

# 13 Noise and Vibration

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## 13.1 Introduction

- 13.1.1 This ES Addendum Chapter, prepared by Buro Happold, provides a Statement of Conformity that reports the findings related to whether the S.73 Amendment Application, or other changes in circumstances, materially affect the environmental information pertaining to noise and vibration effects provided within the 2015 ES to inform decision making.

## 13.2 Competence

- 13.2.1 This ES Addendum chapter was written by Gareth Davies, CEng and BSc(Hons); an Acoustic Consultant over 9 years' consultancy experience and with proficiency in noise and vibration impact assessment and associated EIA inputs for numerous developments.

## 13.3 EIA Topic Overview

- 13.3.1 The purpose of this chapter is to consider the implications on noise and vibration that could arise with the S.73 Application and whether the environmental effects and mitigation measures previously reported within the 2015 ES remain valid.

- 13.3.2 The 2015 ES Chapter identified the following residual effects:

Construction (worst-case assessment):

- Construction noise and vibration: negligible to major

Completed Development:

- Operational road traffic noise: negligible to minor;
- Match day noise: negligible to minor;
- Music concert noise: negligible to minor;
- NFL noise: negligible to minor; and
- External fixed plant noise: negligible.

## 13.4 Relevant Amendments

- 13.4.1 The S.73 Application seeks to amend Plot 3 of the Consented Scheme. The Amendments of relevance to the noise and vibration assessment are as follows:

- Changes to the building form and layout of the building;
- Increase to the height of the building (an increase of approximately 27m from 100m to c.127m); and

- 13.4.2 It is important to note that the overall level of parking, and therefore vehicle trip generation associated with those occupiers who will hold a car parking space, would not materially change from that of the 2015 ES.

### 13.5 Assessment Review

13.5.1 The scope of the noise and vibration assessment is as follows:

- Review and update the baseline conditions where necessary;
- Review and update the policy and guidance section, where necessary;
- Review and identify any new sensitive locations where people might be affected by changes in noise and vibration;
- Qualitatively consider the changes to noise and vibration, using technical guidance;
- Review of cumulative schemes for assessment.

### 13.6 Legislation and Policy Review

13.6.1 A number of the policy documents reviewed as part of the Noise and Vibration chapter of the 2015 ES have been updated in their entirety or in part since that time. This includes the NPPF, Planning practice guidance and London Plan. However, the intent of policy, with regard to noise and vibration remains in line with that presented in the 2015 ES and, therefore, given the scale and scope of the changes requiring assessment, remains valid for the purposes of this ES Addendum.

### 13.7 Baseline Review

13.7.1 Since approval of the Consented Scheme, the Site has undergone significant change as a result of works to deliver the Consented Scheme, with the completion and occupation of Plots 1 and 2. The remainder of the Site is currently occupied by the podium associated with the stadium, public realm and temporary structures.

13.7.2 An environmental noise survey was carried out by Buro Happold between the 3<sup>rd</sup> and 5<sup>th</sup> of August 2022 to assess the existing noise levels around the Site, with results provided in Table 13.1.

13.7.3 Generally the measured noise levels, as presented below, are quieter than those measured at the nearby Location P1 (Park Lane at south west corner of stadium opposite Concorde House) for the 2015 ES. Marginal differences identified are expected to be due to changes in traffic flows on local roads, and significant differences in data more likely to be the difference in monitoring locations in relation to noise sources. As such, the 2015 ES survey data is still considered valid and applicable.

Table 13.1: Baseline Survey Results

| Starting Date                                                          | $L_{Aeq,T,16h}$ (07:00 to 23:00) | $L_{Aeq,T,8h}$ (23:00 to 07:00) | Lowest $L_{A90,15min}$ (07:00 to 23:00) | Lowest $L_{A90,15min}$ (23:00 to 07:00) |
|------------------------------------------------------------------------|----------------------------------|---------------------------------|-----------------------------------------|-----------------------------------------|
| <i>Location – Park Lane at southern edge of Podium for Development</i> |                                  |                                 |                                         |                                         |
| Wednesday 3 August 2022                                                | 58                               | 54                              | 55                                      | 43                                      |
| Thursday 4 August 2022                                                 | 59                               | 56                              | 54                                      | 45                                      |

| Starting Date        | L <sub>Aeq,T,16h</sub> (07:00 to 23:00) | L <sub>Aeq,T,8h</sub> (23:00 to 07:00) | Lowest L <sub>A90,15min</sub> (07:00 to 23:00) | Lowest L <sub>A90,15min</sub> (23:00 to 07:00) |
|----------------------|-----------------------------------------|----------------------------------------|------------------------------------------------|------------------------------------------------|
| Friday 5 August 2022 | 59                                      | -                                      | 56                                             | -                                              |

13.7.4 While on-site during the baseline survey, the main noise sources were noted as being associated with local road traffic movements as well as pedestrian movement. Event-days significantly change the noise climate from low noise levels to high noise levels.

13.7.5 The following new residential noise sensitive receptors (NSRs) have been identified since preparation of the 2015 ES in the vicinity of the Site:

- 798-808 High Road, London, N17 0DH; and
- 807 High Road, N17 8ER.

13.7.6 A number of receptors adjacent to High Road were modelled as part of the 2015 ES; these receptors are considered to represent worst-case exposure of the new receptors. It is not expected that significant noise levels arise at these locations over and above those previously identified in the 2015 ES. It is not anticipated that ambient noise levels have been significantly changed at the nearest NSRs due to the presence of these developments given their residential nature.

## 13.8 Scheme Design and Management Measures Review

### Construction

13.8.1 The Consented Scheme planning permission includes a series of measures designed to control noise and vibration during construction, taking into account noise sensitive receptors both within and adjacent to the Site. This includes adherence to a CEMP and it is still appropriate for the contractor or developer to agree a noise monitoring and control regime with the Local Authority, prior to construction.

### Completed Development

13.8.2 The Consented Scheme includes a series of measures designed to control noise and vibration during the completed Development stage, taking into account noise sensitive receptors both within and adjacent to the Site. These include façade specifications, and plant noise and vibration mitigation.

## 13.9 Assessment of Environmental Effects Review

### Construction

13.9.1 The duration of the construction period for the Development has extended beyond the 2022 opening day predicted within the 2015 ES. The overall duration of each construction period plot-by-plot is assumed to be of a similar nature to that presented within the 2015 ES, as set out in Chapter 6: Construction. Therefore, the construction noise and vibration generated during the construction stage will remain unaltered from that presented in the

2015 ES. There remain a range of residual effects between negligible to major adverse significance that would be localised to the phased area of works.

### **Completed Development**

- 13.9.2 Detailed design of future phases will use the most recent measured noise levels from the proposed development location, as presented in Table 13.1. Event day noise measurements and predictions will be used to assess worst-case ambient noise levels that will inform façade specifications, and plant noise and vibration mitigation.
- 13.9.3 As such, the residual noise and vibration effects will remain as stated in the 2015 ES. No further mitigation is required beyond those already detailed within the 2015 ES.

## **13.10 Mitigation Measures and Likely Residual Effects Review**

### **Construction**

- 13.10.1 The residual effects for the Development will be the same as those previously reported in the 2015 ES and no further mitigation is required beyond those already agreed for the Consented Scheme and secured by planning condition(s).

### **Completed Development**

- 13.10.2 Provided appropriate mitigation measures are implemented to achieve the proposed noise limits, the likely residual noise impacts of operational building services plant are expected to be as stated in the 2015 ES. No further mitigation is required beyond those already detailed within the 2015 ES and secured by planning condition(s).

## **13.11 Cumulative Effects Review**

- 13.11.1 There is not predicted to be any significant cumulative noise and vibration effects during construction as each construction site will employ good site practice. Once operational, the Development and cumulative schemes will operate to the latest building regulations and no significant effects are expected. As such, no further mitigation is considered necessary, as stated in the 2015 ES.

## **13.12 Comparison with the Consented Scheme**

- 13.12.1 The potential impacts from noise and vibration associated with the Amendments as detailed in the S.73 Application have been considered. This has considered the changes as reported in 2015 ES.
- 13.12.2 The potential changes resultant from the Amendments are not materially considered to affect the noise and vibration conclusions stated for the construction phase and completed Development. Therefore, the findings of the 2015 ES are considered still valid and applicable to this application and all likely significant effects resulting from the Development are likely to remain as reported, with no additional effects or mitigation identified.
- 13.12.1 Table 13.2 provides a summary of the previously reported effects presented in the 2015 ES, the potential changes to the effects as a result of the Amendments and additional commentary to accompany.

Table 13.2: Suitability of Previous Reported Findings

| Aspects Previously Considered in 2015 ES   | Potential changes due to Amendments       | Comments                                                                                                                                                                                                                             |
|--------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Construction Stage</i>                  |                                           |                                                                                                                                                                                                                                      |
| Construction Noise                         | No likely change – negligible to major    | Assumptions and criteria have not significantly changed. It is still appropriate for the contractor or developer to agree a noise monitoring and control regime on a phase-by-phase basis, with LB Haringey, prior to construction.  |
| Construction Vibration                     | No likely change – negligible to moderate | Assumptions and criteria have not significantly changed. It is still, appropriate for the contractor or developer to agree a noise monitoring and control regime on a phase-by-phase basis, with LB Haringey, prior to construction. |
| <i>Completed Development Stage</i>         |                                           |                                                                                                                                                                                                                                      |
| Operational road traffic noise             | No likely change – negligible to moderate | Baseline conditions, predictions and criteria have not significantly changed. Predictions and criteria have not significantly changed.                                                                                               |
| Match day noise                            | No likely change – negligible to major    | Baseline conditions, predictions and criteria have not significantly changed.                                                                                                                                                        |
| Music concert noise                        | No likely change – negligible to minor    | Baseline conditions, predictions and criteria have not significantly changed.                                                                                                                                                        |
| NFL noise                                  | No likely change – negligible to minor    | Baseline conditions, predictions and criteria have not significantly changed.                                                                                                                                                        |
| External amenity noise (new consideration) | No likely change – negligible to minor    | The development targets 'inaudibility' from entertainment activities between 23:00 and 01:00 hours as per Condition 4 of the THS Premises Licence.                                                                                   |
| External fixed plant noise                 | No likely change – negligible             | Adoption of the latest environmental noise survey noise levels should see that noise limits will have direct, permanent, negligible effect, as target criteria has not changed.                                                      |

# 14 Socio-economics

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## 14.1 Introduction

- 14.1.1 This ES Addendum chapter, prepared by Quod, provides a Statement of Conformity that reports the findings related to whether the S.73 Amendment Application, or other changes in circumstances, materially affect the environmental information pertaining to socio-economics effects provided within the 2015 ES to inform decision-making.

## 14.2 Competence

- 14.2.1 This ES Addendum chapter was written by Vicky Lohead (BA MSc MRTPI); an Associate at Quod with over 10 years' consultancy experience and with proficiency in socio-economics assessment and associated EIA inputs for numerous developments including in the mixed-use, residential, and commercial/logistics sectors.

## 14.3 EIA Topic Overview

- 14.3.1 The purpose of this chapter is to consider the socio-economic implications, if any, that could arise with the S.73 Application and whether the environmental effects and mitigation measures previously reported within the 2015 ES remain valid.
- 14.3.2 The 2015 ES Chapter identified minor beneficial effects from construction employment at a local level, with a neutral effect at the regional level. Once operational, the Consented Scheme – at the local level – was predicted to lead to major beneficial effects relating to provision of new homes, open space and public realm, employment, local spending, and crime and safety effects. Moderate beneficial effects were predicted for provision of sports and recreation facilities, with minor beneficial effects predicted on healthcare requirements.

## 14.4 Relevant Amendments

- 14.4.1 The S.73 Application seeks to amend Plot 3 of the Consented Scheme. The Amendments of relevance to the socio-economics assessment are as follows:
- An increase in the floorspace of the communal areas without any changes to the maximum permitted number of hotel bedrooms (no.180) or dwellings (no.49) in the hotel. The overall floorspace of the hotel building would increase from approximately 18,820 sqm to 25,798 sqm. There would also be a small increase in the residential floorspace approved by the Consented Scheme to account for additional area required to provide second stair cores; and
  - Updates to the open and play space strategy presented in the updated landscape strategy.

## 14.5 Assessment Review

14.5.1 The scope of the socio-economics assessment review is as follows:

- Review and update the policy and guidance section, where necessary;
- Review and update the baseline conditions, where necessary;
- Review and identify any new sensitive locations where people might be affected by changes in socio-economics;
- Qualitatively consider the changes to socio-economics, using technical guidance;
- Review of cumulative schemes for assessment.

## 14.6 Legislation and Policy Review

14.6.1 A number of the policy documents reviewed as part of the Socio-Economic chapter of the 2015 ES have been updated in their entirety or in part since that time. This includes the NPPF, the London Plan, and the Local Plan. However, the intent of policy, with regard to socio-economics remains in line with that presented in the 2015 ES and, therefore, given the scale and scope of the changes requiring assessment, remains valid for the purposes of this ES Addendum.

## 14.7 Baseline Review

14.7.1 The Site has undergone significant change as a result of works to deliver the Consented Scheme, with the completion and occupation of Plots 1 and 2. The Plot 3 Site is currently occupied by the podium associated with the stadium, public realm and temporary structures.

14.7.2 The 2015 Socio-Economic ES chapter considered the socio-economic context predominantly using 2011 Census<sup>46</sup> data. Various datasets of the 2021 Census<sup>47</sup> are now available. However, it is not considered likely that this information will change the conclusions made particularly given the scale and scope of the Amendments.

## 14.8 Sensitive Receptors

14.8.1 There are no new categories of sensitive receptors in the vicinity of the Site that were not present at the time of the EIA for the 2015 ES.

## 14.9 Scheme Design and Management Measures Review

14.9.1 The mitigation measures identified at the time of the 2015 ES primarily involved enhancing the effects of the scheme rather than mitigating them. Measures included:

- Commitments to construction phase employment and training;
- Engagement in local area management, town centre management, and area promotion;

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<sup>46</sup> Office of National Statistics, 2011. Census.

<sup>47</sup> Office of National Statistics, 2021. Census.

- Enhanced engagement by the Tottenham Hotspur Foundation with local schools, and in sports development activity in the local area;
- A dedicated training programme for the hospitality industry within the hotel element of the development; and
- Business engagement and supply chain initiatives.

14.9.2 No additional mitigation measures have been identified further to those presented above as a result of the Amendments.

## 14.10 Assessment of Environmental Effects Review

### Construction

14.10.1 Given the scale and nature of the Amendments, the significance of the employment effect during the construction phase (as identified as part of the 2015 assessment) is not expected to alter. The duration of the overall Development construction period has extended beyond the 2022 opening day predicted within the 2015 ES. However, the overall duration of each construction period Plot-by-Plot is of a similar nature to that presented within the 2015 ES. Therefore, the employment generated during the construction stage will remain unaltered from that presented in the 2015 ES. This remains a minor beneficial effect at the local level and a negligible impact at the regional level.

### Completed Development

14.10.2 The Amendments do not change the number of residential units proposed as part of the Development as a whole. Therefore, any effects (e.g. demand for education, healthcare, open space and play space) associated with the residential uses proposed to be delivered by the Development are not considered as part of this ES Addendum as they are unchanged.

14.10.3 The Amendments to the Plot 3 (Hotel) element of the Development have the potential to affect the outcomes of the Consented Scheme for employment and spending figures identified through the 2015 ES. However, the Amendments do not change the number of hotel rooms proposed. As the number of hotel rooms forms the basis for the employment calculation, there is no expected change to the level of employment that the Plot 3 (Hotel) is expected to support nor the subsequent spending by those employees.

14.10.4 The Amendments also introduce new areas of open space and play space to Plot 3. The area of play space that will be available is sufficient to meet the needs of the 0-4 age group of children that could live on-Plot in the residential elements of the Plot. Demand from older age groups of children will be met elsewhere across the Development or off-site in existing spaces nearby such as Bruce Castle Park.

14.10.5 Overall, therefore, the range and the significance of the effects identified in the 2015 ES in relation to the completed Consented Scheme remain valid and unchanged in the context of the Development (i.e. the Consented Scheme as changes by the Amendments).

## 14.11 Mitigation Measures and Likely Residual Effects Review

### Construction

- 14.11.1 The residual effects for the Development will be the same as those previously reported in the 2015 ES and no further mitigation is required beyond those already agreed for the Consented Scheme and secured by planning condition(s). These were intended to maximise the beneficial employment effects of this phase. Those effects remain not significant. These measures will form part of the S.73 Application.

### Completed Development

- 14.11.2 Several mitigation measures were identified within the 2015 ES in relation to the completed Consented Scheme. One of these measures included the provision of a health centre as part of the proposals (specifically, as part of Plot 6) to help meet demand generated by residential accommodation proposed on-site. However, it is unlikely this centre will now be delivered. As such, demand for healthcare will be met by alternative planned provision in the area. This is expected to be secured via financial contributions from this and other schemes in the vicinity if addition funding is required over NHS funding and if it meets the Regulation 122 (of the CIL Regulations) tests. Overall, therefore, the residual effect of the Consented Scheme in relation to healthcare will be negligible at the local level after mitigation.
- 14.11.3 Other mitigation measures identified were typically intended to maximise beneficial effects rather than minimise or avoid any adverse effects. Apart from the approach in relation to healthcare provision, these measures remain unchanged as a result of the Amendments and will be resecured as part of the S.73 Application.

## 14.12 Cumulative Effects Review

- 14.12.1 The list of cumulative schemes as presented in Appendix 2.1 differ from those assessed as part of the 2015 ES. However, the schemes collectively are of a nature and scale which means that the conclusions reached in the 2015 ES remain valid. Overall, these schemes are likely to result in significant positive effects from an employment and housing delivery perspective and are negligible from a social infrastructure perspective (following appropriate mitigation via physical provision and/or CIL monies and/or S106 contributions).

## 14.13 Comparison with the Consented Scheme

- 14.13.1 The potential impacts from the Socio-Economic ES chapter associated with the Development as detailed in the S.73 Application have been considered.
- 14.13.2 The potential changes resulting from the Amendments are not materially considered to affect the Socio-Economic conclusions stated within the 2015 ES for the construction phase and completed Development. Therefore, the findings of the 2015 ES are considered still valid and applicable to this application and all likely significant effects resulting from the Development are likely to remain as reported, with no additional effects or mitigation identified.

14.13.3 Table 14.1 provides a summary of the previously reported effects presented in the 2015 ES, the potential changes to the effects as a result of the Amendments and additional commentary to accompany.

Table 14.1: Suitability of Previously Reported Findings

| Aspects Previously Considered in 2015 ES | Potential Changes in Residual Effects due to Amendments                                             | Comments                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Construction Stage</i>                |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Employment Generation                    | No likely change – minor beneficial (local) and negligible (regional)                               | The Amendments do not significantly alter the scale and/or nature of the Development overall. Therefore, the impact of the Development on construction employment is not expected to change to such an extent that it alters the significance of this effect.                                                                                                                                                                       |
| <i>Completed Development Stage</i>       |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Gross Direct Employment                  | No likely change – major beneficial (local), and moderate beneficial (wider impact area).           | The Amendments do not change the overall number of hotel rooms that will be provided within Plot 3 (Hotel). Similarly, no changes are made to the floorspaces of the remainder of the non-residential uses within the Development as a whole. On that basis, employment generated by this use is not expected to be different from that assessed previously and, as such, no change to the significance of this effect is expected. |
| Visitors and Spending                    | No likely change – major beneficial (local), and moderate (wider impact area).                      | The Amendments do not alter the scale or nature of the uses proposed for the Development. As such, there are not anticipated to be any significant changes to overall visitor numbers or spending associated with the Development. As such, the significance of this effect remains unchanged.                                                                                                                                      |
| Provision of New Homes                   | No likely change – major beneficial (local and wider impact area), and minor beneficial (regional). | The Amendments do not alter the number of residential units proposed to be delivered by the Development. Therefore, the significance of this effect remains unchanged.                                                                                                                                                                                                                                                              |
| Healthcare Requirements                  | No likely change – minor beneficial to negligible (local).                                          | The Amendments do not alter the number of residential units to be delivered. As such, there are no changes to the potential demand for primary healthcare, nor do the Amendments affect the potential for the                                                                                                                                                                                                                       |

| Aspects Previously Considered in 2015 ES | Potential Changes in Residual Effects due to Amendments | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          |                                                         | delivery of a community medical centre as part of the Development as a whole. However, as noted in the mitigation section above, the delivery of the health centre as part of Plot 6 is now uncertain. This means that mitigation of demand for healthcare is likely to take the form of a s106 contribution rather than physical provision on-site. As such, the significance of this effect is changed from minor beneficial to negligible at the local level.         |
| Education                                | No likely change - negligible.                          | The Amendments do not alter the number of residential units to be delivered. As such, there is no change to the demand for education nor do they affect the proposed mitigation measures identified in the 2015 ES. As such, the significance of this effect remains unchanged.                                                                                                                                                                                          |
| Open Space and Public Realm              | No likely change – major beneficial (local).            | The Amendments do not alter the proposed provision of open space and public realm across the Development as a whole. Therefore, the significance of this effect remains unchanged.                                                                                                                                                                                                                                                                                       |
| Play Space                               | No likely change – minor beneficial (local).            | The Amendments include the provision of new areas of play space/playable space – primarily to serve the apartments approved as part of a NMA in 2017. In total, 35 sqm of playable space is being delivered by the scheme. This is sufficient to meet demand generated by the 0 to 4 age group with demand from older children met either elsewhere within the development or off-site at Bruce Castle Park. Overall, the significance of this effect remains unchanged. |
| Sport and Recreation                     | No likely change – moderate beneficial (local).         | The Amendments do not alter the proposed provision of sport and recreation facilities as part of the scheme as a whole. As such, the significance of this effect remains unchanged.                                                                                                                                                                                                                                                                                      |
| Crime and safety                         | No likely change – major (local).                       | The Amendments do not change the impacts of the scheme on crime and safety.                                                                                                                                                                                                                                                                                                                                                                                              |

| Aspects Previously Considered in 2015 ES | Potential Changes in Residual Effects due to Amendments | Comments                                                      |
|------------------------------------------|---------------------------------------------------------|---------------------------------------------------------------|
|                                          |                                                         | Therefore, the significance of this effect remains unchanged. |

# 15 Transport

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## 15.1 Introduction

15.1.1 This ES Addendum Chapter, prepared by Ove Arup & Partners (`Arup`), provides a Statement of Conformity that reports the findings related to whether the S.73 Application, or other changes in circumstances, materially affect the environmental information pertaining to transport effects provided within the 2015 ES to inform decision making.

15.1.2 This Chapter is accompanied by the following technical appendices presented within Volume III:

- Appendix 15.1: Transport Assessment Addendum (TAA).

## 15.2 Competence

15.2.1 This ES Addendum chapter was written by Simon Binks, MSC, BEng(Hons); an Associate with over 19 years' consultancy experience and with proficiency in transport assessment and associated EIA inputs for numerous developments in both private and public sectors.

## 15.3 EIA Topic Overview

15.3.1 The purpose of this chapter is to consider the transport implications, if any, that could arise with the S.73 Application and whether the environmental effects and mitigation measures previously reported within the 2015 ES remain valid.

15.3.2 The 2015 ES Chapter identified neutral to minor adverse effects from construction traffic on the highway network. Once operational, the Consented Scheme was predicted to lead to minor beneficial effects on public transport users. Minor adverse effects were predicted on vehicle trips on the local highway network, pedestrians on High Road, and users of public transport entrances during match days.

## 15.4 Relevant Amendments

15.4.1 The S.73 Application seeks to amend Plot 3 of the Consented Scheme. The Amendments of relevance to this assessment are as follows:

- Changes to the building form and layout of the building;
- Amendments to the servicing strategy; and
- The overall floorspace of the hotel building would increase from approximately 18,820 sqm to 25,798 sqm. There would also be a small increase in the residential floorspace approved by the Operative Permission to account for additional area required to provide second stair cores.

## 15.5 Assessment Review

15.5.1 The scope of the transport assessment is as follows:

- Review and update the baseline conditions where necessary;
- Review and update the policy and guidance section, where necessary;
- Review and identify any new sensitive locations where people might be affected by changes in transport;
- Qualitatively consider the changes to transport, using technical guidance;
- Review of cumulative schemes for assessment.

## 15.6 Legislation and Policy Review

### National Planning Policy Framework (NPPF)

- 15.6.1 The previous reported legislation and policy framework is still valid, however the NPPF has been updated and it reinforces and sets out the Government's planning policies for England and how these should be implemented. In terms of the NPPF's transport content, Chapter 9 focuses on the promotion of sustainable transport. Paragraph 104 states that *"transport issues should be considered from the earliest stages of plan-making and development proposals so the potential impacts of development can be addressed and opportunities to promote walking, cycling and public transport are identified and pursued."*
- 15.6.2 Paragraph 105 states that significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering genuine choice of travel modes. In assessing sites, paragraph 110 states that it should be ensured appropriate opportunities to promote sustainable transport modes can be taken up and safe and suitable access can be achieved for all users.
- 15.6.3 With regards to highway effects, Paragraph 111 states a development should only be prevented or refused *"if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe."* Within this context, Paragraph 112 notes application should give priority to pedestrian and cycle movements first, address the needs of people with disabilities and reduced mobility, and create places that are safe, secure and attractive.

### Planning Practice Guidance

- 15.6.4 Planning Practice Guidance (PPG) provides advice on the following traffic and transport topic areas:
- Transport Evidence bases in Plan Making and Decision Making; and
  - Transport Plans, Transport Assessments and Statements.
- 15.6.5 The PPG is clear that Local Planning Authorities should undertake an assessment of the transport implications when reviewing and preparing their Local Plan. This will ensure that a robust transport evidence base is in place that identifies opportunities for encouraging a shift to sustainable transport.

- 15.6.6 With regard to the development of Travel Plans and Transport Assessments, the guidance confirms that the documents should aim to:
- Encourage sustainable travel;
  - Lessen traffic generation and its detrimental impacts;
  - Look to reduce carbon emissions and climate impacts;
  - Create accessible, connected, inclusive communities;
  - Improve health outcomes and quality of life;
  - Improve road safety; and
  - Reduce the need for new development to increase existing road capacity or provide new roads.
- 15.6.7 The above requirements support the NPPF which sets out that planning should actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus on significant development in locations that are or can be made sustainable.

### **The London Plan (2021)**

- 15.6.8 Policy T2 Healthy Streets states that Development proposals and Development Plans should deliver patterns of land use that facilitates residents making shorter, regular trips by walking or cycling.
- Demonstrate how they will deliver improvements that support the ten Healthy Streets Indicators in line with Transport for London guidance;
  - reduce the dominance of vehicles on London's streets whether stationary or moving; and
  - be permeable by foot and cycle and connect to local walking and cycling networks as well as public transport.

## **15.7 Baseline Review**

- 15.7.1 Since approval of the Operative Permission, the Site has undergone significant change as a result of works to deliver the Consented Scheme, with the completion and occupation of Plots 1 and 2.
- 15.7.2 Plot 3 is currently occupied by the podium associated with the stadium, public realm and temporary structures. In addition, some nearby developments that were previously considered as cumulative schemes are now complete and operational and some are under construction, which may change the transport environment.
- 15.7.3 Traffic surveys were undertaken in June 2023 to understand the change in the baseline traffic flow since 2015. The survey data shows a lower baseline traffic flow in 2023 than set out in the 2015 assessment. This reflects changing travel patterns in the local area and across London as a whole. The flows show substantial reductions on key routes as summarised in the Table 15.1.

Table 15.1: Changes in baseline traffic flows

| Location                                | 2015 AADT <sup>48</sup> | 2023 AADT |
|-----------------------------------------|-------------------------|-----------|
| A1010 Fore Street                       | 24,308                  | 10,604    |
| Brantwood Road                          | 8,027                   | 2,548     |
| Northumberland Park                     | 7,643                   | 4,835     |
| White Hart Lane, west of Fenton Road    | 18,549                  | 6,622     |
| High Road                               | 19,069                  | 9,649     |
| Worcester Avenue                        | 803                     | 474       |
| Park Lane, east of Tottenham High Road  | 2,372                   | 937       |
| Lansdowne Road                          | 13,144                  | 9,959     |
| Lordship Lane                           | 15,775                  | 10,966    |
| Tottenham High Road, south of Park Lane | 19,562                  | 11,768    |

### Sensitive Receptors

15.7.4 A number of sites have been completed or granted planning approval for redevelopment subsequent to the completion of the 2015 ES as listed below. Whilst the redevelopment of these sites may not give rise to entirely new sensitive receptors, the occupants and visitors to these sites have been considered in preparing the statement of conformity. These include occupants and visitors of the following development schemes:

- Tottenham Hotspur Football Club, 748 High Road, N17 0AP;
- 798-808 High Road, London, N17 0DH;
- 807 High Road, N17 8ER;
- Selby Centre, Selby Road, N17 8JL;
- Meridian Water, Willoughby Lane and Meridian Way;
- 50-56 Fore Street, N18 2SS; and
- Joyce Avenue and Snells Park Estate N18.

15.7.5 As a worst-case scenario, it is assumed that these developments have been fully constructed and are operational or will be completed and operational prior to completion of the Development.

## 15.8 Scheme Design and Management Measures Review

### Construction

15.8.1 The Operative Permission includes a series of measures designed to control HGV flows during construction, taking into account transport sensitive receptors both within and adjacent to the Site. These include the following mitigation measures:

<sup>4848</sup> Annual Average Daily Traffic

- Routing and scheduling of construction HGVs and delivery times; and
- Provision of construction compound near White Hart Lane Station.

15.8.2 Construction traffic routes, movements and associated effects will be dealt with through management measures set out in the phase-specific CEMPs to be resecured by conditions.

### Completed Development

15.8.3 The Consented Scheme includes a series of measures designed to control traffic flows during the completed Development stage, taking into account transport sensitive receptors both within and adjacent to the Site. These include the following mitigation measures which have been implemented to support the opening of the stadium, as follows:

- Highway improvements around the northern development;
- New CPZ implemented by LB Haringey;
- Service enhancements and station upgrades to improve passenger experience;
- Improvements at Seven Sisters interchange;
- New bus station at Tottenham Hale;
- New Victoria Line timetable with increased frequency;
- New Tottenham Hale railway station;
- Upgrades to pedestrian environment along the High Road; and
- Removal of the Tottenham Hale Gyratory implemented by TfL.

## 15.9 Assessment of Environmental Effects Review

### Construction

15.9.1 The 2015 ES did not identify significant effects during the construction phase, and it is not expected that the Amendments would change these conclusions. The opening year of the Consented Scheme was assumed to be 2022 in the 2015 ES, however the Development is expected now to be operational in 2028. The construction of the Development is not expected to generate more HGVs on the highway network than the Consented Scheme.

### Completed Development

15.9.2 The traffic generation of the Development is expected to be the same as in the Consented Scheme traffic figures presented in the 2015 ES. The trip rates and total person trips are shown in Chapter 3 of Appendix 15.1: Transport Assessment Addendum. A copy of the full Plot 3 trip generation assessment prepared for the 2015 TA is included within Appendix 15.1.

15.9.3 Overall, the significance of the effects identified in the 2015 ES in relation to the construction and operational phases of the Consented Scheme remain valid and unchanged in the context of the Development.

## 15.10 Mitigation Measures and Likely Residual Effects Review

### Construction

- 15.10.1 The residual effects for the Development will be the same as those previously reported in the 2015 ES and no further mitigation is required beyond those already agreed for the Consented Scheme and secured by planning condition(s). The residual effects from the construction phase will remain not significant.

### Completed Development

- 15.10.2 Provided the agreed mitigation measures enlisted in paragraph 15.8.4 of the 2015 ES are implemented for the Development to minimise any highway impact, the likely residual impacts of operational phase of the development are expected to be as stated in the 2015 ES. No further mitigation is required beyond those already detailed within the 2015 ES and secured by planning condition(s).

## 15.11 Cumulative Effects Review

- 15.11.1 The list of cumulative schemes as presented in Appendix 2.1 differ from those assessed as part of the 2015 ES. However, the schemes collectively are of a nature and scale which means that the conclusions reached in the 2015 ES remain valid. In addition, the majority of the trips of the cumulative schemes will be undertaken by sustainable modes; therefore, the significance of the cumulative impacts in relation to traffic and road safety on local roads as well as impact on the public transport network remains as assessed in the 2015 ES. No further mitigation other than implementation of the agreed mitigation measures is considered necessary, as stated in the 2015 ES.

