

17A. Wind Microclimate

17A.1 Introduction

17A.1.1 This Chapter has been prepared by BMT and provides further information with regard to the potential wind microclimate impacts arising from the Scheme with Phase 1A (North) in place (hereafter referred to as the 'Development'). This Chapter provides further environmental information pursuant to the s.73 ES and presents the findings of further wind tunnel testing and assessment which has been undertaken to identify whether significant wind impacts are likely to arise from the Development which could not be identified at the outline planning application stage. Relevant planning condition requirements are also addressed by this Chapter.

17A.1.2 This Chapter is supported by **Appendix 17A.1: Brent Cross Cricklewood London, UK: Phase 1A (North) RMAs Wind Microclimate Study** which presents the detailed methodology and findings of the wind microclimate study.

17A.2 Policy, Legislation and Guidance

17A.2.1 There have been no significant changes to policy, legislation or guidance since the s.73 ES was prepared which have a material effect on the approach to or findings of the assessment. A review of material published or amended since October 2013 is set out below.

[Draft Further Alterations to the London Plan, 2014](#)

17A.2.2 On 15 January 2014, the Mayor published Draft Further Alterations to the London Planⁱ (FALP) for public consultation. The Draft FALP are consolidated with the Revised Early Minor Alterations (October 2013). The alterations do not affect the guidance relating to wind microclimate already considered in the s.73 as set out in the London Plan 2011.

[Sustainable Design and Construction, Supplementary Planning Guidance, 2014](#)

17A.2.3 The Sustainable Design & Construction, Supplementary Planning Guidance (SPG)ⁱⁱ was published in April 2014. Section 2.3.7 states *“Large buildings have the ability to alter their local environment and affect the micro-climate..... One way to assess the impact of a large building on the comfort of the street environment is the Lawson Comfort Criteria. This tool sets out a scale for assessing the suitability of wind conditions in the urban environment based upon threshold values of wind speed and frequency of occurrence. It sets out a range of pedestrian activities from sitting through to crossing the road and for each activity defines a wind speed and frequency of occurrence. Where a proposed development is significantly taller than its surrounding environment, developers should carry out an assessment of its potential impact on the conditions at ground level, and ensure the resulting design of the development provides suitable conditions for the intended uses”*.

17A.3 Relevant Phase 1A (North) RMAs Details

17A.3.1 Following a review of the Phase 1A (North) RMAs, the following structures have been identified as being of particular relevance to the assessment:

- Replacement Tempelhof Bridge structure (B1);

- Temporary Bus Station and Bus Stops (Plots 114 and 113 respectively); and
- New bridge structures which would be available for pedestrian use including eight new River Brent bridges, the Living Bridge (B7) and a new pedestrian and cycle bridge at the M1 junction (B6) (as described in **Chapter 2**).

17A.3.2 These elements were assessed as part of the assessment of the Scheme in outline in the s.73 ES, however further consideration is given within this Chapter to the detailed design of these structures to determine the likely wind conditions and whether significant effects are likely which were not identified in the s.73 ES.

17A.3.3 The proposed public open spaces included in Phase 1A (North) RMAs are relevant to the assessment in that they provide areas of public realm with desired uses which were not previously known in the outline planning application (i.e. the s.73 ES). These areas include:

- Claremont Park Improvements;
- Clitterhouse Playing Fields Improvements Part 1; and
- Central Brent Riverside Park including River Brent Nature Park.

17A.3.4 The residential buildings proposed at Plots 53 and 54 are below four storeys in height and therefore are not considered to require further assessment of pedestrian comfort or safety as no new or different significant effects are considered to be likely. Plots 53 and 54 are therefore not considered further in this Chapter.

17A.3.5 The Temporary Bus Station and Bus Stops (Plots 114 and 113 respectively) have also been considered since they would be used by the general public.

