRA	Detailed Quantitative Risk Assessment
DSP	Delivery and Servicing Plan
DSMP	Delivery and Servicing Management Plan
DTT	Digital Terrestrial Television
DWS	Drinking Water Standards
EA	Environment Agency
EC	European Commission
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EPA	Environmental Protection Act
EPUK	Environmental Protection UK
ES	Environmental Statement
EU	European Union
Ev	Vertical illuminance in lux
FM	Facilities Management
FORS	Fleet Operators Registration Scheme
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
GAC	Generic assessment criteria
GEA	Gross External Area
GIA	Gross Internal Area
GiGL	Greenspace Information for Greater London
GLA	Greater London Authority
GLHER	Greater London Historic Environment Record
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GP	General Practitioner
GPA	Good Practice Advice
GQRA	Generic quantitative risk assessment
GVA	Gross Value Added
Ha	Hectare
HBF	Home Builders Federation
HCA	Homes and Communities Agency
HE	Historic England
HEA	Historic Environment Assessment
HDV	Heavy Duty Vehicles
HGV	Heavy Goods Vehicle
HIA	Health Impact Assessment
HIU	Heat Interface Unit
HS2	High Speed 2
IAQM	Institute of Air Quality Management
IBC	Intermediate bulk containers
ICE	Institute of Civil Engineers
IEMA	Institute of Environmental Management and Assessment
ILP	Institute of Lighting Professionals
IMD	Indices of Multiple Deprivation
JSA	Job Seekers Allowance
JSNA	Camden's Joint Strategic Needs Assessment
km	Kilometres
kWh	Kilowatt hour
kWp	Kilowatt Peak
l/s	Litres per second
LAEI	London Atmospheric Emissions Inventory
LAP	Local Area Partnership
LAQM	Local Air Quality Management
LAQM TG	Local Air Quality Management Technical Guidance
LBC	London Borough of Camden
LCC	Lawson Comfort Criteria
LDA	London Development Agency
LDF	Local Development Framework
LEZ	Low Emission Zone
LISI	London Invasive Species Initiative.

LLAQM	London-specific LAQM system
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LOD	Laboratory limit of detection
LPA	Local Planning Authority
LSOA	Lower Super Output Area
LU	London Underground
LVMF	London View Management Framework
m	Metre
m^2	Square metre
m^3	Cubic metre
mAOD	Metres Above Ordnance Datum
MALP	Minor Alterations to the Plan
MMC	Modern Methods of Construction
m/s	Meters per Second
MS	Morrisons Supermarket Parcel
MVA	Mega Volt Amperes
MVHR	Mechanical Ventilation and Heat Recovery
NAQO	National Air Quality Objectives
N/A	Not applicable
NE	Natural England
NERC	The Natural Environment and Rural Communities
NHBC	National House Building Council
NHS	National Health Service
NIA	Net Internal Area
NNR	National Nature Reserve
NOEL	No Observed Effect Level
NO_2	Nitrogen Dioxide
NOx	Nitrogen Oxides
NPSE	Noise Policy Statement for England
NSL	No-Sky Line
NTS	Non-Technical Summary
NPPF	National Planning Policy Framework
NRMM	Non-Road Mobile Machinery
OD	Ordnance Datum
ONS	Office of National Statistics
OS	Ordnance Survey
PAH	Polycyclic aromatic hydrocarbons
PCU	Passenger car units
PEA	Preliminary Ecological Assessment
PEC	Predicted Environment Concentration
PEM	Project Environmental Manager
PERS	Pedestrian Environment Review System
PFS	Morrisons Petrol Filling Station Parcel
PHAAC	Primrose Hill Camden Advisory Conservation Committee
PI	Performance Indicators
PINS	The Planning Inspectorate
$PM_{2.5}/PM_{10}$	Particulate Material of a particular size fraction
PPC	Pollution Prevention Control
PPE	Personal Protective Equipment
PPG	Planning Practice Guidance
ppm	Parts per million
PRA	Preliminary Risk Assessment
PPV	Peak Particle Velocity
PTAL	Public Transport Accessibility Level
RICS	Royal Institute of Chartered Surveyors
RPA	Root Protection Areas
SBINC	Site of Borough Importance for Nature Conservation
SAC	Special Areas of Conservation
SCI	Statement of Community Involvement
SFRA	Strategic Flood Risk Assessment
SHMA	Camden Strategic Housing Market Assessment
SHoG	Sun Hours on Ground
SI	Site Investigation
SLINC	Site of Local Importance for Nature Conservation
SMA	Soil Mechanics Associates
SMINC	Site of Metropolitan Importance for Nature Conservation
SINC	Site of Importance for Nature Conservation
SOAEL	Significant Observed Adverse Effect Level
SO2	Sulphur dioxide
SPA	Special Protection Area
SPD	Supplementary Planning Documents
SPG	Supplementary Planning Guidance
SPT	Standard penetration testing
SPZ	Source Protection Zone

SRN	Strategic Road Network
SSSi	Site of Special Scientific Interest
SuDS	Sustainable Urban Drainage Systems
SWMP	Site Waste Management Plan
TA	Transport Assessment
TCAs	Townscape Character Area
TEB	Transport Emissions Benchmark
TfL	Transport for London
TLRN	Transport for London Road Network
TMT	Technology, media and telecommunications
TOS	Transient Overshadowing
TPO	Tree Preservation Orders
TVA	Townscape and Visual Impact Assessment
TWUL	Thames Water Utilities Ltd.
UDP	Camden Unitary Development Plan
UK	United Kingdom
ULR	Upward Light Ratio
UST	Underground storage tanks
UXO	Unexploded ordinance
VOA	Valuation Office Agency
VSC	Vertical Sky Component
VDV	Vibration Dose Value
WAC	Waste Acceptance Criteria
WCA	The Wildlife and Countryside Act
WebCAT	Web-based Connectivity Assessment Toolkit
WQS	Water Quality Standards
WSI	Written Scheme of Investigation
ZVI	Zone of Visual Influence

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