## 15.12 Comparison with the Consented Scheme

- 15.12.1 The potential impacts from traffic and transport associated with the Amendments as detailed in the S.73 Application have been considered. This has considered the changes against the residual effects as reported in 2015 ES.
- 15.12.2 The potential changes resultant from the Amendments are not materially considered to affect the traffic and transport conclusions stated for the construction phase and completed Development. Therefore, the findings of the 2015 ES are considered still valid and applicable to this application and all likely significant effects resulting from the Development are likely to remain as reported, with no additional effects or mitigation identified.

Table 15.2: Suitability of Previously Reported Findings

| Aspects Previously Considered in 2015 ES          | Residual Significance of Effect 2015 ES Chapter | Potential Changes due to Amendments | Comments                                                                                                          |
|---------------------------------------------------|-------------------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| <i>Construction Stage</i>                         |                                                 |                                     |                                                                                                                   |
| Excavation activity, site preparation, piling and | Neutral – Minor adverse                         | No likely change                    | Construction vehicle traffic was considered in the 2015 ES to have minor-neutral effect and a magnitude of impact |

| Aspects Previously Considered in 2015 ES                           | Residual Significance of Effect 2015 ES Chapter | Potential Changes due to Amendments | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------------------------------------------|-------------------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| foundations – HGV Impact on highway network                        |                                                 |                                     | <p>of Very Low. No significant effects were identified in the previous assessment.</p> <p>It is not envisaged that Amendments would alter these effects. The net change in HGV and LGV traffic flows on the local transport network during the construction stage is not expected to be significant in the context of the existing traffic flows.</p>                                                                                                                   |
| Construction of stadium – HGV Impact on highway network            | Neutral – Minor adverse                         | No likely change                    | <p>Construction vehicle traffic was considered in the 2015 ES to have minor-neutral effect and a magnitude of impact of Very Low. No significant effects were identified in the previous assessment.</p> <p>It is not envisaged that Amendments would alter these effects. The net change in HGV and LGV traffic flows on the local transport network during the construction stage is not expected to be significant in the context of the existing traffic flows.</p> |
| Construction of southern area uses – HGV Impact on highway network | Neutral – Minor adverse                         | No likely change                    | <p>Construction vehicle traffic was considered in the 2015 ES to have minor-neutral effect and a magnitude of impact of Very Low. No significant effects were identified in the previous assessment.</p> <p>It is not envisaged that Amendments would alter these effects. The net change in HGV and LGV traffic flows on the local transport network during the construction stage is not expected to be significant in the context of the existing traffic flows.</p> |

#### Completed Development Stage

|                                                                                                                        |               |                  |                                                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------|---------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cumulative additional trips on the highway network. Local roads around the Project Site e.g. Park Lane (Non-event day) | Minor adverse | No likely change | The proposed number of residential units and number of hotel bedrooms is unchanged and therefore no change in the trips generated by the proposals is expected. |
|------------------------------------------------------------------------------------------------------------------------|---------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Aspects Previously Considered in 2015 ES                                                      | Residual Significance of Effect 2015 ES Chapter | Potential Changes due to Amendments | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                               |                                                 |                                     | The proposed scheme provides 7 accessible and 60 regular car parking spaces compared to the Consented Scheme which had 80 car parking spaces.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Cumulative additional trips on rest of the highway network (non-event day)                    | Neutral                                         | No likely change                    | <p>The proposed number of residential units and number of hotel bedrooms is unchanged and therefore no change in the trips generated by the proposals is expected.</p> <p>Plot 3 provides 7 accessible and 60 regular car parking spaces compared to the consented Plot 3 allowance which had 80 car parking spaces.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Additional passengers on rail services, Underground services and bus services (non-event day) | Minor beneficial                                | No likely change                    | <p>As part of the Consented Scheme a number of mitigation measures were employed to ensure no significant operational effects associated with the stadium and other future uses were likely. Mitigation measures included service enhancements and station upgrades to Seven Sisters Interchange, a new bus station at Tottenham Hale, a new Victoria line timetable with increased frequency of trains, and reconfiguration of footways.</p> <p>A Framework Travel Plan has been prepared to promote these sustainable transport modes and reduce the use of private car for future occupants. The Consented Scheme did not identify any significant traffic effects. The Amendments will not alter the effects reported within the 2015 ES as the number of rooms and serviced apartments will remain the same. The uplift in floor area is insignificant in the context of the Development as a whole and will not generate additional trips. The main mode of travel for future occupants</p> |

| Aspects Previously Considered in 2015 ES                                                            | Residual Significance of Effect 2015 ES Chapter | Potential Changes due to Amendments | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                     |                                                 |                                     | of the development will likely be public transport, walking and cycling.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Pedestrians along the High Road. Additional pedestrians on non-event days                           | Minor adverse                                   | No likely change                    | The trip generation of the proposed scheme remains as the consented, therefore, the impact on the public transport scheme will remain unchanged.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Event day road closure                                                                              | Neutral                                         | No likely change                    | The stadium is not part of the proposed scheme.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Additional queues at rail stations and Underground stations event days. Impact on background users. | Minor adverse                                   | No likely change                    | <p>As part of the Consented Scheme a number of mitigation measures were employed to ensure no significant operational effects associated with the stadium and other future uses were likely. Mitigation measures included service enhancements and station upgrades to Seven Sisters Interchange, a new bus station at Tottenham Hale, a new Victoria line timetable with increased frequency of trains, and reconfiguration of footways.</p> <p>A Framework Travel Plan has been prepared to promote these sustainable transport modes and reduce the use of private car for future occupants. The Consented Scheme did not identify any significant traffic effects. The Amendments will not alter the effects reported within the 2015 ES as the number of rooms and serviced apartments will remain the same. The uplift in floor area is insignificant in the context of the Development as a whole and will not generate additional trips. The main mode of travel for future occupants of the development will likely be public transport, walking and cycling.</p> |

# 16 Wind Microclimate

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## 16.1 Introduction

- 16.1.1 This ES Addendum Chapter has been prepared by Architectural Aerodynamics. It considers the wind microclimate assessment provided as part of the 2015 ES and whether the Amendments to the Consented Scheme or other changes in circumstances materially affects the environmental information presented within the 2015 ES to inform decision making.
- 16.1.2 This S.73 application seeks permission for amendments to Plot 3 of the Consented Scheme. This ES Addendum chapter technically assesses the Development, taking account of the increased massing of Plot 3 for wind microclimate effects at surrounding sensitive receptors.
- 16.1.3 As well as ascertaining the impacts of the Development, a comparison of the impacts of the Consented Scheme is provided within the Summary of Residual Effects Table (Table 16.5). This is in order to determine whether the changes at surrounding sensitive receptors, when compared against the Consented Scheme, are considered material.
- 16.1.4 Additionally, this chapter provides a brief overview of the design evolution from the Consented Scheme, setting out the resultant changes in wind microclimate (i.e. proposed mitigation measures) at surrounding receptors.
- 16.1.5 This Chapter is supported by the following appendices, located within Volume III of the ES Addendum:
- Appendix 16.1: Wind Microclimate Technical Report.

### Competence

- 16.1.6 This ES Addendum chapter was written by Imran Rasol, MSc Advanced Mechanical Engineering) and BEng (Hons) in Mechanical Engineering with proficiency in CFD analysis for wind microclimate study.
- 16.1.7 The chapter was reviewed by Hayati Hashim, a Line Manager with over nine years' of experience in wind engineering and has led more than 150 wind engineering projects in the internationally high-rise structures, stadia and masterplan as well as over 50 EIA projects.

## 16.2 EIA Context Overview

- 16.2.1 In 2015, wind microclimate was assessed as part of the 2015 ES for the Consented Scheme. This approved detailed proposals for Plots 1, 2 and 3 as well as outline massing for Plots 4, 5 and 6.
- 16.2.2 This determined that there would be neutral wind effects during the construction phase. Once operational, the Consented Scheme (as a whole) would have neutral effects in relation to exceedances of safety criteria. For pedestrian comfort, there would be moderate adverse effects on recreational spaces and balconies, with neutral effects on thoroughfares,

entrances and outdoor seating. In respect of Plot 3, the assessment identified neutral effects in relation to safety exceedances, and moderate adverse effects on thoroughfares, recreational spaces and outdoor seating, with moderate negligible effects on entrances.

16.2.3 The purpose of this ES Addendum Chapter is threefold:

- Firstly, the Chapter provides an assessment of the likely effects of the Development (which includes the Amendments) in relation to wind microclimate at sensitive existing, under construction and consented uses / properties surrounding the Consented Scheme Site. Narrative is also provided on the potential effects taking into consideration the residual outline components of the Consented Scheme.
- Secondly, the Chapter provides an assessment of the Development with other identified cumulative schemes within the study area.
- Lastly, within the Summary of Residual Effects Table (Table 16.5), this Chapter provides a comparison of the effects of the Development to the Consented Scheme, setting out the any changes in impacts at surrounding receptors, and whether they are a considered a material consideration.

## 16.3 Legislation, Planning Policy and Guidance

### Legislation Context

16.3.1 There are no legislative policies relating to the assessment of environmental wind flows in the built environment.

### Planning Policy Context

16.3.2 The following national, regional and local planning policy is relevant to the Development:

#### National

- The revised National Planning Policy Framework (NPPF) (July 2021)<sup>49</sup> contains no national planning policies directly relating to wind microclimate issues. However, the benefits of a high-quality built environment are emphasised and an example of this is presented in paragraph 127 which states that planning policies and decisions should ensure that developments.
- The National Planning Practice Guidance (PPG) (2021)<sup>50</sup> 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?*', in Paragraph 025 ('Consider form').

#### Regional

- The London Plan (March 2021)<sup>51</sup> places great importance on the creation and maintenance of high-quality environment for London. Policies 7.6 and 7.7 apply specifically in relation to wind microclimate. This plan also updates and consolidates

<sup>49</sup> Ministry of Housing, Communities & Local Government. (2021, July). National Planning Policy Framework. London, UK.

<sup>50</sup> Ministry of Housing, Communities & Local Government. (2021, June). National Planning Practice Guidance . London, UK.

<sup>51</sup> Greater London Authority. (2021). The London Plan. London, UK

the existing plan to provide guidance for development and a policy framework for local plans across London which are presented in Policy D1B, Policy D7 Public realm and Policy D8 Tall buildings.

- The Sustainable Design and Construction Supplementary Planning Guidance (SPG) states, in section 2.3.7 that:<sup>52</sup>

*“Large buildings have the ability to alter their local environment and affect the microclimate. For example, [...] tall buildings [...] can influence how wind travels across a site, potentially making it unpleasant at ground level or limiting the potential to naturally ventilate buildings. One way to assess the impact of large buildings 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 speeds 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 use.”*

- The SPG also advises using the Lawson Comfort Criteria to assess the impact of a large building on the comfort of the street environment, which sets out a scale for assessing the suitability of wind conditions in the urban environment.
- The Mayor’s London Environment Strategy sets out the Mayor's vision for London's environment to 2050. The London Environment Strategy includes a number of policies, aspirations, and guidance which can be found in Section 2.3 Site layout and building design: Micro-climate.

#### Local

- LB Haringey’s Local Plan does not contain any planning policies related to wind microclimate.

#### Guidance

16.3.3 The following guidance has informed the assessment of effects within this chapter:

- Quality Assurance Manual - Wind Engineering Studies of Buildings. 2001. AWES-QAM-1-2001<sup>53</sup>;
- The American Society of Civil Engineers (ASCE) Manual of Practice No.67 for Wind Tunnel Studies. ASCE SEI 49/12<sup>54</sup>;
- Engineering Science Data Unit (2001) Computer Program for Wind Speeds and Turbulence Properties: Flat or Hilly Sites in Terrain with Roughness<sup>55</sup>; and

<sup>52</sup> Greater London Authority. (2014, April). Sustainable Design And Construction Supplementary Planning Guidance. London, UK.

<sup>53</sup> Australian Wind Engineering Society . (2019). Quality Assurance Manual: Wind Engineering Studies. Australia.

<sup>54</sup> American Society of Civil Engineers. (2021). Wind Tunnel Testing for Buildings and Other Structures. United States of America.

<sup>55</sup> ESDU (Engineering Science Data Unit). (2001). Item 01008. Computer Program for wind speeds and turbulence properties: flat or hilly sites in terrain with roughness.

- Lawson, T.V. (1990)<sup>56</sup> The determination of the wind environment of a building complex before construction.

## 16.4 Scheme Design and Management

- 16.4.1 As part of the development of the Amendments, a number of mitigation measures were explored. Analysis of these different mitigation options informed the final landscaping of the Development.
- 16.4.2 The mitigation implemented within the Plot 3 is relevant to the Development. Any additional embedded mitigation measures over and above those agreed and implemented as part of the Plot 3 are as follows:
- Within Hotel Ground Terrace, as in Figure 2.2 within the technical report:
  - 3 Planters with hedges to the northeast of TH Hotel (1.6m by 1.2m by 1.0m); and
  - 1.0m planter.
- 16.4.3 Elevated Terraces as in Figure 2.3 within the technical report:
- 1.8m Parapets;
  - Potentially moveable wind break (2.6m by 0.5m by 1.5m);
  - Planting (~1.5m tall); and
  - 1.8m tall privacy screens.

## 16.5 Assessment Methodology

### Consultation

- 16.5.1 An Informal EIA Scoping Note (Appendix 2.1) was submitted to LB Haringey on 5<sup>th</sup> June 2023. The Scoping Note proposed that a wind microclimate would be included within the EIA due to the potential for likely significant effects on sensitive residential receptors within and in close proximity to the Site, and it provided details of assessment methodology. LB Haringey provided no comments in relation to the wind microclimate assessment.

### Summary of Assessment Scope

- 16.5.2 As outlined within the Informal Scoping Note, the scope of the wind microclimate assessment within this chapter is limited to the following assessment of effects:
- The study has employed wind tunnel testing (WTT) to predict the strength of wind speeds that will occur following the introduction of the completed Development.
  - This suitability of wind conditions is determined using the widely accepted industry standard Lawson criteria to determine the suitability of wind conditions on site and the impact of the Development on the surrounding area.

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<sup>56</sup> Lawson, T.V. (1990). The determination of the wind environment of a building complex before construction. Bristol: University of Bristol, Department of Aeronautical Engineering.

### Non-Significant Effects

- 16.5.3 Assessment of potential demolition and construction effects is scoped out. During the demolition and construction works, there would be potential for wind to blow into and across any open areas of the Site with the potential to inconvenience passers-by. However, given the dusty and untidy conditions typical of a construction site, hoarding being present, and the fact that adjacent pavements will be used for thoroughfares only and not for more sensitive recreational uses (such as outdoor cafes that may be present upon completion), pedestrians moving in the vicinity would be likely to have lowered expectations, in terms of comfort. Construction activity is likely to be less sensitive to general wind conditions due to the nature of the Site during construction (i.e. site hoardings, restricted site access for workers) compared to when the completed Development is operational. Conditions for passers-by would predominantly be suitable for strolling and would be acceptable, in terms of comfort. Conditions within the Site will also be acceptable for construction workers and other Site operatives and therefore not significant in EIA terms.

### Study Area

- 16.5.4 A 1:400 scale model of the existing buildings within a 600m radius from the centre of the Site was constructed. Wind impacts are considered to dissipate beyond this proximity such that potential effects would not be expected from a development.

### Establishing Baseline Conditions

- 16.5.5 The baseline conditions are based on the Site and the surrounding area as present during the time of assessment (July 2023). The Site and its surrounds comprise:
- Plot 1 (Stadium);
  - Plot 2 (Tottenham Experience);
  - The podium associated with the Stadium is in place within the south of the Site; and
  - Surrounding developments within a 600m radius from the centre of the Site.

### Future Baseline

- 16.5.6 The Future Baseline is an alternative baseline condition at an indeterminate point in the future for a scenario in 2027 that includes the baseline condition without the Development. It is assumed that should the Development not be consented or brought forward, the Consented Scheme would be implemented.

### Identifying Likely Significant Effects

#### Wind Tunnel Testing (WTT)

- 16.5.7 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, which require the assessment of mean and gust wind conditions. Gust wind conditions are those driven by the turbulent environment induced by the presence of buildings.
- 16.5.8 The principal steps within the procedure are as follows:

- Undertake a wind tunnel test to identify the degree to which the Development increases or decreases local wind speeds, per wind direction, relative to a known reference point;
- Combine wind tunnel test data with meteorological data for the area to derive an accurate picture of the expected wind microclimate at the Site; and
- Using the Lawson Criteria, compare the expected conditions with the planned suitability of conditions, and assess the exceedance (or otherwise) of the safety criteria.

16.5.9 The model was installed in an atmospheric boundary layer wind tunnel on a turntable. Measurements were taken for 36 wind directions, in increments of 10.0°, from 0° round to 350.0°.

16.5.10 The atmospheric boundary layer as it approaches the Site, for each wind direction considered, was generated by a 2D barrier and spires placed at the entrance to the test section of the wind tunnel, plus roughness blocks distributed over the floor of the wind tunnel. The specific arrangement of these elements allows an accurate representation of the wind speed and turbulence properties, as they vary with height, when compared with the full-scale properties expected. Full-scale wind properties at the Site were derived using the industry standard method set out within ESDU (Engineering Sciences Data Unit) data item 01008.

16.5.11 Assessment models have been constructed on the basis of the 3D models received from F3 Architects, the project architects.

16.5.12 The existing surrounding area was based upon information supplied by Ordnance Survey details for the area. Cumulative surrounds were based upon the information contained within the LB Haringey planning portal.

#### Wind Climate

16.5.13 Wind environment studies require that wind speed data obtained from a measurement station be transposed to the site of interest. The measurement station of choice for the assessment is at London Heathrow Airport, consistent with the station that was used in 2015 ES. The meteorological data used in this assessment is deemed to be representative of the local wind microclimate for the London area.

16.5.14 The wind speed history (for a period of 20 years), provided by weather organisations such as the UK Met Office or the National Oceanic & Atmospheric Administration, is reformatted into the number of observations of wind speeds within each of several wind speed ranges, for each wind direction and for each month of the year. The months are grouped into seasons and a Weibull distribution is fitted to the wind speed distribution for each wind direction, for each season. The resulting weather centre wind data is transposed to open country terrain at sea-level, accounting for upwind terrain. The open country wind data is then transposed to reference height at the Site.

#### Completed Development

16.5.15 The building proposals that comprise the completed Development and surrounding cumulative developments were considered for assessment. The following scenarios were modelled in the wind tunnel:

- Existing Site within the context of existing surrounding conditions (including vegetation) (Baseline).
- Completed Development with proposed landscaping within the context of existing surrounding conditions.
- Completed Development with proposed landscaping within the context of existing surrounding conditions with wind mitigation measures.
- Completed Development with proposed landscaping within the context of existing surrounding conditions plus committed developments (but not the Lendlease Scheme<sup>57</sup>).
- Completed Development with proposed landscaping within the context of existing surrounding conditions plus committed developments with the Lendlease Scheme.

16.5.16 The completed Development for this assessment comprises of:

- Plot 1 (Stadium) – Baseline, 2023;
- Plot 2 (Tottenham Experience) – Baseline, 2023;
- Plot 3 (Hotel) – Completed Development, 2027;
- Plot 4 (Extreme Sports Building) – Completed Development, 2027; and
- Plot 5 (Residential Buildings and Flexible B1/D1 Space) – Completed Development, 2028.

#### Cumulative Effects

16.5.17 Cumulative effects are the potential combined effects of several development schemes (in conjunction with the Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.

16.5.18 The methodologies used to identify and assess likely significant cumulative effects are as discussed in paragraphs 16.5.7 – 16.5.16 for the Completed Development.

16.5.19 The ES has given consideration to potential for likely significant cumulative effects for committed developments located within 600m radius from the Site boundary. Within this study area, the following cumulative schemes have been identified for consideration in this assessment:

- 819-829 High Road, Tottenham (HGY/2021/2283 & HGY/2021/2284);
- The Goods Yard and The Depot (HGY/2022/0563);
- 807 High Road, London (HGY/2021/0441); and
- Lendlease Scheme (HGY/2021/3175).

16.5.20 All other cumulative schemes set out in Appendix 2.2 are outside the study area for wind assessment. These developments are sufficiently far from the completed Development that

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<sup>57</sup> LPA ref: HGY/2021/3175. High Road West regeneration scheme submitted on behalf of Lendlease (the 'Lendlease Scheme') and granted planning consent by LB Haringey in August 2022. The Lendlease Scheme is pending judicial review therefore a cumulative assessment is provided with and without this proposed development.

potential cumulative effects would be negligible and do not warrant consideration within the assessment.

## Determining Effect Significance

### Assessment Criteria

- 16.5.21 The industry standard criteria for wind microclimate assessments are commonly referred to in the UK as the Lawson criteria after one of their main authors. As with most other leading practitioners, ArcAero use the LDDC variant of the Lawson Criteria.
- 16.5.22 The LDDC variant applies a single percentage probability of exceedance of a range of wind speeds and associates different wind speeds to different types of usage. This offers a relatively simple and practical manner for the assessment of wind comfort and safety.
- 16.5.23 A wind speed of 15 m/s occurring once per year is rated as unsuitable, in terms of safety, with the potential to de-stabilise the less able members of the public including the elderly, cyclists and children.
- 16.5.24 The LDDC variant of the Lawson criteria prescribes that wind conditions are suitable for a given activity when the threshold is exceeded no more than 5% of the time. The value of 5% has been established as giving a reasonable allowance for extreme and relatively infrequent winds that are tolerable within each category.
- 16.5.25 Where certain activities are year-round, such as walking, entrance use or for waiting areas, comfort ratings are required to be met in all seasons. For more seasonal activities, such as outdoor recreation or for sitting spaces, the assessment focuses on relevant seasons where the expectation will exist for conditions to be suitable. The LDDC comfort threshold wind speed values are presented in Table 16.1.

Table 16.1: Lawson Comfort Criteria

| Threshold Wind Speed [m/s] | Comfort Rating / Activity |                             | Qualifying Comments                                                      |
|----------------------------|---------------------------|-----------------------------|--------------------------------------------------------------------------|
| 4                          | C4                        | Long term sitting           | Reading a newspaper and eating and drinking.                             |
| 6                          | C3                        | Short term standing/sitting | Appropriate for bus stops, window shopping and building entrances        |
| 8                          | C2                        | Strolling                   | General areas of walking and sightseeing.                                |
| 10                         | C1                        | Walking                     | Local areas around tall buildings where people are not likely to linger. |

- 16.5.26 The assessment takes full account of seasonal variations in wind conditions and pedestrian activities. For example, conditions for recreational activities focus on summer (June, July, August), but also consider spring (March, April, May) and autumn (September, October, November), while conditions for pedestrian thoroughfare, access or waiting (e.g. bus stops)

consider all seasons, with winter (December, January, February) usually being the critical season.

- 16.5.27 At each area investigated, the suitability of the pedestrian level wind environment in terms of comfort for various activities is assessed based on the Lawson criteria for pedestrian comfort. The activities considered, and their relation to the Lawson comfort criteria, are summarised in Table 16.2.

**Table 16.2: Suitability Assessment Per Lawson Comfort Criteria**

| Suitability                                                                                                                                                                                                             | Lawson Comfort Criteria                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| For passage in areas where tolerance of less comfortable windy conditions is expected, e.g. in substantially built-up areas of commerce where transit from A to B is often prompt, with pedestrians unlikely to linger. | Walking in all seasons.                              |
| For access to and passage through the Development and surrounding area.                                                                                                                                                 | Strolling in all seasons.                            |
| For leisure uses excluding such as a park, children's play area, etc.                                                                                                                                                   | Standing or short-term sitting from spring to autumn |
| 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 long periods of sitting such as for an outdoor café.                                                                                                                                                                | Long-term sitting in summer.                         |

#### Sensitivity of Receptor

- 16.5.28 Receptors are defined to be pedestrians and cyclists on the thoroughfares within the Development and surrounding areas. All receptors are equally sensitive to the presence or absence of an acceptable wind microclimate. An unacceptable microclimate exists at a receptor when either an exceedance of the safety criteria exists, or when the comfort criteria is not met for the existing / planned pedestrian use at a receptor. All receptors are considered to be highly sensitive to the local wind microclimate conditions and are given an equal weighting.

#### Magnitude of Impact

- 16.5.29 Effect magnitude is defined by the severity of the deviation from the standards set out by the Lawson criteria. Exceedances of the safety criteria are deemed to be the most critical, given their potential effect on pedestrians' wellbeing, i.e. they may be unduly exposed to the potential for harm. Such effects are thus deemed to have a high impact magnitude. Where the comfort criteria are not met, i.e. where the conditions are too windy for a particular receptor to be sufficiently comfortable for existing or planned pedestrian uses and thus inconvenient but not unsafe, such effects are deemed to be of medium impact magnitude. Where the comfort criteria are marginally exceeded, to the extent that the exceedance is expected to be perceptible, but tolerable, such effects are deemed to be of very low impact magnitude.

### Assessing Significance

- 16.5.30 On the above basis, exceedances of the safety criteria are considered to be of major effect significance, while exceedances of the comfort criteria are considered to range from moderate or minor significance.
- 16.5.31 Major and moderate effects are considered to be significant in EIA terms. Minor effects, as noted above being tolerable, are not considered to be significant.
- 16.5.32 The following are the significance criteria used to assess likely wind conditions as a result of the introduction of the Development:
- Major Beneficial: Any effect on wind conditions which is expected to improve pedestrian safety, namely an improvement in conditions from being considered unsafe to being considered safe. This is considered to be significant.
  - Moderate Beneficial: Any effect on wind conditions which is expected to improve pedestrian comfort from unsuitable to suitable for planned activities. This is considered to be significant.
  - Minor Beneficial: Any effect on wind conditions which is expected to improve pedestrian comfort from unsuitable to marginal/tolerable for planned activities, or from marginal/tolerable to suitable for planned activities. This is not considered to be significant.
  - Negligible: Any effect that does not alter the suitability of existing wind conditions with respect to planned activities. This is not considered to be significant.
  - 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. This is not considered to be significant.
  - Moderate Adverse: Any effect on wind conditions that worsens pedestrian comfort from suitable to unsuitable for planned activities. This is considered to be significant.
  - Major Adverse: Any effect on wind conditions adversely affecting pedestrian safety, namely a deterioration in conditions from being considered safe to being considered unsafe. This is considered to be significant.

### Assumptions and Limitations

- 16.5.33 The wind tunnel based approach has been adopted to inform and appraise mitigation and has adopted a discrete measurement approach, where sensors are positioned in sensitive locations and those locations that are expected by veteran practitioners to experience the most significant acceleration of winds. A longstanding approach of this nature is expected to capture worst-case conditions.
- 16.5.34 Unless otherwise specified, the wind tunnel model included deciduous trees in order to obtain conservative results during winter. Deciduous trees have been modelled in bare winter format.
- 16.5.35 Mitigations proposed in the 2015 ES for future Plots would assume to be implemented as part of the completed Development to mitigate any safety and comfort exceedances but were not modelled in this study.

## 16.6 Baseline Conditions

- 16.6.1 The wind microclimate conditions for the baseline scenario are presented graphically within Figure 4.1 and Figure 4.2 within the Appendix 16.1 for worst-seasonal and summer conditions respectively.

### Safety

- 16.6.2 Wind conditions to the south and south-east of Tottenham Stadium (locations 41 & 62) exceed the criteria for wind safety. Elsewhere, all locations within the Site and immediate surroundings meet the safety criteria.

### Comfort

#### Entrances

- 16.6.3 Wind conditions at several locations within the Site and immediate surrounds would be too windy for entrances, these include at the south, south east and south west of the Tottenham Hotspur Stadium (locations 39, 42, 61, 63, 83, 109, 110), being suitable for standing for 83% on average.
- 16.6.4 Elsewhere wind conditions at entrances are suitable for at least short-term standing and thus for comfortable pedestrian ingress / egress.

#### Thoroughfares

- 16.6.5 For recreational thoroughfares, the wind conditions are also too windy for the immediate surrounds, these include the podium to the south of Tottenham Hotspur Stadium (locations 38, 41, 60, 62, 64, 65, 107, 111, 112), suitable for strolling on average 92% of the time.
- 16.6.6 Elsewhere, existing thoroughfare conditions are expected to be suitable for existing uses.

### Future Baseline

- 16.6.7 A future baseline (in the absence of the completed Development) has not been quantitatively assessed but conditions within the 'do nothing' scenario can be qualitatively assessed. The majority of the major committed / consented schemes lie within non-prevailing wind sectors, and as such are likely to have little impact on wind conditions within the Site and immediate surrounds. As such, whilst there may be marginal differences in wind conditions, they are not expected to be materially different from those within the baseline assessment and conditions are expected to remain broadly unchanged from now to 2028.

### Summary of Receptors and Sensitivity

- 16.6.8 Table 16.4 provides a summary of the sensitivity of the receptors group.

Table 16.4: Summary of Receptor Sensitivity

| Receptor        | Assessed within 2015 ES? | Sensitivity (Value) |
|-----------------|--------------------------|---------------------|
| <i>Existing</i> |                          |                     |

|                                                                               |     |      |
|-------------------------------------------------------------------------------|-----|------|
| Users / Pedestrians at thoroughfares within the Site                          | Yes | High |
| Users / Pedestrians at entrances within the Site                              | Yes | High |
| Users / Pedestrians at recreational spaces on elevated levels within the Site | Yes | High |
| Users / Pedestrians at bus stop within the Site                               | No  | High |

## 16.7 Completed Development – Assessment of Effects

### Safety

- 16.7.1 Following the introduction of the completed Development and without any mitigation measures, wind conditions on the podium improve such that locations 41 and 62 satisfy the safety criteria. This represents a permanent, long-term, direct and major beneficial effect on all pedestrians within the Site.
- 16.7.2 There are several areas within the Site and immediate surrounds which fail the wind criteria for safety:
- Within the podium of Plot 5 (the Residential Buildings and Flexible B1/D1 Space) (locations 31, 32 & 33). This area's safety exceedances were predicted and mitigated in the 2015 ES under section 16.5.14 and 16.5.15. The same mitigation (while not re-tested as part of the current study) would be expected to perform similarly well;
  - North west of the Plot 3 hotel (location 77);
  - Plot 3 Hotel, level 12 (location 203);
  - Plot 3 Hotel, level 26 (location 403); and
  - Plot 3 Hotel, level 27 (location 406).
- 16.7.3 This represents a permanent, short-term, direct and major adverse effect on pedestrians within the Site.
- 16.7.4 Elsewhere, all locations within the Site and immediate surrounds meet the safety criteria. This represents a permanent, long-term, direct and negligible effect on all pedestrians within the Site and surrounds.

### Comfort

#### Thoroughfares

- 16.7.5 Several areas to the south of Tottenham Hotspur Stadium (locations 60, 64 and 112) have now become suitable for leisure thoroughfares with the introduction of the elements of the Consented Scheme. This represents a permanent, long-term, direct and moderate beneficial effect on all pedestrians accessing these areas.
- 16.7.6 Several areas within the Site would be considered suitable only for fast walking in winter, including:

- The area at the south of the Tottenham Hotspur Stadium (locations 38, 41, 62, 72) has shown wind comfort improvement from an average of 92% of the time suitable for strolling to 94%. This represents a permanent, long-term, direct and negligible effect on all pedestrians accessing these areas;
- Level 12 of the Plot 3 Hotel (location 203), being suitable for strolling 91% of the time. This represents a temporary, short-term, direct and minor adverse effect on all pedestrians accessing these areas; and
- Within or nearby Plot 5 (locations 30, 35, 36, 48, 49). Mitigation has been identified in the 2015 ES under section 16.5.58 and 16.5.59. This represents a permanent, long-term, direct and negligible effect on all pedestrians accessing these areas.

16.7.7 Within the Plot 5 podium (locations 33 and 32), the wind conditions are uncomfortable for usage but had been mitigated with hard and soft landscaping in the 2015 ES under sections 16.5.58 and 16.5.59. This represents a permanent, long-term, direct and negligible effect on all pedestrians accessing these areas.

16.7.8 At all other thoroughfares conditions are suitable for at least strolling throughout the year and thus for proposed pedestrian use. This represents a permanent, long-term, direct and negligible effect on all pedestrians within the Site.