17A.4 Assessment Methodology

17A.4.1 Further wind assessment has been undertaken by BMT to identify any likely significant environmental impacts arising from the Development with Phase 1A North RMAs in place, but also to address in part, Planning Condition 34.5 of the 2014 Permission which states:

“In order to alleviate adverse wind conditions in accordance with the mitigation proposed in the Environmental Statement all reserved matters applications for buildings and bridge structures must demonstrate that the following mitigation measures have been considered and will be provided where appropriate:

a) Recessing of entrances;

b) Entrance screens;

c) Softening sharp building corners;

d) Canopies above entrances;

e) Localised shelter to create pockets of areas suitable for long periods of outdoor sitting or general recreational activities as required.”[Basis of the Assessment](#)

17A.4.2 The following Development configurations have been assessed in the wind tunnel:

- **Configuration 1: Interim Surrounds** - Phase 1A (North) elements alongside the existing surrounds;
- **Configuration 2: Phase 1A (North) RMAs plus the Illustrative Masterplan** (i.e. Parameter Plan 015: Indicative Layout Plan as included in the Revised Development Specification Framework (RDSF) which formed part of the 2014 Permission);
- **Configuration 3: Phase 1A (North) RMAs plus Maximum Height Parameter Plan** (as per Parameter Plan 007C: Maximum Building and Frontage Heights AOD Setting Out Points as included in the RDSF of the 2014 Permission) for the remainder of the Development; and
- **Configuration 4: Consented Future Schemes with Maximum Height Parameter Plan** (see **Figure 4.1: Cumulative Schemes**).

Method of Assessment

- 17A.4.3 Wind tunnel testing is the most well-established and robust means of assessing the pedestrian wind microclimate. It enables the wind conditions at the Site to be quantified and classified in accordance with the widely accepted Lawson Criteria for comfort and safety. Wind tunnel testing was used in the s.73 ES and the modelling work has been updated to reflect the Phase 1A (North) RMAs.
- 17A.4.4 The wind tunnel test results deliver a detailed assessment of the mean and gust wind conditions around the existing site and the Development for all wind directions in terms of pedestrian comfort and safety.
- 17A.4.5 Although all four configurations were tested within the wind tunnel and results are presented within **Appendix 17A.1**, this Chapter focuses on reporting the outcomes of the wind tunnel test for Configuration 3 (the Maximum Height Parameter Plan for the remainder of the Development), as this represents those parameters approved through the 2014 Permission. As such, this configuration represents the Phase 1A (North) RMAs plans alongside the consented maximum building heights, whilst the width and length dimensions of the buildings within the Scheme (outside of Phase 1A (North)) are provided in line with the indicative layout plan (Parameter Plan 015 of the RDSF) as the maximum width and length parameters were unfeasible to model due to overlapping of maximum parameters and the assessment carried out is considered to be robust and identifies and assesses any new or different likely significant effects as reasonably required.
- 17A.4.6 Detailed design plans and 3D model files were collated from each of the architects and engineering design teams involved in Phase 1A (North) (Howarth Tompkins: Plots 53 and 54, Chapman Taylor: Living Bridge, MacGregor Smith: Open Spaces, and URS: Road, Bridge and River Infrastructure) along with an illustrative Masterplan model (as per the s.73 ES assessment) and a Maximum Height Parameter Masterplan model from Allies and Morrison. BMT created an integrated 3D model for the whole Development using this information which was then used to identify and agree on appropriate probe locations for the wind tunnel test and to then create a physical model of the Development for use in the wind tunnel test.
- 17A.4.7 A 1:400 scale model of the existing buildings at and surrounding the Site within an 800 metre (m) radius from the centre of the Site was constructed. The buildings and other structures as defined by the Phase 1A (North) RMAs (plots 53 and 54, highways infrastructure, bridges and open spaces) and the wider approved Development as well as cumulative surrounding developments were constructed and used in the wind tunnel model. Landscaping plans from MacGregor Smith were

reviewed and trees incorporated within the scale model using their mature height as provided by MacGregor Smith. As such, not all landscaping proposal details (all trees and vegetation) could be represented within the model, however large trees were included for the Phase 1A (North) open spaces.

17A.4.8 The methodology for quantifying the pedestrian level wind environment of the existing Site and the Development is outlined below:

- Step 1: Measure the building-induced wind speeds at pedestrian level in the wind tunnel;
- Step 2: Adjust standard meteorological data to account for conditions at the Site;
- Step 3: Combine these to obtain the expected frequency and magnitude of wind speeds at pedestrian level; and
- Step 4: Compare the results with the Lawson Criteria to 'grade' conditions around the site by reference to the planned/desired pedestrian activities.

17A.4.9 To note, the design drawings modelled for Plots 53 and 54 are based on those available in October 2014 with a proposed unit number of 60 total units. As such the figures associated with this assessment include the layouts with a larger unit number than is now being submitted for the RMA. The final proposal for Plots 53 and 54 provide a total of 47 units in a similar configuration, however the plots are slightly smaller due to the reduced unit number. As such, it is considered that the results presented here provide a worst case outcome for microclimate and potential impacts for overshadowing on nearby residents are therefore conservative. The daylight and sunlight assessment however (provided by GL Hearne) has been updated to incorporate the latest design drawings.

Simulation of Atmospheric Winds

17A.4.10 Wind is unsteady or gusty, and this 'gustiness' or turbulence varies depending upon the Site. Modelling these effects is achieved by a series of grid, barrier and floor roughness elements to create a boundary layer that is representative of urban or open country conditions, as is appropriate.

Measurement Technique and Data Analysis

17A.4.11 Wind speed measurements at assessment locations were made using probes capable of measuring fluctuating pressure differences that are calibrated against wind speed. A system of probes running simultaneously was used to obtain results from 100 locations at a height corresponding to 1.5m at full scale; 84 at ground level and 16 at elevated bridge levels. Measurement locations were selected to achieve the optimum coverage of Phase 1A (North) RMAs elements, as well as the immediate surrounding area.

17A.4.12 Measurements were taken for a full range of wind directions in increments of 22.5° (0° coinciding with OS grid north). Recordings were taken for a sufficient length of time to determine the mean and gust wind speeds.

17A.4.13 For each location the measured wind speeds were combined with long-term wind frequency statistics to assess the wind environment in terms of the exceedance of threshold wind speeds that relate to comfort levels for the intended / desired pedestrian use / activity, and to safety. Wind frequency statistics, covering a period of 10 years, were obtained from London Weather Centre and

transposed, accounting for variations in terrain between the site and the weather centre, to apply directly to the Site.

Pedestrian Wind Safety and Comfort Criteria

17A.4.14 The approach to the assessment methodology, including relevant significance criteria, follows the same methodology as applied in the s.73 ES.

Pedestrian Safety

17A.4.15 At each area investigated, the suitability of the pedestrian level wind environment in terms of safety is assessed based on the Lawson criteria for pedestrian safety. Safety is determined for the ‘able-bodied’ and for the ‘general public’. For the general public a wind speed of 15 metres-per-second occurring once per year is rated as unsafe, with the potential to de-stabilise the less-able members of the public including the elderly, cyclists and children. Able-bodied users are more likely to be capable of defending themselves against extreme pedestrian level winds and thus experience distress at a higher threshold wind speed of 20 metres-per-second, once per year.

17A.4.16 Details of the safety criteria are presented in **Table 17A.1** and are based on the exceedance of the threshold wind speeds, based on the mean hourly value and on the gust equivalent mean value, occurring once per annum.

Table 17A.1: The Lawson Safety Criteria

Threshold Wind Speed Once per Annum	Mean-hourly Speed Exceeded	Safety Rating	Qualifying Comments
> 15 m/s		S2	Unsuitable for general public Less able and cyclists find conditions physically difficult
> 20 m/s		S1	Unsuitable for able-bodied Able-bodied persons find conditions difficult. Physically impossible to remain standing during gusts.

Pedestrian Comfort

17A.4.17 The assessment of wind conditions requires a ‘standard’ against which to benchmark the microclimate. The Lawson Comfort Criteria (LCC) has been established for around thirty years and has been widely used on building developments across the UK.

17A.4.18 Lawson devised a scale for assessing the suitability of wind conditions in the built environment. The LCC define a range of pedestrian activities from sitting through to more transient activities such as crossing the road, and for each activity define a threshold wind speed and frequency of occurrence beyond which the wind environment would be unsuitable for the stated activity. The wind speeds and activities are described in **Table 17A.2**.