#### *Entrances*

16.7.9 The north western corner of the Plot 3 Hotel (location 77) is suitable for fast walking. However, this is a relatively inaccessible area to be used only for emergency exit purposes on rare occasions. This represents a permanent, long-term, direct and minor adverse on occupants accessing this entrance.

16.7.10 The north Plot 3 Hotel terrace entrance (location 75) has exceeded the wind comfort criteria and is only suitable for short-term standing 83% of the time. This represents a permanent, short-term, direct and moderate adverse on occupants accessing this entrance.

16.7.11 The entrances to the south of the Tottenham Hotspur Stadium (locations 39, 42, 61, 63, 109, 110) have showed an improvement with the introduction of elements of the Consented Scheme which are suitable for short-term standing on average 90% of the time from 83% of the time. This represents a permanent, long-term, direct and minor beneficial effect on occupants accessing these entrances.

16.7.12 For location 83 to the south of Tottenham Hotspur Stadium, the wind comfort has now become suitable for short-term standing or better. This represents a permanent, long-term, direct and moderate beneficial on occupants accessing this entrance.

16.7.13 Elsewhere wind conditions at entrances are suitable for at least standing and for comfortable pedestrian ingress/egress. This represents a permanent, long-term, direct and negligible effect on occupants accessing these entrances.

#### *Recreational Spaces*

16.7.14 From spring to autumn, there are several areas within the Site and immediate surrounds which exceed the comfort criteria for recreational usage:

- Ground Terrace, Plot 3 Hotel (locations 75 and 80) exceed the criteria for long-term sitting in summer and would be considered too windy for comfortable use. This represents a permanent, long-term, direct and moderate adverse on occupants accessing this area.
- Level 12 & 13, Plot 3 Hotel (location 201) modestly exceed the wind comfort criteria, being suitable for short-term standing on average 93% of the time in springs and generally suitable for short-term standing in summer. This represents a permanent, long-term, direct and minor adverse on occupants accessing this area.
- Level 26 & 27, Plot 3 Hotel (locations 402, 403 & 406) exceed the wind comfort criteria which are on average 90% of the time suitable for short-term standing in spring and on average 93% of the time in summer. This represents a permanent, long-term, direct and minor adverse on occupants accessing this area.
- South of the Tottenham Hotspur Stadium (locations 65 & 66) modestly exceed the wind comfort which are suitable for short-term standing on average 93% of the time in spring and on average suitable for short-term standing in summer. Effective wind mitigation has been designed for this location as part of the 2015 ES under section 16.5.58 and 16.5.59. This has not been modelled within the current tests. This represents a permanent, long-term, direct and negligible effect on occupants accessing these areas.
- Plot 4 (the Extreme Sports Building) (location 70) have been mitigated in the 2015 ES under section 16.5.58 and 16.5.59. This represents a permanent, long-term, direct and negligible effect on occupants accessing these areas.
- Plot 5 (the Residential Buildings and Flexible B1/D1 Space) (locations 29, 31, 32 & 34) have been mitigated in the 2015 ES under section 16.5.58 and 16.5.59. This represents a permanent, long-term, direct and negligible effect on occupants accessing these areas.

16.7.15 Elsewhere wind conditions for recreational spaces are suitable for at least short term of standing/seating and suitable for recreational activities. This represents a permanent, long-term, direct and negligible effect on occupants accessing these areas.

### *Balconies*

16.7.16 The balconies of the Plot 3 Hotel are part of the facade recess that are well protected to the extent that they will provide comfortable wind conditions. This has been confirmed via initial CFD modelling which demonstrated the wind conditions suitable at least short-term standing or better from spring to autumn. This represents a permanent, long-term, direct and negligible effect on occupants accessing these areas.

### *Surrounding Area*

16.7.17 Following the introduction of the completed Development, conditions on surrounding thoroughfares are suitable for strolling or better with an exception at the south west of Plot 5 where the suitability marginally exceeds that for strolling, with an average 93% of the time suitable for strolling at locations 48 and 49. This area had been mitigated with soft landscaping in the 2015 ES under section 16.5.58. This represents a permanent, long-term, direct and negligible effect on occupants accessing these areas.

- 16.7.18 The outdoor seating area (location 119) continues to be suitable for long-term sitting from springs to autumn and hence suitable for outdoor seating. This represents a permanent, long-term, direct and negligible effect on occupants accessing these areas.

### Mitigation, Monitoring and Residual Effects

- 16.7.19 The completed Development within the existing surrounds has been assessed with the wind mitigation measures which are discussed in detail in sections 16.7.22 and 16.7.26.
- 16.7.20 These results are presented graphically within Figure 4.7 and Figure 4.8 for the winter season conditions and Figure 4.9 and Figure 4.10 for summer conditions respectively within Appendix 16.1.
- 16.7.21 No mitigation is considered necessary on balconies or to mitigate wind conditions in surrounding areas as no potential wind effects have been identified above the thresholds for intended use. Residual effects remain as stated above for balconies and the surroundings area.

### Safety

- 16.7.22 With the introduction of mitigation measures, all locations within the Plot 3 Hotel satisfy the safety criteria. This represents a permanent, long-term, direct and negligible effect on all pedestrians within the Site.

### Comfort

#### Thoroughfares

- 16.7.23 With the introduction of wind mitigation measures, all thoroughfares within the Plot 3 Hotel are suitable for at least strolling throughout the year. This represents a permanent, long-term, direct and negligible effect on all pedestrians within the Site.

### Entrances

- 16.7.24 With the introduction of mitigation measures, all main entrances within the Plot 3 Hotel are suitable for at least standing and thus for entrance use. This therefore represents a permanent, long-term, direct and negligible effect on occupants accessing these entrances.
- 16.7.25 The secondary / emergency exit at location 77 does experience windier conditions which are still considered suitable given the infrequent use of the space. This represents a permanent, long-term, direct and negligible effect on occupants accessing this entrance.

### Recreational Spaces

- 16.7.26 With the introduction of mitigation measures, recreational spaces within the Plot 3 Hotel are generally suitable for use with the exception of:
- A small area at the north of the podium level seating space (location 76) is too windy for comfortable long-term sitting. The rest of this terrace space is suitable for long-term sitting, and the seating will be biased towards these areas. This represents a permanent, long-term, direct and negligible effect.
  - In spring, localised areas of the upper terraces are marginally too windy for use at the three locations set out below. This represents a permanent, long-term, direct and

minor adverse effect on occupants accessing these areas. With these areas being suitable from spring to autumn and the rest of the spaces on the upper terraces being suitable throughout the year, conditions on the terraces would be considered suitable, or at worst tolerable, where conditions are marginally too windy in spring:

- Within the pool on level 12 (location 205);
- At the north east corner on level 13 (location 302); and
- At the northern terrace of level 26 (location 401).

## 16.8 Cumulative Effects

### Scenario 1: Completed Development + Cumulative Schemes

#### Assessment

- 16.8.1 The results for the Completed Development within cumulative surrounds are presented graphically in Figure 4.11 and Figure 4.12 for worst-seasonal and Figure 4.13 and Figure 4.14 for summer conditions respectively within the Appendix 16.1. This scenario does not include the Lendlease Scheme.
- 16.8.2 Following the introduction of cumulative schemes in combination with the completed Development, wind conditions within the study area are materially the same in terms of their comfort suitability for designated uses and pedestrian safety.

#### Mitigation, Monitoring and Residual Effects

- 16.8.3 Since the wind conditions are materially the same compared to the Completed Development within existing surrounds, no additional mitigation is considered necessary and the residual effects will be similar to those identified for the completed Development in isolation.

### Scenario 2: Completed Development + Cumulative Schemes + Lendlease Scheme

#### Assessment

- 16.8.4 The results for the Completed Development with the cumulative schemes and the Lendlease Scheme are presented graphically within Figure 4.15 and Figure 4.16 for worst-seasonal and Figure 4.17 and Figure 4.18 for summer conditions respectively within the Appendix 16.1.
- 16.8.5 Following the introduction of the completed Development in combination with the cumulative schemes and the Lendlease Scheme, wind conditions within the study area are materially the same in terms of their comfort suitability for designated uses and pedestrian safety.

#### Mitigation, Monitoring and Residual Effects

- 16.8.6 Since the wind conditions are materially the same compared to the completed Development within existing surrounds, no additional mitigation is considered necessary and the residual effects will be similar to those identified for the completed Development in isolation.

Table 16.5: Summary of Residual Effects

| Effect                                   | Receptor<br>(Sensitivity) | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact                                                                          | Mitigation and Monitoring                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                       | Residual Effect     |                                                                                              |
|------------------------------------------|---------------------------|---------------------|-------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|----------------------------------------------------------------------------------------------|
|                                          |                           |                     |                   |                                                                                                 | Consented Scheme                                                                                                                                                                                                                    | Development                                                                                                                                                                                                                                                                                                                           | Consented<br>Scheme | Development                                                                                  |
| Construction                             |                           |                     |                   |                                                                                                 |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                       |                     |                                                                                              |
| N / A                                    | N / A                     | N / A               | N / A             | N / A                                                                                           | N / A                                                                                                                                                                                                                               | N / A                                                                                                                                                                                                                                                                                                                                 | N / A               | N / A                                                                                        |
| Completed Development                    |                           |                     |                   |                                                                                                 |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                       |                     |                                                                                              |
| Pedestrian safety in and around the Site | Pedestrians (High)        | Local               | Permanent         | Major beneficial (relating to improved conditions to the south of the stadium) to major adverse | No mitigation required around Plot 3 Hotel<br><br>Soft landscaping (trees, hedging), & screens, primarily around the south and southeast of the stadium and within Plot 5; raised parapets around elevated amenity spaces of Plot 5 | Plot 3 Hotel Ground Terrace (1m planter)<br><br>Plot 3 Hotel Elevated Terraces (1.8m parapets, 1.8m screens, Planting)<br><br>Soft landscaping (trees, hedging), & screens, primarily around the south and southeast of the stadium and within Plot 5; raised parapets around elevated amenity spaces of Plot 5 (per 2015 ES chapter) | Negligible          | Major beneficial (relating to improved conditions to the south of the stadium) to negligible |
| Comfort for pedestrian ingress/egres     | Pedestrians (High)        | Local               | Permanent         | Plot 3 Entrance                                                                                 | N/A – Plot 3 required no mitigation for 2015 ES Chapter                                                                                                                                                                             | 3 Planters with hedges                                                                                                                                                                                                                                                                                                                | Negligible          | Negligible                                                                                   |

| Effect                                                                       | Receptor<br>(Sensitivity) | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact                                                                | Mitigation and Monitoring                                                                                          |                                                                                                                                                            | Residual Effect     |             |
|------------------------------------------------------------------------------|---------------------------|---------------------|-------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
|                                                                              |                           |                     |                   |                                                                                       | Consented Scheme                                                                                                   | Development                                                                                                                                                | Consented<br>Scheme | Development |
| s at entrances<br>to<br>Development                                          |                           |                     |                   | Location 75<br>(moderate<br>adverse)                                                  |                                                                                                                    |                                                                                                                                                            |                     |             |
|                                                                              |                           |                     |                   | Plot 3<br>Entrance<br>Location 77<br>(minor<br>adverse)                               | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter                                                      | 1-metre-tall planter                                                                                                                                       |                     | Negligible  |
|                                                                              |                           |                     |                   | Entrances to<br>south end of<br>stadium<br>(Locations<br>39, 42, 61,<br>63, 109, 110) | Soft landscaping<br>(trees, hedging),<br>screens, primarily<br>around the south and<br>southeast of the<br>stadium | Soft landscaping<br>(trees, hedging),<br>screens, primarily<br>around the south and<br>southeast of the (Per<br>2015 ES chapter, not<br>re-tested in 2023) |                     | Negligible  |
|                                                                              |                           |                     |                   | Other<br>Entrances<br>(negligible)                                                    | None                                                                                                               | None                                                                                                                                                       |                     | Negligible  |
| Comfort for<br>pedestrian<br>access to and<br>passage<br>through the<br>Site | Pedestrians<br>(High)     | Local               | Permanent         | Plot 3<br>thoroughfares<br>(negligible)                                               | None                                                                                                               | None                                                                                                                                                       | Negligible          | Negligible  |
|                                                                              |                           |                     |                   | Thoroughfare<br>s to south<br>end of<br>stadium<br>(Locations                         | Soft landscaping<br>(trees, hedging),<br>screens, primarily<br>around the south and<br>southeast of the            | Soft landscaping<br>(trees, hedging),<br>screens, primarily<br>around the south and<br>southeast of the                                                    |                     | Negligible  |

| Effect                             | Receptor<br>(Sensitivity)                        | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact                                                                                                   | Mitigation and Monitoring                                     |                                                                                  | Residual Effect                                                     |             |
|------------------------------------|--------------------------------------------------|---------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------|
|                                    |                                                  |                     |                   |                                                                                                                          | Consented Scheme                                              | Development                                                                      | Consented<br>Scheme                                                 | Development |
|                                    |                                                  |                     |                   | 38, 41, 62)<br>and within /<br>southeast of<br>Plot 5<br>(Locations<br>30, 31, 32,<br>33, 35, 48,<br>49)<br>(negligible) | stadium and within<br>Plot 5                                  | stadium and within<br>Plot 5 (Per 2015 ES<br>chapter, not re-tested<br>in 2023)  |                                                                     |             |
| Comfort for<br>recreational<br>use | Pedestrians<br>and future<br>residents<br>(High) | Local               | Permanent         | Locations 75<br>& 80 outdoor<br>seating<br>(moderate<br>adverse)                                                         | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter | 2 x 1m tall planters<br>within terrace,<br>3 x 1.6m tall Planters<br>with hedges | N/A – Plot 3<br>required no<br>mitigation<br>for 2015 ES<br>Chapter | Negligible  |
|                                    |                                                  |                     |                   | Location 201<br>(moderate<br>adverse)                                                                                    | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter | 1.8m parapets /<br>windbreak, planting                                           |                                                                     | Negligible  |
|                                    |                                                  |                     |                   | Location 402,<br>403, 406<br>(negligible to<br>moderate<br>adverse)                                                      | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter | 1.8m privacy screens                                                             |                                                                     | Negligible  |
|                                    |                                                  |                     |                   | Other<br>recreational<br>spaces<br>(negligible)                                                                          | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter | None                                                                             |                                                                     | Negligible  |

| Effect                                                                   | Receptor<br>(Sensitivity)        | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact                                                                                                  | Mitigation and Monitoring                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                 | Residual Effect                                           |                                                                                                                |
|--------------------------------------------------------------------------|----------------------------------|---------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
|                                                                          |                                  |                     |                   |                                                                                                                         | Consented Scheme                                                                                                                                                                                                                                                     | Development                                                                                                                                                                                                                                                                                                                                                                     | Consented<br>Scheme                                       | Development                                                                                                    |
| Comfort for<br>Balconies<br>areas (Plot 3)                               | Future hotel<br>guests<br>(High) | Local               | Permanent         | Negligible                                                                                                              | N/A – no balconies<br>were previously<br>considered                                                                                                                                                                                                                  | None                                                                                                                                                                                                                                                                                                                                                                            | N/A – no<br>balconies<br>were<br>previously<br>considered | Negligible                                                                                                     |
| <i>Cumulative Effects, Cumulative &amp; Lendlease Cumulative Effects</i> |                                  |                     |                   |                                                                                                                         |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                 |                                                           |                                                                                                                |
| Pedestrian<br>safety in and<br>around the<br>Site                        | Pedestrians<br>(High)            | Local               | Permanent         | Major<br>beneficial<br>(relating to<br>improved<br>conditions to<br>the south of<br>the stadium)<br>to major<br>adverse | No mitigation<br>required around Plot<br>3 Hotel<br><br>Soft landscaping<br>(trees, hedging), &<br>screens, primarily<br>around the south and<br>southeast of the<br>stadium and within<br>Plot 5; raised<br>parapets around<br>elevated amenity<br>spaces of Plot 5 | Plot 3 Hotel Ground<br>Terrace (1m planter)<br><br>Plot 3 Hotel Elevated<br>Terraces (1.8m<br>parapets, 1.8m<br>screens, Planting)<br><br>Soft landscaping<br>(trees, hedging), &<br>screens, primarily<br>around the south and<br>southeast of the<br>stadium and within<br>Plot 5; raised parapets<br>around elevated<br>amenity spaces of<br>Plot 5 (per 2015 ES<br>chapter) | Negligible                                                | Major beneficial<br>(relating to<br>improved<br>conditions to<br>the south of the<br>stadium) to<br>negligible |
| Comfort for<br>pedestrian<br>ingress/egres                               | Pedestrians<br>(High)            | Local               | Permanent         | Plot 3<br>Entrance                                                                                                      | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter                                                                                                                                                                                                        | 3 Planters with<br>hedges                                                                                                                                                                                                                                                                                                                                                       | Negligible                                                | Negligible                                                                                                     |

| Effect                                                                       | Receptor<br>(Sensitivity) | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact                                                                | Mitigation and Monitoring                                                                                          |                                                                                                                                                            | Residual Effect     |             |
|------------------------------------------------------------------------------|---------------------------|---------------------|-------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|
|                                                                              |                           |                     |                   |                                                                                       | Consented Scheme                                                                                                   | Development                                                                                                                                                | Consented<br>Scheme | Development |
| s at entrances<br>to<br>Development                                          |                           |                     |                   | Location 75<br>(moderate<br>adverse)                                                  |                                                                                                                    |                                                                                                                                                            |                     |             |
|                                                                              |                           |                     |                   | Plot 3<br>Entrance<br>Location 77<br>(minor<br>adverse)                               | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter                                                      | 1-metre-tall planter                                                                                                                                       |                     | Negligible  |
|                                                                              |                           |                     |                   | Entrances to<br>south end of<br>stadium<br>(Locations<br>39, 42, 61,<br>63, 109, 110) | Soft landscaping<br>(trees, hedging),<br>screens, primarily<br>around the south and<br>southeast of the<br>stadium | Soft landscaping<br>(trees, hedging),<br>screens, primarily<br>around the south and<br>southeast of the (Per<br>2015 ES chapter, not<br>re-tested in 2023) |                     | Negligible  |
|                                                                              |                           |                     |                   | Other<br>Entrances<br>(negligible)                                                    | None                                                                                                               | None                                                                                                                                                       |                     | Negligible  |
| Comfort for<br>pedestrian<br>access to and<br>passage<br>through the<br>Site | Pedestrians<br>(High)     | Local               | Permanent         | Plot 3<br>thoroughfares<br>(negligible)                                               | None                                                                                                               | None                                                                                                                                                       | Negligible          | Negligible  |
|                                                                              |                           |                     |                   | Thoroughfare<br>s to south<br>end of<br>stadium<br>(Locations                         | Soft landscaping<br>(trees, hedging),<br>screens, primarily<br>around the south and<br>southeast of the            | Soft landscaping<br>(trees, hedging),<br>screens, primarily<br>around the south and<br>southeast of the                                                    |                     | Negligible  |

| Effect                             | Receptor<br>(Sensitivity)                        | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact                                                                                                   | Mitigation and Monitoring                                     |                                                                                  | Residual Effect                                                     |             |
|------------------------------------|--------------------------------------------------|---------------------|-------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------|-------------|
|                                    |                                                  |                     |                   |                                                                                                                          | Consented Scheme                                              | Development                                                                      | Consented<br>Scheme                                                 | Development |
|                                    |                                                  |                     |                   | 38, 41, 62)<br>and within /<br>southeast of<br>Plot 5<br>(Locations<br>30, 31, 32,<br>33, 35, 48,<br>49)<br>(negligible) | stadium and within<br>Plot 5                                  | stadium and within<br>Plot 5 (Per 2015 ES<br>chapter, not re-tested<br>in 2023)  |                                                                     |             |
| Comfort for<br>recreational<br>use | Pedestrians<br>and future<br>residents<br>(High) | Local               | Permanent         | Locations 75<br>& 80 outdoor<br>seating<br>(moderate<br>adverse)                                                         | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter | 2 x 1m tall planters<br>within terrace,<br>3 x 1.6m tall Planters<br>with hedges | N/A – Plot 3<br>required no<br>mitigation<br>for 2015 ES<br>Chapter | Negligible  |
|                                    |                                                  |                     |                   | Location 201<br>(moderate<br>adverse)                                                                                    | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter | 1.8m parapets /<br>windbreak, planting                                           |                                                                     | Negligible  |
|                                    |                                                  |                     |                   | Location 402,<br>403, 406<br>(negligible to<br>moderate<br>adverse)                                                      | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter | 1.8m privacy screens                                                             |                                                                     | Negligible  |
|                                    |                                                  |                     |                   | Other<br>recreational<br>spaces<br>(negligible)                                                                          | N/A – Plot 3 required<br>no mitigation for<br>2015 ES Chapter | None                                                                             |                                                                     | Negligible  |

| Effect                                     | Receptor<br>(Sensitivity)        | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact | Mitigation and Monitoring                           |             | Residual Effect                                           |             |
|--------------------------------------------|----------------------------------|---------------------|-------------------|------------------------|-----------------------------------------------------|-------------|-----------------------------------------------------------|-------------|
|                                            |                                  |                     |                   |                        | Consented Scheme                                    | Development | Consented<br>Scheme                                       | Development |
| Comfort for<br>Balconies<br>areas (Plot 3) | Future hotel<br>guests<br>(High) | Local               | Permanent         | Negligible             | N/A – no balconies<br>were previously<br>considered | None        | N/A – no<br>balconies<br>were<br>previously<br>considered | Negligible  |



# 17 Daylight, Sunlight, Overshadowing and Solar Glare

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## 17.1 Introduction

- 17.1.1 This ES Addendum chapter has been prepared by GIA. It considers the daylight, sunlight, overshadowing, solar glare and light pollution assessments provided as part of the 2015 ES and whether the Amendments to the Consented Scheme (the Development) or other changes in circumstances materially affects the environmental information presented within the 2015 ES to inform decision making.
- 17.1.2 This S.73 application seeks permission for amendments to Plot 3 of the Consented Scheme. This ES Addendum chapter technically assesses the Development, taking account of the increased massing of the Plot 3 for daylight, sunlight and overshadowing effects at surrounding sensitive receptors.
- 17.1.3 A comparison of the residual effects of the Consented Scheme is provided within the Summary of Residual Effects Table (Table 17.5). This is to determine whether the changes at surrounding sensitive receptors, when compared against the Consented Scheme, are considered material.
- 17.1.4 For those receptors which would potentially see a change in daylight, sunlight, overshadowing, solar glare and light pollution effects, further assessment is undertaken for the Development.
- 17.1.5 Additionally, this chapter provides a brief overview of the design evolution from the Consented Scheme, setting out the resultant changes in daylight, sunlight, overshadowing and solar glare (i.e. proposed mitigation measures) at surrounding receptors.
- 17.1.6 This chapter is supported by the following **appendices**:
- Appendix 17.1: Scenario Overviews;
  - Appendix 17.2: Daylight and Sunlight Results for Existing Receptors;
  - Appendix 17.3: Daylight Results for Future Sensitive Receptors;
  - Appendix 17.4: Transient Overshadowing Results; and
  - Appendix 17.5: Solar Glare Results.

### Competence

- 17.1.7 Fahimeh Soltani is an Associate Partner at GIA with over 8 years' experience in the property development industry. Having completed a Master of Architecture in Sustainable Tall Buildings, Fahimeh has a developed knowledge in technical assessment and consultancy in the field of Daylight, Sunlight and Rights of Light.
- 17.1.8 Lotte is the EIA Lead at GIA, with 5 years' experience in the build environment industry. Lotte works across the GIA's teams to manage the delivery daylight of daylight and sunlight

matters for EIA projects and has gained expertise working in across London Boroughs on large scale developments.

## 17.2 EIA Topic Overview

- 17.2.1 In 2015, daylight, sunlight, overshadowing, solar glare and light pollution was assessed as part of the 2015 ES for the Operative Permission. This approved detailed proposals for Plots 1, 2 and 3 as well as outline massing for Plots 4, 5 and 6.
- 17.2.2 Negligible to major adverse effects were reported at sensitive receptors as a result of the Consented Scheme in the 2015 ES. The summary of the Consented Scheme effects are summarised in Table 17.5.
- 17.2.3 These effects have been revisited to assess whether the Amendments would alter the conclusions reported in the 2015 ES.

## 17.3 Legislation, Planning Policy and Guidance

### Legislation Context

- 17.3.1 There is no legislation relevant to daylight, sunlight, overshadowing and solar glare effects.

### Planning Policy Context

- 17.3.2 The following national, regional and local planning policy is relevant to the Development:

#### National

- National Planning Policy Framework (2021)<sup>58</sup>; and

#### Regional

- The London Plan (2021)<sup>59</sup>.

#### Local

- Haringey New Local Plan (2023)<sup>60</sup>;

### Guidance

- 17.3.3 The following guidance is relevant to the Development:

- National Planning Practice Guidance (2021)<sup>61</sup>;
- Housing Supplementary Planning Guidance (2016)<sup>62</sup>;
- Sustainable Design and Construction Supplementary Planning Guidance (2014)<sup>63</sup>;

<sup>58</sup> Department for Communities and Local Government, (2021). National Planning Policy Framework.

<sup>59</sup> Greater London Authority, 2021. The London Plan. March 2021.

<sup>60</sup> London Borough of Haringey, (2023). New Local Plan (2023).

<sup>61</sup> Department of Communities and Local Government, (Live document). National Planning Practice Guidance [online]. Available: <http://planningguidance.communities.gov.uk/>.

<sup>62</sup> Greater London Authority, (2016). Housing Supplementary Guidance

<sup>63</sup> Greater London Authority, (2014). Sustainable Design and Construction Supplementary Planning Guidance.

- Historic England Guidance on Tall Buildings – Historic England Advice Note 4 (2022)<sup>64</sup>;
- Building Research Establishment (BRE) Guidelines: Site Layout Planning for Daylight and Sunlight 2022, A Guide to Good Practice, Third Edition (2022)<sup>65</sup>.

## 17.4 Assessment Methodology

- 17.4.1 There have been no changes to the assessment methodology for assessing daylight, sunlight and overshadowing impacts to sensitive receptors set out in the 2015 ES which would materially affect the residual effects and likely significant effects of the 2015 ES. The methods as set out in the 2015 ES are therefore also applicable to the assessments presented within this ES Addendum Chapter.
- 17.4.2 As such, the reader is directed to the 2015 ES, Section 17.2, where the methodology for the technical assessment of daylight, sunlight, overshadowing, solar glare and light pollution is provided in full.

### Consultation

- 17.4.3 An Informal EIA Scoping Note (Appendix 2.1) was submitted to LB Haringey on 5<sup>th</sup> June 2023. The Scoping Note proposed that a daylight, sunlight and overshadowing assessment would be included within the EIA due to the potential for likely significant effects on sensitive residential receptors within and in close proximity to the Site, and it provided details of assessment methodology. LB Haringey provided no comments of relevance to the daylight, sunlight and overshadowing assessment.
- 17.4.4 There have been no changes to the assessment methodology set out in the 2015 ES which would materially affect the residual effects and likely significant effects. The methods as set out in the 2015 ES are therefore also applicable to the assessments presented within this ES Addendum Chapter.

## Establishing Baseline Conditions

### Current Baseline Conditions

- 17.4.5 A desk top review of the surrounding environment undertaken in May 2023 found no relevant changes to the built environment surrounding the Site since the assessments were undertaken 2015.
- 17.4.6 Plots 1 and 2 (to the north of the Plot 3) have been completed and are operational as per the Consented Scheme. These two Plots form the majority of the Site area. The remainder of the Site have not commenced the construction of the future Plots and are therefore undeveloped. The podium associated with the Stadium is in place within the south of the Site (including Plot 3), with other small temporary structures present, hardstanding, parking, and landscaping. Therefore, the baseline conditions within the Site have changed since the 2015 ES assessments.

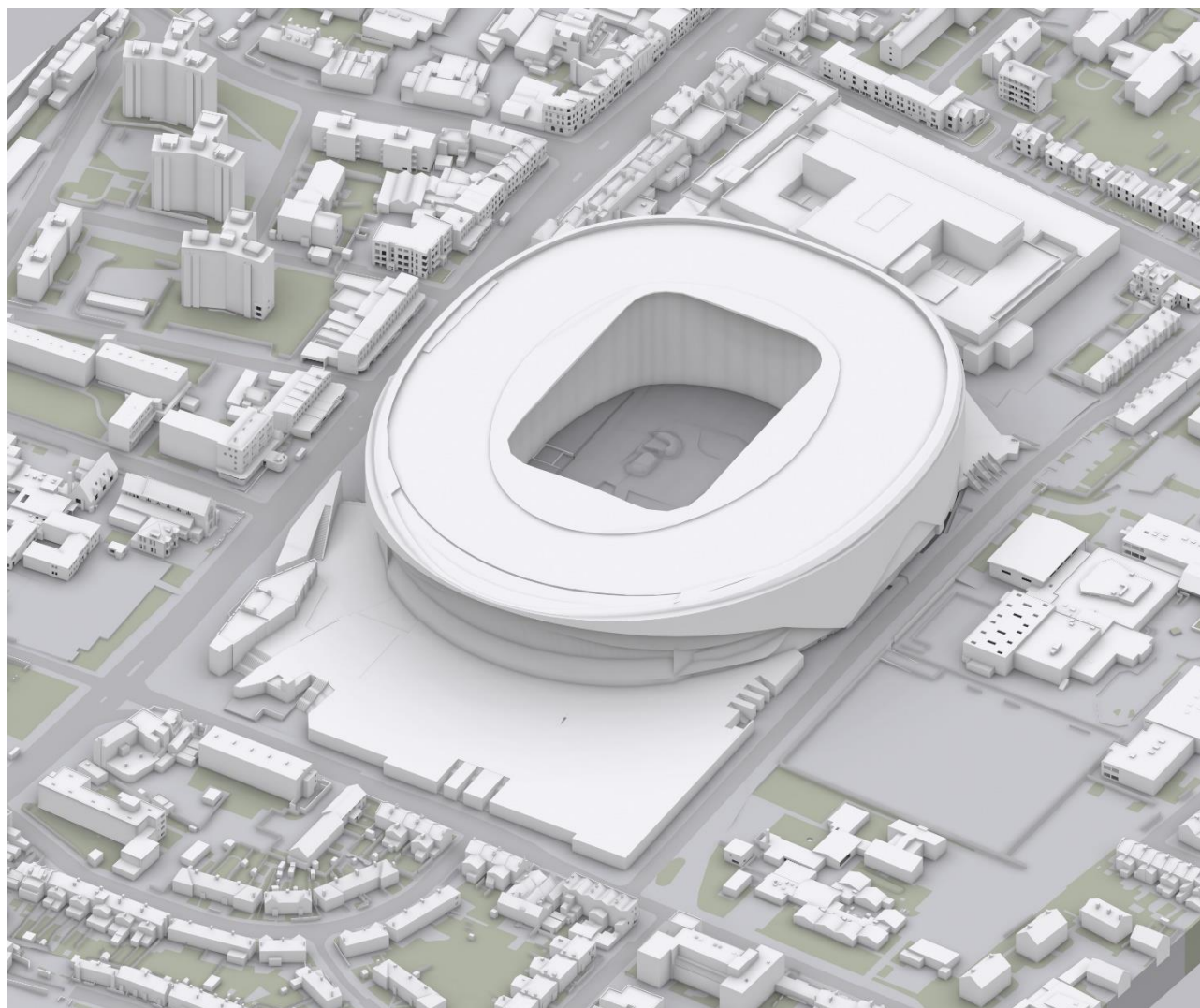
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<sup>64</sup> Historic England, (2015). Historic England Guidance on Tall Buildings – Historic England Advice Note 4

<sup>65</sup> Buildings Research Establishment, (2011). BRE Handbook 'Site Layout Planning for Daylight and Sunlight' a guide for good practice.

- 17.4.7 A three-dimensional (3D) model was developed for the baseline conditions of Plot 3, the Site and the surrounding area, as described above. This 3D model was developed using measured survey data, plans available on the planning portal and confirmed from review of Google Maps<sup>66</sup>.
- 17.4.8 The baseline condition is illustrated in Figure 17.1 and on drawings in Appendix 17.1. The existing buildings surrounding the Site are predominantly low rise in nature and comprise a mixture of residential and commercial uses. The completed stadium is in the centre of the Site, to the north of Plot 3.