17A.4.19 The criteria reflect the fact that sedentary activity, such as sitting, requires a low wind speed for a reasonable level of comfort whereas for more transient activity (such as walking) pedestrians would tolerate stronger winds.

17A.4.20 If the wind conditions exceed the threshold then the conditions are unacceptable for the stated activity. If the wind conditions are below the threshold then they are described as tolerable (or suitable) for the stated activity.

Table 17A.2: The Lawson Comfort Criteria

Threshold Wind Speed Exceeded < 5% of the Time	Mean-hourly	Comfort Rating / Activity	Qualifying Comments
4m/s		C4 Long-term sitting	Reading a newspaper and eating and drinking.
6m/s		C3 Standing or short-term sitting	Appropriate for bus stops, window shopping and building entrances.
8m/s		C2 Walking or strolling	General areas of walking and sightseeing.
10m/s		C1 Business walking	Local areas around tall buildings where people are not likely to linger.
> 10m/s		C0 Uncomfortable	Uncomfortable for all pedestrian activities.

17A.4.21 The assessment takes full account of seasonal variations in wind conditions and pedestrian activities. For example, conditions for recreational activities focus on summer, but also consider spring and autumn, whilst conditions for pedestrian thoroughfare, access or waiting (e.g. bus stops) consider all seasons, with winter usually being the critical season. The pedestrian level wind environment assessment is summarised in terms of suitability for various activities.

17A.4.22 The activities considered, and their relation to the LCC, are summarised in **Table 17A.3**.

Table 17A.3: Suitability Assessment

Suitability	Lawson Comfort Criteria
For long periods of sitting such as for an outdoor café.	'Long-term sitting' in summer.
For pedestrian ingress/egress at a building entrance, or short periods of sitting or standing such as at a bus stop, taxi rank, meeting point, etc.	'Standing or short-term sitting' in all seasons.
For leisure uses excluding long periods of outdoor sitting such as a park, children's play area, etc.	'Standing or short-term sitting' from spring to autumn.
For access to and passage through the development and surrounding area.	'Business walking' / 'Walking or strolling' in all seasons.

Significance Criteria

17A.4.23 With respect to wind microclimate, the significance of the environmental effects of the Development is based on the suitability of wind conditions at each location assessed within the study area against either the current or planned pedestrian activities (as appropriate), based upon the LCC. As such

the locations and activities beyond the redline boundary of the Development (i.e. pedestrian footpaths) that would remain unchanged post development would be assessed against current activities; and where the introduction of the Development would alter the existing activities and built form, the associated locations would be assessed against the planned / desired activity.

17A.4.24 In summary, the following criteria were used to assess likely wind conditions as a result of the Development:

- **Major Beneficial:** Any effect on wind conditions which potentially improves pedestrian safety (such as an improvement in conditions from being considered unsafe to being considered safe).
- **Moderate Beneficial:** Any effect on wind conditions that improves pedestrian comfort from unsuitable to suitable for planned activities.
- **Minor Beneficial:** Any effect on wind conditions which improves pedestrian comfort from unsuitable to marginal/tolerable for planned activities, or from marginal/tolerable to suitable for planned activities.
- **Negligible:** Any effect that does not alter the suitability of existing wind conditions with respect to planned activities.
- **Minor Adverse:** Any effect on wind conditions which worsens pedestrian comfort from suitable to marginal/tolerable for planned activities, or from marginal/tolerable to unsuitable for planned activities.
- **Moderate Adverse:** Any effect on wind conditions that worsens pedestrian comfort from suitable to unsuitable for planned activities.
- **Major Adverse:** Any effect adversely affecting pedestrian safety.

17A.5 Consultation

17A.5.1 LBB has provided an informal scoping review and it has confirmed that it was in agreement with the scope of this further wind assessment for the Phase 1A (North) RMAs. Comments were received from Capita (as detailed in **Table 4.1** of this Report), within the December 2014 EIA Scoping Opinion regarding the proposed scope of the assessment and whether interim site conditions upon completion of Phase 1A (North) would be modelled in advance of the masterplan completion. The wind microclimate assessment includes a modelled scenario for interim site conditions ('Interim Surrounding Conditions') which exist once Phase 1A (North) elements are constructed but prior to the remaining scheme being built, including the temporary bus station and bus stops. The results of this wind tunnel test is provided within this Chapter and in **Chapter 20: Intermediate Years Assessment**. Capita also requested that if dense evergreen trees are proposed as wind mitigation, these should be included within the overshadowing assessment. Landscaping (trees) was included within the microclimate assessment including those on the Living Bridge, however overshadowing from trees was not assessed specifically for Phase 1A (North) in amenity spaces. In consideration of the final landscaping plans, tree locations and heights on the Living Bridge are not deemed likely to result in any significant adverse shading impacts.

17A.6 Baseline Conditions

- 17A.6.1 The wind baseline information presented in the s.73 ES Microclimate Chapter has been reviewed and its validity is confirmed as there have been no significant variations to the baseline condition since the s.73 ES Microclimate Chapter was written. The baseline conditions presented in the s.73 were based on wind tunnel testing of the existing Site.

17A.7 Assessment and Mitigation

Construction

Potential Impacts

- 17A.7.1 Wind impacts related to the construction phase were not identified in the s.73 ES and are generally not considered for potential wind impacts due to the temporary nature and insignificant wind impacts of construction activities and equipment which may alter wind speeds on Site such as hoarding and construction equipment. No significant construction impacts have been identified following a review of the Phase 1A (North) RMAs. The Intermediate Years Assessment within the s.73 ES however considered the wind effects during interim stages of the Development which has been reviewed and updated by BMT and the findings presented in **Chapter 20: Intermediate Years Assessment**.

Mitigation Measures and Residual Impacts

- 17A.7.2 For the reasons set out above, mitigation measures and residual impacts for the construction stage of the Phase 1A (North) RMAs and Development have not been considered further.

Operation

Potential Impacts

- 17A.7.3 Further wind tunnel modelling has been undertaken of the Development with the detailed design of Phase 1A (North) RMAs in place. Full details are provided in **Appendix 17A.1**.
- 17A.7.4 The wind tunnel modelling has been undertaken on the basis of the Phase 1A (North) RMAs in the context of the approved maximum height parameters for the remainder of the Development approved in outline under the 2014 Permission.
- 17A.7.5 The results, based on Configuration 3 Phase 1A (North) RMAs with the maximum height parameters in place for the remainder of the Development are summarised below to represent the worst case scenario for wind and is summarised below by each feature. Details on the Illustrative Masterplan results can be found within **Appendix 17A.1**.

Templehof Bridge

- 17A.7.6 Wind conditions on the replacement Tempelhof Bridge are considered unsuitable, in terms of safety, for less able pedestrians and cyclists with the maximum height parameters masterplan in place and would be considered to have a **major adverse** impact (location 22 in **Figure 17A.1**). This impact is due to the channelling of prevailing south westerly winds between the tall buildings of the Maximum

Height Parameters masterplan to the North and South of the A406. Wind conditions within Interim Surrounds and the Illustrative Masterplan however, are considered safe and comfortable for the intended use as a public thoroughfare. The maximum height parameters are unlikely to be delivered to the approved heights although mitigation would need to be carefully considered once the detailed design of these buildings is known at the detailed design stage for the relevant sub-phase. This impact is not present in the Interim Surrounds (prior to these adjacent Development Zones being constructed) and therefore does not require mitigation through the design of the replacement Templehof Bridge.

Central Brent Riverside Park

- 17A.7.7 Wind conditions along pedestrian routes through the Central Brent Riverside Park were modelled in 9 locations (**Figures 17A.1 & 17A.2**) and are considered to be comfortable for use as a thoroughfare within all surrounding configurations and is therefore considered to be a **negligible impact**.