Figure 17.1: Illustration of Baseline Scenario



#### Future Baseline Conditions

- 17.4.9 The future baseline scenario, i.e. the baseline conditions without implementation of the Development, assumes an alternative baseline condition at an indeterminate point in the future for a scenario in 2028 that includes cumulative schemes in the surrounding environment are complete. It also assumes that Consented Scheme would be implemented instead of the Development. This includes the residential Plot 5 building as a future receptor.

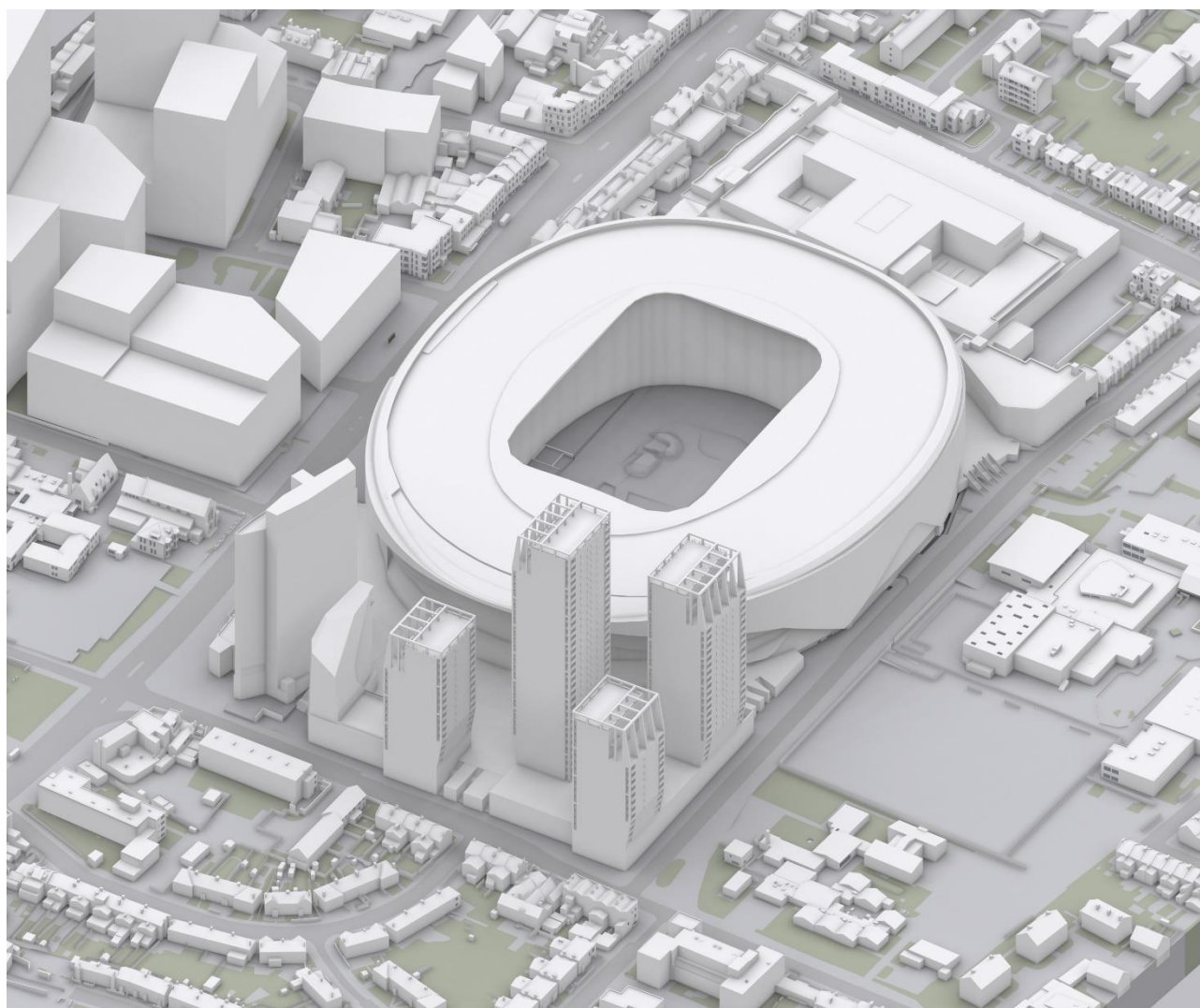
<sup>66</sup> [www.google.com/maps](https://www.google.com/maps) [accessed May 2023]

17.4.10 As the cumulative Lendlease Scheme comprises future residential accommodation, it is relevant to consider in a future baseline scenario. This future sensitive receptor was not apparent at the time of the 2015 ES and therefore requires further consideration within this ES Addendum chapter.

17.4.11 All other cumulative schemes with residential components are too far to be affected by the Amendments and so do not require assessment.

17.4.12 Therefore, within the cumulative effects assessment, a future baseline is considered.

**Figure 17.1: Illustration of Future Baseline Scenario**



## Summary of Assessment Scenarios

### Construction

17.4.13 The demolition and construction section of the 2015 ES reported that daylight, sunlight and overshadowing conditions at sensitive receptors surrounding the Site would gradually change and evolve from the baseline reported in 2015 to the point that the Consented Scheme was built out.

17.4.14 The Amendments to the construction programme will not affect the daylight, sunlight, overshadowing, solar glare and light pollution assessments. Therefore, the effects will gradually increase to the potential effects identified for the completed Development, which represents the worst-case assessment, as outlined in the following section.

#### Completed Development

17.4.15 The purpose of this ES Addendum chapter is threefold:

- Firstly, this Chapter provides a comparison of the effects of the Development to the Consented Scheme in relation to daylight, sunlight and overshadowing at sensitive receptors surrounding the Site, setting out any changes in impacts and whether the Development would alter the effects of the 2015 ES. Where no significant changes are identified, the effects are considered to remain as reported in the 2015 ES chapter and no further assessments are undertaken. The following scenarios have been considered as part of this assessment:
  - i. Consented Scheme;
  - ii. Development;
  - iii. Cumulative Scenario 1; and
  - iv. Cumulative Scenario 2 (including the Lendlease Scheme).
- Secondly, where the exercises above identify significant changes beyond the Consented Scheme, further assessments of the above scenarios are undertaken against the existing baseline to determine whether the changes are likely to alter the significance of effects reported in the 2015 ES.
- Lastly, a new solar glare assessment taking into account the new façade design of the Amendments to Plot 3 was undertaken. Solar glare is not a comparative assessment and therefore it was necessary to undertake a new assessment solar for those viewpoints from which the proposed Plot 3 building would be visible. In line with the 2015 ES, solar glare is assessed in absolute terms and therefore the baseline and cumulative scenarios were not assessed.

#### Consented Scheme

17.4.16 This scenario consists of the current baseline (including Plots 1 and 2 complete and operational) and Plots 3-6 as per the Consented Scheme.

17.4.17 The Consented Scheme is illustrated on drawings 9186/21/01/01-03 in Appendix 17.1.

#### Development

17.4.18 This scenario consists of the Amendments to Plot 3 and Plots 4-6 as per the Consented Scheme in the context of the surrounding existing environment.

17.4.19 The Consented Scheme is illustrated on drawings 9186/21/01/04-06 in Appendix 17.1.

#### Cumulative Scenarios

17.4.20 The relevant cumulative schemes surrounding the Site are assumed to be built out together with the Development. Cumulative schemes are considered relevant to the assessment based on professional judgement and the BRE's 25-degree angle test, taking in

consideration their proximity to the Development and sensitive receptors, scale and planning status.

17.4.21 The Lendlease Scheme is located adjacent to the west of the Site and was granted planning permission from LB Haringey on 31 August 2022. The Lendlease Scheme is pending judicial review and therefore, two cumulative scenarios are considered with and without the Development:

- Cumulative Scenario 1: Consented schemes (as illustrated on drawings 9186/21/02/04-06 in Appendix 17.1); and
- Cumulative Scenario 2: Consented schemes + Lendlease Scheme (as illustrated on drawings 9186/21/03/04-06 in Appendix 17.1).

17.4.22 The daylight and sunlight effects of the Development to future sensitive receptors are considered as part of Cumulative Scenario 2 only.

17.4.23 The purpose of this scenario is to provide an understanding of the future baseline conditions at surrounding future sensitive receptors. It is considered that aside from the Lendlease development (outline), other relevant cumulative schemes in the surrounding area are not close enough to introduce receptors that could be affected by the Development. Daylight impacts to Plot 5, which forms part of the Consented Scheme, is also assessed as a future sensitive receptor within the context of Cumulative Scenario 2 which portrays a worst case scenario.

17.4.24 In ascertaining the daylight impacts of the Development to future sensitive receptors within the context of Cumulative Scenario 2, comparisons are made with the Future Baseline condition (i.e. the Consented Scheme built out including Plot 3).

## Determining Effect Significance

### Sensitivity of Receptor

17.4.25 There is no change to the sensitivity of receptors, which therefore remain as reported in the 2015 ES.

### Magnitude of Impact

17.4.26 There is no change to the magnitude of impacts, which therefore remain as reported in the 2015 ES.

### Assessing Significance

17.4.27 Due to the nature of proposed changes to Plot 3 of the Consented Scheme, an initial technical exercise was undertaken to determine whether the Development results in material changes which would alter effects reported in the 2015 ES.

17.4.28 Appendix F Paragraph 2 of the BRE Report suggests that setting alternative benchmarks may be allowed for extant planning permissions where design changes are proposed and states that:

*“Sometimes there may be an extant planning permission for a site but the developer wants to change the design. In assessing the loss of light to existing windows nearby, a local authority may allow the vertical sky component (VSC) and annual probable sunlight hours*

*(APSH) for the permitted scheme to be used as alternative benchmarks. However since the permitted scheme only exists on paper, it would be inappropriate for it to be treated in the same way as an existing building, and for the developer to set 0.80 times the values for the permitted scheme as benchmarks.”*

- 17.4.29 Therefore, an initial exercise for the VSC and APSH values at surrounding sensitive receptors was undertaken, where the Consented Scheme was compared against the Amendments. This isolated the sensitive receptors which would see significant changes in VSC and APSH because of the Amendments.
- 17.4.30 Where the initial exercise indicated that receptors may experience a significant change, further consideration was given to determine whether the change would materially alter the alter the significance of effects reported in the 2015 ES.
- 17.4.31 The following sections set out the criteria for determining 'significant changes', which would alter the effects reported in the 2015 ES. This criterion is based on BRE's guidance and using professional judgement.

#### *Daylight*

- 17.4.32 For daylight, where no change in VSC occurred beyond the Consented Scheme, the receptor was not considered relevant for further assessment for the Development.
- 17.4.33 Where the following criteria was met, no significant change was considered to occur, and the effects of the 2015 ES are considered to remain valid:
- Retained VSC  $\geq 27\%$  or  $<2\%$  absolute VSC loss at the windows assessed compared to the Consented Scheme.
- 17.4.34 If the VSC criteria described above were met for all windows at a receptor, it was considered that no significant change would occur beyond the Consented Scheme, and the Development would not alter the significance of effects reported in the 2015 ES.
- 17.4.35 For those receptors exceeding these criteria, a significant change would potentially occur and a technical assessment of the Development against the existing baseline was undertaken for that receptor to determine whether the impacts would result in a change to the overall conclusions of the 2015 ES.

#### *Sunlight*

- 17.4.36 For sunlight, where no change in APSH or Winter Probable Sunlight Hours (WPSH) occurred beyond the Consented Scheme, the receptor was not relevant for further assessment for the Development.
- 17.4.37 Where the following criteria was met, no significant change is considered to occur, and the effects of the 2015 ES are considered to remain valid:
- Retained APSH  $\geq 25\%$  or  $<2\%$  absolute APSH loss within the rooms assessed compared to the Consented Scheme; and
  - Retained WPSH  $\geq 5\%$  or  $<1\%$  absolute WPSH loss within the rooms assessed compared to the Consented Scheme.

- 17.4.38 If both the APSH and WPSH criteria described above were met for all rooms at a receptor, it was considered that no significant change would occur beyond the Consented Scheme, and the Development would not the significance of effects reported in the 2015 ES.
- 17.4.39 For those receptors exceeding these criteria, a significant change would potentially occur and a technical assessment of the Development against the existing baseline was undertaken for that receptor to determine whether the impacts would result in a change to the overall conclusions of the 2015 ES.

#### *Overshadowing*

- 17.4.40 For overshadowing, transient overshadowing was initially used. Where no significant change in transient overshadowing occurred based on professional judgment beyond the Consented Scheme, the receptor was not relevant for further assessment for the Development.
- 17.4.41 For those receptors experiencing a significant change in transient overshadowing beyond the Consented Scheme, a technical Sun Hours on Ground assessment of the Development against the existing baseline was undertaken for that receptor to determine whether the impacts would result in a change to the overall conclusions of the 2015 ES.

#### *Solar Glare*

- 17.4.42 There is no change to the method of assessing significance for solar glare, which therefore remain as reported in the 2015 ES.

#### *Light Pollution*

- 17.4.43 Light pollution effects were not retested as the 2015 ES chapter found that no significant light pollution effects were likely during the either the construction phase or the complete and operational phase for the Consented Scheme. As the Amendments do not comprise any high-powered artificial lighting designs likely to result in significant effects, the conclusions of the 2015 ES chapter remain valid. Therefore, further technical assessment is not required and light pollution effects are scoped out of further consideration in this ES Addendum chapter.

#### *Internal Daylight and Sunlight Amenity*

- 17.4.44 The assessment of daylight, sunlight and overshadowing within the Development (i.e. internal receptors at Plot 3) will not form part of this ES Addendum chapter, but will be reported upon a standalone Internal Daylight, Sunlight and Overshadowing Document submitted as part of this S.73 application. This will include a cumulative scenario, to assess the effects of any cumulative schemes on the Development.

#### **Assumptions and Limitations**

- 17.4.45 There are no changes to the assumptions and limitations as described in the 2015 ES chapter.

## 17.5 Receptors and Receptor Sensitivity

### Sensitive Receptors in the Existing Baseline

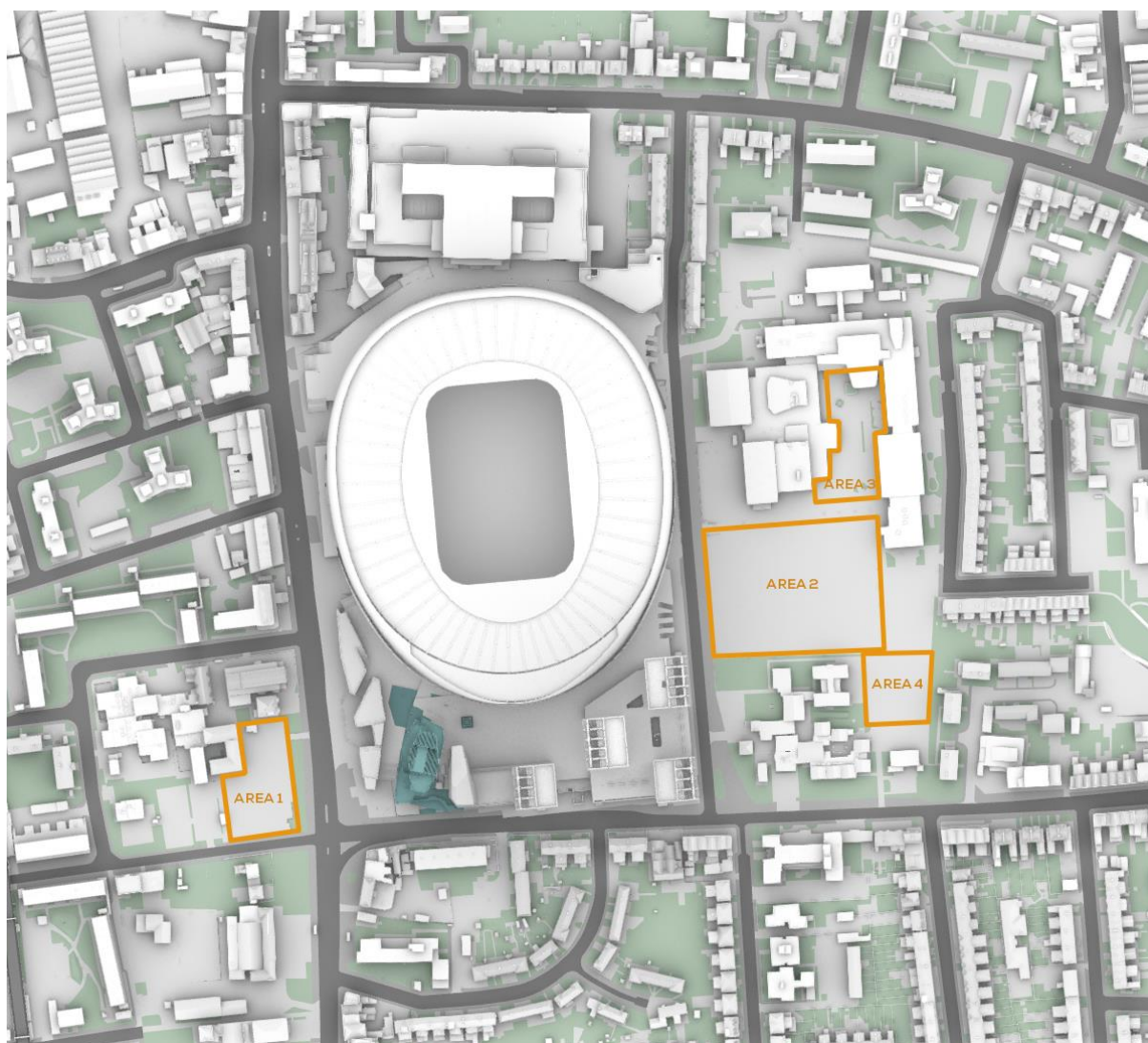
#### Daylight and Sunlight

- 17.5.1 For the daylight and sunlight assessments, the sensitive receptors were defined by the extent of residential properties which have windows facing Plot 3 and are near enough to be affected by the Development where the occupants have a reasonable expectation of daylight and sunlight. These receptors are identified in Table 17.1.

#### Overshadowing

- 17.5.2 There is no change to the existing amenity areas considered sensitive to overshadowing assessed in the 2015 ES Chapter and therefore the same receptors have been considered. These areas are shown in Figure 17.3 and identified in Table 17.1.
- 17.5.3 It is noted that the public amenity north of White Hart Lane has subsequently been consented, however, from review of the transient shadow plots is it too far to be affected and therefore not relevant for assessment.

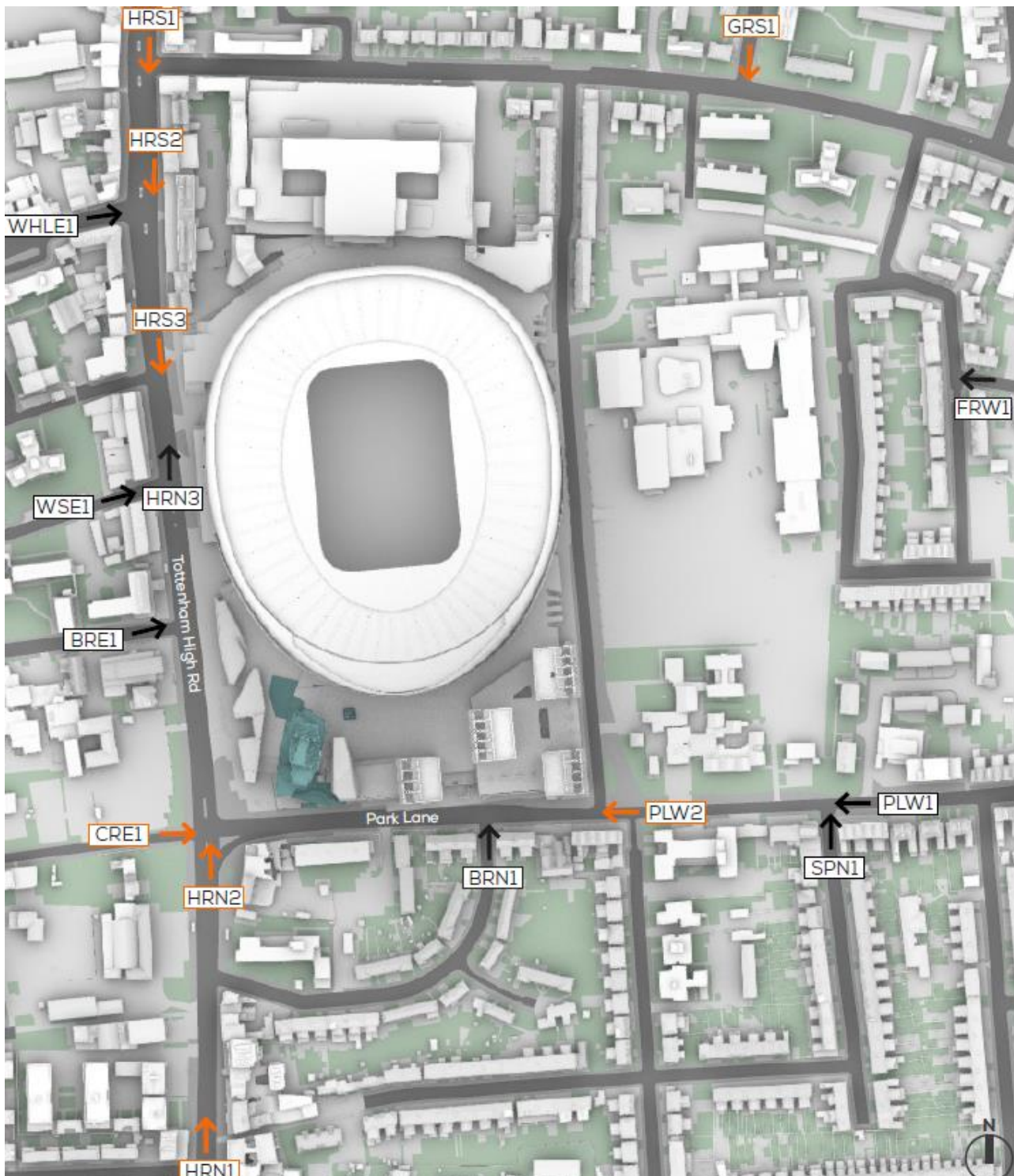
Figure 17.3: Existing Baseline Sensitive Receptors (Overshadowing)



## Solar Glare

- 17.5.4 For solar glare, sensitive viewpoints along surrounding road from which the Development would be visible were assessed. These are shown in Figure 17.4 and included in Table 17.1. A wider study area was considered compared to the receptors considered in the 2015 ES to ensure that all surrounding sensitive road viewpoints from which Plot 3 is visible were included in the assessment. All viewpoints from which the proposed Plot 3 is not visible were scoped out of requiring reassessment, as there would be no change to the assessment presented within the 2015 ES.

Figure 17.4: Existing Baseline Sensitive Receptors (Solar Glare)



### Future Sensitive Receptors

17.5.5 The sensitive daylight and sunlight receptors assessed in the future baseline are shown below in Figure 17.5 and included in Table 17.1.

Figure 17.5: Future Baseline Sensitive Receptors in Pink (Daylight and Sunlight)

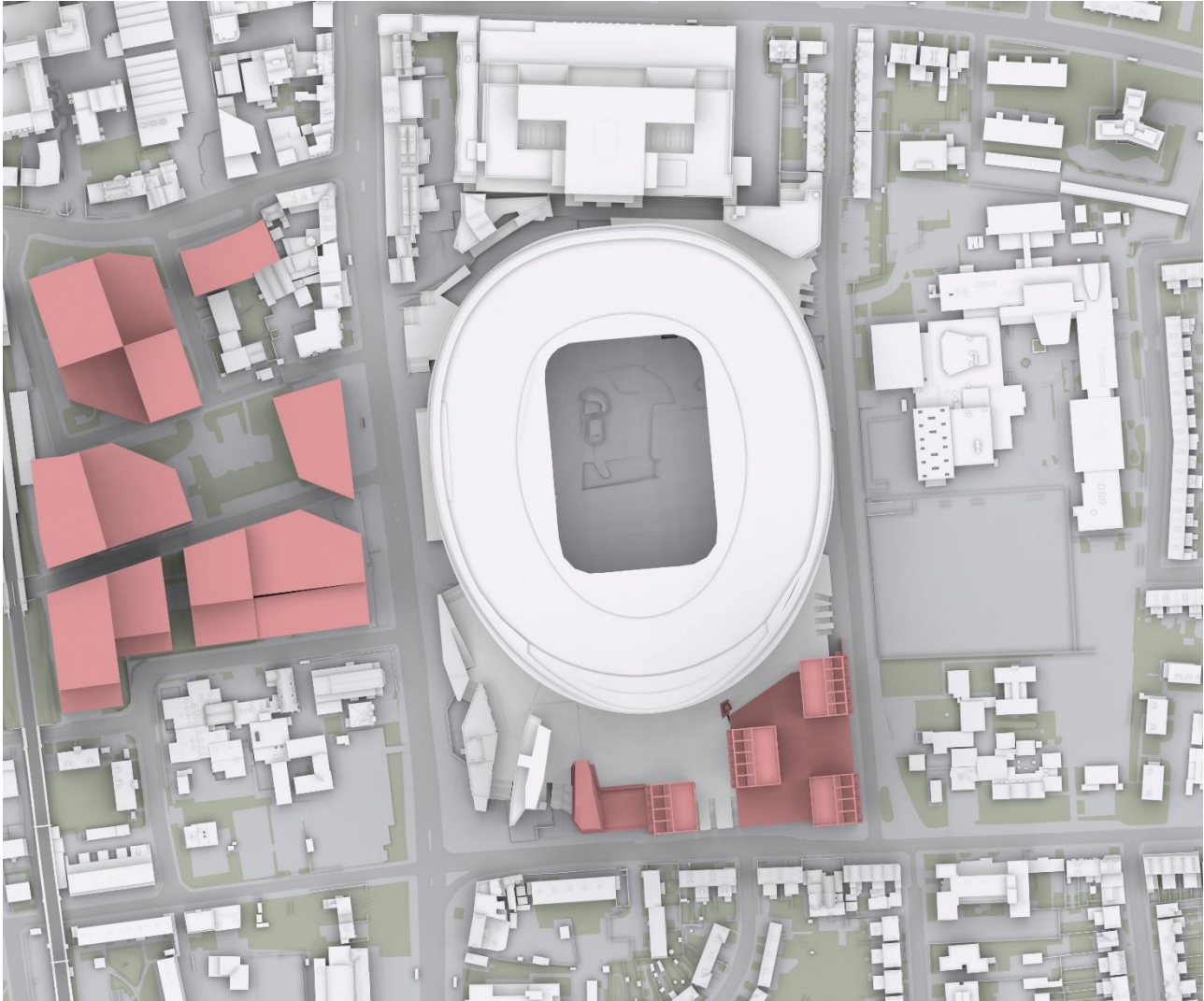


Table 17.1: Sensitive Receptors for Daylight, Sunlight, Overshadowing and Solar Glare

| Receptor                       | Assessed in the 2015 ES? | Descriptor                |
|--------------------------------|--------------------------|---------------------------|
| <i>Daylight and Sunlight</i>   |                          |                           |
| 46 Park Lane                   | Yes                      | Community Centre receptor |
| 2-2a Park Lane                 | Yes                      | Residential receptor      |
| 2 & 4 Park Lane                | Yes                      | Residential receptor      |
| 28-44 Park Lane (even numbers) | Yes                      | Residential receptor      |
| 48 & 48b Park Lane             | Yes                      | Residential receptor      |

| Receptor                                 | Assessed in the 2015 ES? | Descriptor           |
|------------------------------------------|--------------------------|----------------------|
| 60 Park Lane (St Paul-S House)           | Yes                      | Residential receptor |
| 28-44 Park Lane (even numbers)           | Yes                      | Residential receptor |
| 60 Park Lane (St Paul-S House)           | Yes                      | Residential receptor |
| 9-13 Bennets Close                       | Yes                      | Residential receptor |
| 705-707 High Road                        | Yes                      | Residential receptor |
| 729-759 High Road (odd numbers)          | Yes                      | Residential receptor |
| 732 High Road                            | Yes                      | Residential receptor |
| 769-791 High Road (odd numbers)          | Yes                      | Residential receptor |
| 771a High Road                           | Yes                      | Residential receptor |
| 790-820 High Road (even numbers)         | Yes                      | Residential receptor |
| 793-795 High Road (Bank)                 | Yes                      | Residential receptor |
| 797-809 High Road (odd numbers)          | Yes                      | Residential receptor |
| 813-827 High Road (odd numbers)          | Yes                      | Residential receptor |
| 806b High Road                           | Yes                      | Residential receptor |
| 19 Bennets Close                         | Yes                      | Residential receptor |
| 3-23 Northumberland Park (odd numbers)   | Yes                      | Residential receptor |
| 50a Northumberland Park                  | Yes                      | Residential receptor |
| 50b Northumberland Park                  | Yes                      | Residential receptor |
| 29-57 Northumberland Park (odd numbers)  | Yes                      | Residential receptor |
| 52-54 Northumberland Park (even numbers) | Yes                      | Residential receptor |
| Northumberland School-B1, B2, B3 & B4    | Yes                      | Education receptor   |
| Burleigh Court                           | Yes                      | Residential receptor |
| Cavalry Church Of God In Christ          | Yes                      | Residential receptor |
| 2-18 Worcester Avenue (even numbers)     | Yes                      | Residential receptor |
| 1-23 Worcester Avenue (odd numbers)      | Yes                      | Residential receptor |
| Coombes House                            | Yes                      | Residential receptor |
| 1-3 Lancaster Close                      | Yes                      | Residential receptor |
| 29 Bromley Road                          | Yes                      | Residential receptor |
| 38 Bromley Road                          | Yes                      | Residential receptor |
| Bergan-Brooklyn Apartments               | Yes                      | Residential receptor |
| 8 William Street                         | Yes                      | Residential receptor |
| Ermine House                             | Yes                      | Residential receptor |
| 1 Moselle Street                         | Yes                      | Residential receptor |
| 2 Vicarage Road                          | Yes                      | Residential receptor |

| Receptor                                  | Assessed in the 2015 ES? | Descriptor                  |
|-------------------------------------------|--------------------------|-----------------------------|
| 28 Bromley Road                           | Yes                      | Residential receptor        |
| St Francis De Sales School                | Yes                      | Education receptor          |
| St Francais De Sales Church               | Yes                      | Religious receptor          |
| 4-18 Brereton Road (even numbers)         | Yes                      | Residential receptor        |
| 7 White Hart Lane                         | Yes                      | Residential receptor        |
| 13 White Hart Lane                        | Yes                      | Residential receptor        |
| 9-39 White Hart Lane                      | Yes                      | Residential receptor        |
| 25 & 27 Worcester Avenue                  | Yes                      | Residential receptor        |
| 1-22 Concord House                        | Yes                      | Residential receptor        |
| 8-11 Kathleen Ferrier Court               | Yes                      | Residential receptor        |
| 16-19 Kathleen Ferrier Court              | Yes                      | Residential receptor        |
| St Pauls And Hallows School               | Yes                      | Residential receptor        |
| Lendlease Scheme (outline)                | No                       | Future residential receptor |
| Northumberland Development Project Plot 5 | Yes                      | Future residential receptor |

#### *Overshadowing*

|                                                                    |     |                         |
|--------------------------------------------------------------------|-----|-------------------------|
| Area 1: St Francis De Sales RC Junior School Playground            | Yes | School grounds receptor |
| Area 2: Northumberland Park Community School Ground                | Yes | School grounds receptor |
| Area 3: Northumberland Park Sports Centre                          | Yes | School grounds receptor |
| Area 4: St Paul's And All Hallows Infant and Junior School Grounds | Yes | School grounds receptor |

#### *Solar Glare*

|                                  |     |                          |
|----------------------------------|-----|--------------------------|
| White Hart Lane (East) 1 – WHLE1 | No  | Road junction viewpoints |
| Whitehall Street (East) 1 – WSE1 | Yes | Road junction viewpoints |
| High Road (North) 3 – HRN3       | Yes | Road junction viewpoints |
| Brereton Road (East) 1 – BRE1    | Yes | Road junction viewpoints |
| Bromley Road (North) 1 – BRN1    | Yes | Road junction viewpoints |
| Somerfield Place (North) – SPN1  | No  | Road junction viewpoints |
| Park Lane (West) 1 – PLW1        | Yes | Road junction viewpoints |
| Farningham Road (West) 1 – FRW1  | No  | Road junction viewpoints |
| Grange Road (South) – GRS1       | No  | Road junction viewpoints |
| High Road (North) 1 – HRN1       | No  | Road junction viewpoints |
| High Road (North) 2 – HRN2       | Yes | Road junction viewpoints |
| High Road (South) 1 – HRS1       | No  | Road junction viewpoints |

| Receptor                   | Assessed in the 2015 ES? | Descriptor               |
|----------------------------|--------------------------|--------------------------|
| High Road (South) 2 – HRS2 | Yes                      | Road junction viewpoints |
| High Road (South) 3 – HRS3 | Yes                      | Road junction viewpoints |
| Park Lane (West) 2 – PLW2  | Yes                      | Road junction viewpoints |
| Church Road (East) - CRE1  | Yes                      | Road junction viewpoints |

## 17.6 Assessment of Effects

### Construction

- 17.6.1 The magnitude of impact and resultant daylight, sunlight, overshadowing and solar glare effects on surrounding receptors will vary throughout the construction phase depending on the level of obstruction caused.
- 17.6.2 The construction of the new buildings on the Site would have a gradual effect upon the levels of daylight, sunlight and overshadowing as the massing of the Development increases over time. Whilst the effects would be noticeable during the demolition and construction phase, such effects would be less than that of the completed Development. It is therefore considered that the completed Development represents the worst-case assessment in terms of likely resultant effects.
- 17.6.3 As a result, no additional mitigation would be required. Accordingly, the residual effect of the Development would increase from negligible up to those stated for the completed Development.

### Completed Development

#### Daylight

- 17.6.4 The daylight result of the Development compared against the Consented Scheme can be found in Appendix 17.2. Drawings of both scenarios can be found in Appendix 17.1
- 17.6.5 A total of 1026 windows within 117 properties were assessed for VSC. 527 of the assessed windows will experience no change in VSC when comparing the Development to the Consented Scheme and 40 will experience improvements. The remaining 459 windows will experience VSC losses of no greater than 1.7% absolute and 170 retain VSC values of greater than 27%.
- 17.6.6 It is therefore concluded that none of the daylight receptors assessed would experience a significant change following the implementation of the Development. Therefore, the daylight effects of the 2015 ES remain valid and further consideration is not required within this ES Addendum.

#### Sunlight

- 17.6.7 The sunlight result of the Development compared against the Consented Scheme can be found in Appendix 17.2. Drawings of both scenarios can be found in Appendix 17.1

- 17.6.8 A total of 134 rooms within 27 properties had windows within 90 degrees of due south and were therefore relevant for sunlight assessment. assessed for VSC. 108 of the assessed rooms will experience either no change or improvements in APSH when comparing the Development to the Consented Scheme and 105 will experience no change in WPHS. The remaining rooms will experience losses of no greater than 1% absolute for both APSH and WPHS.
- 17.6.9 Importantly, where there are any reductions, the rooms will remain BRE compliant by retaining over 25% APSH and 5% WPHS.
- 17.6.10 It is therefore concluded that none of the sunlight receptors assessed would experience a significant change following the implementation of the Development. Therefore, the sunlight effects of the 2015 ES remain valid and further consideration is not required within this ES Addendum.

#### Overshadowing

- 17.6.11 The full transient overshadowing results for the Development and Consented Scheme can be found in Appendix 17.4.
- 17.6.12 The results of this assessment illustrate that only the north east corner of the Northumberland Park Community School Ground experiences an additional shadow cast by the Development when compared against the Consented Scheme on March 21<sup>st</sup> at 4pm.
- 17.6.13 Given that this area receives direct sunlight for well over 2 hours, it is considered that this receptor would not experience a significant change following the implementation of the Development. Therefore, the overshadowing effects of the 2015 ES remain valid and further consideration is not required within this ES Addendum.

#### Solar Glare

- 17.6.14 The updated solar glare assessment can be found in Appendix 17.5.
- 17.6.15 The technical assessment has been undertaken from 16 nearby locations which are considered sensitive in terms of solar glare. The technical assessment considers the potential occurrence, proximity and duration of solar reflections from the façades of the amended Plot 3.
- 17.6.16 At eight viewpoints assessed, Plot 3 is not visible and as such there is no potential for any solar glare effects. Five of these were assessed in the 2015 ES and therefore the previous effects reported remain valid:
- WSE1;
  - HRN3;
  - BRE1;
  - BRN1; and
  - PLW1.
- 17.6.17 Three of these viewpoints were not previously assessed, but due to the additional height of Plot 3 additional viewpoints have been included in the assessment. However, as shown in

Appendix 17.5, no reflections would be visible at the following three viewpoints and so the effect is considered negligible:

- WHLE1;
- SPN1; and
- FRW1

17.6.18 The remaining eight viewpoints are considered further due to the potential for reflections within 30° of a road users' line of sight.

17.6.19 At four of these eight remaining viewpoints, reflections from Plot 3 would be visible and are therefore discussed further.

#### *HRN2*

17.6.20 At this viewpoint travelling north along High Road, a very small reflection would potentially be visible at approximately 27° of a road users' field of view between 12:00 and 13:00 from mid-March to mid-April and mid-September to mid-October. However, the reflections would occur on a very limited portion of the façade and in the peripheries of a road user's line of sight. Additionally, the reflection could be shielded by deploying the sun visor. As the location and duration where reflections could occur remains similar to that of the 2015 ES assessment, no additional impacts would occur because of the Amendments and so the effect is considered to remain negligible.

#### *HRS2 and HRS3*

17.6.21 At these two viewpoints travelling south along High Road, reflections from the top of Plot 3 would potentially be visible at approximately 20° – 30° of a road users' field of view. At HRS2, the reflections would occur between 16:00 and 17:00 from mid-March to mid-April and mid-September to mid-October. At HRS3, potential reflections would occur from 12:00 GMT to 13:00 GMT throughout the year. However, at both viewpoints, the reflections would occur on very limited portions of the façade and in the peripheries of a road user's line of sight. All reflections could be shielded by deploying the sun visor. As the location and duration where reflections could occur remains similar to that of the 2015 ES assessment, no additional impacts would occur because of the Amendments and so the effect to both viewpoints is considered to remain negligible.

#### *PLW2.*

17.6.22 At this viewpoint travelling west along Park Lane, very small reflections would potentially be visible at approximately 15° of a road users' field of view between 04:00 GMT and 05:00 GMT in the summer months and from 16:00 GMT to 17:00 GMT in the mid seasons. However, the reflections would occur on a very limited portion of the façade and in the peripheries of a road user's line of sight. Most of the reflection could be shielded by deploying the sun visor. Additional reflections can be seen to occur because of the Amendments and so the effect is considered to change from negligible in the 2015 ES to negligible to minor adverse.

#### *CRE1*

17.6.23 The final viewpoint, where a road user would be travelling east, there is the potential for reflections throughout the day across the year. At the closest point of a road user's line of

sight within 5°, reflections would potentially occur after 18:00 GMT during the mid-seasons. These potential reflections occur on small portions of the façade at a time of year when the probability of the sun shining is limited. Additionally, the intensity of the sun is lower in the evening. Most of these reflections could be shielded with the use of the sun visor. Therefore, taking each of these factors into consideration, the effect is considered minor to moderate adverse, compared to negligible to minor adverse in the 2015 ES.

- 17.6.24 The remaining three viewpoints, GRS1, HRN1 and HRS1, were not previously included in the solar glare assessment. Reflections from the top of Plot 3 would potentially be visible at these three viewpoints from approximately 15° – 30° of a road users' field of view on very limited portions of the façade and from relatively far away. This means that reflections would only occur for a short period of time in the peripheries of a road users' field of view. The reflections would all occur above the visor line, meaning that all reflections could be shielded once deployed. Taken these factors into consideration, the effect to all three viewpoints is considered to negligible to minor adverse.

#### Solar Glare Conclusions

- 17.6.25 Whilst solar glare effect have been identified, this is almost unavoidable where glazed materiality such as windows are proposed and a common result of schemes of this nature.

#### Mitigation, Monitoring and Residual Effects

- 17.6.26 The mitigation implemented within the Consented Scheme is relevant to the Development.
- 17.6.27 No additional mitigation is proposed as all mitigation is embedded within design. GIA, the authors of this ES chapter, have worked with the scheme architects and project team to minimise the overall daylight, sunlight, overshadowing and solar glare impact to the neighbouring sensitive receptors surrounding the Development, such that the effects remain in line with the Consented Scheme. This has involved the consideration of massing options in relation to sensitive receptors.
- 17.6.28 It is therefore considered that mitigation has been embedded through the scheme design process and no further mitigation or monitoring is proposed for the Development.
- 17.6.29 The residual effects remain as reported above under Assessment of Effects.

### 17.7 Cumulative Effects

#### Cumulative 1: Completed Development + Cumulative Schemes Construction

- 17.7.1 There is no change to the effects during construction in this Cumulative Scenario.
- 17.7.2 Therefore, the construction of the new buildings on the Site together with the cumulative schemes would have a gradual effect upon the levels of daylight, sunlight and overshadowing as the massing of the Development and cumulative schemes increase over time. Whilst the effects would be noticeable during the demolition and construction phase, such effects would be less than that of the completed Development and cumulative schemes. It is therefore considered that the completed Development and cumulative schemes represents the worst-case assessment in terms of likely resultant effects.

As a result, no additional mitigation would be required. Accordingly, the residual effect of the Development would increase from negligible up to those stated for the completed Development.

## Completed Development

### Daylight and Sunlight

- 17.7.3 The daylight result of the Cumulative Scenario 1 compared against the Consented Scheme can be found in Appendix 17.2. Drawings of both scenarios can be found in Appendix 17.1
- 17.7.4 Due to the location of the cumulative schemes in relation to the sensitive receptors assessed and the orientation of their windows, no additional cumulative sunlight effects would occur, and vast majority of receptors would not see any additional cumulative daylight effects.
- 17.7.5 Only 5 windows at 791 High Road would experience VSC losses of greater than 2% absolute when compared against the Consented Scheme. However, all 5 windows retain VSC values of greater than 29% and will therefore remain BRE compliant.
- 17.7.6 It is therefore concluded that the daylight and sunlight effects in the Cumulative Scenario 1 remain as reported for the Development in isolation.

### Overshadowing

- 17.7.7 The full transient overshadowing results for Cumulative Scenario 1 as well as the Development and Consented Scheme for comparison purposes can be found in Appendix 17.4.
- 17.7.8 Due to the location of the cumulative schemes to the north of the sensitive amenity areas, these cumulative schemes would not cast any additional shading to these receptors. Therefore, no cumulative overshadowing effects would occur.
- 17.7.9 As such, the overshadowing effects in the Cumulative Scenario 1 remain as reported for the Development in isolation.

## Mitigation, Monitoring and Residual Effects

- 17.7.10 No additional mitigation or monitoring is proposed for the Cumulative Scenario 1 as the effects remain as reported for the Development in isolation.
- 17.7.11 The residual effects remain as reported above under Assessment of Effects.

## Scenario 2: Completed Development + Cumulative Schemes + Lendlease Scheme

- 17.7.12 Cumulative Scenario 2 assesses the effects of the Development in combination with the relevant cumulative schemes against the Consented Scheme. Additionally, the impact of the Development upon future sensitive receptors within Cumulative Scenario 2 are assessed.
- 17.7.13 For the consented Plot 5 within the Consented Development, a study of daylight potential was carried out as part of the 2015 ES with reference to VSC assessment. To ascertain

whether the Development would materially affect the daylight availability to Plot 5 when compared against the Consented Scheme, a like-for-like VSC façade study for the outline Plot 5 was undertaken with the Development in place. The results of these assessments are included in Appendix 17.3 and are discussed below.

- 17.7.14 With regards to the Lendlease Scheme, given that the outline massing is considered as a worst-case scenario, VSC façade assessments of the maximum parameters were assessed to determine the potential likely significant effects. The VSC façade assessment results are presented within Appendix 17.3 and discussed below.

## Construction

- 17.7.15 There is no change to the effects during construction in the Cumulative Scenario 2.
- 17.7.16 Therefore, the construction of the new buildings on the Site together with the cumulative schemes + Lendlease Scheme would have a gradual effect upon the levels of daylight, sunlight and overshadowing as the massing of the Development and cumulative schemes + Lendlease Scheme increase over time. Whilst the effects would be noticeable during the demolition and construction phase, such effects would be less than that of the completed Development and cumulative schemes + Lendlease Scheme. It is therefore considered that the completed Development and cumulative schemes + Lendlease Scheme represents the worst-case assessment in terms of likely resultant effects.
- 17.7.17 As a result, no additional mitigation would be required. Accordingly, the residual effect of the Development would increase from negligible up to those stated for the completed Development.

## Completed Development

### Daylight and Sunlight – Existing Baseline

- 17.7.18 The daylight and sunlight result for the Cumulative Scenario 2 can be found in Appendix 17.2.
- 17.7.19 Due to the location of the cumulative schemes in relation to the sensitive receptors assessed and the orientation of their windows, the majority of receptors would not see any additional cumulative daylight and sunlight effects.
- 17.7.20 Alterations in daylight and sunlight as a result of the Lendlease Scheme coming forward can be seen at Bergan-Brooklyn Apartments, which is located directly north east of the Lendlease Scheme site boundary and at Francis De Sale School and Church. As these neighbours are not materially affected by the Amendments, all the impacts can be attributed to the Lendlease development coming forward. Therefore, as the Lendlease Scheme planning application, which was submitted in the knowledge of the Consented Scheme as partially built out, the cumulative effects to these properties are already accounted for and further consideration is not required within this ES Addendum.
- 17.7.21 The properties at 1-22 Concord House would see additional daylight impacts in the Cumulative Scenario 2. However, the additional impacts compared to the Consented Scheme equate to no more than 3.5% absolute VSC loss to bedrooms and kitchens, where daylight may be considered less important. Additionally, the primary living spaces in Concord House are located on the south facade facing away from the Site and Lendlease

and therefore would not be affected for daylight. These cumulative effects are already accounted for, and further consideration is not required within this ES Addendum.

17.7.22 Coombes House, 732 High Road, 4 Park Lane and 2 Park Lane would also see additional daylight impacts in the Cumulative Scenario 2 which equate to no greater than 3.7% absolute VSC loss when compared to the Consented Scheme. All the assessed windows in these properties will retain VSC levels of above 18% and therefore could be considered commensurate with the surrounding context of a dense urban environment of which the Site is located within. In addition, the room uses are unknown and there is a possibility that several of the windows assessed may be bedrooms which are considered less sensitive than living areas as stated within BRE guidelines. These cumulative effects are already accounted for, and further consideration is not required within this ES Addendum.

17.7.23 No alterations in APSH would occur at Concord House, Coombes House, 732 High Road, 4 Park Lane and 2 Park Lane due the only sensitive windows being located on the northern façade towards the Site and Lendlease Scheme.

#### *Daylight Effects to Lendlease Scheme – Future Baseline*

17.7.24 The VSC façade studies showing the daylight effects to the elevations of the outline Lendlease Scheme can be found in Appendix 17.3.

17.7.25 The results show that there are no perceivable daylight changes to the elevations of Lendlease Scheme as a result of the Amendments and the effects are therefore not considered significant when compared against the Consented Scheme.

#### *Daylight Effects to the consented Plot 5 – Future Baseline*

17.7.26 The results of the VSC façade studies showing the daylight effects to the elevations of Plot 5 of the Consented Scheme can be found in Appendix 17.3.

17.7.27 It is clear from the images provided that the Amendments will not have a significant impact to the daylight levels available at the elevations of Plot 5. The largest reduction from the Consented Scheme to the indicative receptors equates to less than 4% absolute and all of the indicative receptors experiencing reductions beyond 2% will achieve VSC levels of 27% and above (depicted in yellow).

17.7.28 It is therefore concluded that none of the indicative daylight receptors assessed would experience a significant change following the implementation of the Development.

#### **Mitigation, Monitoring and Residual Effects**

17.7.29 Due to the outline nature of the Lendlease Scheme, the maximum parameter has been assessed to represent a worst-case scenario. Future detailed development within these parameters would not be built out the maximum extents and so it is likely that the Cumulative Scenario 2 effects would either reduce or remain similar.

17.7.30 No additional mitigation or monitoring is proposed for the Cumulative Scenario 2 as it is embedded into the design.

17.7.31 The residual effects remain as reported above under Assessment of Effects.

Table 17.5: Summary of Residual Effects

| Effect                                                                                                                                                                                                                                                       | Receptor<br>(Sensitivity) | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact         | Residual Effect                                                                                                                                                                                                                 |             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------|-------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
|                                                                                                                                                                                                                                                              |                           |                     |                   |                                | Consented Scheme                                                                                                                                                                                                                | Development |
| Development                                                                                                                                                                                                                                                  |                           |                     |                   |                                |                                                                                                                                                                                                                                 |             |
| Construction                                                                                                                                                                                                                                                 |                           |                     |                   |                                |                                                                                                                                                                                                                                 |             |
| Refer 'Impact Assessment Methodology – Construction' – The Completed Development represents the worst-case assessment in terms of likely daylight, sunlight, overshadowing and solar glare.<br>Refer Residual Effects for the Completed Development (below). |                           |                     |                   |                                |                                                                                                                                                                                                                                 |             |
| Completed Development                                                                                                                                                                                                                                        |                           |                     |                   |                                |                                                                                                                                                                                                                                 |             |
| Daylight impacts to existing receptors                                                                                                                                                                                                                       | High                      | Local               | Permanent         | Negligible to major adverse    | Negligible to 76 properties with 17 instances of minor adverse, two instances of minor to moderate adverse, three instances of moderate adverse, two instances of moderate to major adverse and two instances of major adverse. | No Change   |
| Daylight impacts to future receptors                                                                                                                                                                                                                         | High                      | Local               | Permanent         | Negligible                     | N/A                                                                                                                                                                                                                             | Negligible  |
| Sunlight impacts to existing receptors                                                                                                                                                                                                                       | High                      | Local               | Permanent         | Negligible to major adverse    | Negligible to 60 properties with six instances of minor adverse and one instances of moderate adverse effects.                                                                                                                  | No Change   |
| Transient Overshadowing impacts to                                                                                                                                                                                                                           | High                      | Local               | Permanent         | Negligible to moderate adverse | Minor adverse for March and June 21 <sup>st</sup> and minor to                                                                                                                                                                  | No Change   |

| Effect                            | Receptor<br>(Sensitivity) | Geographic<br>Scale | Temporal<br>Scale | Magnitude of<br>Impact            | Residual Effect                                                                                                                                                                  |                                                                                                                                                                                |
|-----------------------------------|---------------------------|---------------------|-------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                   |                           |                     |                   |                                   | Consented Scheme                                                                                                                                                                 | Development                                                                                                                                                                    |
| existing<br>receptors             |                           |                     |                   |                                   | moderate adverse for<br>December 21 <sup>st</sup>                                                                                                                                |                                                                                                                                                                                |
| Solar Glare to<br>road viewpoints | High                      | Local               | Permanent         | Negligible to<br>minor<br>adverse | Negligible for seven<br>viewpoints with one instance<br>of negligible to minor<br>adverse, one instance of<br>minor adverse and one<br>instance of minor to<br>moderate adverse. | Negligible for nine viewpoints<br>with four instances of<br>negligible to minor adverse,<br>one instance of minor<br>adverse and one instance of<br>minor to moderate adverse. |

#### Cumulative Scenario 1

*There would be no additional effects in the Cumulative Scenario 1. Refer Residual Effects for the Completed Development.*

#### Cumulative Scenario 2

*There would be no additional effects in the Cumulative Scenario 2. Refer Residual Effects for the Completed Development.*

## 18 Electronic Interference

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### 18.1 Introduction

- 18.1.1 This ES Addendum Chapter, prepared by Quod, provides a Statement of Conformity that reports the findings related to whether the S.73 Amendment Application, or other changes in circumstances, materially affect the environmental information pertaining to electronic interference effects provided within the 2015 ES to inform decision making.

### 18.2 Competence

- 18.2.1 This ES Addendum chapter was written by Alistair Walker, a chartered environmental planner and Associate EIA consultant at Quod with over 10 years of experience. He is inherently familiar with the production of ESs for urban regeneration developments that incorporate tall buildings and associated EIA constraints, including electronic interference.

### 18.3 EIA Topic Overview

- 18.3.1 Interference to certain telecommunications systems (e.g. television, mobile phone and radio) can arise from buildings physically blocking and absorbing associated signals. Therefore, a loss or degradation of the reception of such systems can result from the introduction of new or amended buildings and is often referred to as 'electronic interference', with the affected area referred to as the 'shadow area'.
- 18.3.2 The purpose of this Chapter is to consider the implications on electronic interference, if any, that could arise with the S.73 Application and whether the environmental effects and mitigation measures previously reported within the 2015 ES remain valid.
- 18.3.3 The 2015 ES Chapter only considered the potential effects of the Consented Scheme on TV reception, with potential effects on radio reception (both analogue and digital), mobile phone signals, wireless networks and emergency service communications scoped out of the assessment. Sensitive receptors to TV reception are considered to be domestic dwellings where TV is watched as an amenity along with public health and public transport services. Places where TV is part of a commercial offering such as hotels, offices and shops are not considered to be sensitive receptors.
- 18.3.4 At the time of assessment the Consented Scheme was predicted to affect between zero and 51 aerial installations. Proposed mitigation included upgrading of terrestrial aerials by providing a non-subscription satellite service ('Freesat' or 'Sky' at a on-off cost) and increasing height of satellite dishes, were applicable. Following mitigation, no residual effects were predicted from the Consented Scheme during the construction or operational phase.

### 18.4 Relevant Amendments

- 18.4.1 The S.73 Application seeks to amend Plot 3 of the Consented Scheme. The Amendments of relevance to this assessment are as follows:
- Changes to the building form and layout of the building; and

- Increase to the height of the building (an increase of up to approximately 27m from 100m to c.127m AOD).

## 18.5 Assessment Review

18.5.1 The scope of the electronic interference assessment is as follows:

- Review and update the baseline conditions where necessary;
- Review and update the policy and guidance section, where necessary;
- Review and identify any new sensitive locations where people might be affected by changes in electronic interference;
- Qualitatively consider the changes to electronic interference, using technical guidance;
- Review of cumulative schemes for assessment.

## 18.6 Legislation and Policy Review

18.6.1 There is no existing legislation of relevance to electronic interference. The previous reported policy framework is still valid, however the NPPF has been updated and it reinforces and sets out the Government's planning policies for England and how these should be implemented.

18.6.2 The London Plan was updated, most recently in 2021. Policy D9: Tall Buildings reiterates the previous sentiment of Policy 7.7 (as per the 2015 version) that *"buildings, including their construction, should not interfere with...telecommunications"*. There are no relevant policies regarding electronic interference in the most recently adopted version of the LB Haringey Local Plan.

18.6.3 In summary, the updates to policy do not have any implications for the assessment presented in the 2015 ES.

## 18.7 Baseline Review

18.7.1 Consented Scheme, the Site has undergone significant change as part of the delivery of the Consented Scheme. Plots 1 and 2 are complete and occupied and meanwhile uses are present within Plot 3. The completed Plots 1 and 2 structures are within the previously considered shadow area. Plots 1 and 2 would lead to some of the previously considered shadow area now being in place. In addition, some nearby developments that were previously considered as cumulative schemes are now complete and operational and some are under construction which could change the electronic interference environment. However, it is not considered that these changes to the baseline scenario would change the conclusions made in the 2015 ES.

### Sensitive Receptors

18.7.2 There are a number of new sensitive receptors in the vicinity of the Site that were not present at the time of the EIA for the 2015 ES and therefore were not considered to form part of the baseline assessment. However, as they are considered to be newly built or refurbished developments, it is expected that suitably modern TV connections will have been installed such that electronic interference from tall buildings would not be an issue.

## 18.8 Assessment of Environmental Effects Review

### *Construction and Completed Development*

- 18.8.1 Since completion of the assessment for the Consented Scheme in 2015, the majority of the population has switched over to streaming-based TV services that come directly through a landline. Notwithstanding, there is potential for adverse effects on new sensitive receptors in the slightly enlarged shadow area although these are not considered to be significant given the relatively small increase in height of the Development from the Amendments. This is in-line with the conclusions stated in the 2015 ES.

## 18.9 Mitigation Measures and Likely Residual Effects Review

### *Construction and Completed Development*

- 18.9.1 Should the Development result in any adverse effects upon existing or new sensitive receptors, suitable mitigation measures would be identified and offered via a Section 106 agreement, such as the potential relocation and or upgrading of any receiving equipment that is adversely affected, so that they can receive unhindered television service.
- 18.9.2 The residual effects for the Development will be the same as those previously reported in the 2015 ES and no further mitigation is required beyond those already agreed for the Consented Scheme and secured by planning condition(s).

## 18.10 Cumulative Effects Review

- 18.10.1 No schemes were identified in the 2015 ES to have the potential to create a cumulative effect.
- 18.10.2 A number of new major planning permissions have been granted planning consent since 2015, as set out in Appendix 2.2. None of these planning applications assessed the potential effects on electronic interference and so cumulative effects cannot be quantified. However, significant effects are not expected based on the rationale applied above.

## 18.11 Comparison with the Consented Scheme

- 18.11.1 The potential impacts from electronic interference associated with the Amendments as detailed in the S.73 Application have been considered. This has considered the potential changes to the effects reported in 2015 ES.
- 18.11.2 The Amendments will not significantly vary the Consented Scheme and, provided that all mitigation measures suggested in the 2015 ES are implemented, the assessment conclusions reported in the 2015 ES are considered to remain valid, with no additional effects or mitigation identified.

## 19 Climate Change

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### 19.1 Introduction

- 19.1.1 This chapter of the ES was prepared by Ecolyse Limited and presents an assessment of the likely significant climate change effects of the Development.
- 19.1.2 The assessment is presented in two parts:
- Part A assesses the likely significant effects of the Development on climate change through an assessment of the Development's whole life Greenhouse Gases (GHG) footprint and determines its significance in the context of local, regional and national climate change policy. Additionally, a qualitative commentary is presented on the effects of the Development; and
  - Part B considers the resilience of the Development to future changes in climate.
- 19.1.3 Mitigation measures are identified, where appropriate, to avoid, reduce or offset any significant adverse effects identified and / or enhance likely beneficial effects. The nature and significance of the likely residual effects are reported.
- 19.1.4 Potential effects associated with the combined impacts of the Development and climate change on environmental receptors are considered in the supporting documents that accompany the planning application, such as the Flood Risk Assessment.
- 19.1.5 Appendix 19.1 provides details on modelling of GHG emissions.

### Competence

- 19.1.6 The assessment was led by Dr Graham Earl (PhD, IMechE), Director at Ecolyse Ltd. and reviewed by Laurence Caird (MEarthSci, CSci, MIES, MIAQM), Technical Director at Air Quality Consultants Ltd (AQC).
- 19.1.7 Dr Graham Earl has over 25 years' experience in the fields of climate change, environment and asset management. Since the formation of Ecolyse eight years ago, Dr Earl has developed approaches to assessing GHG emissions and climate change for EIA and has specialised in the assessment of climate change, and preparation of GHG inventories and climate resilience assessments for the purposes of EIAs for numerous light industrial, mixed used housing developments, as well as major infrastructure projects.
- 19.1.8 Laurence Caird has over 17 years' experience in the fields of air quality and greenhouse gas emissions. He has helped shape a methodology for the assessment of greenhouse gas emissions within EIA to satisfy the requirements of the EIA Regulations and has produced carbon footprints and greenhouse gas assessments for numerous projects requiring EIAs including major residential, commercial and mixed-use developments and industrial facilities.

### 19.2 Legislation, Planning Policy and Guidance

#### Legislation Context

- 19.2.1 The following legislation is relevant to the Development:

- Climate Change Act (2008)<sup>67</sup>;
- Climate Change Act 2008 (2050 Target Amendment) Order (2019)<sup>68</sup>; and
- Town and Country Planning (Environmental Impact Assessment) Regulations 2017<sup>69</sup> (as amended)<sup>70</sup>.

## Planning Policy Context

### National

19.2.2 The NPPF (2021)<sup>71</sup> is the key national planning policy relevant to the Development, specifically paragraphs 152 to 158. In December 2022, the Department for Levelling Up, Housing and Communities (DLUHC) published proposed revisions to the NPPF. The proposed changes are currently under consultation running to March 2023. Proposed changes do not have a material impact on the assessment set out in this chapter.

### Regional

19.2.3 The following regional planning and environmental policy is relevant to the Development:

- The London Plan<sup>72</sup> (2021) Spatial Development Strategy for Greater London ('London Plan'), specifically Policy SI2, SI3, and SI4; and
- London Environment Strategy<sup>73</sup> (2018).

### Local

19.2.4 The following local planning and environmental policy is relevant to the Development:

- LB Haringey Local Plan (2017)<sup>74</sup>; specifically, Policy SP04; and
- LB Haringey Development Management DPD (2017)<sup>75</sup>; specifically, Policies DM21 to DM28.

## Guidance

19.2.5 The following guidance is relevant to the GHG assessment of the Development:

- IEMA Guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022)<sup>76</sup> ('IEMA Guidance');

<sup>67</sup> HMSO, (2008). Climate Change Act 2008.

<sup>68</sup> HMSO, (2019). The Climate Change Act 2008 (2050 Target Amendment) Order 2019.

<sup>69</sup> UK Government, (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations (2017), [online]. Available at: [https://www.legislation.gov.uk/ukxi/2017/571/pdfs/ukxi\\_20170571\\_en.pdf](https://www.legislation.gov.uk/ukxi/2017/571/pdfs/ukxi_20170571_en.pdf). Accessed: August 2021.

<sup>70</sup> HMSO, (2018). The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018. The Stationary Office. October 2018.

<sup>71</sup> Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>. Accessed July 2021.

<sup>72</sup> Mayor of London (2021) The London Plan, The Spatial development Strategy for London.

<sup>73</sup> Mayor of London (May 2018) London Environment Strategy

<sup>74</sup> London Borough of Haringey, 2017, Haringey's Local Plan, Strategic Policies 2013 – 2026 (formerly the Core Strategy) March 2013 Consolidated with alterations since 2017.

<sup>75</sup> London Borough of Haringey, 2017. Development Management DPD, Adopted July 2017.

<sup>76</sup> IEMA, (2022). Assessing Greenhouse Gas Emissions and Evaluating their Significance. 2<sup>nd</sup> Edition.

- The Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (GHG Protocol) (2001)<sup>77</sup>;
- Publicly Available Standard (PAS) 2080: 2023 – Carbon Management in Buildings and Infrastructure (2023)<sup>78</sup>;
- Committee on Climate Change (CCC), Net Zero Technical Report (2019)<sup>79</sup>;
- CCC, Sixth Carbon Budget (2021)<sup>80</sup>;
- HM Government, Net Zero Strategy: Build Back Greener (2021)<sup>81</sup>;
- HM Government, Carbon Budget Delivery Plan, (2023)<sup>82</sup>
- Royal Institution of Chartered Surveyors (RICS): Whole life carbon assessment for the built environment, 1st edition (2017)<sup>83</sup>;
- British Standard EN15978:2011 - Sustainability of Construction Works (2011)<sup>84</sup>;
- Whole Life-Cycle Carbon Assessments Guidance (2022)<sup>85</sup>;
- LB Haringey Supplementary Planning Document: Sustainable Design and Construction (2013)<sup>86</sup>; and
- Haringey Climate Change Action Plan (2021)<sup>87</sup>

19.2.6 The following guidance is relevant to resilience of the Development to climate change:

- IEMA Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation (2020)<sup>88</sup>;
- The UK Climate Projections 2018 (UKCP18) <sup>89</sup>;
- Met Office UK (2019) UK Climate Projections: Headline Findings <sup>90</sup>;
- The National Adaptation Programme (NAP) and the Third Strategy for Climate Adaptation Reporting (DEFRA, 2018) <sup>91</sup>; and

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<sup>77</sup> World Resources Institute, World Business Council for Sustainable Development, (2001). The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard. World Resource Institute, Revised Edition.

<sup>78</sup> Publicly Available Standard (PAS) 2080: 2023 Carbon Management in Buildings and Infrastructure, published 30<sup>th</sup> April 2023. BSI.

<sup>79</sup> CCC, (2019). Net Zero, Technical report.

<sup>80</sup> CCC, (2021). Sixth Carbon Budget. Available at: <https://www.theccc.org.uk/publication/sixth-carbon-budget/>

<sup>81</sup> HM Government (2021). Net Zero Strategy: Build Back Greener

<sup>82</sup> HM Government (2023). Carbon Budget Delivery Plan

<sup>83</sup> RICS, (2017). Whole life carbon assessment for the built environment. 1<sup>st</sup> edition.