River Brent Bridges

- 17A.7.8 The new bridges 1-2 and 7-10 across the River Brent would be available for pedestrian use (bridges 3-6 are vehicular only), although they will primarily be used by road traffic (see bridge locations in **Figure 2.4**). Wind conditions in the area within the Central Brent Riverside Park and surrounding area, including these additional bridges, are considered to be comfortable for use as a thoroughfare within all surrounding configurations. The impacts in terms of pedestrian safety and comfort would therefore be **negligible**.

Living Bridge

- 17A.7.9 The Living Bridge is primarily designed to be used as a thoroughfare for pedestrians and cyclists between the northern and southern sides of the A406. However, some areas of the bridge at the northern and southern approaches are also planned for use as outdoor restaurant / cafe seating, market stalls and / or bandstand shows. A total of 14 locations were tested to establish wind conditions on the Living Bridge (see **Figure 17A.2**). Conditions are predicted to be comfortable for use as a thoroughfare within all surrounding configurations since with the maximum height parameters in place for surrounding buildings wind conditions are considered suitable for short term sitting / standing in all locations along the Living Bridge. Four locations, two at the northern end (14 and 15) and two at the southern end (31 and 35) are identified as requiring mitigation for their desired use of café (north) and market stalls (south). The Living Bridge is considered unsuitable for long periods of sitting that would be required for outdoor seating and is therefore this is considered to represent a **moderate adverse** impact prior to any mitigation being considered (see below).

B6 Pedestrian and Cycle Bridge

- 17A.7.10 The pedestrian and cycle bridge at B6 at the M1/A406 junction is designed to connect existing and future residents and visitors to the Site from the north and south of the Development for ease of access. Probe location 1 is located on the bridge as shown in **Figure 17A.1**. Conditions are predicted to be suitable for 'strolling' and therefore comfortable for the proposed users, this is therefore considered to represent a **negligible** impact.

Claremont Park

- 17A.7.11 Claremont Park is relatively sheltered from prevailing south-westerly and westerly winds. Wind conditions within the park, with detailed design as defined by the Phase 1A (North) RMAs, are considered suitable for long periods of sitting within the maximum height parameters configurations and would therefore be considered to have a **negligible** impact (refer to Probe locations 53 – 65 on **Figure 17A.1**).

Clitterhouse Playing Fields

- 17A.7.12 Wind conditions within Clitterhouse Playing Fields are considered suitable for the intended uses as sports fields and general recreational use and therefore impacts would be **negligible** (refer to probe locations 90 – 100 on **Figure 17A.1**).

Residential Plots 53 & 54

- 17A.7.13 Wind Conditions around Plots 53 & 54 are considered suitable, in terms of comfort, for all configurations and therefore impacts would be **negligible** (**Figure 17A.3**).

Temporary Bus Station and Bus Stops

- 17A.7.14 The temporary bus station and bus stops (Plots 114 and 113 respectively) layout were not modelled within the wind tunnel test as the design of these elements had not been completed by October 2014 when the assessment was completed. Despite this, probe locations (2 and 3 on **Figure 17A.1**) were added to the wind tunnel test at the location of both features to obtain wind speed results for the 'with' and 'without' scenarios in the Interim state. The wind speeds surrounding the temporary bus station in Plot 114 were found to be approximately 8 m/s, with a comfort rating of C2 suitable for walking and strolling, but not suitable for short term sitting. The wind speeds however at the temporary bus stops at Plot 113 were approximately 6 m/s with a comfort rating of C3 suitable for standing or short term sitting. As such, the temporary bus station was deemed inappropriate for bus stops which would have short term sitting, without some shelter present, whilst the bus stops at Plot 113 were deemed to be acceptable without further shelter.
- 17A.7.15 As such, the temporary bus station (Plot 114) will result in a minor adverse impact without any form of bus shelter for passengers, whilst bus stops at Plot 113 will result in a negligible impact.
- 17A.7.16 Due to the recent design development of the temporary bus station and bus stops, following the wind tunnel test, it has been possible to include appropriate bus shelters in the final design that would become inherent mitigation and reduce the impacts at both locations to negligible. Bus shelters have been designed to shelter passengers from the south-westerly prevailing winds.