<sup>84</sup> EN15978, (2011). Sustainability of construction works. Assessment of environmental performance of buildings. Calculation method.

<sup>85</sup> Mayor of London. (March 2022) Whole Life-Cycle Carbon Assessments guidance

<sup>86</sup> LB Haringey, Supplementary Planning Document: Sustainable Design and Constriction, March 2013

<sup>87</sup> Haringey Climate Change Action Plan, A Route Map for a Net Zero Carbon Haringey, March 2021

<sup>88</sup> IEMA, (2020). Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation

<sup>89</sup> Met Office UK, (2018). UK Climate Projections. [Online]. Available at:

<https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index>

<sup>90</sup> Met Office UK, (2019). UK Climate Projections: Headline Findings. [Online]. Available at:

<https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp-headline-findings-v2.pdf>

<sup>91</sup> Department for Environment, Food & Rural Affairs (Defra), (2018). The National Adaptation Programme (NAP) and the Third Strategy for Climate Adaptation Reporting. [Online]. Available at:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/727252/national-adaptation-programme-2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/727252/national-adaptation-programme-2018.pdf)

- UK Climate Change Risk Assessment 2022 (HM Government, 2022)<sup>92</sup>.

### 19.3 Consultation

- 19.3.1 An Informal EIA Scoping Note was submitted to LB Haringey on 6<sup>th</sup> June 2023. LB Haringey have not provided a response to the Informal EIA Scoping Note.
- 19.3.2 The scope of the ES Addendum was therefore informed by a review of relevant legislation, policy and guidance alongside the Development proposals.
- 19.3.3 There were no other relevant comments from consultees and stakeholders and no further consultation has been carried out with LB Haringey or other statutory consultees.

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<sup>92</sup> Her Majesty's Government, (2022). UK Climate Change Risk Assessment 2022. [Online]. Available at: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1047003/climate-change-risk-assessment-2022.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1047003/climate-change-risk-assessment-2022.pdf)

## Part A: Greenhouse Gas Assessment

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### 19.4 Assessment Methodology

#### Study Area and Scope

- 19.4.1 GHGs are gaseous compounds that have been identified as contributing to a warming effect in the earth's atmosphere. The primary GHG of concern with respect to the Development is carbon dioxide (CO<sub>2</sub>) which is emitted from combustion sources such as vehicular transport and heating and energy plant. Other GHGs also contribute to climate change and these are accounted for based on their Global Warming Potential (GWP). The combined effect of all GHG emissions will be presented as carbon dioxide equivalent (CO<sub>2</sub>e) and will account for the seven GHGs included in the United Nations Framework Convention on Climate Change's (UNFCCC) Kyoto Protocol. These are: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>), and nitrogen trifluoride (NF<sub>3</sub>).
- 19.4.2 The scope of the assessment was defined through its:
- Geographic scope;
  - Temporal scope; and
  - The activities contributing to GHG emissions.
- 19.4.3 Each is described further below.

#### Geographic Scope

- 19.4.4 GHGs contribute to climate change, which is a global environmental effect and as such the study area for the assessment is not limited by any specific geographical scope or defined by specific sensitive receptors.
- 19.4.5 The geographic scope was determined by identifying emission sources associated with the Development over which the Applicant has some ability to control or influence, as detailed further below.

#### Temporal Scope

- 19.4.6 The temporal scope was consistent with assessing the whole lifecycle GHG emissions from the Development.
- 19.4.7 The construction and operational phases of the Development was considered as follows:
- **Construction Phase:** Direct and indirect GHG emissions resulting from the Development over the construction period. The construction period is assumed to start in Q3 2024 with construction of the Development expected to be completed by the 2028. For the purposes of this assessment the modelling of construction related activity will be based on current day emission factors thereby ensuring a conservative worst-case assessment;

- **Operational Phase:** Direct and indirect GHG emissions resulting from the operation of the completed Development is assumed to start in 2028, which is taken to be the assessment year.

19.4.8 The whole life emissions are also considered from the commencement of the construction phase over the 60-year lifespan of the Development, consistent with approach adopted for the Whole Life Cycle Assessment (WCLA)<sup>93</sup> submitted with this planning application.

#### Activities Contributing to GHG Emissions

19.4.9 Table 19.1 details the activities which will contribute to GHG emissions included in the assessment covering the construction, operational and end of life stages of the Development. This is consistent with the life stages adopted by RICS<sup>83</sup> and also the stages used in the WCLA completed for the Development. Table 19.1 also includes emissions from transport during operations which is not covered by the WCLA and RICS standard but is relevant to this assessment.

**Table 19.1: GHG Activities included in Assessment**

| Development Phase                           | RICS Stage Identifier | Stage Name and Scope                       | Description                                                                                                                                                                     |
|---------------------------------------------|-----------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Demolition and Construction (product) Stage | A1 – A3               | Product Stage                              | Raw materials used to construct the Development to completion and operation.                                                                                                    |
|                                             | A4                    | Material transport to Site                 | Transportation of goods to Site.                                                                                                                                                |
|                                             | A5                    | Construction installation process.         | Machinery/process used in construction.                                                                                                                                         |
| Operational (use) phase                     | B1                    | In Use Emissions                           | Emissions arising during the life of the building from its components – such as the emissions from GHG and Hydro-Fluoro-Carbon (HFC) blown insulation, which leeches over time. |
|                                             | B2                    | Maintenance, cleaning and associated works | Emissions associated with energy and products for maintenance.                                                                                                                  |
|                                             | B3                    | Repair Emissions                           | Reasonable allowance for repairing unpredictable damage over and above the standard maintenance regime.                                                                         |
|                                             | B4                    | Replacement Emissions                      | Emissions associated with the replacement of items within the building, in accordance with the standard expected lifespan.                                                      |
|                                             | B6                    | Operational Energy Use                     | Emissions associated with the operation of the building through the operation of its                                                                                            |

<sup>93</sup> Whole Life Carbon Assessment, Northumberland Development Project , S73 Application, Produced by Buro Happold, July 2023.

| Development Phase | RICS Stage Identifier | Stage Name and Scope                                        | Description                                                                                                              |
|-------------------|-----------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|                   |                       |                                                             | technical systems over the life of the building.                                                                         |
|                   | B7                    | Operational Water Use                                       | Emissions associated with the water use during the operation of a building during its operational life.                  |
|                   | Not applicable        | Transport                                                   | Emissions from residential transport movements to and from the building during its operational lifetime.                 |
| End of Life       | C1                    | Deconstruction and Demolition Emissions                     | Emissions covered by all Site activity required to dismantle, deconstruct and/or demolish the built asset.               |
|                   | C2                    | Transport Emissions                                         | Transport emissions associated with the discarded items from Site.                                                       |
|                   | C3                    | Waste Processing for reuse, recovery or recycling emissions | Processing emissions for waste arising from the demolition of the Site when processing for recycling, reuse or recovery. |
|                   | C4                    | Disposal Emissions                                          | Emissions associated with the disposal of materials which are not being recycled and are to be disposed of.              |

19.4.10 A small number of minor activities were scoped out consistent with the IEMA Guidance. IEMA recommends that activities with emissions that individually make up less than 1% and in total equal less than 5% of the lifecycle emissions of the Development are scoped out of the assessment. These are as follows:

#### *Demolition and Construction*

- The Site is brownfield and therefore any GHG emissions due to land use change will be minimal and be minimised through the biodiversity and landscape planting for the Site.

#### *Completed Development*

- GHG emissions from the treatment and disposal of waste materials – these are a very small component of the GHG emissions of the Development and will be minimised through standard best practice.

#### **Establishing Baseline Conditions**

19.4.11 Plots 1 and 2 have been completed and are operational as per the Consented Scheme. These two Plots form the majority of the Site area. The remainder of the Site (i.e. the area covered by future plots) have not commenced the above ground construction of the future Plots and are therefore undeveloped. The earthworks and basement have been delivered as part of the Consented Scheme, below Plots 1 and 3. A podium associated with the Stadium

is in place within the south of the Site, with other small temporary structures present, hardstanding, parking, and landscaping.

- 19.4.12 To ensure a conservative worst-case assessment, GHG emission associated with the baseline for this Development are taken as zero.

### Identifying Likely Significant Effects

- 19.4.13 The assessment considered the whole life GHG emissions from the Development. This included GHG emissions during the construction and operational phases of the Development.

- 19.4.14 The GHG assessment of effects is structured as follows:

- Quantification of whole life GHG emissions from the Development;
- Assessment of the likely significant effects (following the 2-step process described in paragraph 19.4.33 to 19.4.39); and
- Assessment of residual effects.

### Construction

- 19.4.15 The GHG emissions from the construction phase (stage A1 to A5 covering construction materials, traffic, equipment and waste materials) were taken from the Whole Lifecycle Carbon Assessment (WLCA)<sup>93</sup>. The WLCA complies with British Standard EN15978 Assessment of Environmental Performance of Buildings<sup>84</sup>, London Plan Policy SI2, Mayor of London guidance on WLCA<sup>85</sup>, and RICS Guidance<sup>83</sup> and considered all the upstream and downstream processes and transport flows needed to construct and operate the Development until end of life.

### Completed Development

- 19.4.16 The assessment of operational effects of the completed Development adopted the following approaches:

- The completed Development GHG emissions from operational traffic in the opening year were calculated using government published GHG emission factors in combination with traffic trip and distance travelled data by mode provided by the appointed Transport Consultant, as detailed in Appendix 19.1. Whole life traffic GHG emissions were modelled based on published strategies for decarbonisation of the electricity grid and transport modes reflecting UK climate change policy and strategies (see also Appendix 19.1);
- GHG emissions associated with water consumption, and the maintenance and repair of the buildings during its lifetime are based on the WLCA; and
- GHG emissions from operational energy consumption in the opening year were based on energy modelling detailed in the Energy Strategy Addendum<sup>94</sup> based on Part L 2021 factors. The whole life emissions from energy use were taken from the WLCA.

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<sup>94</sup> Energy Strategy Addendum, Northumberland Development Project , S73 Application, July 2023. Prepared by Buro Happold.

## End of Life

19.4.17 GHG emissions associated with the end-of-life activities are based on the WLCA.

19.4.18 The net change in GHG emissions from the Development was calculated by comparison to the future baseline emissions and is presented for:

- The construction phase;
- The completed Development in the assessment year (2028); and
- Over the whole life of the Development (assumed to be 60 years).

19.4.19 The assessment also presents the GHG mitigation being proposed, which follows the principles of the GHG management hierarchy (avoid, reduce, off-set) to minimise, as far as reasonably practicable, the anticipated GHG emissions over the Development's lifecycle.

## Cumulative Effects

19.4.20 IEMA Guidance<sup>76</sup> makes clear that climate change is "*the largest interrelated cumulative environmental effect*" and therefore the assessment of GHG emissions which contribute to climate is intrinsically cumulative.

19.4.21 On this point IEMA state that "*The atmospheric concentration of GHGs and resulting effect on climate change is affected by all sources and sinks globally, anthropogenic and otherwise. As GHG emission impacts and resulting effects are global rather than affecting one localised area, the approach to cumulative effects assessment for GHGs differs from that for many EIA topics where only projects within a geographically bounded study area of, for example, 10km would be included*".

19.4.22 In terms of this assessment the following are therefore relevant:

- The assessment will consider the effects of the Development in the context of national and local cumulative totals. Since the national totals assume that other developments will contribute GHGs, the assessment will consider their implications in determining significance; and
- The geographical location of emissions has no relevance to the assessment. Therefore, the effects of the Development are independent of any local cumulative emissions.

19.4.23 Taking this into account, an assessment of the GHG emissions associated with cumulative developments was not undertaken and the cumulative GHG effects are considered to be the same as those for the completed Development (and EIA Development).

19.4.24 This is consistent with IEMA Guidance which states that "*Effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other*".

## Determining Effect Significance

19.4.25 For GHG emissions there are no recognised significance criteria and thresholds that relate to the quantum of GHG emissions released.

- 19.4.26 The approach to classifying and defining likely significant effects therefore relies on IEMA Guidance<sup>76</sup> and applying expert judgment on the significance of the Development's lifecycle GHG emissions taking into account their context, compliance with policy, and mitigation measures.
- 19.4.27 The IEMA Guidance defines five distinct levels of significance (see Table 19.2 later in this section) which are not solely based on whether a project emits GHG emissions alone, but the degree to which the project's GHG emissions are consistent with science-based 1.5°C aligned emission trajectories towards net zero. For the UK these trajectories are effectively defined by carbon budgets, including any sectoral pathways that are designed to achieve the UK's 2050 net zero target.
- 19.4.28 IEMA established three underlying principles, which informed its approach to significance, as follows:
- The GHG emissions from all projects will contribute to climate change, the largest interrelated cumulative environmental effect;
  - The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive – e.g., population, fauna and soil; and
  - GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant.
- 19.4.29 Based on these principles, IEMA conclude that:
- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible.
  - Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages.
  - Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.
- 19.4.30 In advising on the significance of any net change in GHG emission resulting from a development, IEMA identify that, to limit the adverse effects from climate change, global temperature change needs to be limited to well below 2°C, aiming for 1.5°C. The implication of this objective is that global emissions need to fall to net zero by 2050.
- 19.4.31 The UK's response to limiting climate change is enshrined in law through the Climate Change Act which requires the UK economy to be net zero by 2050 following a trajectory set through 5 yearly carbon budgets. The 2050 target (and interim budgets set to date) are, according to the CCC, compatible with the required magnitude and rate of GHG emissions reductions

required in the UK to meet the goals of the Paris Agreement<sup>95</sup>, thereby limiting severe adverse effects.

19.4.32 It follows that the significance of any net change of GHG resulting from a development is not so much whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions consistent with a trajectory towards net zero by 2050.

19.4.33 To establish the significance of the GHG emissions from the Development, judgements were made on:

- the Development's consistency with policy requirements, since these are specified to ensure the economy decarbonises in line with the UK's net zero target; and
- the degree to which the Development has sought to mitigate its emissions.

19.4.34 Examining each of these dimensions allows the assessment to make professional judgement on the likely significance of effects based on a set of significance criteria established in the IEMA Guidance, summarised in Table 19.2.

Table 19.2: GHG Significance Criteria (based on IEMA Guidance<sup>76</sup>)

| Significance Rating | Description                                                                                                                                      | Criteria to determine significance of net GHG emissions                                                                                                                                                                                                                                                                                    |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Major Adverse       | A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero | The project's net GHG impacts are: <ul style="list-style-type: none"> <li>▪ not mitigated or are only compliant with do-minimum standards set through regulation; and</li> <li>▪ do not provide further reductions required by existing local, regional and national policy for projects of this type.</li> </ul>                          |
| Moderate adverse    | A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.                               | The project's net GHG impacts are: <ul style="list-style-type: none"> <li>▪ partially mitigated; and</li> <li>▪ may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local, regional and national policy goals for projects of this type.</li> </ul> |
| Minor Adverse       | A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.                   | The project's net GHG impacts are: <ul style="list-style-type: none"> <li>▪ fully consistent with applicable existing and emerging policy requirements; and</li> <li>▪ in line good practice design standards for projects of this type.</li> </ul>                                                                                        |
| Negligible          | A project with negligible effects provides GHG                                                                                                   | The project's net GHG impacts are:                                                                                                                                                                                                                                                                                                         |

<sup>95</sup> International treaty adopted at the Conference of Parties 21 in Paris in December 2015 setting global goal to limit climate change to less than 2 degrees Celsius, preferably to 1.5 degrees Celsius compared to pre-industrial levels.

| Significance Rating | Description                                                                                                           | Criteria to determine significance of net GHG emissions                                                                                                                                                                                                                                     |
|---------------------|-----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions. | <ul style="list-style-type: none"> <li>reduced through measures that go well beyond existing and emerging policy; and</li> <li>better than good practice design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050.</li> </ul> |
| Beneficial          | A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.         | <p>The project's net GHG impacts are:</p> <ul style="list-style-type: none"> <li>below zero; and</li> <li>it causes a reduction in atmospheric GHG concentrations, whether directly or indirectly, compared to the without-project baseline.</li> </ul>                                     |

19.4.35 IEMA Guidance also advise that:

- Major adverse, moderate adverse and beneficial effects should be considered significant in the context of EIA. Consequently, negligible and minor adverse are considered not significant;
- In the case of large-scale developments, irrespective of the level of mitigation if net GHG emissions exceed 5% of UK or devolved administrations carbon budget, that this is a level of change that is considered significant;
- Meeting the minimum standards set through existing policy or regulation cannot necessarily be taken as evidence of avoiding a significant adverse effect, and it is recommended therefore that the assessment also considers emerging policy / standards and the guidance of expert bodies such as the CCC on necessary policy developments, particularly for multi-phased projects with long timescales; and
- To aid decision making, it is important to inform the decision maker about the relative severity of environmental effects such that they can be weighed in a planning balance. Therefore, it is essential to provide context for the magnitude of GHG emissions reported in the EIA in way that aids evaluation of these effects by the decision maker. IEMA advise that context can be provided through comparison of the whole life GHG emissions resulting from the Development with national, local and carbon budgets.

19.4.36 Therefore, the assessment of significance is established over two steps as follows:

*Step 1: Establish Context of GHG Emissions*

19.4.37 Context for decision making is provided by comparing the net change in the whole life GHG emissions resulting from the Development with local and national GHG emissions totals, and carbon budgets.

*Step 2: Determine Significance of Effects*

19.4.38 Significance of effects is established through applying the criteria detailed in Table 19.2 based on professional judgement that considers:

- Step 2a: The consistency of the Development with national, regional and local policies designed to limit GHG emissions and meet the UK's net zero target; and
- Step 2b: The robustness, timeliness and efficacy of mitigation measures proposed to avoid, reduce and compensate GHG emissions.

19.4.39 In terms of mitigation, IEMA recommends that mitigation should in the first instance seek to avoid GHG emissions. Where GHG emissions cannot be avoided, the development should aim to reduce the residual significance of its emissions at all stages. Where additional GHG emissions remain but cannot be further reduced at source, approaches should be considered that compensate for the Development's remaining emissions, for example through offsetting.

#### Sensitivity of Receptor

19.4.40 The assessment of climate change does not include identification of sensitive receptors, as GHG emissions do not directly affect specific locations, but lead to indirect effects by contributing to climate change.

#### Assumptions and Limitations

19.4.41 It is necessary to make a number of assumptions when carrying out a GHG assessment, although assumptions made have generally sought to reflect a realistic worst-case scenario. Key assumptions made in carrying out this assessment include:

- A number of emission sources were scoped out as detailed in para. 19.4.10 although these are all minor and would not affect the conclusions of the assessment;
- In relation to operational traffic movements, some assumptions were made on transport trip distance. Average transport trip distances were adopted to be conservative and ensure a realistic worst case;
- The WLCA<sup>93</sup> makes assumptions on material types, quantities, and methods of construction.
- Assumptions have been made on the rate of future decarbonisation of transport modes and electricity generation. These are detailed in Appendix 19.1.

### 19.5 Baseline Conditions

19.5.1 Baseline GHG emissions for the Site are assumed as zero as described earlier in paragraph 19.4.11.

#### Future Baseline

19.5.2 Similar to the Baseline scenario, future baseline emissions for the Site are also assumed to be zero.

### 19.6 Scheme Design and Management

#### Construction

19.6.1 Measures will be undertaken during the construction phase to minimise generation of GHG emissions. This includes adherence to management plans which are already secured as part of the Consented Scheme, including a Construction Environment Management Plan (CEMP). A phase-specific CEMP will be provided which will seek to minimise construction waste (and therefore embodied carbon), maximise energy efficiency during construction works and

promoting use of fuel-efficient construction vehicles and plant to minimise associated emissions.

19.6.2 The Development will also be assessed under BREEAM New Construction (NC) 2018, with a target to achieve at least a “Very Good” rating.

19.6.3 Reducing GHG emissions from the construction works will include a focus on procurement of sustainable materials that minimise embodied GHG emissions where feasible consistent with meeting BREEAM “Very Good” rating. Key measures to reduce embodied carbon of materials identified through the WCLA include:

- Use of in situ concrete flat slab to minimise material requirements;
- Use of slabs to reduce slab thickness and improve reinforcement quantities;
- Material optimisation strategy including size of columns, foundations, thickness of slabs etc;
- Foundation and basement re-use;
- Façade systems with fewer metal fixings and systems that can self-support at lower levels reducing materials requirements;
- Use of 50% cement replacement with GGBS (Ground Granulated Blast-furnace Slag); and
- Use of 97% recycled steel.

### Completed Development

19.6.4 The Development has adopted a ‘Fabric First’ approach to design, incorporating good passive design and selective use of construction materials to minimise energy consumption and reduce the need for heating in winter and cooling in summer. These measures seek to follow the Mayor’s energy hierarchy, detailed further below:

- Be lean: A highly efficient approach to building fabric and MEP systems has been utilised to reduce GHG emissions from the outset. Highly insulated and air-tight fabric has been utilised to reduce heat losses in winter with modest glazed ratios to minimise solar gains during the summer months. A curtain walling façade system is proposed across the whole building, with external shading fins or “projected mullions” providing enhanced solar gain mitigation. The balconies on the south are strategically positioned to shade the glazing from the high-angle southerly sun to minimise overheating risk. All domestic hot water (DHW) is provided centrally with highly insulated pipework to prevent un-necessary heat loss within the building. LED lighting will be used throughout the development to minimise energy consumption of artificial lighting and cooling systems by reducing internal heat gains. Intelligent control of lighting and ventilation is proposed within the hotel rooms and apartments via use of the guest room cards;
- Be clean: The proposed development will connect to the existing (Energetik) site-wide District Heat Network (DHN), in line with the heating hierarchy as set out within the London Plan. This promotes the expansion of London’s heat network capacity, and facilitates any future decarbonisation of the network by connecting to a single heating source; and
- Be Green: Provision of roof mounted solar photovoltaic array, allocated entirely to the nondomestic building areas.

19.6.5 The Development has been designed to minimise the need to travel, maintain low levels of anticipated car-use, increase sustainable transport modes to and from the Site, and implement effective travel targets. A Framework Travel Plan (FTP) has been developed for the Development which includes a package of measures for hotel guests, residents and employees, as well as targets and monitoring proposals. Specifically, the FTP sets out a series of measures including the following:

- Encourage sustainable access to the Development by active modes such as walking and cycling;
- Promote public transport use; and
- Reduce single-occupancy car use.

19.6.6 These measures are primary (inherent design) and can therefore be relied on for the purposes of this assessment.

## 19.7 Assessment of Effects

19.7.1 The climate change assessment considers the net GHG emissions resulting from the Development and is structured as follows:

- Quantification of the net GHG emissions from the Development over:
  - A. The construction phase;
  - B. The completed Development phase;
  - C. The end-of-life phase; and
  - D. Over the whole lifetime of the Development.
- Assessment of the likely significant effects; and
- Assessment of mitigation and residual effects.

### Quantification of Whole Life GHG Emissions from the Development

#### A: Construction Phase

As described in paragraph 19.4.15, the GHGs from the whole construction phase is taken from the WLCA for the Development. The results from the WLCA for the construction phase are summarised within

| Table 19.3

19.7.2 ~~Table 19.3.~~

Table 19.3: Construction Phase GHG Emissions

| Source             | PAS 2080/RICS Lifecycle reference | Tonnes CO <sub>2</sub> e |
|--------------------|-----------------------------------|--------------------------|
| Construction Phase | A1 to A5                          | 22,555                   |

### B. Operational Phase

19.7.3 The net operational GHG emissions from the Development in the completed year are summarised in ~~Table 19.4~~ [Table 19.4](#) based on data taken from WCLA, Energy Strategy and transport emission assessment (See Appendix 19.1).

Table 19.4: Operational GHG Emissions in Completed Year

| GHG Source                                     | RICS product stage reference | GHG Emissions in tonnes CO <sub>2</sub> e |                  |            | Notes                                                                                                                 |
|------------------------------------------------|------------------------------|-------------------------------------------|------------------|------------|-----------------------------------------------------------------------------------------------------------------------|
|                                                |                              | No development case                       | Development Case | Net        |                                                                                                                       |
| Use, maintenance, repair and replacement phase | B1 to B5                     | 0                                         | 150              | 150        | Development case estimated as 1/60 <sup>th</sup> of WLCA emissions.                                                   |
| Operational Energy (regulated and unregulated) | B6                           | 0                                         | 101              | 101        | Development case based on Energy Strategy (See <a href="#">Table 19.5</a> <del>Table 19.5</del> and paragraph 19.7.6) |
| Operational Water Use                          | B7                           | 0                                         | 0.7              | 0.7        | Development case estimated as 1/60 <sup>th</sup> of WLCA emissions.                                                   |
| Transport                                      | n/a                          | 0                                         | 128              | 128        | See Appendix 19.1                                                                                                     |
| <b>Total</b>                                   |                              | <b>0</b>                                  | <b>380</b>       | <b>380</b> |                                                                                                                       |

~~19.7.4~~ [Table 19.4](#) ~~Table 19.4~~ shows that the net operational GHG emission in the completed year of the Development are 380 tonnes CO<sub>2</sub>e.

### ~~19.7.4~~ [Table 19.5](#)

19.7.5 ~~Table 19.5~~ provides additional details on the energy related GHG emissions in the completed year based on Part L 2021 calculations produced by the Energy Strategy.

Table 19.5: Regulated CO<sub>2</sub> Site Wide Emissions (Domestic and Commercial) from Energy Use in Completed Year

| Energy Strategy                                        | Total regulated emissions (Tonnes CO <sub>2</sub> /annum) | CO <sub>2</sub> savings (Tonnes CO <sub>2</sub> /annum) | % Savings |
|--------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------|-----------|
| Part L 2021 Baseline                                   | 117.5                                                     | n/a                                                     | n/a       |
| Be Lean                                                | 98.7                                                      | 18.8                                                    | 16%       |
| Be Clean                                               | 56.4                                                      | 42.2                                                    | 36%       |
| Be Green                                               | 59.0                                                      | -2.6                                                    | -2%       |
| <b>Total site wide regulated emissions and savings</b> |                                                           | 58.4                                                    | 50%       |

19.7.6 Additionally, the Energy Consultant has estimated that the unregulated emissions from the Site would be 42 tonnes CO<sub>2</sub>. Therefore, total CO<sub>2</sub> emissions in the completed year are estimated as 101 tonnes (59 tonnes Regulated and 42 tonnes Unregulated emissions).

#### C. Decommissioning Phase

19.7.7 Table 19.6 summarises the net GHG emissions from the end-of-life phase and is based on the results of the WLCA.

Table 19.6 : End of Life Phase GHG emissions

| Source            | PAS 2080/RICS Lifecycle reference | Net CO <sub>2</sub> e emission (tonnes) |
|-------------------|-----------------------------------|-----------------------------------------|
| End of Life phase | C1 to C4                          | 577                                     |

19.7.8 Table 19.6 shows that the GHG emission from end of life of the development are 577 tonnes CO<sub>2</sub>e. These estimates are based on current day emissions factors and, therefore, are considered to be highly conservative. The estimates do not account for the projected decarbonisation of the UK economy in the period up to and beyond 2050 when the UK is projected to be net zero.

#### D. Whole Life GHG Emission Footprint

19.7.9 Table 19.7 details the whole life net GHG emissions from the Development. The net GHG emissions are taken to be the difference between the GHG emissions without the Development (the future baseline) and with the Development.

Table 19.7: Net Whole Life GHG Footprint for the Development

| Development Phase | GHG Source                                     | RICS Life cycle stage reference      | Without Development | With Development | Net Emissions | % Of Total  |
|-------------------|------------------------------------------------|--------------------------------------|---------------------|------------------|---------------|-------------|
| Construction      | Construction                                   | A1 to A5                             | 0                   | 22,555           | 22,555        | 32%         |
| Operation         | Use, maintenance, repair and replacement phase | B1 to B5                             | 0                   | 8,976            | 8,976         | 13%         |
|                   | Operational Energy (regulated and unregulated) | B6                                   | 0                   | 35,981           | 35,981        | 51%         |
|                   | Operational Water Use                          | B7                                   | 0                   | 42               | 42            | 0%          |
|                   | Transport                                      | n/a                                  | 0                   | 1,745            | 1,745         | 2%          |
| End of Use        | End of Life phase                              | C1 to C4                             | 0                   | 577              | 577           | 1%          |
| <b>Total</b>      |                                                | <b>A1 to C4, including Transport</b> | <b>0</b>            | <b>69,877</b>    | <b>69,877</b> | <b>100%</b> |

19.7.10 Table 19.7 shows that the net whole life GHG emissions from the Development is calculated as 69,877 tonnes CO<sub>2</sub>e. The most significant source of GHG emissions is from energy use (B6) which represent 51% of the net change.

### Assessment of Significance of Effects

19.7.11 The assessment of the significance of the GHG emissions is informed through IEMA Guidance detailed in Section 19.3 and follows a 2-step process detailed below.

#### Step 1: Establish Context

19.7.12 The GHG emissions from the Development are compared to national and local CO<sub>2</sub>e totals to establish context.

#### National

19.7.13 The UK has legislated a 2050 net zero target following recommendations and analysis completed by the CCC<sup>79</sup>. To meet this target the CCC sets carbon budgets to define a pathway to net zero.

19.7.14 The completed development emissions coincide with the 4<sup>th</sup> carbon budget (covering the period 2023 to 2028).

19.7.15 Table 19.8 summarises the net change in GHG from operational emissions as a percentage of the relevant annual carbon budget.

~~19.7.15~~

Table 19.8: Net GHG from Development Operational Emissions as % of Carbon Budgets

| Carbon Budget        | Period    | CO <sub>2</sub> e Million Tonnes (MT) |                   |                                                            | % of annual carbon budget |
|----------------------|-----------|---------------------------------------|-------------------|------------------------------------------------------------|---------------------------|
|                      |           | Budget value                          | Average per annum | Net change in operational GHG emissions due to Development |                           |
| Fourth carbon Budget | 2023-2028 | 1,950                                 | 390               | 0.00038                                                    | 0.0001%                   |

19.7.16 Table 19.8 shows that the net change in operational GHG emissions (380 tonnes) as a percentage of carbon budgets is 0.0001% and therefore very small.

19.7.17 Construction related emissions will occur over the period Q3 2024 to Q3 2028 and therefore also coincide with the fourth carbon budgets. Table 19.9 assesses the proportion of Carbon Budget represented by the construction phase emissions from the Development.

Table 19.9: Construction Phase Related Emissions as % of Carbon Budgets

| Carbon Budget        | Period    | Carbon Budget value (MT CO <sub>2</sub> e) | Construction emissions from Development in Carbon Budget (MT CO <sub>2</sub> e) <sup>1</sup> | % of Carbon Budget |
|----------------------|-----------|--------------------------------------------|----------------------------------------------------------------------------------------------|--------------------|
| Fourth Carbon Budget | 2023-2028 | 1,950                                      | 0.02256                                                                                      | 0.0012%            |

19.7.18 Reference to the above shows that the GHG emissions from construction phase of the Development are 0.0012% of the fourth carbon budget.

### Local

19.7.19 Government-published GHG emissions by local authority show the CO<sub>2</sub>e emissions for LB Haringey in 2020 (the latest published year) were 651 kilo tonnes CO<sub>2</sub>e.

19.7.20 On this basis comparing the net change in operational GHG from the completed Development (380 tonnes) equals 0.1%, which is a small contribution.

19.7.21 The Tyndall Centre at Manchester University<sup>96</sup> has also established future Carbon Budgets consistent with net zero trajectory by Local Authority. The fourth Carbon Budget for LB Haringey is proposed as 1.4MT CO<sub>2</sub>, or 280,000 tonnes CO<sub>2</sub> per annum and is for emissions from energy use in the borough. The net change in operational energy GHG emissions would therefore be 0.0362% of LB Haringey's Carbon Budget in the opening year, again a small contribution.

19.7.22 It is not appropriate to compare construction related emission to local budgets since construction emissions are predominately from emissions embedded in materials and those are not represented within local totals. This does not mean that the Development will not seek to procure materials locally.

### Step 2: Determine Significance

19.7.23 Significance of effects is established through applying the criteria detailed in Table 19.2. This requires judgments on:

- a) The consistency of the Development with national, regional and local policies designed to limit GHG emissions and meet the UK's net zero target; and
- b) The robustness, timeliness and efficacy of mitigation measures proposed to avoid, reduce and compensate GHG.

19.7.24 Each is considered further below.

### Step 2a: Consistency of the Development with National, Regional and Local Policies

#### National

19.7.25 The NPPF sets out the Government's planning policies for England and how these should be applied, both in drawing up plans and making decisions about planning applications.

19.7.26 Paragraph 152 states:

*"The planning system should support the transition to a low carbon future in a changing climate... shape places in ways that contribute to radical reductions in greenhouse gas emissions... and support renewable and low carbon energy and associated infrastructure".*

19.7.27 Paragraph 153 states that Local Planning Authorities:

*"Should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure"*

19.7.28 Paragraph 154 states that:

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<sup>96</sup> See <https://carbonbudget.manchester.ac.uk>

*“New development should be planned for in ways that (...) can help to reduce greenhouse gas emissions, such as through its location, orientation and design.”*

19.7.29 Paragraph 155 states that:

*“To help increase the use and supply of renewable and low carbon energy and heat, plans should:*

*a) provide a positive strategy for energy from these sources, that maximises the potential for suitable development, while ensuring that adverse impacts are addressed satisfactorily (including cumulative landscape and visual impacts);*

*b) consider identifying suitable areas for renewable and low carbon energy sources, and supporting infrastructure, where this would help secure their development; and*

*c) In line with the objectives and provisions off the Climate Change Act 2008 identify opportunities for development to draw its energy supply from decentralised, renewable or low carbon energy supply systems and for collocating potential heat customers and suppliers.”*

19.7.30 Paragraph 157 states that: “in determining planning applications, local planning authorities should expect new development to:

*a) comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable...”*

19.7.31 Paragraph 188 states that *“The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively.”*

19.7.32 In terms of national climate change policy, the CCC<sup>80</sup> has established a “balanced net zero pathway” which considers feasible and cost-effective policy and technology interventions to ensure the UK can meet its new net zero target.

19.7.33 For power generation under this scenario, the CCC consider that 100% of power generation by 2050 will be low carbon and for ground transport it forecasts that all ground transportation (apart from small number of HGVs) will be electrically powered. The CCC therefore forecast that power and ground transportation sectors are largely decarbonised by 2050 with any residual emissions removed through technical and or natural means.

19.7.34 The Government’s Net Zero Strategy<sup>81</sup> and Carbon Budget Delivery Plan<sup>82</sup> also set out plans to meet carbon budgets including policies and plans that will decarbonise energy and transport to near zero by 2050.

19.7.35 It is therefore reasonable to assume that national policy measures will ensure that energy and transport emissions relating to the Development will be decarbonised consistent with the UK’s net zero target. The recent government announcement bringing forward the ban on sale of new vehicles that are fossil fuel powered to 2030 is an example of policy that is being developed.

19.7.36 Importantly the Development has adopted measures that are supportive and compliant with national policies to meet net zero consistent with the CCC's balanced net zero pathway, the government's Net Zero Strategy and the NPPF. Specifically, this includes:

- Installing EV charging points to accommodate charging requirements of electric vehicles;
- Adherence to a phase-specific CEMP and design measures that include focus on procurement of sustainable materials that minimise embodied GHG emissions where feasible consistent with meeting BREEAM "Very Good" rating;
- Use of WLCA reduction principles to minimise GHG emissions across each life cycle stage of the Development;
- Energy measures that across the whole site result in a 50% saving vs Part L 2021;
- Connection of the Development to the existing DHN; and
- Transport planning measures aimed at increasing use of low carbon transport modes.

#### Regional

19.7.37 The London Environment Strategy, published in May 2018<sup>73</sup>, sets out an action plan for environmental improvement in London up to 2050 and covers a range of core environmental aspects including energy and climate change, air quality, green infrastructure, waste and noise.

19.7.38 The strategy sets a series of targets, including the aim to make London a zero-carbon city by 2050; reiterating the same commitment as is included in the new London Plan<sup>72</sup>. The strategy sets out a series of measures designed to achieve this aim, which are focussed upon delivering zero-carbon energy, zero-carbon transport and zero-carbon development. The strategy also sets out plans for retro-fitting existing buildings to enable them to be zero-carbon.

19.7.39 The new London Plan<sup>72</sup> sets out the Mayor's spatial development strategy for London. Of particular relevance to greenhouse gas emissions, the Plan describes that *"the Mayor is committed to London becoming a zero-carbon city"*. It also explains that *"Carbon' is used in the London Plan as a shorthand term for all greenhouse gases"*.

19.7.40 Policy SI2 in the new London Plan relates specifically to greenhouse gas emissions; it states:

#### *"Policy SI2 – Minimising Greenhouse Gas Emissions*

*Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:*

- *be lean: use less energy and manage demand during operation.*
- *be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly.*
- *be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site.*

- *be seen: monitor, verify and report on energy performance.*

*Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy*

*A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, and shortfall should be provided, in agreement with the borough, either:*

- *through a cash in lieu contribution to the borough's carbon offset fund, or*
- *off-site provided that an alternative proposal is identified and delivery is certain.*

*Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.*

*Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.*

*Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions."*

19.7.41 The London Plan also requires Boroughs to ensure that all developments maximise opportunities for on-site electricity and heat production from solar technologies (photovoltaic and thermal) and use innovative building materials and smart technologies. This approach will reduce carbon emissions, reduce energy costs to occupants, improve London's energy resilience and support the growth of green jobs.

19.7.42 In December 2018 the Mayor of London has also declared a climate emergency and committed to make London net zero-carbon by 2030.

19.7.43 The Development is compliant with regional policies as follows:

- The Development's energy strategy follows the be lean, be clean, be green hierarchy and results in an overall 50% improvement (across the domestic and commercial element) relative to Part L (2021). Whilst the commercial element on its own does not meet the policy reduction target the site as a whole achieves an overall saving of 50% since the domestic element outperforms the Part L target with an 80% reduction.
- Be lean: Passive design measures have been included in the Development and lead to a significant reduction in regulated CO2 emissions over the Part L (2021) standard. The Energy Strategy Addendum<sup>94</sup> demonstrates a 16% improvements across the whole site when using Part L 2021 emission factors, which exceeds the 10% and 15% targets set out within the London Plan Policy SI 2 for domestic and commercial developments respectively;

- Be clean: The energy strategy will ensure connection to DHN consistent with the Mayor's energy hierarchy;
- Be green: The energy strategy includes the use of renewable energy sources that demonstrates compliance with Mayor's requirement for the Development to maximise opportunities for renewable energy by producing, storing and using renewable energy on-site;
- Be seen: Energy monitoring systems have been specified following recommendations set out in CIBSE TM39: 2009 Building Energy Metering, BREEAM 2018 NC, as well as the principles set out in NABERS-UK Rules for Metering and Consumptions; and
- The Development will achieve the zero-carbon target through a carbon-offset payment which offsets the shortfall in regulated CO<sub>2</sub> emissions;

19.7.44 A WCLA assessment has been completed and includes actions to reduce whole life GHG emissions. The effect of the measures is that the WCLA calculates average benchmark values of:

- 824 kg CO<sub>2</sub>e/m<sup>2</sup> GIA for the construction phase (module A1 to A5), which meets the GLA target of <850 kg CO<sub>2</sub>e/m<sup>2</sup> GIA;
- 349 kg CO<sub>2</sub>e/m<sup>2</sup> GIA for the in use and end of life modules B-C (excl. B6 and B7), which meets the GLA target of <350 kg CO<sub>2</sub>e/m<sup>2</sup> GIA; and
- 1171 kg CO<sub>2</sub>e/m<sup>2</sup> GIA for Modules A-C (excluding B6\_B7; including sequestered carbon), which meets the GLA target of <1200 kg CO<sub>2</sub>e/m<sup>2</sup> GIA.

19.7.45 The project has also identified a number of recommendations to help it further improve its performance as the project moves to detailed design stage:

- Focus on leaner structural design and optioneering to reduce structural sizing;
- Continue to investigate cement replacements and novel concrete technology outside of GGBS;
- Investigation of steel reuse over recycling within roof and canopy;
- Minimise carbon intensive internal finishes such as suspended ceilings and raised access flooring, instead focus on longer lifespan, higher quality materials;
- Specification of long life and de-constructable façade materials; and
- Specification of lower embodied carbon refrigerant within MEP kit and planning of MEP maintenance regime to increase longevity.

#### Local

19.7.46 In March 2021, LB Haringey committed to becoming a Net Zero council by 2027, and net zero carbon borough by 2041 and published its Haringey Climate Change Action Plan<sup>87</sup>.

19.7.47 The LB Haringey Local Plan<sup>74</sup> sets out a vision and key policies for the future development of the borough up to 2026. It takes forward the priorities of Haringey's Sustainable Community Strategy and other plans and strategies, to identify a vision for Haringey as a place to live, work and visit, and contains key policies and an implementation framework to deliver the vision. Policy CP4 Working towards a Low Carbon Haringey is the key policy relevant to the Proposed Development. This policy states that:

*“Over the life time of the Local Plan, reducing energy use in buildings and working towards a low carbon borough will be one of the key challenges facing Haringey. The Council will promote the measures outlined below to reduce carbon emissions from new and existing buildings.*

*1. In line with London Plan policy, the Council will promote and require all new developments to take measures to reduce energy use and carbon emissions during design, construction and occupation, by incorporating the following measures:*

*a. From 2011 onwards, all new residential development will achieve a minimum 25% reduction in total (regulated) CO<sub>2</sub> emissions in line with Code for Sustainable Homes Level 4 energy standards, and should aim to achieve Level 6. All new residential development shall be zero carbon from 2016 onwards; and*

*b. From 2011 onwards all new non-residential development shall be built to at least BREEAM “very good” standard and should aim to achieve BREEAM “excellent” or the current nationally agreed standard. All new non-residential development shall be zero carbon from 2019.*

*2. The Council will promote low- and zero-carbon energy generation through the following measures:*

*a. Requiring all developments to assess, identify and implement, where viable, site-wide and area-wide decentralised energy facilities including the potential to link into a wider network;*

*b. Establishing local networks of decentralised heat and energy facilities by requiring developers to prioritise connection to existing or planned networks where feasible;*

*c. Working with neighbouring boroughs and other partners to explore ways of implementing sub-regional decentralised energy networks including the potential in the Upper Lee Valley Opportunity Area; and*

*d. All new developments are required, where viable, to achieve a reduction in predicted carbon dioxide emissions of 20% from on site renewable energy regeneration, which can include connections to local sources of decentralised renewable energy.”*

19.7.48 The Development is compliant with the elements of Policy SP4 since:

- The Development’s energy strategy follows the be lean, be clean, be green hierarchy and results in 50% improvement relative to Part L (2021).
- The site will connect to a DHN resulting in a 36% saving.
- The site achieves a “very good” BREEAM rating.
- The Development will achieve the zero-carbon target through a carbon-offset payment which offsets the shortfall in regulated CO<sub>2</sub> emissions; and
- A WLCA assessment has been completed and includes actions to reduce whole life GHG emissions.

19.7.49 As the majority of the Development's operational GHG emissions are associated with energy consumption and transport emissions, the annual emissions are expected to decarbonise year on year in line with local and national policies to decarbonise energy generation and road transport, as discussed further in paragraphs 19.7.32 to 19.7.36. The Development's transport emissions will be minimised through the FTP and design measures such as installation of EV charging points.

19.7.50 LB Haringey Local Plan (Development Management Policies)<sup>75</sup> also provides policy direction on energy and climate change. Specifically, Policy DM21: Sustainable Design layout and Construction states that:

*"A: All new development, including building and landscape works, will be expected to consider and implement sustainable design, layout and construction techniques. Proposals should:*

*a Apply the energy hierarchy to minimise energy use in order to meet, and if possible exceed, minimum carbon dioxide reduction requirements;*

*b Apply the cooling hierarchy to reduce the potential for overheating and limit reliance on mechanical air conditioning systems;*

*c Maximise opportunities to enhance biodiversity on-site, including through appropriate landscaping, Sustainable Drainage Systems, living roofs and green walls*

*d Wherever possible, use building materials with high environmental performance ratings; and*

*e Seek opportunities for locally sourced labour.*

*B The Council will support appropriate measures to sustainably retrofit existing homes and non residential buildings.*

*C Proposals that fail to demonstrate adequate consideration for sustainable design, layout and construction techniques will be resisted.*

*D Consideration will be given to the use of carbon offset payments, to be secured by planning obligations, where it can be demonstrated that proposals are unable to meet carbon dioxide emission reduction targets on-site."*

19.7.51 Policy DM22: Decentralised Energy is also relevant and in summary states that:

*"Subject to other policy requirements, proposals that contribute to the provision and use of Decentralised Energy network infrastructure will be supported."*

19.7.52 The Development is compliant with Policy DM21 and DM22 as it meets requirements of the Mayor's targets and is designed to connect with the local DHN.

19.7.53 Additionally, LB Haringey's Supplementary Design Guidance<sup>86</sup> provides additional guidance on Policy SP4, DM21 and DM22 above.

### Step 2b: Robustness, timeliness and efficacy of mitigation

19.7.54 The principles of the IEMA Guidance are that where GHGs cannot be avoided, that mitigation should be provided to minimise GHGs. Mitigation measures adopted by the Development are described for each element of the GHG footprint.

#### Construction

19.7.55 Mitigation measures adopted by the Development to minimise GHG emissions from the construction phase are inherent in the design and described in Section 19.5. No additional measures are proposed.

#### Operation

##### Transport

19.7.56 An FTP has been prepared to support the planning application specific to Plot 3 (Hotel). This describes the short- and long-term strategies which will be implemented to encourage sustainable travel and to reduce reliance on private car use. The FTP proposes a number of Indicative Travel Plan targets, as follows;

- Increase the overall walk and cycle mode share for residents to greater than 30%;
- Increase the overall walk and cycle mode share for employees to greater than 35%; and
- Reduce car mode share for residents to less than 10%.

19.7.57 The final targets will be reviewed and agreed with LB Haringey once the baseline surveys have been completed. To meet these targets the FTP sets out a comprehensive set of measures summarised in Table 19.10.

Table 19.10: Summary of Framework Travel Plan Measures

| Measure                                                    | Summary Description                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sustainable Travel Manager/ Travel Plan Co-ordinator (TPC) | A Sustainable Travel Manager (STM) will be appointed to take responsibility for development and management of the plan and ensuring its delivery. The STM will be assisted in delivering the measures by Travel Plan Co-ordinators (TPCs) for the residential building and the hotel where the thresholds in TfL's Travel Plan Guidance (2013) are met.                                                                                                             |
| Employee information pack                                  | <b>Hotel Land Use</b><br>Employee/resident information packs will be distributed upon occupation of the Site. The packs will include information on sustainable travel options such as: walking and cycling maps, including journey times; public transport maps, routes, timetables and fares; and information on assessing travel information online through mobile apps and the health benefits associated with using active and or sustainable transport modes. |
| Notice board and intranet                                  | <b>Hotel Land Use</b><br>Additional transport information will be provided at prominent locations, accessible to the employees and visitors. This will include information on walking and cycling including route and local area maps; relevant up-to-date.                                                                                                                                                                                                         |

| Measure                       | Summary Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                               | local public transport maps, routes and timetable and fare information. This information will also be available online.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Website and social media      | <p><b>Hotel Land Use</b></p> <p>Occupiers will be encouraged to post additional transport information on company websites / intranets. This will include information on walking and cycling including routes and local area maps; relevant up-to-date local public transport maps, routes and timetable and fare information.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Measures to encourage cycling | <p><b>Hotel Land Use</b></p> <p>The occupiers of the hotel will be encouraged to investigate the following initiatives to encourage employees to cycle to work:</p> <ul style="list-style-type: none"> <li>• Raising awareness of cycle parking facilities provided, cycle maintenance clubs and local retailers;</li> <li>• Raising awareness of local walking and cycle routes through employee newsletters and forums;</li> <li>• Promoting the free cycle training offered by Haringey and available to everyone who lives, works, or studies in the borough;</li> <li>• Promoting local cycle groups such as Haringey Cycling Campaign that run regular meetings and events in the local neighbourhood;</li> <li>• Take advantage of the government's 'Cycle to Work scheme' to aid employees in buying cycles and accessories through its associated tax savings and the ability to spread the payments out over time;</li> <li>• Negotiation of discounts with local cycle shops for staff purchases and maintenance;</li> <li>• Payment of a cycle mileage allowance for employees using their own cycles for business trips, and</li> <li>• Setting up Cycle User Clubs; these enable cycle users to meet to discuss problems and issues that may arise and offer staff who lack the confidence to cycle on their own the opportunity to pair up with fellow cyclists who cycle along a similar route</li> </ul> |
| Promoting walking and cycling | <p><b>Residential Land Use</b></p> <p>The uptake of cycling among residents can be promoted by:</p> <ul style="list-style-type: none"> <li>• Raising awareness of cycle parking facilities provided, cycle maintenance clubs and local retailers;</li> <li>• Raising awareness of the health benefits of walking and cycling through promotional material;</li> <li>• Raising awareness of local walking and cycle routes through a residential travel information pack for new residents and resident newsletters;</li> <li>• Promoting local cycle groups;</li> <li>• Promoting membership of the London Cycling Campaign (LCC): LCC is a cyclists' organisation with local groups throughout London. Local LCC groups promote cycling locally, improve conditions for cyclists in their borough and organise leisure rides and social events and provide support for cyclists, and</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Measure                      | Summary Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | <ul style="list-style-type: none"> <li>Provision of Santander Cycle scheme membership for households for up to three years</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Residential pack information | <p><b>Residential Land Use</b></p> <p>Every residential unit will be provided with a travel information pack upon first occupation. This will contain details of the cycling, walking and public transport routes to key local facilities, plus links to local bus, and rail journey planning services. The travel information pack will also raise awareness of the active and sustainable travel initiatives being implemented through the FTP including:</p> <ul style="list-style-type: none"> <li>Provision of map showing walking and cycling routes surrounding the Site;</li> <li>Promotion of key services and facilities: Full details of the key services and facilities provided by the FTP will be included within the information pack;</li> <li>Promotion of Car Share Clubs: Details of car sharing websites such as <a href="https://liftshare.com/uk">www. https://liftshare.com/uk</a> will be included within the information pack; and</li> <li>Promotion of Car Clubs: Promotion of car clubs such as Zipcar and Enterprise Car Club will be included within the information pack.</li> </ul> <p>The information pack will also invite those persons wishing to raise specific transport-related matters to discuss them with the TPC or representative. A copy of the information pack will be provided within communal areas, such as lobbies</p> |

### Energy Consumption

19.7.58 Key mitigation measures adopted by the Development to minimise GHG emissions from energy consumption are inherent in the design and described in Section 19.5. No additional measures are proposed.

### Mitigation Summary

19.7.59 Table 19.11 sets out an assessment of the Development's approach to mitigation against the mitigation principles described in IEMA Guidance, to avoid and reduce GHGs where practicable and compensate for any residual emissions.

Table 19.11: Development Approach to Mitigation in Accordance with IEMA Mitigation Principles

| Development Phase     | Avoid and Reduce GHGs                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Construction          | <p>Good and best practice approach adopted to minimise materials with high embodied carbon meeting GLA benchmarks</p> <p>Good practice measures to minimise GHGs from construction activities and adoption of good practice performance standards and guidelines for construction e.g. BREEAM "Very Good" rating</p> <p>Adherence to CEMP which will include measures to minimise construction journeys.</p> |
| Operation – Transport | Implementation of FTP with best practice measures to promote use of sustainable transport modes.                                                                                                                                                                                                                                                                                                             |

|                    |                                                                         |
|--------------------|-------------------------------------------------------------------------|
| Development Phase  | Avoid and Reduce GHGs                                                   |
|                    | Installation of on-site EV charging for cars                            |
| Operation – Energy | Energy efficiency design measures including connection to existing DHN. |

### Summary of GHG Assessment

19.7.60 The assessment of significance has followed a 2-step process consistent with IEMA Guidance and is summarised below in Table 19.12.

Table 19.12: Assessment of Significance

| Step   | Description                                       | Assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Applicable IEMA rating                                                                                 |
|--------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Step 1 | Context                                           | The Development's operational net emissions are a very small component of local (0.1%) and national carbon budgets (0.0001%).                                                                                                                                                                                                                                                                                                                                          | N/A                                                                                                    |
| Step 2 | Consistency with National and Local policy        | The Development includes primary design measures and further operational measures that are consistent with national and local policies to decarbonise emissions to net zero.                                                                                                                                                                                                                                                                                           | The Development is <i>"fully consistent with applicable existing and emerging policy requirements"</i> |
|        | Robustness, timeliness and efficacy of mitigation | The Development has adopted good practice measures to avoid and minimise GHG emissions during the construction phase and over the lifetime of its operation. Good practice energy saving measures have been adopted including connection to the local DHN.<br><br>Construction emissions are minimised through material selection measures meeting GLA WLCA benchmarks with recommendations identified for further carbon reduction as the design develops benchmarks. | The Development is <i>"in line with good practice design standards for projects of this type."</i>     |

19.7.61 Based on Table 19.12 and with reference to IEMA's significance criteria (see Table 19.2) the assessment therefore finds that the effects are *"fully in line with measures necessary to achieve the UK's trajectory towards net zero"* and are therefore assessed as minor adverse and not significant.

## Residual Effects

- 19.7.62 No additional measures are proposed and therefore the residual effects remain as minor adverse and not significant.

## 19.8 Comparison to Consented Scheme

- 19.8.1 The Development forms the Consented Scheme plus the Amendments. There is limited information on the GHG footprint of the Consented Scheme components that have been built out and therefore it is not possible to provide a quantitative GHG assessment of the Development
- 19.8.2 Notwithstanding, it is possible to conclude that the Consented Scheme was subject to a detailed Energy Strategy and Transport Strategy both of which were considered compliant with policy at the time of consent. The Consented Scheme was also subject to phase-specific CEMPs which would act to minimise GHG emissions over the construction phases for each Plot. National measures to decarbonise transport and energy would also equally apply to the Consented Scheme.

## Part B: Resilience to Climate Change

### 19.9 Assessment Methodology

- 19.9.1 This part of the chapter provides a qualitative assessment of the embedded mitigation and resilience of the Development to climate change. The assessment methodology takes into account the recommendations in the IEMA EIA guide to Climate Change Resilience and Adaptation<sup>88</sup> and has been adapted to ensure the assessment is proportionate to the Development.

#### Study Area and Scope

- 19.9.2 There are two key strands to assessing climate change resilience issues within EIA, which need separate treatment:
- The risks of changes in the climate to the project (i.e. the resilience or conversely the vulnerability of a project to future climate changes). A climate risk assessment has been carried out to establish likely significant effects resulting from climate change on the Development; and
  - The extent to which climate exacerbates or ameliorates the effects of the Development on the environment (i.e. 'in-combination' climate effects). In line with the IEMA Guidance, this has been analysed within relevant ES technical chapters. The effects of the Development on various environmental receptors have been assessed, then these effects have been re-assessed taking into account climate change if relevant.

#### Geographical Scope

- 19.9.3 The study area for climate resilience, unlike other disciplines, focuses on the impact that climate will have on the Development (as opposed to the impact of the Development on the environment). The study area is therefore the footprint of the Development, split into its constituent parts (receptors).

#### Temporal Scope

- 19.9.4 The Development is envisaged to have a lifespan of 60 years. Climate projections from UKCP18 for the 2080s have been used (Representative Concentration Pathway (RCP) 8.5 - high emissions scenario). This is the latest time horizon for which UKCP Projections are available and consistent with IEMA (2020) Guidance<sup>88</sup>.

#### Establishing Baseline Conditions

- 19.9.5 The assessment of resilience of the Development to the impacts of climate change was informed by regional scale information on historic and projected change in climate variables, and other studies undertaken relevant to the Development.
- 19.9.6 The future baseline conditions were defined by potential climate risks identified in the UK Climate Change Risk Assessment (2022)<sup>9292</sup>, National Adaptation Programme<sup>91</sup>, and the Key Climate Projections: Headline Findings produced by the Met Office UK (2019)<sup>90</sup>. These are based on the 2018 UK climate projection dataset (UKCP18)<sup>89</sup>.

## Identifying Likely Significant Effects

- 19.9.7 It is standard practice in EIA to distinguish between construction and operational effects of the Development on the environment. The Resilience to climate change assessment however is required to establish any significant effects of climate change on the Development. The focus of the assessment is therefore in the future when it is anticipated that changes from the existing climate will have occurred and these may pose risks in relation to the operational function of the Development and its users. As such, this component of the assessment does not explicitly consider climate risks during the construction period since these works will largely be happening in a period which is not subject to additional climate change to that already experienced and those risks are well established and managed through standard practices.
- 19.9.8 In terms of mitigation to climate change, this is principally a function of the design which needs to anticipate future risks and build in appropriate adaptation measures as required. There is therefore an important focus on embedded measures to address future climate change.
- 19.9.9 The assessment therefore starts by establishing potential receptors, potential climate risks and considers the significance of that risk through an assessment of likelihood and consequence taking into account embedded design measures.
- 19.9.10 As a further step the assessment identifies additional mitigation as required to address any significant effects and concludes on the residual risks.
- 19.9.11 To summarise, climate change by its nature occurs over many decades and future changes, as modelled by UKCP 18 consider climate change in the 2050s and beyond. The focus of the assessment is therefore of the completed Development and the risks it may face due to future climate change in the context of design measures that are adopted during the construction phase and any additional operational measures that may be required in the future.

- 19.9.12 Following IEMA Guidance<sup>88</sup>, the assessment is carried out over five-steps, as follows:

### Step 1: Establish Relevant Local and Regional Policy Requirements

- 19.9.13 This step establishes any relevant policy that informs the assessment of climate risks, and requirement for measures to manage those risks (knowns as adaptation measures).

### Step 2: Identify Receptors

- 19.9.14 During this stage, relevant receptors in the Development which may be affected by climate change (e.g. change in average weather conditions and extreme events) are identified.

### Step 3: Identify Potential Impacts of Climate Change on Receptors and Confirm Embedded Mitigation

- 19.9.15 This stage comprises identification of potential impacts of changes in a range of climate variables on the receptors identified in Step 2. This is undertaken using professional judgement and identifies the design measures to mitigate the impacts taking into account policy requirements identified in Step 1.

#### Step 4: Assess the Significance of Effects of Climate Change on Receptors

19.9.16 This step assesses the significance of each hazard (using definitions in Table 19.13) based on scoring the likely consequence and likelihood of that hazard arising, using a five-point scale described in Table 19.14 and Table 19.15. The assessment of significance and scoring of likelihood and consequence are based on IEMA Guidance<sup>88</sup>.

Table 19.13: Qualitative Description of Consequence

| Measure of Consequence | Description                                                                                                                                                                                                                                                               |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Negligible             | No damage to the Development, minimal adverse effects on health, safety and the environment or financial loss. Little change to service and disruption lasting less than one day.                                                                                         |
| Minor Adverse          | Localised disruption or loss of service. No permanent damage, minor restoration work required: disruption lasting less than one day. Small financial losses and/or slight adverse health or environmental effects.                                                        |
| Moderate Adverse       | Limited damage and loss of service with damage recoverable by maintenance or minor repair. Disruption lasting more than one day but less than one week. Moderate financial losses. Adverse effects on health or the environment.                                          |
| Large Adverse          | Extensive damage and severe loss of service. Disruption lasting more than one week. Early renewal of 50-90% of the Development. Permanent physical injuries and/or fatalities. Major financial loss. Significant effect on the environment, requiring remediation.        |
| Very Large Adverse     | Permanent damage and complete loss of service. Disruption lasting more than one week. Early renewal of the Development >90%. Severe health effects or fatalities. Extreme financial loss. Very significant loss to the environment requiring remediation and restoration. |

Table 19.14: Qualitative Description of Likelihood

| Measure of Likelihood | Description (assuming 60-year lifetime)                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------------------------------|
| Very High             | The event occurs multiple times during the lifetime of the Development e.g., approximately annually.            |
| High                  | The event occurs several times during the lifetime of the Development e.g. approximately once every five years. |
| Medium                | The event occurs limited times during the lifetime of the Development e.g. approximately once every 15 years.   |
| Low                   | The event occurs occasionally during the lifetime of the Development e.g. once in 60 years.                     |
| Very Low              | The event may occur once during the lifetime of the Development.                                                |

19.9.17 These determinants are combined to assess the significance of effects on receptors, as shown in Table 19.15. The assessment is qualitative and based on expert judgment based on knowledge of similar schemes, engagement with the wider design team and a review of relevant literature.

19.9.18 The assessment of significance takes embedded mitigation into account. Embedded mitigation is identified through consultation with the design team and taking into account policy requirements identified through Step 1.

Table 19.15: Significance Rating Matrix

| Likelihood of hazard occurring | Consequence of Hazard Occurring |                 |                  |                 |                    |
|--------------------------------|---------------------------------|-----------------|------------------|-----------------|--------------------|
|                                | Negligible                      | Minor Adverse   | Moderate Adverse | Large Adverse   | Very Large Adverse |
| Very High                      | Not significant                 | Significant     | Significant      | Significant     | Significant        |
| High                           | Not significant                 | Significant     | Significant      | Significant     | Significant        |
| Medium                         | Not significant                 | Not significant | Significant      | Significant     | Significant        |
| Low                            | Not significant                 | Not significant | Not significant  | Significant     | Significant        |
| Very Low                       | Not significant                 | Not significant | Not significant  | Not Significant | Not Significant    |

#### Step 5: Establish Further Adaptation Measures and Determine Residual Effects

19.9.19 In the fifth step, further adaptation and mitigation measures for any significant effects are identified through expert opinion based on knowledge of similar schemes and consultation with the project team and any residual effects of climate change on the receptors are assessed using Table 19.13 to Table 19.15.

#### Assumptions and Limitations

19.9.20 This assessment provides a broad indication of the potential impacts of climate change on the Development based on a qualitative assessment and professional judgement using knowledge of similar schemes. The UKCP18 projections are the most up-to-date projections of climate change for the UK.

19.9.21 UKCP18 provides probabilistic projections of future climate for a range of emissions scenarios. Future GHGs emissions, and resulting pathway, is uncertain. A precautionary approach, consistent with IEMA Guidance<sup>8888</sup> has therefore been adopted by selecting a high emissions scenario (RCP8.5) and long-term time slice (2080s) which offer the longest-term projections into the project timescale.

19.9.22 The embedded adaptation measures are based on information provided by the Design Team. The determination of significance has been undertaken under the assumption that industry design standards will be adhered to where detailed design information is unavailable.

## 19.10 Baseline Conditions

### Existing Conditions

19.10.1 Table 19.16 sets out the current understanding of climate hazards within the Site, based on the assessments carried out within the Flood Risk Assessment (FRA)<sup>97</sup> (submitted in standalone with the planning application), and Met Office published baseline data<sup>98</sup>.

Table 19.16: Current Climate Change Hazards

| Climate Hazard                  | Current Baseline                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Extreme rainfall and Flood Risk | <p>According to the EA surface water flood map, the majority of the site is classified as having a very low probability of surface water flooding, though part of the north-east of the site has an area of low risk of surface water flooding.</p> <p>There are no documented records of groundwater flooding within the proposed Development site according to the LBH Surface Water Management Plan (SWMP). The overall risk of groundwater rising above ground level and causing flooding to the site is considered to be low due to the impermeable nature of the underlying London Clay.</p> <p>The Met office climate data for 12km square located at the Site states there have been 8 rainy days on average per month (in the summer) and 10 days in the Winter over the period 1991-2019, with a wettest summer day in the past 30 years resulting in 37mm of rain, and 31mm in the Winter.</p> |
| Storms and Drought              | <p>The Met office confirms that although severe storms will occur more frequently with climate change, drought conditions are also expected to increase as summers become drier and hotter. London and the South East are already classed as 'seriously water stressed', meaning more water is taken from the natural environment than is sustainable in the long-term.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Extreme Temperatures            | <p>The Met office climate data<sup>99</sup> for the 12km square located at the site states that the hottest summer day in the past 30 years (between 1991 and 2019) was 37.1C (and winter day of 19.6C), with 6 days during the summer where the temperatures was above 25C per month on average.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## 19.11 Future Baseline

19.11.1 In this baseline section, the UKCP 2018 Climate Projections<sup>99</sup> central estimate (50<sup>th</sup> percentile) projections for high emissions scenario (RCP8.5) are presented. The high emissions scenario was used to adopt a 'worst-case' estimate of climate projections. These are summarised in Table 19.17.