Mitigation Measures

- 17A.7.17 In 2008, a wind mitigation scheme was undertaken as part of the RES 2009. The s.73 ES relied upon Planning Condition 34.5 which requires all reserved matters applications for buildings and bridge structures to demonstrate that *"mitigation measures have been considered and will be provided where appropriate."*
- 17A.7.18 Mitigation measures for those areas where adverse wind conditions have been identified compared to the desired use are as follows:

- **Templehof Bridge** – The addition of mitigation, for example a 1.5m high solid barrier along the bridge sides where railings are proposed, will be required if the maximum height parameters are taken forward for the future development plots to the north and south of the bridge. However, with the Illustrative Masterplan in place building heights do not result in wind speed exceedances leading to safety concerns and would therefore not require the introduction of mitigation measures. It is there therefore considered that the need for any mitigation cannot be determined until the building heights of the future phases is known, however careful consideration of the potential wind speed exceedances in this area should be given to inform the detailed design of adjacent Development Zones/phases. Further wind tunnel testing and mitigation workshops are proposed for the future development phases as they enter into detailed design for RMAs.
- **Living Bridge** – With the introduction of mitigation, wind conditions have the potential to improve further, creating areas of the bridge which are suitable for outdoor café seating. Potential mitigation for the Living Bridge (predominantly associated with the surrounding future Development Plots) at probe locations 14, 15, 31 and 35 could include:
 - Porous screens or baffles towards the southern end of the bridge to both break up southern winds funnelled between buildings and help alleviate the effects of the downdraught;
 - A canopy placed between buildings on either side of the southern end of the bridge to deflect or diffuse winds accelerated towards the ground by tall buildings beside the bridge; and
 - A canopy over the entrance to the Shopping Centre (probe location 14) providing local protection to seating at this end of the bridge. This mitigation would create areas of the bridge that could be suitable for longer periods of sitting, and therefore suitable as outdoor seating for restaurants.
- The wind assessment would therefore be revisited at each sub-phase RMA for the Development to determine the impacts of the detailed design of the adjacent development plot buildings in particular their height, on wind speeds across the Living Bridge. Given that the wind assessment and design details would require LBB approval it is reasonable to conclude that the proposals for these development plots adjacent to the bridge would result in acceptable wind levels on the Living Bridge. The details of wind mitigation will therefore be confirmed at future phases (Phase 1B (north and south) and 1C) with the relevant RMA for the adjacent development plots.

Residual Impacts

- 17A.7.19 With the introduction of the proposed mitigation measures as described above it is predicted that all Phase 1A (North) elements would be considered as suitable, in terms of comfort and safety, for intended purposes. The residual wind impacts associated with Phase 1A (North) can therefore be considered **negligible**.

17A.8 Summary

17A.8.1 The following new or different potential impacts, mitigation or residual impacts arising from the Development have been identified in respect of Wind Microclimate for the Development including Phase 1A (North) RMAs within the Maximum Height Parameters Masterplan in place as a worst-case.

Table 17A.4: Potential Impacts, Mitigation Measures and Residual Impacts

Issue	Potential Impacts	Mitigation Measures	Residual Impacts
	ES FIR	ES FIR	ES FIR
Tempelhof Bridge	Major Adverse	Detailed design of adjacent Development Zones to ensure pedestrian safety levels are not exceeded.	Negligible
Central Brent Riverside Park	Negligible	N/A	Negligible
Living Bridge	Moderate Adverse	Localised soft landscaping / porous screens, canopies on adjacent Development Zones at northern / southern ends of bridge (to be defined at subsequent RMA stage)	Negligible
River Brent Bridges	Negligible	N/A	Negligible
Claremont Park	Negligible	N/A	Negligible
Clitterhouse Playing Fields	Negligible	N/A	Negligible
Plots 53 and 54	Negligible	N/A	Negligible
Temporary Bus Station and Bus Stops	Negligible	Bus shelters orientated to shelter from prevailing southwesterly winds inherent in design therefore does not form mitigation commitment.	Negligible

References

- ⁱ Greater London Authority (2014); Draft Further Alterations to the London Plan
- ⁱⁱ Greater London Authority (2014); Sustainable Design & Construction, Supplementary Planning Guidance¹