<sup>97</sup> Flood Risk Assessment, THFC Hotel , S73 Application, Produced by Buro Happold, July 2023.

<sup>98</sup> See <https://www.bbc.co.uk/news/resources/idx-d6338d9f-8789-4bc2-b6d7-3691c0e7d138>

<sup>99</sup> This data excludes data relating to the record heatwave that was experienced in July 2022

Table 19.17: Climate Projections for London in 2070-2089 using UKCP18 - RCP8.5 (50<sup>th</sup> percentile)<sup>100</sup>

| Climate Variable <sup>a</sup> | 2070/80s |
|-------------------------------|----------|
| Mean annual temperature       | +3.6 °C  |
| Mean winter temperature       | +2.9°C   |
| Mean summer temperature       | +4.9 °C  |
| Mean winter precipitation (%) | +21 %    |
| Mean summer precipitation (%) | -31 %    |

<sup>a</sup> Change relative to 1981-2000 baseline

19.11.2 Extreme weather events are considered for the Development. Climate change predictions indicate increasingly erratic weather pattern that are likely to lead to greater number of extreme weather events.

19.11.3 This includes heatwaves (precursor to droughts) and increase in localised intense precipitation events, (precursor to flooding) with some climate models predicting an increase in frequency and intensity of winter storms<sup>90</sup>. Increase in the frequency and intensity of these extremes can put further pressure on resources and increase risk posed to infrastructure and public health and safety.

19.11.4 The projected changes to the climate in the UK are translated in to eight priority risk areas in the UK Climate Change Risk Assessment 2022<sup>92</sup>:

- Risks to the viability and diversity of terrestrial and freshwater habitats and species from multiple hazards;
- Risks to soil health from increased flooding and drought;
- Risks to natural carbon stores and sequestration from multiple hazards leading to increased emissions;
- Risks to crops, livestock and commercial trees from multiple hazards;
- Risks to supply of food, goods and vital services due to climate-related collapse of supply chains and distribution networks;
- Risks to people and the economy from climate-related failure of the power system;
- Risks to human health, wellbeing and productivity from increased exposure to heat in homes and other buildings; and
- Multiple risks to the UK from climate change impacts overseas.

### Snow

19.11.5 According to UKCP18 projections, for the period 2061-2080, under a high emissions scenario (RCP8.5), the regional (12km) and local (2.2km) projections show a decrease in both falling and lying snow across the UK relative to the 1981-2000 baseline.

<sup>100</sup> Data based on UKCP18 key results: Probabilistic and sea level projections (.xlsx spreadsheet - 434kB) see <https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-key-results.xlsx>

## Wind

- 19.11.6 There are no compelling trends in storminess, as determined by maximum gust speeds, from the UK wind network over the last four decades. UKCP18 projections over the UK show an increase in near surface wind speeds over the UK for the second half of the 21<sup>st</sup> century for the winter season when more significant effects of wind are experienced. This is accompanied by an increase in frequency of winter storms over the UK. However, the increase in wind speeds is modest compared to inter-annual variability.
- 19.11.7 Winds associated with major storm events can be some of the most damaging and disruptive events for the UK with implications for property, power networks, road and rail transport and aviation.

## 19.12 Assessment of Climate Resilience

- 19.12.1 The assessment has followed the 5-step process identified earlier. The assessment under each step is detailed further below.

### Step 1: Establish Relevant Local Policy Requirements

- 19.12.2 The LB Haringey Local Plan Policy SP5 is relevant to the assessment of resilience to climate change. Specifically, in terms of climate resilience this requires:

- *Take account of flood risk vulnerability classification as set out in paragraph 100 of the NPPF and will apply the NPPF Sequential Test and Exception Test;*
- *Implement measures to prevent (or mitigate as last resort) local surface water and downstream flooding;*
- *Implement Sustainable Drainage Systems from strategic to individual site level to improve water attenuation, quality and amenity;*

- 19.12.3 LB Haringey DPD Policy DM24: Managing and Reducing Flood Risk states that:

*“The Council will ensure that all proposals for new development avoid and reduce the risk of flooding to future occupants and do not increase the risk of flooding.”*

- 19.12.4 Nationally the NPPF sets out policy on climate resilience. Paragraph 153 states that Local Planning Authorities:

*“Should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures. Policies should support appropriate measures to ensure the future resilience of communities and infrastructure to climate change impacts, such as providing space for physical protection measures, or making provision for the possible future relocation of vulnerable development and infrastructure”*

### Step 2: Identify Receptors

- 19.12.5 The key receptors on-site identified are:

- Buildings and occupiers;

- Site access and infrastructure;
- Amenity areas; and
- Landscaping and biodiversity.

### Step 3: Identify Potential Impacts of Climate Change on Receptors and Embedded Mitigation

19.12.6 A number of potential impacts were identified. The Project Team were consulted regarding the potential risks inherent to the Development's design. The results are detailed in Table 19.18.

Table 19.18: Climate Risks and Mitigation

| Climate Variable                                      | Receptor                | Potential Impact                           | Design Measures to Mitigate Impacts                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------|-------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hotter Summers<br>Extreme Temperatures<br>(Heatwaves) | Buildings and occupiers | Overheating                                | <ul style="list-style-type: none"> <li>▪ Overheating analysis has been undertaken in accordance with CIBSE TM59 utilising dynamic modelling.</li> <li>▪ Dynamic thermal modelling has been undertaken to help direct the façade design and determine any residual overheating risk.</li> <li>▪ The results show that the façade has levels of passive design incorporated to minimise overheating with mechanical cooling provided to resolve any residual overheating risk</li> </ul> |
|                                                       |                         | Fire                                       | <ul style="list-style-type: none"> <li>▪ The Development design adheres with relevant standards and guidance on fire prevention.</li> </ul>                                                                                                                                                                                                                                                                                                                                            |
|                                                       | Amenity Areas           | Reduced usability due to urban heat effect | <ul style="list-style-type: none"> <li>▪ Landscape design provides as much planting as functionally possible, breaking up the hard landscape with trees and biodiverse herbaceous planting to provide shade and reduce the urban heat effect.</li> <li>▪ A canopy above the Hotel Plaza provides shade for pedestrians.</li> </ul>                                                                                                                                                     |
| Wetter Winters<br>Extreme Rainfall                    | Buildings and occupiers | Combined Sewers flooding                   | <ul style="list-style-type: none"> <li>▪ Under the proposed Foul Water Drainage Strategy, foul water will be discharged directly to the existing TW foul water sewers by gravity. There are no known issues</li> </ul>                                                                                                                                                                                                                                                                 |

| Climate Variable | Receptor                     | Potential Impact                                            | Design Measures to Mitigate Impacts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|------------------------------|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  |                              |                                                             | associated with lack of capacity of the TW foul water sewer network. In addition, all surface water is proposed to be discharged to a dedicated surface water sewer. It is therefore considered that the risk of the TW foul sewer surcharging and flooding the proposed development is low.                                                                                                                                                                                                                                                                                                  |
|                  |                              | Surface water flooding                                      | <ul style="list-style-type: none"> <li>▪ The surface water drainage strategy has been developed in accordance with the drainage hierarchy set out in the London Plan.</li> <li>▪ The surface water strategy has been developed to attenuate surface water in a combination of below ground drainage systems in the form of below ground geocellular storage / tree pit attenuation.</li> <li>▪ Sufficient storage volume has been provided within the drainage system to accommodate the critical '1 in 100-year storm event plus an additional 40% allowance for climate change'.</li> </ul> |
|                  |                              | Increased weathering due to mechanical action               | <ul style="list-style-type: none"> <li>▪ Robust materials are proposed for building facades throughout the development with back-insulated glass panels, powder coated aluminium panels and precast concrete panels as the principal façade materials.</li> </ul>                                                                                                                                                                                                                                                                                                                             |
|                  | Landscaping and biodiversity | Damage to landscaping by surface water flooding             | <ul style="list-style-type: none"> <li>▪ Proposed planting is detailed with suitable drainage requirements to mitigate heavy rainfall</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                  |                              | Loss of site planting and biodiversity due to high rainfall | <ul style="list-style-type: none"> <li>▪ The proposed plant species are selected in relation to the location, aspect, soil type and microclimate of the site as well as for their resilience to ongoing climate change.</li> </ul>                                                                                                                                                                                                                                                                                                                                                            |
|                  |                              |                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

| Climate Variable         | Receptor                       | Potential Impact                                                     | Design Measures to Mitigate Impacts                                                                                                                                                                                                                   |
|--------------------------|--------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drier Summers<br>Drought | Buildings and occupiers        | Increased weathering due to thermal action                           | <ul style="list-style-type: none"> <li>Use of thermal insulation, precast concrete, thermally-broken mullions and triple glazing on facades ensures a higher thermal mass than other cladding options and in turn reduces thermal variance</li> </ul> |
|                          | Site access and infrastructure |                                                                      |                                                                                                                                                                                                                                                       |
|                          | Landscaping and Biodiversity   | Loss of site planting and biodiversity due to drought                | <ul style="list-style-type: none"> <li>The proposed plant selection creates a 'Futureproof Landscape' with resilient and adaptive qualities in order to meet the climate change needs for the future.</li> </ul>                                      |
| Wind and Storms          | Buildings and occupiers        | Storm damage to roofs and facades                                    | <ul style="list-style-type: none"> <li>Majority of roofs are flat, with a concrete roof slab and therefore robust and resistant to significant damage. Final roof build-ups/finishes to be developed at a later stage.</li> </ul>                     |
|                          | Landscaping and biodiversity   | Soil erosion, damage to trees and planting and loss of biodiversity. | <ul style="list-style-type: none"> <li>Tree and hedge planting have been located at strategic positions throughout the site to contribute to wind mitigation measures.</li> </ul>                                                                     |

#### Step 4: Assess the Significance of Effects of Climate Change on Receptors

19.12.7 Table 19.19 details the assessment of climate risks identified in Step 2 above, taking into account design measures to mitigate risks.

Table 19.19: Climate Resilience Assessment

| Climate Variable                                      | Receptor                | Potential Impact                           | Likelihood | Consequence | Significance    |
|-------------------------------------------------------|-------------------------|--------------------------------------------|------------|-------------|-----------------|
| Hotter Summers<br>Extreme Temperatures<br>(Heatwaves) | Buildings and occupiers | Overheating                                | Medium     | Minor       | Not significant |
|                                                       |                         | Fire                                       | Very Low   | Large       | Not significant |
|                                                       | Amenity Areas           | Reduced usability due to urban heat effect | Medium     | Minor       | Not significant |
| Wetter Winters                                        |                         | Fluvial flooding                           | Very Low   | Moderate    | Not significant |

| Climate Variable      | Receptor                            | Potential Impact                                                    | Likelihood | Consequence | Significance    |
|-----------------------|-------------------------------------|---------------------------------------------------------------------|------------|-------------|-----------------|
| Extreme Rainfall      | Buildings and occupiers             | Surface water flooding                                              | Low        | Moderate    | Not significant |
|                       |                                     | Increased weathering due to mechanical action                       | Medium     | Minor       | Not significant |
|                       | Landscaping and biodiversity        | Damage to landscaping by surface water flooding                     | Low        | Moderate    | Not significant |
|                       |                                     | Loss of site planting and biodiversity due to high rainfall         | Medium     | Minor       | Not significant |
| Drier Summers Drought | Buildings and occupiers             | Increased weathering due to thermal action                          | Medium     | Minor       | Not significant |
|                       | Hard surfaces / site infrastructure | Increased weathering due to thermal action                          | Medium     | Minor       | Not significant |
|                       | Landscaping and biodiversity        | Loss of site planting and biodiversity due to drought               | Medium     | Minor       | Not significant |
| Wind and Storms       | Buildings and occupiers             | Storm damage to roofs and facades                                   | Low        | Moderate    | Not significant |
|                       |                                     | Loss of power to building systems                                   | Low        | Minor       | Not significant |
|                       | Landscaping and biodiversity        | Soil erosion, damage to trees and planting and loss of biodiversity | Low        | Minor       | Not significant |

## Step 5 Establish Further Adaptation Measures and Determine Residual Effects

19.12.8 Table 19.19 shows that there are no significant effects on the Development due to future climate change.

### Residual Effects

19.12.9 The residual effects are in line with those described in Table 19.19 and are not significant.

### 19.13 Cumulative Resilience Effects

19.13.1 All cumulative developments as presented in Appendix 2.1 have been considered in the identification of cumulative effects from climate change.

19.13.2 The climate resilience assessment considers the impacts of climate change on the Development and as such, the receptors for the assessment are the Development and its users. The changes in climate variables described in the baseline section will be experienced by all developments in the vicinity of the Development. However, the potential impacts from climate change may alter as a result of cumulative developments.

19.13.3 Effects associated with flooding and surface water runoff as a result of higher winter rainfall and extreme rainfall events may be exacerbated by cumulative developments which increase the impermeable area in the vicinity of the Development. However, the Flood Risk Assessment takes account of climate change and cumulative effects so this is not further assessed here.

19.13.4 Effects associated with higher summer temperatures and more extreme temperature events could be exacerbated by cumulative developments if they result in a large increase in hard surface in the vicinity of the Development (urban heat island effect). However, the Development is already in an urbanised region, and landscaping and planting has been designed to minimise the urban heat effect created by the Development.

19.13.5 Cumulative effects with respect to climate resilience are therefore not significant.

### 19.14 Conclusions

19.14.1 The climate resilience measures identified and adopted by the design seek to minimise climate risks due to future climate change.

19.14.2 The assessment has found that the Development is resilient to likely climatic changes within its lifetime and the effects are not significant.

19.14.3 The resilience of the Consented Scheme was not explicitly assessed in the 2015 ES, although a flood risk assessment was submitted in support of the planning application to demonstrate that the Consented Scheme met flood risk policy requirements. Assuming that the design and mitigation principles applied to the Development would also be applied to future development of the Consented Scheme (e.g. through requirements resulting from detailed subsequent planning applications) this would result in no significant effects from future climate change for the Development (i.e. the Consented Scheme and Amendments taken together).

Table 19.1: Summary of Residual Effects

**Part A: GHG Assessment**

| Effect                                        | Receptor<br>(Sensitivity) | Geographic<br>Scale | Temporal<br>Scale | Magnitude<br>of Impact | Mitigation and Monitoring                                                                                                                  | Residual<br>Effect |
|-----------------------------------------------|---------------------------|---------------------|-------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <i>Construction and Completed Development</i> |                           |                     |                   |                        |                                                                                                                                            |                    |
| Whole life GHG emissions                      | Not applicable            | Global              | Permanent         | Minor adverse          | Adherence to the CEMP<br>BREEAM Very Good rating<br>Transport Plan and mode share targets<br>Energy efficient design and connection to DHN | Minor adverse      |

**Part B: Resilience to Climate Change**

| Effect                                        | Receptor<br>(Sensitivity) | Geographic<br>Scale | Temporal<br>Scale | Magnitude<br>of Impact | Mitigation and Monitoring                                                                                                                                                                                                                                                                                                                                       | Residual<br>Effect |
|-----------------------------------------------|---------------------------|---------------------|-------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <i>Construction and Completed Development</i> |                           |                     |                   |                        |                                                                                                                                                                                                                                                                                                                                                                 |                    |
| Resilience to climate change                  | Not applicable            | Local               | Permanent         | Not significant        | Climate resilience measures embedded in design including; building fabric and material selection to withstand future extreme temperatures, ground and surface water flood attenuation measures for a design discharge with increase for climate change of 40%, building materials, ventilations and overheating measures to protect occupiers from extreme heat | Not Significant    |

## 20 Effect Interactions

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### 20.1 Introduction

- 20.1.1 This chapter assesses the interaction of individual effects of the Development upon identified receptors / resources from multiple technical topics in the EIA (known as 'intra-project' effects). This chapter forms part of the cumulative assessment provided within this ES.
- 20.1.2 Details on the assessment approach for inter-project effects of the Development with other cumulative schemes are provided in Chapter 3: EIA Methodology. The inter-project cumulative assessments are provided in each technical chapters of this ES (Chapters 6–19).

### 20.2 Methodology

- 20.2.1 There is no consistent guidance or standardised approach to the assessment of effect interactions. However, it is recognised that the Development has the potential to give rise to a variety of impacts upon a number of different receptors, some of which have the potential to combine to become significant effects.
- 20.2.2 Table 20.1 provides a summary matrix showing where effect interactions would occur between environmental topics that have been scoped into the EIA for the Development. For the purposes of this assessment, where no effect interactions between environmental topics occur these topics are scoped out of further assessment.

Table 20.1: Summary Matrix of Effect Interactions

| Topic           | AQ | A | CH | E | W<br>&F | G&H | T&V | N&V | SE | T | W | DS<br>O | EI | CC |
|-----------------|----|---|----|---|---------|-----|-----|-----|----|---|---|---------|----|----|
| AQ              |    | N | N  | Y | N       | N   | N   | Y   | N  | Y | N | N       | N  | N  |
| A               | N  |   | Y  | N | N       | N   | N   | N   | N  | N | N | N       | N  | N  |
| CH              | N  | Y |    | N | N       | N   | Y   | N   | N  | N | N | N       | N  | N  |
| E               | Y  | N | N  |   | Y       | Y   | N   | N   | N  | N | N | N       | N  | N  |
| W&F             | N  | N | N  | Y |         | Y   | N   | N   | N  | N | N | N       | N  | N  |
| G&H             | N  | N | N  | Y | Y       |     | N   | N   | N  | N | N | N       | N  | N  |
| T&V             | N  | N | Y  | N | N       | N   |     | N   | N  | N | N | N       | N  | N  |
| N&V             | Y  | N | N  | N | N       | N   | N   |     | Y  | Y | N | N       | N  | N  |
| SE              | N  | N | N  | N | N       | N   | N   | Y   |    | Y | N | N       | N  | N  |
| T               | Y  | N | N  | N | N       | N   | N   | Y   | Y  |   | N | N       | N  | N  |
| W               | N  | N | N  | N | N       | N   | N   | N   | N  | N |   | N       | N  | N  |
| DSO             | N  | N | N  | N | N       | N   | N   | N   | N  | N | N |         | Y  | N  |
| EI              | N  | N | N  | N | N       | N   | N   | N   | N  | N | N | Y       |    | N  |
| CC <sup>1</sup> | N  | N | N  | N | N       | N   | N   | N   | N  | N | N | N       | N  |    |

Key:

N: No potential for effect interactions; Y: Potential for effect interactions; AQ: Air Quality; A: Archaeology; CH: Cultural Heritage; E: Ecology; W&F: Water and Flood Risk; G&H: Ground Conditions and Hydrogeology; T&V: Townscape and Visual; N&V: Noise and Vibration; SE: Socio-Economics; T: Transport; W: Wind Microclimate; DSO: Daylight, Sunlight and Overshadowing; EI: Electronic Interference; and CC: Climate Change and Greenhouse Gases.

<sup>1</sup>Climate Change considerations are inherently considered in the Surface Water and Flood Risk and Air Quality assessments so no effect interactions are expected with these topics.

20.2.3 The assessment of transport, noise and vibration, air quality, wind microclimate, daylight, sunlight and overshadowing, electronic interference, townscape and visual effects, and indirectly ground conditions and flood risk, all concern ground level human receptors. These are namely the occupants of properties in proximity to the Site, the users of the road network, drivers, pedestrians and cyclists on the surrounding road network, and future occupiers of the Development. There is also an indirect effect of socio-economics which is conducted at a greater spatial scale. Human receptors are principally considered in relation to their health and wellbeing.

20.2.4 The potential cultural heritage effects only impact on buried archaeological assets and built heritage assets, imposing no effects on people. Therefore, cultural heritage effects are scoped out of further consideration in this chapter as there is no potential for effect interactions with other topics. Visual effects on the setting of built heritage assets have inherently been considered in the assessment provided in Chapter 8: Cultural Heritage.

20.2.5 No effects were predicted in the Chapter 9: Ecology for the construction or operational phases and therefore no effect interactions are predicted on ecological receptors.

20.2.6 Considering the above, the following topics are taken forward for assessment:

- Air Quality;
- Surface Water Resources and Flood Risk;

- Ground Conditions and Hydrogeology;
- Townscape and Visual;
- Noise and Vibration;
- Socio-Economics;
- Transport;
- Wind Microclimate;
- Daylight, Sunlight and Overshadowing; and
- Climate Change and Greenhouse Gases.

20.2.7 Table 20.2 summarises the proposed receptor-based assessment process to be used for both construction and operation of the Development for those technical topics identified within paragraph 20.2.6, which should an effect be identified may be able to interact and cause an effect interaction.

**Table 20.2: Effect Interactions Assessment Process**

| Step                                            | Description                                                                                                                                                                                                                                                                                                                                                                   |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Step 1: Identify and categorise receptors       | Identify all topic sensitive receptors and their geographical locations based on the study areas and study areas of the respective technical assessments. These will then be categorised by type.                                                                                                                                                                             |
| Step 2: Identify impacts                        | Identify all topic impacts associated with sensitive receptor(s)/ receptor types.                                                                                                                                                                                                                                                                                             |
| Step 3: Screen receptors and associated impacts | Undertake a screening exercise upon the identified receptors and impacts. Screened items out from further assessment if they are: <ul style="list-style-type: none"> <li>▪ Receptors where no topic impacts overlap;</li> <li>▪ Receptors with no temporal overlap with topic impacts; or</li> <li>▪ Receptors where topic impacts are identified as 'negligible'.</li> </ul> |
| Step 4: Assess effect interactions              | Qualitative assessment based on professional judgement of the effect interactions.                                                                                                                                                                                                                                                                                            |

20.2.8 The intra-project effects assessment uses professional judgement and takes a qualitative assessment approach. Assessing the significance of effects interaction requires subjective judgement about how well a receptor is able to accommodate the multiple changes that will occur as a result of the Proposed Development.

20.2.9 The study area, or Zone of Influence (ZoI), for the in-combination effects assessment was defined by the study areas of the scoped-in environmental topic assessments, which are discussed in the relevant topic chapters.

20.2.10 Steps 1 and 2 were undertaken within each technical assessment as part of the assessment of effects process. Steps 3 and 4 were undertaken by the EIA co-ordinators, Quod, for both the construction and completed development phases.

20.2.11 During the screening exercise, a spatial overlap was identified when the same receptor was identified in more than one technical chapter. These effects were then checked for a

temporal overlap. If both a spatial and temporal overlap were identified, and the associated topic effects were above negligible, then the intra-project effects on that receptor / receptor group were taken forward for assessment (Step 4).

## 20.3 Baseline

20.3.1 The baseline for the effect interactions assessment for this EIA is as described in each technical chapter affecting:

- Construction phase: Current Site users, drivers, pedestrians and cyclists on the surrounding road network, recreational users of the surrounding area and occupants of existing properties in the vicinity of the Site;
- Construction phase: River Moselle and underlying groundwater aquifer; and
- Operational phase: Existing and future Site occupiers, drivers, pedestrians and cyclists on the surrounding road network, recreational users of the surrounding area and occupants of properties in the vicinity of the Site.

## 20.4 Assessment of Effects

### Construction Phase Effects

20.4.1 No residual effects with a minor significance or greater were identified in the ecology, townscape and visual, wind microclimate, daylight, sunlight and overshadowing, and electronic interference assessments during the construction phase. As such, these topics have not been considered further.

20.4.2 Effects of a minor significance or greater were identified for drivers, pedestrians and cyclists on the surrounding road network, occupants of existing properties in proximity to the Site, construction workers across a number of technical assessments. Effects of a minor significance or greater were also identified on the River Moselle and underlying groundwater aquifer.

20.4.3 Table 20.3 provides an assessment of these potential effect interactions.

Table 20.3: Potential Effect Interactions – Construction

| Receptor                                                                                                      | Chapter                                           | Residual Effect (as reported in topic chapter)  | Assessment of Effect Interaction                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Current Site users, including construction workers; drivers, pedestrians and cyclists on the surrounding road | Chapter 6: Air Quality                            | Minor adverse construction traffic effects      | Based on the residual construction effects outlined in column 3 of this table, it is considered that there is potential for temporary effect interactions on construction workers, surrounding |
|                                                                                                               | Chapter 10: Surface Water Drainage and Flood Risk | Minor beneficial flood risk to surrounding area |                                                                                                                                                                                                |

| Receptor                                                                                                               | Chapter                                           | Residual Effect (as reported in topic chapter)                                                                                                                                                                                                                                  | Assessment of Effect Interaction                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| network; recreational users of the surrounding area; and occupants of existing properties in the vicinity of the Site. | Chapter 11: Ground Conditions and Hydrogeology    | Minor adverse to construction workers from inhalation and ingestion of contaminated dust particles                                                                                                                                                                              | properties and users of local roads. Further details are provided in the paragraphs below.                                                                                                                                                                   |
|                                                                                                                        | Chapter 13: Noise and Vibration                   | Neutral to moderate adverse construction noise and vibration effects on dwellings on Worcester Avenue; Moderate to Major adverse effects on schools on Worcester Avenue; Neutral to Major adverse effects to dwellings on Park Lane and High Road from construction activities. |                                                                                                                                                                                                                                                              |
|                                                                                                                        | Chapter 14: Socio-economics                       | Minor beneficial effects on construction employment generation at the local level                                                                                                                                                                                               |                                                                                                                                                                                                                                                              |
|                                                                                                                        | Chapter 15: Transport                             | Neutral to minor adverse effects from construction traffic                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                              |
| River Moselle and underlying groundwater aquifer                                                                       | Chapter 10: Surface Water Drainage and Flood Risk | Minor beneficial effects from controlled construction site measures, regulated discharge rates, monitoring and decommissioning of boreholes.                                                                                                                                    | Based on the residual construction effects outlined in column 3 of this table, it is considered that there is potential for temporary effect interactions on the River Moselle and underlying aquifer. Further details are provided in the paragraphs below. |
|                                                                                                                        | Chapter 11: Ground Conditions and Hydrogeology    | Minor adverse from increased leaching and mobilisation of contaminants, and via fuel and chemical spills.                                                                                                                                                                       |                                                                                                                                                                                                                                                              |

20.4.4 Construction workers, surrounding properties and users of local roads will experience localised air quality, flood risk, contamination, socio-economic, noise and transport effects during construction works. There is potential for effect interactions on the River Moselle and

groundwater aquifer from increased leaching and mobilisation of contaminants and changes in flood risk,

- 20.4.5 In practice, the exact location and duration of construction activities will vary as the Development is built out meaning the identified receptors will experience fluctuations in the magnitude of the aforementioned effects over the course of the five-year construction programme and may only experience significant effects during short extents of this period when specific works are localised. Although effects have been identified as potentially acting on two receptor groups for a specific period of time, the nature of these effects are not considered to be synergistic.
- 20.4.6 The lack of synergistic interaction along with the varying source location and intensity of potential effects during construction works is unlikely to result in effects greater than individual residual effects identified for the respective topics in isolation. Furthermore, the construction activities will be typical of an urban development project of this scale and nature meaning the standard mitigation measures, such as adherence to controls set out in the Construction Environmental Management Plan (Condition D2), Air Quality and Dust Management Plan (Condition D3), and controls set out in Condition D14: Contamination and D15: Contamination Remediation will be adequate to effectively mitigate this effect interaction. Therefore, no significant effect interactions are predicted.

#### Completed Development Effects

- 20.4.7 No residual effects with a minor significance or greater were identified in the ground conditions and hydrogeology and electronic interference assessments. As such no effect interactions were identified for these topics and they have not been considered further.
- 20.4.8 Effects of minor significance or greater were identified for air quality, surface water drainage and flood risk, townscape and visual, noise and vibration, socio-economics, transport, wind microclimate, daylight, sunlight and overshadowing, and climate change and greenhouse gases. Therefore, there is potential to experience an effect interaction between these topics where applicable to the same receptor(s). Table 20.4 provides an assessment of these potential effect interactions.

Table 20.4: Potential Effect Interactions – Completed Development

| Receptor                                                                                                                     | Chapter                                           | Residual Effect (as reported in topic chapter)                                                            | Assessment of Effect Interaction                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Existing and future Site users; drivers, pedestrians and cyclists on the surrounding road network; recreational users of the | Chapter 6: Air Quality                            | Minor adverse from operational traffic; Moderate adverse from energy plant and diesel generator emissions | Based on the residual completed Development effects outlined within column 3 of this table, it is considered that there is potential for effect interactions on |
|                                                                                                                              | Chapter 10: Surface Water Drainage and Flood Risk | Neutral to minor beneficial effects on flood risk (on and off-site).                                      |                                                                                                                                                                 |

| Receptor                                                               | Chapter                          | Residual Effect (as reported in topic chapter)                                                                                                                                                                                                                                                                                             | Assessment of Effect Interaction                                                   |
|------------------------------------------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| surrounding area; and occupants of properties in vicinity of the Site. | Chapter 12: Townscape and Visual | Moderate adverse to major beneficial impacts on the views from specified viewpoints.                                                                                                                                                                                                                                                       | identified receptors. This is discussed in further detail in the paragraphs below. |
|                                                                        | Chapter 13: Noise and Vibration  | Minor to Major adverse effects on dwellings and schools on Worcester Avenue; Major adverse effects on dwellings on Park Lane; and Neutral to Minor adverse effects on dwellings on High Road from matchday noise. Neutral to minor adverse effects on dwellings on Worcester Avenue, Park Lane and High from music concerts and NFL games. |                                                                                    |
|                                                                        | Chapter 14: Socio-economics      | Major beneficial effects on employment, provision of new homes, local spending, provision of open space and public realm, and crime and safety at the local level; Moderate beneficial effects on sport and recreation at the local level; Minor beneficial effects on primary healthcare and play space provision at the local level.     |                                                                                    |
|                                                                        | Chapter 15: Transport            | Minor adverse effects on local traffic flows. Minor adverse effects on pedestrians during non-event days. Minor beneficial effects on public transport users from improvements to public transport infrastructure, with minor adverse effects during matchdays.                                                                            |                                                                                    |

| Receptor | Chapter                                                     | Residual Effect (as reported in topic chapter)                                                                                                                                                                                                          | Assessment of Effect Interaction |
|----------|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|          | Chapter 16:<br>Wind<br>Microclimate                         | Moderate adverse effect on pedestrian thoroughfares, entrances, and recreational spaces                                                                                                                                                                 |                                  |
|          | Chapter 17:<br>Daylight,<br>Sunlight and<br>Overshadowing   | Negligible to minor adverse, with instances of moderate adverse daylight and sunlight effects.<br>Minor adverse with one instance of minor to moderate adverse effects on overshadowing.<br>Instances of minor to moderate adverse solar glare effects. |                                  |
|          | Chapter 19:<br>Climate<br>Change and<br>Greenhouse<br>Gases | GHG emissions from operations: Potential minor adverse                                                                                                                                                                                                  |                                  |

- 20.4.9 Existing and future users of the Site and surrounding area will experience beneficial effects due to socio-economic, specifically improvements in delivery of housing, educational and sports/amenity facilities, open space, and employment opportunities. There would also be localised beneficial effects on public transport accessibility, although there may be increased queuing on matchdays. Additionally, there would be adverse and beneficial impacts on the views from specified viewpoints.
- 20.4.10 Occupiers of nearby buildings, notable on adjacent roads may experience adverse noise, traffic and daylight and sunlight effects.
- 20.4.11 Future Site users are likely to experience beneficial effects on transport and access due to improvements in the surrounding transport network and internal connections, although adverse wind effects may occur.

# 21 Summary of Residual Effects and Mitigation

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## 21.1 Introduction

- 21.1.1 Table 2.1 within Chapter 2: EIA Regulatory Framework provides a summary of the changes of the 2015 ES, changes to legislation and policy, baseline, predicted effects and mitigation for each technical topic assessed. Within each chapter of this ES Addendum, the previously reported effects and relevant mitigation within the 2015 ES is stated.

## 21.2 Changes to Residual Effects

- 21.2.1 The residual effects for the Development remain as presented in the 2015 ES for all technical topics, with the exception of the following:
- Townscape and Visual Amenity: changes in likely effects for six viewpoints; and
  - Wind Microclimate: reduction from moderate adverse to negligible for pedestrian comfort wind conditions.

## 21.3 Changes to Mitigation

- 21.3.1 No additional mitigation further to those presented in the 2015 ES are required for the Development, with the exception of the implementation of the new landscaping scheme for wind mitigation purposes.